The Statistical Reporter

1892

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THE

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A MONTHLY JOURNAL OF STATISTICAL ENQUIRIES CONCERNING INDIA.

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TRADE STATISTICS,—INDIA.

(From Toulmin and Co.'s Circular.)

LEADING STAPLES EXPORTED FROM CALCUTTA FOR 12 MONTHS OF 1871 AND CORRESPONDING MONTH DURING THE PREVIOUS 9 YEARS.

	Indigo.					Indian Tea.					Bengal Silk.				Silk Waste.			
	Great Britain.	Foreign Europe.	America.	Gulf., &c.	Total Indian Maunds.	Great Britain.	Foreign Europe	America	All other places.	Total lbs	Great Britain.	Foreign Europe.	Bombay & Coast.	Total Bales.	Great Britain.	Foreign Europe.	Bombay & Coast.	Total Bales.
DECEMBER 1871	10,047	17,204	1,709	1,128	30,088	1,871,027	5,269	8,660	28,091	1,916,047	70	12	152	261	61	2	.	63
Previous 11 months.. .	37,167	8,845	6,122	1,608	57,122	13,864,337	15,171	32,831	96,616	14,008,258	6,019	1,054	1,962	8,431	2,768	94	29	2,891
TOTAL 12 months 1871	56,514	26,039	7,831	5,826	96,210	15,737,364	20,740	41,491	125,607	15,925,205	6,089	1,066	1,514	8,698	2,829	96	29	2,954
Same time in.. . .1870	53,505	19,021	7,083	4,724	84,025	11,776,803	1,341	31,666	62,714	11,872,054	6,295	1,824	1,971	10,089	2,559	585	145	3,089
Ditto in.... 1869	33,111	14,979	2,853	3,986	55,262	11,706,111	7,060	15,242	103,061	11,831,709	5,602	2,137	1,698	9,437	4,291	61	76	4,428
Ditto in.....1868	56,600	28,081	8,181	7,282	100,147	10,506,910	9,245	1,634	54,191	10,571,272	5,911	2,188	1,162	9,501	5,284	36	...	5,320
Ditto in.....1867	73,636	29,556	3,658	7,561	114,431	8,188,192	112	87,230	78,027	8,353,561	7,355	3,091	1,159	11,608	2,176	91	..	2,267
Ditto in.... 1866	56,530	21,187	3,972	11,103	92,852	1,827,710		12,088	17,137	1,857,535	8,272	1,611	2,398	12,311	3,705	254	62	4,021
Ditto in.....1865	62,779	22,589	2,645	12,020	100,024	2,065,797	1,510	3,500	12,106	2,085,914	8,181	2,516	1,705	12,432	5,217	327	..	5,544
Ditto in.....1864	72,143	16,127	2,355	8,518	99,143	1,142,788			39,820	1,182,608	7,149	927	2,670	11,053	2,649	..	...	2,649
Ditto in 1863	63,184	21,610	1,655	3,546	90,025	2,017,020			9,020	2,026,040	6,890	1,117	1,175	9,521	1,812	..	..	1,813
Ditto in.....1862	52,386	16,077	1,762	1,687	72,509	1,000,614	6,836	1,000	7,911	1,017,053	6,257	615	1,233	8,105	3,237	17		3,254

	Bengal Cotton.				Jute.									
					Jute including rejections					Jute Cuttings.				
	Great Britain.	Foreign Europe.	Hong-Kong.	Total Bales	Great Britain.	Foreign Europe.	America	Bombay & Coast	Total Bales.	Great Britain.	Foreign Europe.	America.	Bombay & Coast.	Total Bales.
DECEMBER ... .1871	43,111	15,117	2,728	60,880	179,161	3,805	10,935	1,711	198,745	2,750	.	18,816		21,566
Previous 11 months	207,196	43,331	88,181	338,711	1,171,568	1,485	7,293	11,556	1,205,702	14,626		111,922	2,150	158,698
TOTAL 12 months.....1871	250,340	58,751	90,509	399,600	1,351,029	5,290	85,058	19,070	1,461,017	17,376		130,738	2,150	180,264
Same time in 1870	74,342	11,466	71,803	157,611	921,621	2,811	65,351	6,395	999,208	11,484		70,806	25	82,315
Ditto in 1869	152,041	26,983	37,455	216,479	874,849	18,733	42,289	20,079	858,180	20,222		16,812	..	67,034
Ditto in 1868	151,774	1,522	107,667	260,963	962,238	3,135	54,573	61,972	1,071,738	58,175	548	40,153	..	99,176
Ditto in 1867	199,273	4,773	173,340	371,386	640,080	2,241	17,041	54,292	713,611	1,146	.	14,892	..	30,038
Ditto in 1866	310,762	4,298	87,120	411,180	536,970	2,005	41,692	26,101	607,158	21,784		10,366	..	31,750
Ditto in 1865	150,487	8,216	81,971	241,674	751,711	9,140	20,230	25,384	818,777	90,826		1,298	.	93,124
Ditto in ? 1864	174,720	4,517	3,377	182,614	552,818	9,456	16,646	159,110	738,260	40,986	110	3,950		45,376
Ditto in 1863	120,508	1,953	8,215	130,736	717,365	16,755	12,199	28,128	774,447	14,592	269	1,252	..	45,113
Ditto in 1862	86,600	1,690	14,029	102,328	369,043	1,271	12,960	13,43	429,006					..

	Gunny Cloth.				Gunny Bags.						
	Great Britain.	America.	All other places	Total Pieces.	Great Britain	America.	Bombay & Madras	Burmah.	Singapore, &c.	Australia.	Total Bags.
DECEMBER 1871	....	2,160	311	2,501	15,000	119,250	1,075,080	1,216,252	37,250	262,550	2,725,382
Previous 11 months.....	....	116,454	36,447	182,091	7,000	1,692,000	11,228,706	6,391,916	1,162,255	385,000	20,866,907
TOTAL 12 months ..1871	....	148,614	36,791	185,405	22,000	1,811,250	12,303,780	7,608,168	1,199,505	647,550	23,592,289
Same time in.....1870	....	314,863	7,062	321,925	1,000	4,390,353	6,024,874	3,871,897	826,710	685,780	16,712,586
Ditto in.....1869	....	74,392	5,722	80,114	11,550	364,042	16,636,865	3,031,789	2,107,000	188,452	26,240,598
Ditto in.....1868	....	139,958	8,385	148,343	12,000	1,814,050	18,811,624	7,142,273	877,729	553,940	28,711,616
Ditto in.....1867	37,328	402,020	971	440,322	10,000	5,472,217	*10,761,197	5,573,310	390,980	352,700	22,360,414
Ditto in.....1866	21,379	512,416	....	536,705	71,688	15,825,275	16,167,000	1,316,011	702,058	747,995	37,830,057
Ditto in.....1865	16,411	106,543	....	152,954	28,000	7,703,706	14,940,202	6,989,711	742,200	499,390	30,903,212
Ditto in.....1864	8,952	13,124	2,312	24,388	27,500	3,338,974	9,750,027	5,548,747	851,172	299,518	19,794,938
Ditto in.....1863	1,270	22,500	321	24,091	66,250	1,041,200	10,020,730	5,178,535	1,137,875	255,350	18,899,740
Ditto in.....1862	3,414	158,525	51,327	214,186	1,200	3,037,130	10,12,020	1,164,371	1,348,570	58,750	18,752,050

1 MARCH.

LEADING STAPLES EXPORTED FROM CALCUTTA FOR 12 MONTHS OF 1871 ATD CORRESPONDING MONTH DURING THE PREVIOUS 9 YEARS.—*Continued.*

	Saltpetre.						Shellac.					Lacdye.				
	Great Britain.	Foreign Europe.	America.	China.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	America.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	America.	All other places.	Total Cwts.
D— BER 1871	19,292	14	1,738	4,511	1,817	27,135	3,482	46	1,204	73	4,805	610	55	174	..	839
P— 11 months	274,929	6,080	47,083	23,012	11,315	355,149	38,808	2,417	14,081	812	56,118	10,870	316	1,294	..	12,480
TOTAL 12 months..... 1871	294,221	6,094	48,821	27,576	16,102	382,884	42,290	2,163	15,285	865	60,923	11,480	371	1,468	..	13,319
Same time in 1870	298,158	2,700	85,089	7,939	7,139	411,030	26,789	1,516	15,388	1,156	44,849	11,768	164	2,340	..	14,272
Ditto in 1869	229,101	10,757	82,718	56,985	20,777	400,668	15,705	4,931	8,999	1,362	61,087	17,932	64	2,627	..	20,623
Ditto in 1868	242,147		78,238	19,504	14,213	354,121	31,155	2,959	10,150	963	46,527	9,820	1,241	4,691	..	15,752
Ditto in 1867	197,825	..	47,054	57,092	9,002	308,972	28,111	4,021	1,360	2,033	38,525	9,016	158	2,096	2	11,267
Ditto in 1866	305,186		67,044	11,770	17,503	129,503	12,791	1,522	5,860	3,239	23,412	10,905	77	3,356	..	14,338
Ditto in 1865	287,414	9,784	123,408	71,104	1,746	505,906	46,219	3,622	6,087	1,990	58,518	9,034	382	4,124	..	14,440
Ditto in 1864	181,471	12,840	98,611	38,141	8,681	360,012	42,791	3,199	3,556	318	50,189	13,530	233	2,144	1	15,908
Ditto in 1863	367,500	4,319	91,668	61,213	8,820	529,520	51,143	1,958	5,032	230	58,558	12,045	54	1,897	..	13,996
Ditto in 1862	437,023	3,573	182,016	16,050	6,791	645,454	36,003	1,853	4,560	230	46,216	8,175	385	2,059	60	11,579

	Cutch.					Turmeric.					Borax.				
	Great Britain	Foreign Europe	America	All other places	Total Cwts.	Great Britain.	Foreign Europe.	America	All other places.	Total Cwts.	Great Britain.	Foreign Europe	America.	All other places.	Total Cwts.
DECEMBER 1871	821	..	27	52	380	..	..	618	115	733	555	....	..	129	684
Previous 11 months...	15,062	2,666	30,551	1,545	19,801	67,151	7,881	5,759	3,388	84,179	13,294	....	..	2,305	15,599
TOTAL 12 months 1871	15,283	2,666	30,578	1,577	20,184	67,151	7,881	6,377	3,503	84,012	13,849	....	..	2,434	16,283
Same time in 1870	21,146	22,923	27,860	109	71,138	43,807	5,222	6,269	6,287	61,585	8,013	....	..	3,196	11,209
Ditto in 1869	21,459	17,665	18,492	1,101	58,620	42,441	18,103	4,084	21,016	85,911	18,219	....	..	1,716	19,935
Ditto in 1868	12,307	5,029	13,923	191	31,450	11,610	8,660	3,277	18,715	75,298	10,627	....	100	2,187	13,004
Ditto in 1867	6,551	109	12,048	32	19,040	31,031	8,178	3,852	2,804	15,868	11,360	....	.	2,527	13,896
Ditto in 1866	1,998	66	2,057	165	7,287	15,891	3,617	2,010	3,774	25,295	7,647	....	.	1,073	8,684
Ditto in 1865	6,194	11	7,215	50	13,453	27,212	1,091	152	1,087	32,732	192	....	..	4,955	5,117
Ditto in 1864	1,803	7,781	1,073	111	11,101	21,672	6,111	106	1,066	29,555	5,659	....	..	1,633	7,292
Ditto in 1863	7,681	1,111	2,851		11,956	8,749	1,107	.	2,321	12,167	9,079	485	..	318	9,882
Ditto in 1862	20,991	8,918	1,506	82	31,597	967	1,255	.	892	2,514	2,657	1,318	..	1,369	5,344

	Corahs			Safflower.					Castor Oil.					
	Great Britain.	Foreign Europe.	Total Pieces	Great Britain	Foreign Europe.	America.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	America.	Australia.	All other places.	Total Cwts
DECEMBER 1871	3,382	140	3,822	518	..	..	7	525	1,125	....	74	4,370	751	6,320
Previous 11 months	84,719	988	85,707	15,419	289	638	919	17,165	20,141	167	838	7,371	15,612	44,129
TOTAL 12 months 1871	88,101	1,128	89,529	15,937	289	638	926	17,690	21,266	167	912	11,741	16,363	50,449
Same time in 1870	98,611		98,611	12,197	763	836	315	14,141	20,082	..	10,010	15,210	16,497	61,799
Ditto in 1869	67,176		67,176	14,815	801	280	377	20,173	42,790	1,980	6,988	8,858	18,464	79,080
Ditto in 1868	86,493		86,493	15,370	..	472	206	16,048	26,612	2,355	3,624	16,672	12,093	61,386
Ditto in 1867	55,798		55,798	8,379	150	211	897	9,016	24,828	221	2,026	6,280	18,316	51,671
Ditto in 1866	65,047		65,047	11,411	916	189	1,004	13,520	21,215	1,203	5,813	2,288	20,137	50,956
Ditto in 1865	59,136		59,136	8,776	610	117	2,508	12,011	16,019	2,183	5,609	3,251	13,271	42,333
Ditto in 1864	111,057		111,057	8,107	480	62	1,122	10,071	15,107	467	2,744	10,887	5,390	34,595
Ditto in 1863	133,595		133,595	8,727	134	136	1,565	10,802	24,448	6,324	6,260	5,063	6,586	48,671
Ditto in 1862	165,639		165,639	5,840	..	..	710	6,550	27,817	3,378	5,063	5,220	3,092	45,107

	Ginger.					Sugar.							
	Great Britain	Foreign Europe.	America	All other places	Total Cwts.	Great Britain.	Foreign Europe.	America.	Bombay & Coast.	Australia.	Burmah & China.	Ceylon & Gulfs.	Total Indian Maunds.
DECEMBER 1871	..	..	677	73	750	5,824	....	....	13,570	....	306	2,425	22,215
Previous 11 months	5,510	116	1,668	1,564	8,858	108,546	2	..	319,667	1,363	17,622	23,502	530,702
TOTAL 12 months 1871	5,510	116	2,345	1,637	9,608	174,370	2	....	333,237	1,363	18,018	25,927	552,917
Same time in 1870	5,200	..	5,161	3,169	13,838	139,589	....	....	317,501	....	11,411	16,503	485,094
Ditto in 1869	8,354	1,225	1,098	11,115	22,722	241,579	....	35,864	175,482	....	13,020	5,841	471,886
Ditto in 1868	5,579	558	2,367	20,712	29,216	181,030	....	....	260,123	....	20,086	13,827	494,079
Ditto in 1867	1,242	10	903	14,190	16,351	27,201	....	.. ..	355,470	7,202	22,249	16,789	428,960
Ditto in 1866	8,315	..	5,231	5,084	18,630	61,350	5,634	....	380,344	11,404	28,898	72,858	568,348
Ditto in 1865	9,752	.	3,250	10,271	23,282	170,000	....	....	715,017	11,110	43,010	17,739	996,505
Ditto in 1864	21,365	..	1,935	7,218	30,518	780,268	7,610	13,252	517,175	13,683	27,417	16,957	1,376,321
Ditto in 1863	9,122	..	1,527	1,254	11,903	53,727	....	11,762	467,152	2,827	16,850	17,709	551,887
Ditto in 1862	341	..	1,441	2,096	3,874	53,192	131	5,520	417,453	24,587	17,510	16,348	534,742

LEADING STAPLES EXPORTED FROM CALCUTTA FOR 12 MONTHS OF 1871 AND CORRESPONDING MONTH DURING THE PREVIOUS 9 YEARS.—*Continued.*

SEEDS.

	Lin-Seed.					Rape-Seed.					Teel-Seed.				Poppy-Seed.				
	Great Britain.	Foreign Europe.	America.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	America.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	All other places.	Total Cwts.	Great Britain.	Foreign Europe.	America.	All other places.	Total Cwts.
DECEMBER 1871	87,020	..	36,412	201	124,233	1,710	10,010	..	..	11,720	..	..	..	..	..	..	..	424	424
Previous 11 months....	1,256,113	132	1,109,633	330	2,657,211	1,320,636	288,721	3	603	1,609,960	709	165,996	4,103	170,808	21,131	20,385	..	871	42,387
TOTAL 12 months 1871	1,343,733	132	1,437,015	537	2,781,117	1,322,352	298,731	3	603	1,621,692	709	165,996	4,103	170,808	21,131	20,385	..	1,295	42,811
Same time in 1870	1,317,043	6,001	1,816,89	117	3,140,050	1,116,856	388,018	..	2,295	1,787,199	16,808	105,711	89,875	512,394	141,267	46,813	2,000	3,538	193,618
Ditto in 1869	711,211	14	1,046,746	90	1,757,061	645,895	99,309	..	380	736,584	1,700	59,661	31,403	92,764	131,599	26,357	..	685	158,641
Ditto in 1868	1,440,178	..	1,233,355	96	2,682,629	95,264	..	..	661	95,926	4,147	67,220	2,939	74,306	54,032	1,033	..	1,636	56,701
Ditto in 1867	1,144,939	..	975,053	101	2,120,093	870,972	16,933	15	2,353	890,273	52,036	311,377	71,424	407,837	126,977	13,553	..	370	140,900
Ditto in 1866	722,248	219	697,048	12,599	1,432,139	1,229,571	15,509	..	1,925	1,247,020	63,366	146,629	106,459	316,954	88,338	53,508	26	5,791	147,663
Ditto in 1865	1,308,033	256	519,567	1,509	1,829,365	766,873	6,225	..	156	773,254	18,396	2,193	1,111	22,000	215,144	10,907	..	330	226,381
Ditto in 1864	2,313,514	..	346,993	17,501	2,678,008	178,439	..	..	122	178,561	1,068	870	..	4,938	52,458	..	..	8	52,466
Ditto in 1863	2,035,403	12,869	845,778	48,110	2,142,160	248,201	3,153	..	33	251,387	22,343	11,137	..	33,490	90,482	3,725	..	..	94,207
Ditto in 1862	1,002,818	3,369	405,050	5,151	2,016,388	115,093	..	..	462	115,555	10,605	24,297	150	35,052	84,871	..	..	158	35,029

	Rice.												
	Great Britain.	Foreign Europe.	Bombay.	Madras.	Ceylon.	Australia.	China.	Singapore, &c.	Mauritius, &c.	Gulfs & Red Sea.	Cape and St. Helena.	West Indies.	All other places.	Total Indian Maunds.
DECEMBER 1871	228,733	...	189,188	9,194	5,032	56,486	21,675	14,728	184,133	315,245	.....	37,287	18,787	1,080,528
Previous 11 months	1,195,078	14,877	1,807,223	111,106	291,281	118,736	247,299	12,130	1,271,007	929,524	61,575	424,021	121,577	6,892,033
TOTAL 12 months 1871	1,423,811	14,877	1,996,410	153,600	299,313	175,222	278,974	57,175	1,456,140	1,244,809	61,575	461,308	140,364	7,772,561
Same time in 1870	1,087,637	68,238	2,671,858	164,086	781,036	64,249	77,050	28,395	2,487,502	751,567	83,618	286,985	259,431	8,714,561
Ditto in..... 1869	379,758	48,078	1,512 210	208,526	898,472	46,450	2 730	34,144	1,283,166	323,769	36,731	261,742	239,998	5,375,583
Ditto in..... 1868	1,690,986	98,349	1,616,172	157,320	931,587	185,161	1,000	12,522	2,106,159	1,024,010	58,077	510,733	36,875	8,463,157
Ditto in..... 1867	1,772,173	52,910	1,278,432	36,331	1,107,894	145,011	10,523	17,101	1,152,515	691 186	81,893	308,902	29,560	6,990,767
Ditto in..... 1866	233,166	10,881	1,017,111	77,288	805,749	121,810	5,163	39,968	1,755,284	570,959	75,539	286,615	60,401	5,066,527
Ditto in..... 1865	501,576	20,890	1,268,922	75,882	1,546,181	152,167	2,825,038	251,023	2,184,545	836,149	46,364	476,186	140,932	10,326,464
Ditto in..... 1864	503,293	64,499	5,180,882	161,306	1,046,186	351,786	3,630,318	175,216	2,809,571	987,896	104,080	235,987	60,147	15,329,110
Ditto in..... 1863	1,218,206	223,219	1,859,351	108,767	1,103,113	319,243	2,588,760	205,610	2,703,681	566,301	144,552	343,191	154,837	13,197,187
Ditto in..... 1862	1,644,515	365,759	735,587	168,706	2,020,110	295,175	1,013,301	119,985	2,330,106	555,707	119,333	373,340	104,044	10,195,998

HIDES, SKINS, AND HORNS EXPORTED FROM CALCUTTA FOR 12 MONTHS OF 1871 AND SAME TIME IN THE PREVIOUS 9 YEARS.

	Great Britain.								Foreign Europe.							
	Hides.		Skins.				Horns.	Horn Tips.	Hides.		Skins.				Horns.	Horn Tips.
	Cow.	Buffalo.	Calf.	Goat	Kid.	Sheep.	Cwt. qr. lbs.	Cwt. qr. lbs.	Cow.	Buffalo	Calf.	Goat.	Kid.	Sheep.	Cwt.qr.lbs.	Cwt.qr.lbs.
DECEMBER 1871	625,147	9,800	1,586	....	..	....	1,002 0 20	135 3 0	133,222	1,912	11,188	9,325	..	..	....	....
Previous 11 months ..	4,517,378	29,799	71,071	18,841	8,370	5,340	5,711 0 7	1,486 1 17	804,664	10,610	21,914	5,510	..	1,900	928 2 18	....
TOTAL 12 months 1871	5,042,525	39,599	72,657	18,841	8,370	5,340	6,713 0 27	4,021 4 17	936,886	15,522	33,102	14,835	..	1,900	928 2 18	....
Same time in 1870	1,237,111	21,559	22,454	32,300	17,010	21,331	11,212 1 12	3,190 1 26	552,518	3,304	1,900	9,595	2,000	1,300	3,689 0 15	64 1 10
Ditto in 1869	3,919,171	9,359	30,168	112,177	19,388	....	8,666 0 25	4,977 3 18	366,791	193	204	2,000	3,250	..	2,765 2 24	195 1 21
Ditto in 1868	3,628,163	15,181	40,555	275,230	17,762	....	3,818 0 0	2,618 0 26	529,611	....	6,912	39,140	..	1,176	2,986 0 8	....
Ditto in 1867	2,556,171	11,480	19,871	449,112	17,348	....	1,868 0 0	3,249 2 2	132,327	237	12,778	30,911	4,825	..	5,094 1 10	376 2 18
Ditto in 1866	2,864,104	5,719	45,279	144,416	15,185	7,900	6,015 1 26	4,036 1 26	197,378	284	8,037	6,353	3,208	..	2,560 0 14	86 2 0
Ditto in 1865	2,293,610	13,828	31,775	63,065	10,000	.. ..	3,502 2 20	3,065 3 25	165,591	2,000	15,821	..	..	..	3,287 1 0	366 1 16
Ditto in 1864	2,687,201	710	34,239	45,121	10,084	....	4,388 2 1	3,396 2 0	81,674	....	6,013	..	..	..	2,195 1 11	....
Ditto in 1863	2,999,218	22,009	30,492	156,818	18,058	....	1,145 3 8	3,711 3 6	171,366	.. .	1,318	..	..	..	2,519 1 15	657 3 10
Ditto in 1862	3,404,092	21,950	60,427	121,048	20,712	3,070	5,650 1 2	2,060 2 3	292,907	....	12,370	..	1,000	..	2,791 0 7	1,573 1 10

	America.								All other Places.							
	Hides.		Skins.				Horns.	Horn Tips.	Hides.		Skins.				Horn Tips.	Horns.
	Cow.	Buffalo.	Calf.	Goat.	Kid.	Sheep.	Cwt. qr. lbs	Cwt. qr. lbs.	Cow.	Buffalo.	Calf.	Goat.	Kid.	Sheep.	Cwt.qr.lbs.	Cwt.qr.lbs.
DECEMBER 1871	17,500	7,136	....	151,400	..	24,000	....	....	....	....	..	....	..	60	....	....
Previous 11 months ..	161 041	320,562	....	2,412,579	2,000	375,322	....	....	48	163	..	4,000	..	5,310	.....	....
TOTAL 12 months 1871	181,541	333,698	....	2,593,979	2,000	399,322	....	....	48	163	..	4,000	..	5,370	....	....
Same time in 1870	402,102	435,049	....	2,282,304	1,000	197,308	....	....	1,401	40	180	6,606	..	1,300	....	....
Ditto in 1869	328,040	322,687	240	944,371	200	160,500	....	....	328	12	288	13,250	..	12,225	....	....
Ditto in 1868	258,401	200,159	....	703,350	..	20,500	....	....	....	....	288	3,000	..	1,000	....	....
Ditto in 1867	448,006	134,157	....	500,052	..	....	....	100 0 0	202	18	..	2,050	..	..	....	....
Ditto in 1866	205,000	144,930	....	1,230,105	..	23,000	119 3 0	....	....	....	..	18,323	..	92,549	....	....
Ditto in 1865	109,067	170,659	....	1,293,855	..	21,500	5 1 18	....	3,100	....	..	..	..	5,040	....	....
Ditto in 1864	234,000	83,280	....	801,578	..	11,000	....	....	....	....	..	2,410	..	400	....	....
Ditto in 1863	104,116	170,153	....	1,059,136	..	44,498	....	....	160	24	..	17,650	..	3,555	146 3 10	....
Ditto in 1862	267,800	177,570	....	698,297	..	11,100	....	....	120	10,093	120	26,258	..	..	89 1 4	....

CONSUMPTION OR QUANTITY RETAINED FOR MANUFACTURING PURPOSES, OF THE LEADING ARTICLES OF COMMERCE, AND OTHER STATISTICS OF THE UNITED KINGDOM.

Year.	Estimated Population 31st Dec.	Sugar. Raw and Refined. Tons	Sugar. Raw and Refined. lbs. per head	Molasses. Tons	Molasses. lbs. per head	Tea. Lbs.	Tea. per head	Coffee. Lbs	Coffee. per head.	Cocoa. Lbs	Cocoa. per head	Rice. Tons.	Rice. Lbs. per head.	Tobacco. Lbs.	Tobacco. per head.	Tallow. Tons.	Tallow. Lbs. per head.	Wine. Gallons.	Wine. per head.
1860	28914000	448070	34·61	27908	2·08	76859428	2·66	35674381	1·24	3481181	0·12	76778	5·94	35412345	1·22	71049	5·50	7358189	0·25
1861	29196000	478040	36·06	54500	1·18	77949065	2·67	35475875	1·21	3576384	0·12	79172	6·07	31976453	1·20	57590	4·42	10787091	0·37
1862	29400000	488856	37·21	55840	1·22	78817000	2·68	31661155	1·18	3926500	0·13	132457	10·08	35614985	1·21	48519	3·70	9803046	0·33
1863	29600000	495050	37 16	37452	2 83	85200776	2·88	32986116	1·11	4106408	0 14	73235	5·54	37616248	1·27	50333	4·26	10478057	0·35
1864	29800000	499804	37·53	25311	1·90	78647088	2·98	31591122	1·06	4171082	0 14	80518	6·05	38239521	1·28	49300	3·70	11456715	0·38
1865	30000000	515781	40·75	28092	2 11	97021911	3·26	30718419	1 02	4286635	0 14	27261	2·04	39179801	1·30	46015	4·03	12061386	0·40
1866	30050000	550166	41 68	32255	2 41	102325067	3 41	30914363	1·03	4606997	0·15	18726	3·63	40995161	1·36	64518	4·81	13327916	0·44
1867	30100000	594458	44·15	20146	1 48	111057705	4·69	31567760	1 05	4585517	0 15	78868	5·87	41053613	1·98	52076	3·84	13754313	0 46
1868	30200000	561155	41 62	34579	2 77	106918118	3 54	30908164	1·01	5730223	0 19	131729	10·00	41280001	1·36	57163	4·21	15181741	0·50
1869	30450000	588369	44·05	37088	2 74	111889113	3·69	29109113	0·95	6561216	0·22	175038	12·92	41719500	1·37	59056	4·36	14840158	0·49
1870	30500000	659705	48·15	35568	2 61	111782620	3·84	30913413	1 01	6913081	0 24	87503	6·43	41052795	1·37	77879	5·72	15053100	0·50

Year.	British and Foreign Spirits. Gallons.	per head	Foreign Wool. lbs.	per head.	Cotton. Lbs	per head	Raw Silk. Lbs.	per head	Total Value of Importations £.	per head	Total Value of British and Irish Produce Exported. £.	per head	Ships in Foreign Trade Entered Inwards. Ton'ge	per head.	Declared Value of Gold, Silver, and Specie. Imported	Exported.	Bank. Interest. An. Avge. per cent.	Income-Tax. Net Amount Charged for Property and Profits.	Per head.
1860	27066125	0 94	117639210	4 06	1140510112	39 40	6021654	0 21	171739166	118/8	145891227	99/11	12172745	0 42	22978196	25531768	4·18	29923878	206/9
1861	25097640	0 86	92795747	3 18	958986816	32 81	4619859	0 16	179031111	122/8	124102814	85/8	13179589	0 45	18747045	20811648	5·21	30134865	208/5
1862	24720611	0 84	124810674	4 21	3092580506	10 52	3090410	0 17	184120121	125/3	124137812	84/5	14091000	0 47	31656176	28326191	5 53	31707086	215/8
1863	24718991	0 84	113419703	3 83	1282130768	11 47	5505220	0 18	203426363	137/9	146602412	99/1	13259063	0 45	30030791	26541040	4·10	32894129	218/11
1864	26514650	0 89	150539096	5 05	618502416	21 74	1744271	0 6	229577691	152/0	160436302	107/7	14515011	0 45	27728276	23157515	7·35	32660950	219/1
1865	26994464	0 90	129761317	4 33	675069060	22 75	1580230	0 15	219396087	146/6	165802402	115/1	14117886	0 48	21102211	15210994	4·75	34930165	232/10
1866	29769808	0 99	172755201	5 75	984177568	32 88	3188711	0 12	238773102	158/10	188827785	125/8	15612170	0 52	31287139	21970087	6·90	36430553	248/6
1867	29090097	0 97	142951240	4 75	911910496	30 21	5947631	0 14	220862585	146/9	181183971	120/5	11827617	0 39	23821017	14327289	2·51	37432902	248/9
1868	28610658	0 94	147673811	4 80	1005163536	32 9	1105582	0 4	249616302	165/4	179163611	119/0	13851317	0 46	21852595	20229014	2 10	38564266	254/9
1869	29024124	0 98	141853483	4 67	918298512	31 21	2521215	0 09	250617820	165/2	190015240	125/3	11185945	0 48	20500991	16391999	3·20	Not yet	....
1870	....	..	167168419	5 48	1074501744	35 20	3018669	0 11	279031192	169/10	198157898	129/11	14910486	0·49	28923106	18331150	3·04	published.	....

HISTORY OF THE EUROPEAN TRADE WITH THE EAST INDIES.

The Genoese and Venetians acquired almost exclusive commercial privileges from the sovereigns of Constantinople, for a long time previous to, and until the downfall of the Eastern Empire. The European trade by the Euxine and Caspian seas, and by the caravans with India, had centered at Constantinople, which, with Alexandria, became the mart for distributing the rich products of the East over Europe. The Turks destroyed the commercial entrepot of Constantinople, in which the Genoese had the most ample privileges. After that expulsion, the Venetian power retained for more than half a century, the unrivalled monopoly of the remaining great emporium of Alexandria. But this monopoly was, in the early part of the sixteenth century, transferred, not only from Alexandria to other entrepôts, but from the Venetians to a previously unimportant nation. The progress of navigation round the coasts of Africa, which was commenced by the Portuguese, extended, in 1481, so far, that Diego Cam discovered Congo, and, it is said, brought to Portugal "an account of a Christian king who reigned in Ethiopia, which induced King John II of Portugal to send trusty persons to gather intelligence," but they returned without performing such service. In 1187, two Portuguese travellers, Pedro de Covillam and Alonzo de Payva, who spoke Arabic, left Portugal for Alexandria and Cairo, as merchants; they proceeded from Cairo, with a caravan of Moors, to Tor, on the Red Sea, where they were informed of the trade to Calicut. They sailed together to Aden, where they separated. Covillam went in a Moorish ship to Cannanore, and from thence to Goa. He was the first Portuguese that ever was in the Indian seas. From thence he passed to Sofala, on the east coast of Africa, to visit the gold mines, where he gained intelligence of Madagascar, called by the Moors "the Island of the Moon." From Sofala he went back to Aden, and thence to Egypt, where he learned that Payva, who had parted with him for Ethiopia, was dead. He then went again to Tor, thence to Aden, where, hearing of the fame of the city of Ormus, he sailed thither, and having observed what was most remarkable, he returned to the Red Sea. He then went to the court of the King of Abyssinia, where he was detained a prisoner till 1520 when he was released, and returned to Europe.

In 1493, Bartholomew Diaz was employed by the King of Portugal to proceed along the south coast of Africa, until he reached a high cape, which he doubled, and sailed some way to the east of it. He named the promontory the "Cabo Tormentoso," from the boisterous weather he experienced. On his return to Portugal, the king changed its name to "Cabo Boua Esperanza," or the Cape of Good Hope, which name it has retained. In 1497, the account of Diaz, with the despatches from India transmitted by Covillam, occasioned an expedition to be equipped, consisting of four ships under Vasco de Gama. He sailed from Lisbon on Friday, July 8th 1497, rounded the Cape of Good Hope November 20th; and having proceeded along the coast as far as the River Guama, they repaired their ships, and sailed on the 22nd of January 1498. On the 1st of March they discovered Mosambique, where they narrowly escaped being cut off by the Moors. On the 7th of April they arrived at Mombas, and on the 13th at Melinda; they were kindly received at the latter, were they obtained a pilot for the Indies. On the 20th of May 1498, they arrived at Calicut, and met with a favourable reception; but the Moors, who considered their trade menaced by rivals, persuaded the chief of Calicut to plan the destruction of the new adventurers. De Gama, having been informed of this treachery, is said to have hastened on board his ship, and to have written a letter to the king, complaining of his breach of faith; and that the king returned a courteous answer, blaming his ministers and the Mahometan Moors; and that he then wrote a letter to the King of Portugal, by which he consented that the Portuguese should trade freely with the town and country of Calicut. De Gama then proceeded to Anjediva, where he repaired his ships, and then sailed homewards. On the 20th of March 1499, he doubled the Cape of Good Hope, and in September following arrived safe at Lisbon, after a most successful voyage of two years and ten months.

On the 9th of March 1500, a second Portuguese fleet, of thirteen ships, sailed from the Tagus for India, under the command of Cabral, who discovered the coast of Brazil, April 24th. During very tempestuous weather off the Cape of Good Hope, several of the ships were lost. In one of them was Bartholomew Diaz, who first sailed round the Cape. Cabral visited Mosambique, Quiloa, and Melinda, and arrived at Calicut September 13th. The king sent for Cabral, on his arrival on shore, and received him courteously, granting him permission to erect a factory. Cabral afterwards, either believing or fearing that the intentions of the king, or the samorin, as he was called, were treacherous, commenced hostilities by seizing the samorin's ships; upon which the inhabitants attacked the factory, forced the gates, pillaged and burnt the factory, and of sixty-six people who were in it, killed fifty; the remaining sixteen escaped on board their ships. The Portuguese then burnt ten vessels richly-laden in the port, made slaves of their crews, and battered the town with heavy artillery. Cabral then sailed to Cochin, off which place he arrived on December the 20th 1500, concluded a treaty with the king, established a factory, obtained cargoes for his ships, and on the 10th of January 1501, sailed for Europe, where he arrived July 31st having on board ambassadors from Cochin, Quilon, and Cannanore. Of the thirteen ships which sailed under Cabral, six only returned, the others having been lost during the voyage. Before his return to Europe, Cabral established factories at Melinda, Mombas, and Querimba, and compelled several of the princes on the east coast of Africa to acknowledge themselves tributary to the Portuguese.

In 1502, Vasco de Gama sailed from the Tagus, with a fleet of twenty ships, a second time for India. In March following he reached Sofala, and obtained leave to settle a factory. He then sailed for Mosambique, where he also obtained permission to build a factory. On July 12th he reached Quiloa, whose prince acknowledged himself tributary to Portugal. He then proceeded to Cannanore, concluded a treaty of commerce, loaded some of his ships, and then departed for Calicut, which he cannonaded, destroying the palace and many of the houses. He captured several ships in the roads with rich cargoes; he then returned to Cannanore, from whence he sailed for Europe, December 20th, 1503;

and arrived at Lisbon, September 1st 1504. In 1503, a fleet from Portugal, under Albuquerque, visited Socotra, Guardafui, and Muria Bay. At Cochin he built a fort, and he established a factory at Quilon. Saldanha Bay was this year first visited by the Portuguese, and Mombas, Zanzibar, and Brava, on the east coast of Africa, became tributary to them. In 1505, Calicut was a third time bombarded by the Portuguese, who burnt Cranganore, and captured many richly-laden vessels belonging to the Moors. These expeditions were of a character little superior to those of pirates. The Mahometan, Moors, and Arabs were at this period the chief Oriental merchants and navigators. They had three marts from whence they carried on a great trade with the most distant parts of India. First, Aden, at the mouth of and constituting the Gibraltar of the Red Sea; Ormus in the Persian Gulf; and Malacca, within the straits of the same name. The Portuguese in a short time resolved to become possessed of these marts, by sending out large fleets with numerous land forces. Events were taken advantage of with this view. The King of Quilon refusing to pay tribute, the Portuguese took and plundered the town, and built a strong fort, leaving a garrison of 500 men; they were afterwards driven out by the Arabs.

On the 25th of March 1507, a fleet of twenty-two ships sailed from Lisbon, under Francis Almeyda, upon whom the King of Portugal conferred the title of Viceroy and Governor-General of the Indies. He arrived at Mombas on August the 8th, where his boats being fired upon, he battered the forts, took the city by storm, and made slaves of the inhabitants. From thence he proceeded to Anjediva, and built a fort. He then sailed to Onore, where being ill-received, he burnt the town, and the shipping that were in the harbour. He then proceeded to Cananore, where he likewise built a fort. At the same time, the Portuguese built a fort at Sofala, surveyed the Maldive Islands and sailing round Cape Comorin discovered the Island of Ceylon. In 1507, Muskat, or Muscato, was reduced by the Portuguese, who committed great ravages on the towns upon the coast of Africa, plundering and burning all places where the chiefs refused to become tributary. The fleet under Albuquerque made also an unsuccessful attempt upon Ormus. Malacca was first visited by the Portuguese in this year. On the 6th of March 1508, a fleet in two divisions, under Tristan d'Acunha and Alphonso Albuquerque, sailed from Lisbon. The former discovered the islands which bear his name. On their passage to India they visited Brava, which, being in rebellion against the Portuguese, was plundered and burnt, and great cruelties were inflicted upon the inhabitants. Socotra was also taken. In 1509, the Portuguese made an unsuccessful assault upon Diu; the Moorish ships in the harbour were destroyed. The city of Calicut was taken, plundered, and burnt by the Portuguese The Island of Sumatra was discovered by them. In 1510 the city of Goa surrendered to the Viceroy Albuquerque, who made his public entry into it on February the 17th; after but it was soon retaken by the inhabitants of the country, but on November 22nd it was again assaulted by the Portuguese, who put the whole garrison to the sword. Several forts were then built, and Goa then became the capital of the Portuguese East Indies. The chief of Zanzibar neglecting to pay the stipulated tribute, the place was plundered, and destroyed by the Portuguese. On the 2nd of May 1511, Albuquerque sailed from Goa for Malacca, where he arrived on the 1st of July On the 24th he attacked the town, and after an obstinate resistance, it was taken by storm, and plundered The Portuguese then visited Siam, where they were kindly received. In 1512 Albuquerque sent three ships to the Spice Islands. They visited Parlembang, on Sumatra; the islands of Ternate, Bouro, Amboyna, and Banda, where they obtained great quantities of spices. Surat was plundered and destroyed this year by the Portuguese. In 1513 Albuquerque, with a large fleet and army, made an unsuccessful attempt upon Aden, the stronghold of the Moors; he then sailed up the Red Sea. He was the first European who had entered this great Gulf. He wintered at the Island of Camaran, and then returned to India. On the 26th of February 1514, Albuquerque sailed for Ormus, where he arrived on 26th of March. This mart surrendered to him, and he built a fort in the place. He then returned to India, and died near the bar at Goa, December 16, 1515.

In 1516, the successor of Albuquerque, Soarez, fitted out a considerable fleet for the Red Sea. On his way thither he stopped at Aden. The inhabitants being apprehensive of an attack, sent deputies to offer their submission. The Portuguese relying on their professions, neglected the erection of defences to secure the place, of which the natives took advantage, and in a short time put themselves into such a posture as to defy any of the Portuguese to obtain possession. An unsuccessful attempt was made upon Judda; but Zeyla was taken and burnt by the Portuguese. In 1517, the Portuguese, under Soarez, proceeded to Columbo, in Ceylon, where the king finally agreed to become tributary to them, and to pay annually 1,200 quintals of cinamon. He also ceded to them Point de Galle. In this year Ferdinand Andrada arrived and opened a trade at Canton, and returned with a valuable cargo to Molucca. The Portuguese this year burnt the town of Barbora. In 1519, the Spaniards laid claim to Banda and the Malacca Islands, as falling within the line laid down by the Pope in 1493. The Emperor Charles V. employed Ferdinand Magellan to explore them by a new route westward, through the straits which bear his name. In this way he discovered the Philippine Islands, where he lost his life in a skirmish with the natives. The ships reached Tidore, and returned home by the Cape of Good Hope. This was the first voyage made round the world. The Spaniards made many successful attempts to obtain possession of the Moluccas; at length the King of Portugal lent the Emperor, his brother-in-law, 350,000 ducats, on condition of his not being disturbed therein till the money was repaid. Spain neither repaid the money, nor renewed the claim. In 1520, the islands of Bahreen in the Persian Gulf, and Catif, were subjected to the Portuguese. In 1521, a fleet was sent against Diu, but finding it strongly fortified, the attack was abandoned. This year the Portuguese built a fort at Ternate, and the Spaniards obtained possession of Tidore. A trade with China having been established by Andrada, his brother Simon this year obtained leave to proceed thither with five ships; but, in consequence of the misconduct, alleged or real, of the Portuguese, the Chinese massacred greater number of them, the survivors escaped to Malacca. De Witt, in his "Interest of Holland," says, the spice trade at this time yielded the King of Portugal above 200,000 ducats yearly, he also observes that when the spice trade centered in Calicut, the great staple of India, and was carried to Bussorah and Egypt, and from thence to Cairo by caravans, and shipped for Europe the sultans of Syria and Egypt, through whose dominions they passed, derived an annual revenue of 80,000 ducats in customs.

The Venetians having enjoyed the whole commerce in spices, till deprived of it by the Portuguese, proposed to the Court of Lisbon to buy all the spice annually imported (over and above what that kingdom itself might consume) at a certain fixed price: the proposal was rejected. The Portuguese attacked Acheen in Sumatra, but were repulsed with great loss, the Sumatrans then became inveterate enemies to their assailants, and invariably inflicted shocking cruelties upon such Portuguese as fell into their hands. In 1525, the fort built by the Portuguese at Calicut, was attacked by the natives, and the former abandoned the place after having demolished the fortifications. In the year 1526, the Portuguese discovered the island of Celebes, and plundered and destroyed Dofar on the coast of Arabia, and Massuah on the coast of Abyssinia. In 1527, Borneo was discovered by the Portuguese, who also plundered and burnt Mangalore, Porca, and Chitwa on the Malabar coast; and took Tidore from the Spaniards. In 1529, the towns of Bassein and Tannah were subjected to the Portuguese. In 1530, a Portuguese fleet proceeded up the river Taptee, burnt Surat, and several villages. About this time Dumaum was taken, and a treaty concluded with the King of Cambay upon terms favourable to the Portuguese, who built a fort at Diu, but the natives expelled them from the island of Ternate. In 1531, and the following year, the Portuguese destroyed Gogo, Pate, Mangarole, and most of the other towns on the coast of Guzerat. In 1532, Aden rendered tribute to the Portuguese. In 1534, the King of Cambay ceded Bassein and its dependencies in perpetuity to the Portuguese. In 1537, the King of Cambay, repenting of his grant to the Portuguese to build a fort at Diu, made an unsuccessful attempt to dislodge them, in which he lost his life, and the Portuguese obtained entire possession of the island. Malacca was twice attacked by the forces of the King of Acheen, but was repulsed with considerable loss. The island Magindanao discovered. In 1538, the Arabs sent a fleet from Suez, and made an attempt upon Diu, but were repulsed with great slaughter. On their return to the Red Sea, they expelled the Portugnese from Aden. About the year 1540, the Portuguese first traded to Patany, Cambodia, and Cochin China. In 1542, the coast of Japan was discovered by three Portuguese, who were driven thither in a junk, bound from Siam to China. They were received hospitably by the Japanese.

In 1545, the King of Cambay attempted unsuccessfully to obtain possession of Diu, and the Portuguese destroyed Gogo, and many other places on the seacoast of his dominions. Delagoa Bay was visited by the Portuguese. In 1555 the Portuguese plundered Tatta, and put 8,000 of the inhabitants to the sword. The western powers of India formed a league in 1567 against the Portuguese. The King of Acheen acceded to it, and besieged them in Malacca with a fleet, and with 15,000 men and 200 pieces of artillery; but after prodigious efforts of valour, the Portuguese resisted all assaults, and retained the place. This was one of the most desperate sieges which the Portuguese repelled in India, their whole force not exceeding 1,500 men, of whom only 200 were Europeans. The successes of the Portuguese in various parts of the world, gained them, during this and the following three or four years, further high naval and military reputation; their fleets covered the sea, and their settlements were spread along the eastern and western coasts of Africa. From the Red Sea to China and Japan, they were sole masters of the European trade of the east; and in America, the coasts of Barzil were under their dominion. In 1578, the King of Acheen having made several attempts against Malacca, invested it with a fleet of 300 vessels, 80 of which were junks of 400 tons each. After a siege of three months, and a loss of 10,000 men, he returned. The crown of Portugal was annexed to that of Spain in 1580, from which period the Portuguese interest in India were neglected by the united crowns. At this period the Portuguese possessed the following places:—Sofala, Mosambique, and Mombas, on the East coast of Africa, Muscat in Arabia, the Island of Ormus, and Bussorah in the Persian Gulf, Diu, on the coast of Guzerat; a fortified factory at Dumaum, the town and castle of Choul, and a factory at Dabul; the city of Bassein, the island of North Salsette, and the town of Tannah; the island of Bombay; the town and fort of Goa, which was the capital of their possessions; a factory at Onore, Barcelore, at Mangalore, at Cannanore, and the town of Calicut; a factory at Cranganore, the port of Cochin, and a factory at Quilon. They had also established themselves in several parts of Ceylon. On the Coromandel coast they had stations at Negapatam, St. Thomé, and Mausulipatam, and had established commercial stations in the province of Bengal. They had also factories, or liberty of trade, at Pegu and Martaban, a station at Junk-Ceylon, and had taken possession of, and fortified Malacca; but they do not appear to have had any establishments of consequence on the islands of Sumatra or Java. All these places were controlled by the supreme Government of Goa, where the Viceroy presided over all, civil and military, and the Archbishop over ecclesiastical affairs.

The crown of Portugal derived from those settlements, during about fifty years, a net annual revenue, estimated at about 250,000*l.*, after paying the salary of the Viceroy (about 1,000*l.* a year), together with that of the subordinate Governors, and the whole expense of the civil, military, and ecclesiastical establishments. This revenue was derived from the duties levied on all goods imported and exported at the different places that have been enumerated, from the tribute paid by some of the small states on the coast of Malabar, for the protection afforded them; and from the sale of those vessels that were captured, when found trading in the Indian seas, without a license from the Viceroy. With respect to the trade carried on between Portugal and India, there are no data to form a correct estimate of its profits; but from the quantity of goods imported from Asia and Africa annually to Lisbon, and the value of those goods in India, and the prices at which they sold in Europe, the profit was estimated at 150,000*l.* per annum. Portuguese writers state, that a fleet of twenty ships sailed regularly every year from Goa to Lisbon, laden with the products and manufactures of India and China. Indian goods then yielded in Europe a profit of about 30 per cent. The private fortunes made by individuals were enormous. In about fifty years some of the Viceroys returned to Portugal with 300,000*l.*, several of the Governors and Generals with 100,000*l.*, and many subordinate, civil, and military officers with from 20,000*l.* to 50,000*l.* The ecclesiastics realised fortunes from the fees they were authorised to take, and from plundering the villages, in order to compel the inhabitants to embrace the Romish faith. About the year 1586, a pirate, who committed great ravages upon the coasts of China, obtained possession of the island of Macao. He then blockaded Canton and besieged the city. The Portuguese assisted the Chinese, and drove the pirates out of Macao, by which means the Portuguese obtained a grant from the Emperor to make a settlement at Macao, where they built and fortified a town, which they still hold. Soon after this period the English trade commenced with the East. Before noticing the further details of the Portuguese trade, or of the Dutch, French, or other commercial advantures, east of the Cape of Good Hope, we will endeavour to give an account of the rise and progress of the British trade with India

RISE AND PROGRESS OF THE BRITISH TRADE, NAVIGATION, AND POWER IN THE EAST INDIES.

The first attempts of England to open a maritime intercourse with India was not by a voyage round the Cape of Good Hope, but by an unsuccessful attempt made by Forbisher to discover a passage round the worth west of America, in 1576. In the following year, Drake sailed on his voyage round the world. He passed through the Straits of Magellan, traversed the Pacific coasts, plundered several Spanish settlements, crossed the Pacific, touched at the Moluccas, entered into a treaty with the chief, and brought, in 1580, a quantity of spices to England. In 1583, three English merchants, Fitch, Newberry, and Leedes, travelled overland to India, provided with letters to the King of Cambay, the Emperor of China, &c. They proceeded to Tripoli, in Syria, thence to Bagdad, and down the Tigris and Persian Gulf to Ormus, where they embarked for Goa. They then proceeded to Agra, where Leedes entered into service of the Great Mogul. Newberry died in India; and Fitch proceeded to Ceylon, Bengal, Pegu, Siam, Malacca, and many other parts of the East Indies, in all of which places they found the Portuguese had formed settlements or trading ports. They were in general received kindly by the natives of the various countries they visited, but thwarted by Portuguese. In 1586, Cavendish sailed from Plymouth, the 21st of July, arrived at the Cape de Verd Islands in September 1586, and passed through the Straits of Magellan in January 1587. He followed the Pacific coast to the northward, and traversed the ocean to the Ladrones, where he arrived on the 3rd of January 1588, and by the 6th of March passed the Straits of Sunda, and arrived, by the way of the Cape of Good Hope, at Plymouth on the 9th of September 1588. This was the second voyage round the world performed by the English. In 1587, Sir Francis Drake captured, near the Azores, a Portuguese ship from the East Indies, and brought her to England, with papers which afforded very ample information relative to the Oriental trade of the Portuguese. Camden attributes to these papers the first idea of commerce from England to India. In 1591, the voyages of Drake and Cavendish were fitted out more for annoying and plundering the Spaniards than for commerce. But the information obtained in consequence, and from those who had visited India by overland routes, induced some merchants of London to fit out, and sent direct by the way of the Cape of Good Hope, in diffiance of the Portuguese pretensions to the exclusive right to the navigation by that route, three ships, the *Penelope*, the *Merchant Royal*, and the *Edward Bonaventure*, under the command of George Raymond and James Lancaster. The avowed object of this expedition was to establish a commercial intercourse between England and India, but the profits of privateering were, however, kept in view, and before reaching the Cape several Portuguese ships were captured. The consequent loss of time delayed their reaching the Cape, they encountered the most inclement season, and the crews were so sickly, that the *Merchant Royal* was sent back. The other ships soon after parted company in a storm; and the *Penelope* with Raymond was never heard of. Lancaster arrived at Sumatra; but owing to the sickly state of his crew did not reach the Moluccas. On his return home, being short of provisions, he sailed to the West Indies, where he, with many of his crew, landed upon an uninhabited island, in order to procure food. While on shore the remainder of his crew sailed away with the ship. He was some time after rescued and brought home, but not before most of his people had perished from want of food

In 1592, some English privateers captured a large Portuguese ship, called the *Madre de Dios*,* of 1,600 tons' burden, and brought her into Dartmouth; this was the largest ship ever seen in England. The cargo consisted of spices, calicoes, silks, gold, pearls, drugs, porcelain, &c., valued moderately at 150,000*l.*; and this immensely rich prize excited the most rapacious spirit of enterprise, but little was effected until 1596, when Sir Robert Dudley and others fitted out three ships with the intention of trading to China. Wood, the commander, had letters from Queen Elizabeth to the Emperor of China. This expedition was fatally disastrous: no one ever returned. The origin of the British trade to India is attributed by most writers to Queen Elizabeth. She, no doubt, countenanced the earliest enterprises; but, allowing that princess all just merit, we cannot follow those courtly adulators at the expense of truth for the trade from England to India owed its origin to the general progress of commercial enterprise and to necessity. In 1599, Queen Elizabeth appointed Sir John Mildenhall as her minister to travel overland, by the route of Constantinople, to the Great Mogul. He arrived at the court of that potentate, and applied for trading privileges to an English Company. He was opposed by the Portuguese at that court: but he finally succeeded to a partial extent. Individual enterprise, in regard to the risk of undertaking uncertain adventures, was paralysed by the disastrous fate of Raymond's expedition. The Dutch had, however, opened a successful trade to India. "At this juncture England," says Methuen, "not being able to get supplied with Eastern commodities from Lisbon, on account of the war, could only obtain them through the medium of the Dutch, or her own Turkey Company, by way of the Levant. The Dutch, taking advantage of this circumstance, raised the pepper upon us, from about three shillings to the extravagant rate of six and eight shillings per pound. Aggrieved by this imposition, the merchants of London conceived an idea of putting in for a share of this trade. A meeting was accordingly called on the 22nd of September 1599, at Founder's Hall, at which the Lord Mayor and most of the Aldermen and principal merchants of the city, to the number of 101, attended, and agreed to form an association, for the purpose of establishing a commercial intercourse with India direct. The sum raised for that purpose was 30,133*l.* 6*s.* 8*d.*" Managers, or committee-men, were soon after appointed to conduct the adventure, and a petition presented to the Lords of the Privy Council, set forth, "that, stimulated by the success which has attended the voyage to the East Indies by the Dutch, and finding the Dutch are projecting another voyage, for which they have bought ships in England; the merchants, having the same regard to the welfare of this kingdom that the Dutch have to their Commonwealth, have resolved upon making a voyage of adventure, and for this purpose entreat Her Majesty will grant them letters patent of incorporation, succession, &c.; for that the trade, being so far remote from hence, cannot be managed but by a joint and united stock." On the 4th of October, the subscribers were informed that the Lords of the Privy Council were pleased to favour the enterprise. On the 16th they reported that Her Majesty had expressed her gracious approbation of the voyage, as also that the Lords of the Council desired some of the principal adventurers would attend them to receive orders for their further proceedings.

Queen Elizabeth however stopped at this stage of the proceedings, on account of the attempt then made on the part of Spain to negotiate a peace with England. Commissioners from Madrid had arrived in London for that purpose, and as it was known that Spain would insist upon excluding England from the trade to India, it was judged advisable to petition the Lords of the Council, "soliciting their lordships' warrant, that the voyage might be proceeded upon without any hindrance, notwithstanding the treaty, and that by reason thereof, they should not be staid when the shipping was prepared." In reply, "their lordships declined granting such warrant, as deeming it more beneficial for the general state of merchandise to entertain a peace, than that the same should be hindered by the standing with the Spanish Commissioners for the maintenance of this trade, and thereby forego the opportunity of concluding the peace." The committee of management then, "fearing lest, after they were drawn into a charge, they should be required to desist from the voyage, were determined to give up the concern." The negotiation for peace with Spain was soon after entirely broken off, and in 1600 the merchants of London applied to the Queen for a charter, to undertake a trade to the East Indies. On the 31st of December 1600, their request was granted, and an East India Company erected under the title of "The Governor and Company of Merchants of London trading to the East Indies," under a charter constituting them a body corporate, with a common seal. This company consisted of George, Earl of Cumberland, and 215 Knights, Aldermen, and merchants.

The management of the Company was placed under a governor and twenty-four committee-men, to be annually chosen in July in each year, who were to have the direction of voyages, provision of shipping, and sale of merchandise. The members of the Company, their sons of the age of twenty-one years, and their apprentices, factors, and servants, were empowered to carry on trade to all countries east of the Cape of Good Hope to the Straits of Magellan, for fifteen years from Christmas 1600, on the following terms, *viz.*:—"Freely to traffic and use the trade of

* The ship was 165 feet long, from the beak head to the stern; 46 feet 10 inches broad on the second close deck, whereof she had three. She drew 31 feet water on leaving Cochin, but not above 26 feet on her arrival at Dartmouth, September 7, 1592. She carried in height seven several stories, one main orlop, three close decks' one forecastle, and a spar deck, of two floors or pieces, the length of her keel was 100 feet, her mainmast 121 feet, and her main-yard 106 feet long. By this perfect, commensuration of the parts appears the hugeness of the whole, far beyond the mould of the biggest shipping in England, either for war or commerce.—*Mulburn.*

merchandise by sea, in and by such ways and passages already discovered, or hereafter to be found out or discovered, as they should esteem and take to be fittest, into and from the East Indies, into the countries and ports of Asia and Africa; and into and from all the islands, ports, havens, cities, creeks, rivers, and places of Asia, Africa, and America, or any of them beyond the Cape of Good Hope to the Straits of Magellan, where any trade or traffic may be used to and from every of them, in such order, manner, form, liberty, and condition as they themselves should from time to time agree upon."

They were also empowered to make bye-laws, to inflict punishments, provided such punishments accorded with the laws of England. To export goods free of duty for four years; and afterwards the duty on all exports which should miscarry, to be deducted from future goods when shipped. For the duties on imported goods they were allowed six months' credit for half, and twelve months for the payment of the remainder, with free re-exportation for thirteen months. They were also permitted to export to the amount of 30,000*l.* in foreign coin or bullion, provided that 6,000*l.* were re-coined in Her Majesty's Mint. All other Her Majesty's subjects were by the charter excluded, under severe penalties, from this trade, without the assent and leave of the Company. The charter was not to extend to any place in the actual possession of any of Her Majesty's allies. The Company were obliged to return, six months after the completion of a voyage, the same quantity of silver, gold, or foreign coin as they had exported the first voyage excepted. It was likewise provided that "if within the space limited by the charter, this monopoly should appear in any respect detrimental to the public, it should then, upon two years' warning under the privy seal, become null and void. But if experience proved this new corporation was for the weal and benefit of the nation, in this case Her Majesty passed her royal word, not only to renew their charter, but to add such other clauses and garces as should appear most conducive to the interest of the commerce, the undertakers, and the kingdom in general, the true end of all public enterprises."

In virtue of this charter, the merchants began to raise, by subscription, a joint stock for the purpose of carrying out its object, which became popular, that 72,000*l.* were soon paid into the treasurer's hands. The Company then purchased four ships, the largest, the *Susan*, for 1,600*l.*, and the owners agreed to give 800*l.* for her after her return from the first voyage. The *Malice Scourge*, afterwards named the *Dragon*, of 600 tons, with all her stores, was bought of the Earl of Cumberland for 3,700*l.*; and they came to a resolution "not to employ any gentlemen in any place of charge." The allowances granted to the commanders were 100*l.* wages, and 200*l.* on credit for each adventure; and as an incitement to activity and zeal in the service, if on their return, the profit yielded 2 for 1, they were to be allowed 500*l.*; if 3 for 1, 1,000*l.*; if 4 for 1, 1,500*l.*; and if 5 for 1, 2,000*l.* Thirty-six factors, or supercargoes, were appointed. Three principal, or factors of the first class, were each to be allowed 100*l.* for equipment, and 200*l.* as an adventure; four factors of the second class, 50*l.* for equipment, and 100*l.* for an adventure; four of the third class were to have 30*l.* for equipment, and 50*l.* for an adventure; and four of the fourth class were to be allowed 20*l.* each for equipment, and 40*l.* for an adventure. They were to give security for their fidelity, and that they would abstain from all private trade; the principal factors to the extent of 500*l.* each, and the others in proportion.—*Milburn.*

A fleet of five ships, the *Dragon* of 600 tons, the *Hector* of 300 tons, the *Ascension* of 260 tons, the *Susan* of 240 tons, and a tender, under the command of Captain James Lancaster, was equipped and manned, the cargoes of which were composed of bullion, 28,742*l.*; and goods, consisting of iron, tin wrought and unwrought, lead, eighty pieces of broad-cloths of all colours, eighty pieces of Devonshire kerseys, 100 pieces of Norwich stuffs, with smaller articles intended as presents, amounting to 6,860*l.* They were furnished with letters and presents from the Queen to the Kings of Acheen and Bantam. The fleet sailed from England the 13th of February 1601, and arrived at Acheen the 5th of June 1602, where they were received with every mark of distinction; they formed a treaty, and left factors, but did not obtain a sufficiency of pepper to load their ships. From thence they sailed to Bantam, and were graciously received. So successful in every respect was this fleet, that it excited the jealousy of the Portuguese, who soon began to do the English all the mischief in their power. Having settled factors at Bantam, Lancaster set sail for England, and arrived, after a prosperous voyage, in the Downs on the 11th of September 1603. On their passage home, they took possession of the Island of St. Helena.—*Milburn*

Lancaster's expedition was successful. He made treaties with the Kings of Achoen and Bantam, left factors in those places, and procured from both supplies of pepper. He captured, in concert with a Dutch vessel, a large Portuguese carrack, of 900 tons, richly-laden with calicoes and other Eastern products. It was his misfortune to arrive in England during the reign of James I., at the time when London was ravaged by the plague. The money required for defraying the current expenses of the adventure, and of fitting out a second voyage in the ensuing season, could not be subscribed, nor could a sale of the commodities brought home by him be at the time effected; for the King interfered, and decreed that no part of the pepper which the Company had newly brought home should be disposed of, until the quantity belonging to His Majesty, then lying in Leadenhall-street, "should have been uttered and sold."

About 35,000*l.* was required to defray the current expenses, such as seamen's wages, the king's duties, and other incidental charges of the Company, and the original adventurers, from necessity, resolved that each subscriber of 250*l.* to the first capital, should be required to advance a further sum of 200*l.*, in consideration of which, he should be allowed to receive pepper and spices, at given rates of valuation, to the amount of 500*l.*, to be sold at his discretion. The sum of 60,150*l.* was thus raised to pay existing demands, and to send out the same ships upon a second voyage.

In 1604 this expedition, consisting of the four ships which had performed the former voyage, sailed under the command of Sir Henry Middleton. The sum subscribed was expended as follows:—For repairs of the ships, stores, and provision, 48,140*l.*; bullion, 11,160*l.*; merchandise, 1,142*l.* This squadron sailed the 25th of March, and arrived at Bantam on the 22nd of December; two of the ships were laden with pepper, the other two proceeded to Banda and Amboyna for nutmegs, mace, and cloves. Middleton returned to England in May 1606, with the loss of one of his ships. The net profit upon this and the former voyage was calculated at ninety-five per cent. King James I., from the knowledge of this profit, granted a license to Sir Edward Michelborne and others, to trade to "Cathay, China, Japan, Corea, and Cambaya, &c., and the isles thereto belonging, and to trade with the said countries and people, not as yet frequented and traded unto by any of our subjects or people, without interruption, any restraint, grant, or charter to the contrary notwithstanding." This license was a direct violation of the privileges granted by Queen Elizabeth to the Company, and the origin of private traders, termed interlopers. Michelborne, on his arrival in India, instead of exploring new places of trade, as was the professed object of his voyage, committed various depredations upon the Chinese junks trading among the Eastern islands; and having obtained a considerable booty, he returned to England with the plunder. His conduct disgraced the English name, and involved the Company's affairs at Bantam in difficulty.

In 1606 a new capital was subscribed amounting to 53,500*l.*, and three ships were fitted out, the *Dragon*, Captain Keeling; *Hector*, Captain Hawkins; and *Consent*, Captain Middleton. The expense of repairs and equipping amounted to 28,620*l.*; the cargo consisting of bullion, 17,600*l.*, and goods 7,280*l.*, amounted to 24,880*l.* The *Dragon* and *Consent* sailed to Bantam, thence to the Moluccas, where the Dutch, Spaniards, and Portuguese refused them liberty of trade, on which they returned to Bantam, and procured a lading of pepper, and a small quantity of cloves. The *Hector* sailed to Surat, with powers from King James to treat with the Mogul, where Hawkins was opposed by the Portuguese and the Governor of Surat; he consequently travelled to Agra, with the King's letters to the Mogul, who gave him a grant for establishing a factory at Surat. That grant, the Portuguese and the Governor of Surat induced the Mogul to revoke, and to forbid the English ever to enter his ports. Hawkins arrived in England in 1613. The original cost of the above cloves brought to England from Amboyna in this fleet was 2,948*l.* 15*s.*, and the proceeds of the sale in December 1608, were 36,287*l.*, the profits amounted to 231 per cent. on the original subscription. The subscription for this voyage was raised on a new plan. In the former voyages each subscriber had a voice in the regulation of the concerns, which in all matters of importance were transacted in a general court. This had been productive of inconvenience, as the minor interest in numbers frequently prevailed over the major in value.

In the first and second voyages, out of 247 subscribers, 212 were in sums under 300*l.*; and in the third, out of 205, 108 were under 200*l.*, and thirty-six under 100*l.* It was afterwards resolved on the third subscription that no one should subscribe less than 500*l.*, but "a modification was adopted, by which whoever subscribed 500*l.* or upwards, might take under-subscribers, who should be entitled to a share of the profits that attached to the principal subscriber, in proportion as such under-subscription shall bear to the main subscription of the person under whom they subscribed; but that they should have no voice in the management of affairs, which should be confined only to the principal subscribers of 500*l.* and upwards." In 1607, the fourth voyage commenced with two ships, the *Ascension* and *Union*, under the command of Sharpey. A subscription of 33,000*l.* was entered into. The expense of repairs and equipment amounted to 14,600*l.*; the cargo consisted of 15,000*l.* in bullion, and 3,400 in goods. The *Ascension* arrived at Aden the 8th of April 1609, and obtained the grant of a free trade, but was afterwards lost off Diu. The *Union* sailed to Priaman, in Sumatra, and was laden with pepper, but on returning was lost on the coast of France.

In 1608, upon the arrival of the *Consent* from the Moluccas, belonging to the third voyage, with a cargo of spices, which the commander obtained in spite of the Dutch, the adventurers raised an additional subscription of twenty-five per cent. on their capital, and sent out another ship, the *Expedition*, commanded by David Middleton. This was the fifth voyage, the equipment of which cost 6,000*l.* The cargo consisted of 6,000*l.* in bullion, and 1,700*l.* in goods. This ship sailed to Bantam and Banda, but the Dutch refused them permission to trade, and the ship proceeded to Pulo Way, where a cargo of nutmegs, mace, pepper, and other commodities was procured. Middleton's conduct was so judicious during this as on the former voyage, that a profit of 211 per cent was divided on the settlement of accounts. The fifteen years' exclusive trade granted to the East India Company by Elizabeth would not expire till 1615, but the increase of interlopers induced the Company to apply to King James in 1609 for a renewal of their privileges. The king, by letters patent, dated the 31st of May 1609, reciting the charter of Elizabeth, empowered the Company, as a body politic and corporate for ever, with perpetual succession, to make bye-laws, to possess lands and to alienate the same, with "the whole entire and only trade and traffic to the East Indies for ever;" and "all persons were enjoined not to trade within the Company's limits, except by licenses obtained from them under their common seal: and to prevent any apprehensions which the Company might entertain of licenses granted to private traders being obtained from the crown, it was expressly stated that the same should not be given without the consent of the Company, explaining that, notwithstanding these privileges if the trade should not be found profitable to

the realm, such exclusive privileges were to cease and determine after three years' warning. The maritime power of England was at the end of the sixteenth century of very feeble power. The corporation of the Trinity House reported, "that in 1588 the whole number of ships in the navy were 150, of which only forty belonged to the Crown; that there was a like number of vessels employed in trading voyages to all parts the average burden of which was about 150 tons each. In 1602, it was represented that, within the last twelve years, the shipping and seamen, of the country were decayed about one third, owing to the wars with Spain, losses by captures, and in many private adventures and expeditions to America, Africa, &c. Sir William Monson, in his Naval Tracts, states that at the death of Queen Elizabeth, there were not more than four ships in the kingdom, of 400 tons each; and the ships that sailed to India in 1601, were described by him as "four of the best merchant ships in the kingdom."

The East India Company, not being able to procure proper vessels, either in England or at any foreign ports, resolved to build their own ships, on ground which they purchased at Deptford; where they formed a dockyard, with storehouses and other buildings, erected at a very great expense, and in 1609 they launched from that yard, says Sir William Monson, "the goodliest and greatest ship that was ever framed in this Kingdom, and from this beginning may be dated the *increase of great ships in England*." King James I. honoured the launch with his presence, accompanied by his son (afterwards Charles I.), the principal officers of state, and numbers of the nobility. His Majesty named her the *Trade's Increase*. After the launch, the King and nobility partook of a sumptuous banquet, provided at the Company's expense, and "as a specimen of Eastern magnificence, all the tables were covered with services of Chinaware."

In 1610, a capital of 80,163*l.* was subscribed by the Company, and the *Trade's Increase*, the *Pepper Corn*, and *Darling*, departed on a sixth voyage, under the command of Sir Henry Middleton. British commodities, particularly woolens and metals, formed the chief articles of their cargoes, in order to be disposed of in the Red Sea, and it was calculated that calicoes and Indian articles procurable from the Mogul's subjects who traded thither, might be carried to Bantam, the Moluccas, &c., to be disposed of in exchange for spices and drugs. On arriving at Mocha with his squadron, and landing his goods, they were seized, and Middleton and several of his people were arrested and sent to prison, where they were detained several months. He at length with his companions escaped and reached his ships. Sir Henry, by threatening to use force, obtained indemnity for his losses. He sailed to Surat, where his landing was opposed by the Portuguese, and effected only by force, but he was permitted to trade. He then returned to the Red sea, seized several of the Mogul's ships, and demanded and obtained for their release a sum equivalent to the losses he had sustained by the impediments to his trading. He then sailed to Ticoo, in Sumatra, where, and at Bantam, he obtained cargoes of pepper for two of his ships; had to repair the damage which the *Trade's Increase* has sustained by running on a rock: and in careening this ship in Bantam roads, she overset and was lost. Sir Henry soon after died, it is said, of grief. The adventurers finally divided the capital subscribed, with 121*l.* 13*s.* 4*d.* per cent. profit.

The seventh voyage from England to India was undertaken by one ship only, the *Globe*, commanded by Hippon, with two merchants on board, who had quitted the Dutch service. The object of this voyage was to open a trade on the coast of Coromandel for calicoes, partly for sale in the Eastern islands, and also experimentally in England. They sailed from the Downs on the 5th of February 1610, and arrived safely on the Coromandel coast; but at Pulicat the Dutch, who were settled there, had the grant of an exclusive trade. At Pettapole, Hippon traded and left factors. At Masulipatam they also traded, paying four per cent. duty of customs: the Governor at first exacted twelve per cent. From thence he sailed to Patany, where he was allowed a free trade. He also settled a factory at Siam, and returned to Masulipatam the 16th of December 1613. In 1614 the King of Nusmata invited him to settle a factory; but, he dying before they left the place, the Governor, who had obtained goods of them refused payment. Hippon in consequence seized his son, and carried him on board his ship; the Governor then paid the debt, and obtained his son's release. He returned to Bantam, where they loaded a cargo, and returned to England. The profit on this voyage amounted to 218 per cent on the 15,536*l.* subscribed. The value of the exports from England by the Company amounted in the years 1601 to 1610, inclusive, to, in merchandize, 51,673*l.*, in bullion 119,022*l.*, total 170,695*l.* The value of the imports are not ascertained, for the Company made their dividends occasionally in goods in imitation of the Dutch. The amount has been estimated by Milburn at near 1,000,000*l.* per annum. The amount of the customs duties paid in England during the same period on the Company's imports, was 97,950*l.*, or on an average 9,795*l.* per annum.

In 1611, three ships, as a distinct adventure, the *Clove*, the *Hector*, and *Thomas*, under Captain Saris, sailed from England in April 1611. This was the eighth voyage, and the ships arrived safely at Mocha; they were about to trade, when Sir Henry Middleton, on his return from Surat, and Captain Saris, in order to prevent collisions of interests, agreed to act in concert. They prevented accordingly the Moorish ships from entering Mocha, and bartered with them for their commodities in exchange for European goods. They then sailed for Bantam, where two of the ships took in pepper and spices, and Saris, in the *Clove* proceeded to open a trade with Japan. In his way he touched at the Moluccas, and would have obtained cloves from the natives, but the Dutch would not suffer him to trade. At Japan, Saris met with a friendly reception, and obtained permission to trade. He afterward returned to Bantam, and took in a cargo for Europe. The capital subscribed for this eighth voyage was 55,947*l.*, and it yielded a profit of 211 per cent.

In 1612 a ninth voyage was undertaken in a single ship, which sailed for Bantam, and from thence to the coast of Coromandel. The capital subscribed was 19,161*l.*, and the profit 160 per cent. The tenth voyage was accomplished by two ships, the *Dragon* and *Hoseander*, under Captain Thomas Best. His instructions were "to quiet the mind of the Mogul, in respect to the proceedings of Sir Henry Middleton, in laying the ships of his subjects under contribution in the Red Sea." Captain Best accomplished his object, and entered into a treaty of amity and commerce with the Mogul, and procured a firman or license, allowing the English nation permission to trade, on paying 3½ per cent. customs, and the privilege of having an ambassador at Agra, &c. The Portuguese determined to prevent the English from trading in the Mogul's dominions; and with their naval force of four galleons and twenty six frigates, attacked the English ships. The Portuguese fought well, but by the bravery of Captain Best and his people, after four several engagements the Portuguese were defeated with great loss, to the joy of the Moors, who believed them until then to be invincible. From Surat, Best proceeded to Acheen, where he obtained a confirmation of the privileges granted to Lancaster on the first voyage. He afterwards visited various places in Sumatra, and sailed to Bantam, for a cargo of pepper, with which he returned to England. The capital subscribed for this voyage amounted to 46,092*l.*, which yielded a profit of 148 per cent. The eleventh voyage was performed in a single ship, which was sent out to bring home the remains of the adventurers who had subscribed to the third and fifth voyage. The amount subscribed was 10,669*l.*, and the voyage being made direct out and home in twenty months, the profit amounted to 320 per cent. The twelfth and last voyage of those conducted as separate adventurers, was accomplished by one ship the *Expedition*, Captain Newport. Sir Robert Shirley, the king's embassador to Persia, sailed in this ship. He was to have been landed at Guadel, and thence to proceed by land to Ispahan; but the natives of Guadel having planned the plundering and murdering him and his suite, the ship proceeded to Diu. The Governor of Diu would have admitted the English to trade but was prevented by the Portuguese; a conditional agreement was, however, made to admit the English in another year, on which they proceeded to Ticoo and Bantam, and from whence the ship returned home with pepper. The capital expended for this voyage was 7,112*l.* The outward cargo consisted of 1,250*l.* in money, and 650*l.* in goods. The profit amounted to 137*l.* 18*s.* 4*d.* per cent. The whole of the capitals subscribed for these *twelve voyages*, or expeditions in the aggregate, amounted to no more than 464,284*l.*, or upon an average 38,690*l.* for each voyage, which sum is estimated by Mr. Milburn to have been invested in the following manner:

	£		£	
In merchandize, &c.	62,111,	or, on an average,	5,201	per voyage.
Bullion	138,127	,,	11,510	,,
Shipping, stores, provisions, &c.	263,746	,,	21,979	,,

which gave a profit, one voyage with another, of 148 per cent.

The English East India Company had however only traded hitherto as mere adventurers, who fitted out their voyagers, as separate and distinct speculations, without factories in India, and without stock or any of the elements of permanency. On the other hand, the Portuguese the Spaniards, and the Dutch, had their respective seaports, factories, and fortresses; and they generally prevented all but the English from trading. The time had however arrived when it was either necessary to abandon the trade, and its uncertainties, or to constitute a Joint-Stock Company, of sufficient capital and power to compete with other European powers. In the disposal of the homeward cargoes, by the English Company, great inconvenience was experienced, either by being sold at public sale, or divided among the adventurers in kind, and it often happened that private accommodation was studied at the expense of the general interest. It was, in consequence, resolved to relinquish all further separate voyages, and to subscribe a capital upon a joint-stock account. The stock subscribed was limited to four years, in order that the subscribers might have an opportunity of regulating their future acts by circumstances. The amount of stock subscribed was 418,691*l.*, which it was agreed should be paid up in equal proportions in each of the four years. The Joint Stock Company was soon after successful, though opposed by the Portuguese and the Dutch.

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* "That no erroneous idea," says Mr Milburn, "may prevail with regard to the supposed magnitude of these profits, compared with the state of things at the present day, it will be necessary to bear in mind that the voyages above referred to, were seldom made in less than thirty months, and often were extended to three and four years, from the time of the ships leaving England till their return; that, upon their arrival, their cargoes were disposed of at long credits, from eighteen to twenty-four months, and that, from irregularity in the factors, as well in keeping, as in the transmission of their accounts, it was frequently six, seven, and eight years before the concerns of a voyage were finally adjusted (the first and second voyage accounts, which commenced in 1600, were not brought to a close till 1609, and then it was by making over their remains to the third voyage, who advanced the amount upon a valuation); taking it, therefore, upon a medium of seven years, it reduces it to something less than twenty per cent. per annum. It must all be noticed that this was not merely the simple profit of the voyage out and home, but included the accumulated profits of all the various barters and sales in their transit from port to port in India, which were by no means inconsiderable. It is further to be recollected that the Company, by building their own ships, and fitting them out within themselves, derived the advantages which now attach to the various professions employed in and about shipping, taking, therefore, all these circumstances into consideration, it may be fairly doubted whether the profits upon an insignificant sum under 20,000*l.*, were more than what they will be found to be upon a capital of 6,000,000*l.*"

In 1613, the first expedition on the joint-stock account consisted of four ships, under the command of Captain Nicholas Downton. On his arrival at Surat, he asked for a reduction of customs and other privileges, and the Mogul being at the time at war with the Portuguese, sought the aid of the Company which was declined. The Governor of Surat in consequence determined to prevent the English from trading, and the Portuguese insinuated that the English meant to lend their assistance to them against the Mogul. The Mogul being undeceived, sent a firman allowing the English to trade; and the presents of the Company for the Mogul were forwarded to Agra. Upon the arrival of a Portuguese fleet, the Government of Surat sued for peace, which was haughtily refused. The Portuguese then attacked the English ships, but the latter repulsed the former, and burnt several of their ships. Attempts were made by the Jesuits to reconcile matters, which proved ineffectual, from the imperious demands made by the Portuguese, who with fire ships attempted to destroy the English ships, but without effect. The Viceroy then made proposals for peace with the Mogul, which was refused, and the Portuguese retired to Goa. The English having completed their lading, sailed for Bantam, where one of the ships procured a cargo of mace and silk, and then proceeded to Mausulipatam; the others returned to England. Serious charges were at this time made against the conduct of the Dutch, both at Bantam and Macassar, to the English factors. An attempt was also made to open a trade with Persia, and the English factors were well received there.

In 1614, the dissensions that prevailed between the English and Dutch Companies' servants in India were now become so alarming as to cause a negotiation between the respective Governments in Europe. Commissioners were appointed on both sides to fix upon some satisfactory plan for the regulation of the future trade to India. In the conferences which took place on this occasion, a proposition was made on the part of the Dutch, that an union should be established between the two Companies, and the trade carried on as a joint concern. But this proposal was, after a very careful deliberation, rejected by the English East India Company.

In 1615, the Company applied to the King for an Ambassador to proceed to the Great Mogul. The King agreed, and appointed Sir Thomas Roe "to be Ambassador to the Great Mogul or King of India;" the Company agreeing to defray the expenses, in consideration that, under their exclusive privileges, they were to acquire such benefits as might result from the mission. Sir Thomas Roe sailed from England in March 1615, on board the *Lion*, Captain Newport, one of four ships fitted out on the joint-stock account, and arrived at Surat, from whence he proceeded to the Mogul's court, which he reached in December 1615, and on the 10th of January 1616, was presented to the Great Mogul, when he delivered the King's letter, and the presents; the Mogul gave the Ambassador a gracious reception. On the 24th of January, Sir Thomas had a second audience of the Mogul, when he stated the injuries the English had sustained from the arbitrary conduct of the Governors of Surat, and proposed the renewing the articles of the firman or treaty between the Mogul and the English nation, which was complied with, and of which the following is the substance:—

It was stipulated that English subjects should have liberty of trade, and be allowed to establish factories in any of the ports of the Mogul Empire. That they should be furnished with all kinds of provisions and carriages by the inhabitants of the seaports, according to the ordinary rates of charge. That the merchants should be protected against any exactions in all sales, not exceeding 16 rials of eight. That all presents sent to the Mogul, should be protected from being opened at the seaports, and be forwarded to the English Ambassador at court, to be delivered agreeably to his instructions. That the goods of the English merchants should be rated within six days after being landed at any port: and after payment of the stipulated duty, might be forwarded free to any other English factory. That the goods purchased by the English, in any part of the Mogul's dominions, should have a free transit to the ports at which they were to be shipped. That the property of the Company's servants, who might die in the Mogul's dominions, should be delivered to the Company's officers, or their successors. That the provisions necessary for the shipping should be exempted from duty. By a seprate article it was agreed that the rate of customs on English imports should be fixed at 3½ per cent. and 2 per cent. on rials of eight; and that mutual assistance should be given against the enemies of either of the contracting parties.—*Milburn.*

Sir Thomas Roe resides some years in India, and conducted himself to the Company's satisfaction. On his return, in 1619, he had an honorary seat in their Court of Committees, and was allowed an annual stipend of 200*l.* per annum. Keelinge, who commanded one of the ships which sailed with Sir Thomas Roe, proceeded to Cranganore, where he arrived in March 1616, and obtained liberty to trade, and permission to establish a factory; and its was agreed by treaty that the English and the Samorin of that place should join their forces, and expel the Portuguese from Cochin, which, on being captured, should be ceded to the English. This year a treaty was concluded with the King of Acheen, and liberty to trade and settle a factory at Ticoo was granted to the English, on payment of seven per cent. customs on imports and exports. A pamphlet published at this time, entitled "Trade's Increase," charges the East India trade as draining the country of specie, among other alleged evils. Sir Dudley Digges, who answered these charges says that, "the Company had employed, from their origin, twenty-four ships, of which four had been lost; that nineteen of them were from 150 to 600 tons' burden; that one was of 800 tons, one of 900, one of 1,060, one of 1,100, and one of 1,293 tons; and that the reason for having such large ships was owing to the navy not being sufficiently strong to protect them from the Barbary rovers." He states that the largest value of goods exported in one year was 34,000*l.*; that 70,000*l.* had been saved annually to the nation in the prices of pepper, cloves, and nutmegs for home consumption; that spices had been exported in the last year to the value of 218,000*l.*, besides indigo, calicoes, China silks, and drugs, to which should be added the King's customs, and also the employment given to ships and mariners in the re-exportation.

That besides cinnamon, the Company calculated that there were annually consumed at home, viz.:- pepper, formerly at 8*s.* but now at 2*s.* per lb., 450,000 lbs.; cloves, 50,000 lbs.; mace 15,000 lbs.; nutmegs, 100,000 lbs.; and that the cloves, mace, and nutmegs were proportionably reduced in price since our direct trade to India. That the cargoes, in 1614, amounted to 100,000*l.*, and consisted of kays, kersies, and broad cloths, dyed and dressed, 14,000*l.*; lead, iron, and foreign merchandise, 10,000*l.*; treasure (which is less than allowed to export by charter), 12,000*l.*; the shipping and furniture cost in the same year, 34,000*l.*; for provisions and other extraordinary charges, 30,000*l.*

In 1616, the stock for the next voyage was estimated at 52,087*l.* in money, and 16,506*l.* in goods; and the expedition fitted out consisted of seven ships, under the command of Captain Pring, who sailed from the Downs, in March, and arrived at Surat in October 1616, where he captured a Portuguese frigate, and then sailed to Bantam. At Jacatra they agreed to give 700 rials per annum for the liberty of trade, and 1,500 rials for a piece of ground for a factory. The Dutch, observing the rapid progress of the English in the East India trade, sought every opportunity to embarrass their operations. To protect the English Company from the Dutch, Sir Thomas Dale proceeded with a fleet to India, with power to seize the ships of illicit traders. This force, on its arrival at Bantam, was joined by the Company's shipping in India, making thirteen sail, with which they engaged, and beat the Dutch fleet. The Dutch had previously seized the English factors at Jacatra, and burnt the factory, and even went so far as to attack the royal palace. The King of which on this sent to Bantam for the assistance of the English, which being rendered him, the Dutch proposed to surrender their fort at Jacatra. The English attacked and beat off four Dutch ships off Sumatra but in an after-engagement five of the English ships were taken. The profits of the four voyages on joint-stock, did not amount to more than eighty-seven-and-a-half per cent. on the original subscription, notwithstanding the cargo of one of the ships cost only 40,000 pieces of eight, and produced at the sales in England 80,000*l.* sterling.

In 1617, the period of four years, to which the trade of the first joint-stock was limited, being expired, a fresh subscription was opened; and so anxious were persons of all ranks to enrol themselves therein, that at the period of its close, the sums that were underwritten, amounted to no less than 1,629,040*l.*—*Milburn.* The subscribers to this original stock consisted of 15 Dukes and Earls; 82 Knights, including 2 Judges, all the King's Council, and 5 Privy counsellors; 13 Countesses and ladies; 26 doctors of divinity and physic; 18 widows and virgins; 313 merchants; 214 tradesmen; 212 without title; 25 merchants, strangers; 36 whose occupations were unknown. Making in all 954. This joint stock, like the former one, was limited in its trade to four years' duration; that is to say, trading adventurers to send out trading ships for four succeeding years, and then to wait their arrival, in order to bring the concern to a close. The Directors fixed on Surat and Bantam as the principal marts of the trade, and that such out-stations as had been established should be controlled by the two principal factories. A proposition was again made by the Dutch, for the English and Dutch to join in concert; on the ground partly that an East India Company was forming in France, and another in Denmark; but this proposal was also rejected. The Dutch Company then sent instructions to their servants in India to take measures for engrossing the whole of the pepper trade at Bantam and Batavia, at both of which places the English had carried on a trade. In 1617, the following were the English Company's places of trading in India, according to Mr. Milburn, and an official statement:—

Surat, at which, though English goods were not in great demand, yet the eastern parts of India could be supplied with cloths; but those articles could only be procured by the exchange of China goods, spices, and money. Acheen and Ticoo, where large quantities of Cambay and Mausulipatam goods might be disposed of; and in return, gold, camphire, pepper, and benjamin could be obtained. Bantam, which was then the greatest place of trade in the Indian seas; where Cambay and Mausulipatam goods, to the amount of 60,000 rials, were annually imported, and in return, from 60,000 to 150,000 sacks of pepper could be exported, the price of pepper, however, had been raised treble within the last few years, from the competition between the English, Dutch, and Chinese. Jacatra offered arrack, rice, and fish; but a settlement there would be difficult, from the exorbitant sum demanded by the King for ground to build a factory upon. Jambee had been recently settled as a factory, at which there was an increasing demand for Cambay and Coromandel cloths, and in return, afforded 10,000 sacks of pepper. At Patany about 10,000 rials of Surat and Coromandel cloths might be sold; but it furnished few articles of export, and trade was on the decline. At Siam, if the country were in a state of peace, Coromandel cloths might be sold to the amount of 40,000 rials per annum; and in return, it would yield gold, silver, and deer skins for the Japan market. At Japan, English cloth, lead, deer-skins, silks, and other goods, would find a considerable market; and in return it would furnish silver, copper, and iron; but the English cargoes hitherto sent had been ill-assorted, and the trade was on the decline. At Succadana, diamonds, bezoar stones, and gold might be obtained, had not this trade been ruined by the ignorance of the first factors. At Banjarmassin, diamonds, gold and bezoar stones could be procured; but the character of the natives was so treacherous, that it would be expedient to withdraw the factory. At Macassar the best rice in India could be bought, and about 40,000 rials per annum of India cloths sold; but this place was resorted to by the Portuguese, though abandoned by the Dutch. At Banda about 50,000 rials annually of Coromandel cloths could be sold; and in return about 100 tons of

nutmegs and mace could be purchased, and a still greater quantity, could peace be established between the Europeans trading to it. The English also obtained in 1617, possession of the islands of Pulo Roon and Rosengyn, and fortified them; the Dutch attacked the former, but were repulsed. They, however, captured two of the Company's ships.

In 1618, James granted letters patent for the establishment of the trade to India from Scotland. This patent was "to Sir James Cunningham, appointing him, his heirs, and assigns, to be Governors, rulers, and directors of the Scottish East India Company, and authorising him to trade to and from the East Indies, and the countries or parts of Asia, Africa, and America, beyond the Cape of Bona Sperantia to the Straits of Magellan, and to the Levant Sea, and territories under the Government of the Great Turk, and to and from the countries of Greenland, and all other countries and islands in the North, North-west, and North-east seas, and other parts of America and Muscovy." The Russian Company and the English East India Company represented to His Majesty, that this patent would be highly prejudicial to their trade; and the king informed the Company, that, as he considered them "to be a strength to the kingdom, and an honour to himself, he would withdraw the patent, on their recompensing Sir James Cunningham for the charges and expenses he had incurred in his proceedings;" and "that the East India Company should join with the Russia Company in the support of their trade, the concerns of which had long been in an enfeebled state. The Company thereupon, at His Majesty's entreaty, and under a promise that he would grant no other patents that should be injurious to their interests, as also induced thereto by his having been graciously pleased to withdraw the Scottish patent, agreed to advance 30,000,000*l.* per annum for the remaining time of their duration, which, with a similar sum to be advanced by the Russia Company, it was hoped would give life and vigour to that trade, which for the last sixty years had yielded no benefit to the adventurers. The trade was carried on by both Companies jointly for two seasons, but without success; upon which, on the 29th of December 1619, the connexion was dissolved. The East India Company's loss on this occasion was estimated at 40,000*l.*"—*Milburn.*

Two ships, the *Dragon* and *Expedition*, which sailed in 1618, for the Malabar coast, were defeated in their trade at Dabul, Baticaloe, and Calicut, by the Samorin. They then sailed to Sumatra. The *Dragon* was attacked by six Dutch ships off Ticoo, and after a brave defence, taken, and her crew treated with barbarity.

In 1619, an expedition was fitted out, consisting of the *London*, *Hart*, *Roebuck*, and *Eagle*, under Captain Shillinge. He sailed in February 1619. On the passage out, he took possession of Saldanha Bay. On his arrival in Malabar, the *Hart* and *Eagle* were despatched for *Jasques*; but on attempting to enter that port, they found it blockaded by a Portuguese fleet, and they were obliged to return to Surat, where they were joined by the other ships; and they all sailed for Jasques, where they fell in with the Portuguese fleet. An engagement took place which lasted nine hours, but with little effect. The Portuguese gave way, and allowed the English ships to enter the port; but having received assistance from Ormus, a second engagement took place; the conflict was obstinate, but terminated in favour of the English who however lost Captain Shillinge. The ships soon after returned to Surat. A treaty of friendship and trade was this year concluded with Persia upon terms very advantageous to the English, who were permitted to build a fort at Jasques; and this year the Dutch took four of the Company's ships off the coast of Sumatra. A treaty was concluded by the English and Dutch Commissioners, and on the 7th of July 1619, an agreement was signed, which, after specifying an amnesty and oblivion of all excesses committed by either part in the East Indies, and a mutual restoration of ships and property, declared the trade of the two nations in the East to be free, to the extent of the respective funds which might be employed and specified; that the exertions of both Companies should be directed to reduce the duties and exactions of the native officers at the different ports; that the pepper trade at Java should be equally divided; that the English should have a free trade at Pulicat, on paying half the expenses of the Garrison; that the English at the Moluccas and Bandas should enjoy one-third of the import and export trade, and the Dutch two-thirds, and that Commissioners should be appointed to regulate the trade, the charges of the Garrisons to be paid in the same proportion; that each Company should furnish ten ships of war for common defence, but that those ships were not to be employed to bring cargoes to Europe, but only in the carrying trade from one part of the East Indies to another; and that the whole proceedings should be under the regulation of a council of defence in the Indies, composed of four members from each Company. This treaty was to be binding for twenty years. On its ratification, King James promised not to grant another charter during the term of its agreement. In India, hostilities ceased, and harmony was for a short time restored. The English then sailed for Japan, where, having united with the Dutch, they settled with the Emperor the terms for carrying on their trade.—*Milburn.*

The English East India Company now equipped the greatest fleet they had ever despatched to the oriental seas. It consisted of ten ships, the largest of which was 1,000 tons' burden, and several of the others 700 tons. The stock sent by this expedition amounted to 62,490*l.* in bullion, and 28,508*l.* in goods. Of this fleet, nine of the ships were detained in India, and only one returned with a cargo, which realised 108,887*l.*

In 1620, the Dutch Government at Batavia, notwithstanding the treaty which had been concluded, fitted out an expedition, which proceeded to the islands of Lantore and Pulo Roon, and took possession of them, treating the few Englishmen they found there with great barbarity. The Company, on receipt of this intelligence, presented a memorial, praying for protection and redress: but the state of the nation prevented any efforts being made to obtain satisfaction.

In 1621, there was published a treatise in favour of the East India trade, written by Mr. Munn, an eminent merchant of London, and one of the Directors of the East India Company. He states the quantities of Indian merchandise consumed annually in Europe, with their prime cost, and all charges still on board, by the old way from Aleppo and also the new way by the Cape of Good Hope, whence, he states, will be seen the great benefit of the East India commerce, viz:

Annual Consumption.	Cost at Aleppo.			Cost in India.		
	s. *d.*	£ *s.* *d.*		*s.* *d.*	£ *s.* *d.*	
6,000,000 lbs. pepper ... per lb.	2 0	600,000	0 0	0 2½	62,500	0 0
450,000 do. cloves ... do	1 9	106,875	0 0	0 9	16,875	0 0
150,000 do. mace ... do.	1 9	35,625	0 0	0 8	5,000	0 0
400,000 do. nutmegs ... do.	2 4	46,666	13 4	0 4	6,666	13 4
350,000 do. indigo ... do.	4 4	75,833	6 8	1 2	20,416	13 4
1,000,000 do. raw silk ... do.	12 0	600,000	0 0	8 0	400,000	0 0
Total ...	...	1,466,000	0 0	...	511,458	6 8

For rather more than a third of the prices of the goods shipped from Turkey they were shipped from India; and by adding one-sixth for the expense of the voyage homeward above that from Turkey, the goods cost only about half the price they did from Turkey. The statements made by Mr. Munn are supposed to apply to a period antecedent to the year 1621. Mr. Munn estimated the annual importation of India goods, with the prices they cost on board the ships in India, and those they sold for in England, as follows:—

Annual Importation.	Cost on Board in India.			Selling Prices in England.		
	s. *d.*	£ *s.* *d.*		*s.* *d.*	£ *s.* *d.*	
250,000 lbs. pepper ... per lb.	0 2½	26,041	13 4	1 8	208,333	6 8
150,000 do. cloves ... do.	0 9	5,625	0 0	6 0	45,000	0 0
150,000 do. nutmegs ... do	0 4	2,500	0 0	2 6	18,750	0 0
50,000 do. mace ... do.	0 8	1,666	13 4	6 0	15,000	0 0
200,000 do. indigo ... do.	1 2	11,666	13 4	5 0	50,000	0 0
107,140 do. China raw silk ... do.	7 0	37,499	0 0	20 0	107,140	0 0
50,000 pieces of calico ... each.	7 0	17,500	0 0	20 0	50,004	0 0
Total ...	...	102,500	0 0	...	494,228	6 8

The difference, which consisting of freight, duties, charges, and profits, was, he considered, a gain to the nation. He estimates the annual consumption of the following goods in England with a comparative view of the lowest prices, when imported from Turkey or Lisbon, before England imported any from India, and the common prices in his own time viz:—

Annual Consumption.	Lowest Ancient Prices.			Common Modern Prices.		
	s. *d.*	£ *s.* *d.*		*s.* *d.*	£ *s.* *d.*	
400,000 lbs. pepper ... per lb	3 6	70,000	0 0	1 8	33,333	6 8
40,000 do. cloves ... do.	8 0	16,000	0 0	6 0	12,000	0 0
20,000 do. mace ... do.	9 0	9,000	0 0	6 0	6,000	0 0
160,000 do. nutmegs ... do.	4 6	36,000	0 0	2 6	20,000	0 0
375,000 do. indigo ... do.	7 0	52,500	0 0	5 0	37,000	0 0
Total ...	...	183,500	0 0	...	108,333	6 8

The difference of these sums he also considered as a saving of expenditure, in consequence of the direct importation. According to a report presented to Parliament by the Company in 1621, on "The estate of their trade from the beginning thereof in 1600 to the 29th of November 1621. There hath been sent forth in the said term of twenty-one years, eighty-six ships to the Indies, whereof thirty-six returned safely home laden; nine were lost; five worn out by long service from port to port in India; eleven have been taken and surprised by the Dutch; and twenty-five do remain in India, or on their homeward passage. The East India Company, by license from His Majesty, might have shipped out of these realms, in the said term of twenty-one years, 910,000*l.* in foreign coin; but they have not sent out so much by near 300,000*l.*; for they have laden away in all the said time, upon all the said ships, as well out of these realms, as out of the Downs, Holland, and other places, but 613,681*l.* And, together with the said money, they also have shipped out of the realm, in woollens, lead, iron, tin, and other wares, to the value of 319,211*l.*, making together 932,892*l.* And of all the before-mentioned moneys and goods sent into the Indies, there hath been employed the value of 375,288*l.* for the lading of 36 ships, which are returned hence with sundry sorts of wares, all of which wares have produced here in England by the sales, 2,004,600*l.* Whereby it doth plainly appear, that if 557,604*l.* of our money and goods sent out, were returned with no more success than the 375,288*l.* which is already received, it would produce in all 5,000,000*l.* sterling, which is a far greater proportion of the kingdom's stock than can be procured by any other foreign trade whatsoever known unto us. For, although it is very true that the said 5,000,000*l.* be procured by the money and goods afore-written alone, without a further great charge also disbursed for shipping, victuals, ammunition, wages for captains, officers, factors, and mariners, besides His Majesty's customs and imports, with many other charges, yet all these disbursements made within this realm from one to the other, do not diminish the kingdom's stock, although they directly abate the merchant's gain." The ships equipped in 1621 consisted of four ships, the value of the cargoes of which were estimated at 12,900*l.* in bullion, and 6,353*l.* in goods. Of these ships only one returned to England, and her cargo, which consisted of pepper, cloves, &c., produced at the sales 94,464*l.*

In 1622, the Portuguese, from the first appearance of the Dutch and the English in India, had determined to keep them out of the trade by force, under the pretence of exclusive right, as the original discoverers of the voyage by the Cape of Good Hope. The English and Dutch resisted, and a war was in India, though the English were at peace with Spain. The English Commanders had acted only upon the defensive in the various engagements that had taken place with the Portuguese. The Portuguese possessed the island and castle of Ormus, which commanded the trade of the Persian Gulf, in which they committed various depredations upon the English and others trading there. The King of Persia was desirous of dispossessing them; and calling to his assistance the English, with whom he was then in alliance, it was proposed to make a joint attack upon the island; and the King agreed that, if it proved successful, he would place it in the Company's hands, and give them one-half of the customs. The attack was chiefly conducted by the English, and the city and castle were taken on the 22nd of April 1622. The English received a proportion of the plunder, and a grant of half the customs of Gombroon, which was paid till about 1680, when the Company, not being able to clear the gulf of pirates, the King of Persia withheld their share of the duties.—*Milburn.*

The expedition to India in 1623 consisted of seven ships; the cargoes were estimated at 68,720*l.* in Spanish silver, and 17,345*l.* in goods. The homeward ships were five in number; their cargoes consisted of pepper, cloves, mace, and nutmegs, these produced at the sales 485,593*l.*, exclusive of Persian raw silk, which amounted to 97,000*l.*, making in the whole 582,593*l.* The outward ships were detained on a claim of the Duke of Buckingham, as Lord High Admiral, for a share of the Ormus prize-money; and the Company paid him 10,000*l.*, and a like sum to the Secretary of State for the King's use, before they were allowed to sail. In February 1622-3, the English at Amboyna were tortured, and then murdered by the Dutch. A similar atrocity was committed previously at Lantore, and the other islands; and the Dutch afterwards engrossed the whole spice trade, until the spice islands were captured by the English during the war of 1793.

In 1623, on the 8th of March, a debate took place in Parliament, in which the East India trade was denounced as injurious to the national interests, on the plea of its draining the nation of treasure, of which it was said they exported to the amount of 80,000*l.* per annum. Upon this occasion they were defended by two of the city members and many others.

In 1625, by an order of the House of Commons, the following "Abstract of the Trade to the East Indies, from the 25th of March 1620, to the 25th of March 1624," was laid before them :—

		£		£		£
1620.	There were laden on ten ships	62,490	in bullion, and	28,508	goods.—Total	90,998
1621.	On four ships	12,900	,,	6,523	,,	19,423
1622.	On five ships	61,600	,,	6,430	,,	68,030
1623.	On seven ships	68,720	,,	17,345	,,	86,065
		Exported 205,710	,,	58,806		Total 264,516

The imports were as follows :—

	£
"1620. This year, by reason of our differences with the Dutch, our ships were kept in India for our defence, to our very great damage, and only one ship returned with indigo, calicoes, drugs, &c., value .. .. ..

referred to the Privy Council on the 6th of January 1617. The Company also gave directions that the parties concerned in this piratical act should be prosecuted. This was interrupted on the 22nd of February by a message from the King, desiring 'that Sir William Courteen might not be troubled on the subject of his ships.' The other ships belonging to this association proceeded to China, where their conduct was somewhat similar to that in the Red Sea."—*Milburn.*

On the 1st of June 1637, the King by a new grant confirmed the privileges conferred on the new Company to trade for five years to all places, in India, where the old Company had not settled any factories or trade before the 12th of December 1633; and "to export during the said term 40,000*l.* in gold and silver bullion to India, and to re-export India goods, free of customs." On the 10th of December 1634, the King declared that he would revoke all patents formerly granted for plantations beyond the Cape of Good Hope, and grant no more. Courteen's Association to be allowed reasonable time to wind up its affairs and adventures. Further, that a new capital should be subscribed for an extensive joint-stock, and when the subscription should be completed, His Majesty would renew the Company's charter, with additional privileges "for carrying on so great and important a trade." In 1640, a court of the proprietors was summoned, when it was proposed to raise a new, or fourth joint-stock, on the following conditions:—

I. That the subscription should be paid in four years.
II. That the subscription should be open to all persons, foreigners as well as English, till the 1st of May 1640, and the instalments paid quarterly.
III. That in case of default in payment of the instalments, one per cent. per month should be levied as a fine, till such payment should be made.
IV. That no Englishman should subscribe less than 500*l.*, and no foreigner less than 1,000*l.*
V. That if any Englishman should buy any share after the books were closed, he should pay 20*l.*, and a foreigner 40*l.*, as a fine for his freedom to the new Company.
VI. That to prevent inconvenience and confusion, the old Company, or adventurers in the third joint stock, should have sufficient time allowed for bringing home their property, and should send no more stock to India on that account after the month of May 1640.

Charles I., in his necessity, compelled the East India Company to sell to the crown the whole of the pepper in their warehouses, amounting to 607,522 lbs., at 2*s.* 1*d.* per lb., payable by instalments. This pepper was actually sold for ready money at 1*s.* 8*d.* per lb., and it was many years before the Company could get the account settled.

On the 15th of November 1640, the Company obtained a grant of the town and port of Madras-patnam, where they built Fort St. George. As an encouragement to the English to settle there, they were allowed to trade, free of the customs' duty. Of the duty paid by other traders, one-half was to be allowed to the Company, and the other half to the Indian King. On obtaining this grant, the factory removed from Armagon to Fort St. George, which has continued since then to be the chief settlement on the sea-coast, and as Madras, the capital of the presidency of the same name.

The Company finding their ship-yard at Deptford too limited for their naval construction, a copyhold ground was purchased at Blackwall, which was at this time a marsh without a house. Here another and larger ship-yard was established, and here they built a ship of 1,200 tons (the *Royal James*), and several others of the burden of 900, 800, and 700 tons each. In these two ship-yards were executed every division of work connected with the outfit of shipping. Here the Company built their own ships and boats, made their own masts, yards, sails, anchors, cables, and cordage, imported their own flour, baked their own bread, killed and salted their own provisions, imported staves from the Baltic, made their own casks, and imported from the continent saltpetre to make their own gunpowder. King Charles I. had taken the monopoly of saltpetre, but was unable to supply the Company with the quantity they required. At this period, and in the then state of England, it would have been impossible for the Company to procure sufficient ships, or fully to equip them by any other means. But there was also competition: for in 1640 the Company were *first* offered a ship upon freight, at 25*l.* per ton; and which as their own shipping cost them about 31*l.* per ton, was chartered, and performed a voyage to and from India in the space of eleven months, being the shortest that had previously been known. This voyage proving advantageous to the owners of the chartered ship, others followed their example, and the Company's trade for some time was carried on partly by their own and partly by chartered ships. The Company afterwards finding that ship-building had so rapidly increased in the Thames and other English sea-ports, sold their dockyards, and chartered ships. The second joint-stock, originally established in 1617, having been from time to time protracted till 1631, before it reimbursed the original sum subscribed, it was transferred to the third joint-stock, at a valuation of 12½ per cent. The third joint-stock amounted to 420,700*l.*, of which nearly one-half was to be paid to the former joint-stock, as the valuation of their remains in India and in England. The remaining sum was too limited for the undertaking. Public affairs were now disturbed. The Company, attacked by enemies abroad, and without protection at home, found their affairs nearly in a desperate condition, until 1640, when they finally realised sufficient money to discharge their debts, and they divided their capital in the following year, with a profit, in eleven years, of only thirty-five per cent.

At a meeting of the proprietors of the third joint-stock, on the 6th of October 1641, it was resolved, "that a necessity exists of something being done to support and uphold the East India trade, as, if this year is passed over, the trade may pass off so as never to be again revived." A subscription was then opened to undertake a *single voyage* and 67,500*l.* was subscribed. In this comparatively miserable state of the Company's affairs, it was agreed to pay the proprietors of the third joint-stock one per cent. of management at home, and six per cent. on the invoice cost of their goods, for service of factories, warehouses, and small shipping in India.

The adventurers in the *fourth joint-stock* consisted of such of the members of the former stock as chose to transfer their interests into the fourth stock, on a valuation of twenty-five per cent., and of a few new subscribers: but the total amount of subscriptions, including an addition in 1643, was only about 105,000*l.* The nation being involved in a civil war, the affairs and stock of the Company were reduced nearly to ruin. Macknel, one of their commanders, carried his ship, the *John*, with a cargo valued at 20,000*l.* into Bristol, and gave this ship up to the King's use. Another ship was wrecked valued at 35,000*l.* The Company was then compelled either to dissolve or borrow money upon their bonds, availing themselves of their credit abroad. They succeeded so far as merely to hold together until 1646, when the debts, owing by the Company in England, amounted to 122,000*l.* Their effects consisted of, quick stock at Surat, 83,600*l.*; quick stock at Bantam, 60,781*l.*, in shipping and stores, 31,180*l.*; and customs at Gombroon, estimated at 5,000*l.*: forming a total of 180,511*l.* It was estimated that the profits of the quick stock would be sufficient to discharge the debt, and leave a clear capital of 180,000*l.* in money, merchandise, and outstanding debts in England and India.

In 1649, the Company represented a memorial to the Council of State, stating, "that under their charter they had carried on a trade to the East Indies, with great advantages to the public revenues, during the past twenty-five years, had received from it above 500,000*l.*—that, in prosecuting this trade, they had experienced heavy losses from the Portuguese, though by a truce, within the last fourteen years, that nation had accommodated matters with them;—that licenses had been granted in the late reign to Courteen's Association, to carry on trade, and establish factories in the countries within their limits, and that their depredations on the native traders had exposed the Company's servants to imprisonment, and their property to heavy losses;—that this same Association was now applying for permission to form a settlement on the Island of Assada, near Madagascar, and was preparing shipping, and engaging settlers for that purpose;—that the consequence of such an establishment would be, that their ships would renew their depredations on the shipping and trade of the native States in India, and again expose the Company's property and servants to seizure and imprisonment;—and that the ultimate effect must be to exclude the English nation from trade in the East Indies:—they therefore prayed that the Council of State would pass an Act for the support and encouragement of the East India trade, as managed by the Company."

Courteen's Association took the name of Assada Merchants, and the Council of State recommended the parties to confer, and come to an agreement between themselves. After several meetings it was finally agreed that the Assada Merchants should not trade from port to port in India, but might proceed direct from Assada to any ports on the coasts of Asia, Africa, or America, and return direct to Assada; that they should be allowed a free trade, without restriction, to the coast of Melinda, the river of Sofala, Mosambique, and parts adjacent; that the trade to Guinea, for gold, and ivory, should in future be included with the East India trade.

On the 31st of January 1649—1650, Parliament, on considering a petition from the Company, resolved, "that the trade to the East Indies should be carried on by one Company and with one joint-stock, and the management thereof to be under such regulations as the Parliament should think fit."

The *United Joint Stock* was in consequence formed, and towards which 157,000*l.* was subscribed; the residue of the fourth joint-stock was purchased for 20,000*l.* It was also proposed that no vessel should be sent to India after the 1st of March 1653. The injuries which the English had experienced from the Dutch in India for a series of years, were then enumerated in a petition, and presented by the Company on the 14th of November 1650, the High Court of Parliament stating, "that in violation of the treaty of 1619, they had been expelled by them from the Island of Pulo Roon, their ancient inheritance, and from the islands of Lantore, Molucca, Banda, and Amboyna, where their factors and servants had been barbarously murdered; that the spice-trees in Pulo Roon had been cut down by the Dutch; and the Company's houses and stores at Jaccatra burnt, and their treasure taken away; that Bantam had been blockaded by the Dutch for six years together, whereby the English were deprived of the benefit of that trade; that the shipping and subjects of the Mogul had been protected by the Dutch against the English; that the Dutch had committed piracies in the Red Sea under the English flag, for which the Company had to pay 103,000 rials of eight; that a quantity of pepper had, in the year 1649, been taken by the Dutch out of one of the Company's ships at Indrapour; and that, on the whole, they had, during the last twenty years, sustained losses from the Dutch to the amount of 2,000,000*l.* sterling; that they had repeatedly represented their grievances, but never could obtain any reparation; and therefore prayed that their case might be taken into consideration, that satisfaction should be demanded from the States-General for the loss which they had sustained, and particularly that Pulo Roon should be restored to them."

This petition was referred by the Parliament to the Council of State. The war with Holland commenced soon after, and the Company remained without any redress until the treaty of Westminster, in 1654; by which it was stipulated "that the States-General shall take care that justice be done upon those who were partakers or accomplices in the *massacre of the English at Amboyna, as the Republic of England is*

pleased to term that fact, provided any of them be living; and that four Commissioners shall be named on both sides, to examine and distinguish all the losses and injuries either party complains of having suffered from the other." Commissioners were named, and met in London on the [illegible] of August 1654, to decide on the claims of the respective Companies, for compensation. The English Company stated their damages, as [illegible]ished by regular accounts from 1611 to 1652, at 2,695,992*l.* 15*s.* To counterbalance this statement, the Dutch brought forward accounts, [illegible]ch they estimated their damages at 2,919,861*l.* 8*s.* 6*d.* The Commissioners appear to have overlooked these claims, and reported that there should be an oblivion by both parties of past injuries and losses; that the island of Pule Roon should be restored to the English; that the Dutch Company should pay to the English Company 85,000*l.* by two instalments; and further that the sum of 3,615*l.* should be paid to the heirs or executors of the sufferers at Amboyna. These sums were paid by the Dutch Company.

From the commencement of the Company's establishment, complaints had often been made against their exclusive trade to India. Cromwell, by way of experiment, declared the navigation and commerce to India open and free to all for three years. Milburn remarks,—

"All ranks eagerly embarked in the trade. The consequence of this permission is thus truly stated by an intelligent author:—'When the East India trade was laid [illegible] heap, that they supplied more parts of Europe, and even Amsterdam itself therewith, than ever they did after, whereby they very much sunk the East India Company's *actions*;' and there was also a great lowering of English commodities in India.' In this year the Company made up the actual state of their affairs, by which it appeared that their assets amounted to 185,589*l.* 7*s.*, and their debts to 29,271*l.* 19*s.* 4*d.*, leaving a balance in their favour of 156,317*l.* 2*s.* 8*d.*"

In 1656, the Company, in a petition to the Government, stated, "that they had been at great expenses in purchasing privileges, and erecting factories in various parts of India; that the time of the united stock being expired, and many ships having been sent by individuals under licenses, the interference of which had the effect of raising the price of India produce from forty to fifty per cent., and to lower the price of English manufactures in an equal proportion, they prayed that the Protector would renew their charter, and that it might be confirmed by Act of Parliament." This petition was submitted to the Council of State, and on the 3rd of November 1656, it was referred to a Select Committee.

The Select Committee reported, on the 18th of December, "that they had carefully considered the petition of the East India Company, and that they might have the fullest information on this important subject, had directed notices to be fixed on the exchange, appointing a day for all persons concerned in the East India trade to attend them." Several merchants attended, and a full hearing was given to both parties. The committee reported to the Council of State, "that though it was their private opinion the trade ought to be conducted with an united joint-stock, yet they considered the commerce to India of so much importance, that they referred the whole case to the Council of State for their decision."

The Council of State appointed the 28th of January 1657, for the Governor and committee of the East India Company, and the principal merchant adventurers, to attend them; when, after a full hearing of the claims of both parties, the council gave it as their advice to the Protector, "that the trade of East India be managed by a united joint-stock, exclusive of all others." On the 10th of February the Protector approved of this advice, and a committee was appointed to consider of the charter to be granted to the East India Company.

An union was then effected between the Company and the merchant adventurers, and 786,000*l.* was subscribed to form a new joint-stock, and the forts, previleges, and immunities in India and Persia were transferred to the new joint-stock on payment of 20,000*l.* Fort St. George and the several factories on the Coromandel coast and in Bengal; the factories at Surat, and Gombroon in Persia, with their dependencies; and the factory at Bantam, with its dependencies of Jambee and Macassar, were then transferred by the old to the new Company.

After the death of Cromwell, the energy of the Government was relaxed; and in 1660, notwithstanding the Company's privileges, interlopers ventured to trade. A case at this time occurred which produced the most serious differences. A ship, fitted out by a person named, Skinner, arrived in India in 1658. The Company, under their new charter, seized Skinner and his effects. Skinner complained to Charles II. who referred his case to the Privy Council, from whence it was carried to the House of Peers.

"The Peers, on hearing the complaint directed the Company to put in their answer. The Company urged their exclusive privileges, and at the same time demurred against the jurisdiction of the Lords, as the case had not come before them regularly by an appeal from an inferior court. The Lords overruled the plea, and in 1666 appointed the case to be heard at their bar. The Company obtained a postponement till 1667, when they again demurred, and complained to the Commons of the illegality of the Lords' proceedings. The Lords on this were inflamed, and passed a decree in favour of Skinner, with 5000*l.* damages. This exasperated the Commons, who passed some severe resolutions against the Lords, and sent Skinner to the Tower. The Lords upon this voted the Company's petition to be false and scandalous. The Commons, in return, resolved that whoever should execute the sentence of the Lords, in favour of Skinner, should be deemed a betrayer of the rights and liberties of the commons of England, and an infringer of the privileges of their house. These violent contentions obliged the King to prorogue the Parliament seven times. In 1670 the quarrel was again revived, when the King called both houses to Whitehall, and prevailed upon them to erase all the offensive votes from their journals."—*Milburn.*

Thus ended a case which occasioned many discussions in respect to the jurisdictions of the houses of Parliament. In the early period of the Company's trade, the ships visited the northern parts of India, where they disposed of part of their cargoes, and with the proceeds purchased piece goods for the supply of the ports to the southward: here they disposed of the remainder of their British goods, and such of the piece goods as were suitable for those markets, and invested the produce in pepper, spices, and other articles for their return cargoes. The state of Asiatic politics, from the Indian princes being mostly engaged in warfare, and the opposition which the Company experienced from their inveterate enemies, the Portuguese and Dutch, obliged them to be continually shifting their factories. The Company therefore resolved to confine themselves to the direct trade out and home. The trade from port to port in India, termed the country trade, was left to the Company's servants in India, and to persons licensed to reside there as free merchants.

The national ships at this period, were generally of small dimensions, and few were able to fight off the pirates of Algiers, called "Turkish rovers." To encourage the building of ships of above 550 tons, and *with three decks*, the Company offered to give them employment in their service in preference to all others, at 20*s.* per ton more than the ordinary rates of freight. The first ship of this description tendered to the Company, was the *Loyal Merchant*, built by Captain Millett in 1660.*

In the years 1658, 1659, and 1660, the total value of the Company's exports was 251,583*l.*, and consisted of bullion, 227,820*l.*, and goods 23,763*l.* In 1661, the Company obtained from Charles II. a new charter, dated the 3rd of April 1661; the preamble of which states, that divers disorders and inconveniences had been committed by the King's subjects and by foreigners, to the great prejudice of the Company, and interruption of their trade; whereupon the Company had besought the King to confirm their charters, granted them by Queen Elizabeth and King James. The King accordingly grants, ratifies, and confirms unto the Governor and Company, that they shall be a body corporate and politic by their former name, with perpetual succession for ever. And the charter then proceeds, like that from King James, to the nomination of the first Governor, Deputy-Governor, and twenty-four committee-men, with instructions for their annual election; and grants to the Company the following powers in addition to those given them by their last charter, viz:

That the Commissioners of customs shall permit no entry of India goods, but such as shall be allowed by the Governor and Company, under their seal, or under the hand of the Company's officers, to be by them appointed to sit at the custom-house for that purpose. That every member shall have a vote in the general court, at all elections and bye-laws, for each 500*l.* stock which he shall possess; and that persons may unite smaller sums to make up that amount, and vote jointly for the same. That all plantations, forts, &c., where the Company's factories are, or shall be established, shall be under their own command and control, with the appointment of Governors and officers to govern the same, and that *such Governor and his Council may exercise civil and criminal jurisdiction in the said factories, &c., according to the laws of England; and if the offence shall be committed in a place where it cannot be tried, the offender may be sent to such other plantation or fort where there is a Governor-in-Council to try him, that justice may be done.* That the Company *may export warlike stores, make peace and war with princes and people in the limits of their trade* (not being Christians), *and recompense themselves for wrongs and damages sustained at their settlements.*

That they may fortify St. Helena and any other places within any limits of their trade, and supply their forts and settlements with clothing, victuals, ammunition, and implements, free from custom or duty, and transport thither such men as shall be willing to go; may govern them in a legal and reasonable manner, and inflict punishments for misdemeanours, or impose fines for breach of orders. That they may seize all Englishmen and other persons in the East Indies sailing in any Indian or English vessel, or inhabiting those parts without the Company's license, or that shall disobey their orders, and send them home to England. That the King's subjects, employed by the Company in the limits aforesaid, shall suffer such punishment for offences there committed as the Company's President and Council shall think fit, and the quality of the offences requires; and in case of appeal, the offender shall be sent home for punishment. And for the better discovery of offenders, all persons may be examined upon oath before the Company's President and Council touching the same. The Company are restricted from trading in the dominions of any Christian prince or State, in amity with the crown of England, who shall overtly declare it to be against his will or good liking. With proviso, that if the continuance of this charter shall not be profitable to the crown and the realm, the King may resume it on three years' notice. By the 11th article of the treaty of marriage of King Charles II. with the Infanta of Portugal, the crown of Portugal ceded and granted to the crown of England the island and harbour of Bombay, in full sovereignty, which was taken possession of and retained by the crown till 1668, when, in consequence of the expenses of maintaining greatly exceeding its revenues, Charles granted it to the Company in perpetuity. The island of Roon, otherwise Pulo Roon, was, by the arbitrators in 1654, decreed to be restored to the English; but the Dutch not fulfilling the obligation, this island was forcibly taken by the East India Company, who held it only a short time before the Dutch, in 1664, again seized it; by the treaty of Breda in 1667, it was ceded to the Dutch.

* a royal inspection, and Charles II. was so pleased with her construction that, as an encouragement for building ships of a similar description, [illegible] be passed (14 Charles II., chap. 2.), by which it was conditioned, that for seven years to come, whoever should build ships with three decks, or with two decks and-a-half, and a forecastle, with a space of five feet between each deck, and mounted at least with thirty cannon, should for the first two voyages receive one-tenth part of all the customs that were payable on their export and import lading.

In 1664, as the seven years for which the Company were associated expired, public notice was given that such of the subscribers as were inclined might withdraw their shares. No one considered it profitable or necessary to do so, although the price of India had been reduced so low as seventy per cent. A statement was in consequence made of the Company's affairs, by which it appears that in India, quick and dead stock, 425,713*l.*; in England, cash and bullion in their treasury, 37,663*l.*; saltpetre and cash advanced on account of exports, 9,227*l.*; drugs of various kinds, and pepper, 4,707*l.*; lease of house in Leadenhall-street, 1,112*l.*; debts owing them for goods sold, 127,935*l.*; sundry other debts owing to them 21,316*l.*; being a total of 660,841*l.*; from deducting sundry debts which the Company owed, 165,807*l.*, left a balance of 495,734*l.* in their favour, by which it appeared that the stock was worth 130 per cent., and it was agreed to open books for a new subscription at that rate.

In 1666, the great fire in London destroyed the East India Company's saltpetre warehouses, and their pepper in the vaults under the old Exchange; their other warehouses escaped the conflagration.

In the year 1670, Sir Josiah Child, who was an East Indian Director, published his "Discourses on Trade." In that work he maintains with respect to the Indian trade, that,—

I. It employs from twenty-five to thirty of the most warlike merchant ships of the kingdom, with sixty to 100 mariners in each.

II. It supplies the kingdom constantly and fully with that necessary article, saltpetre.

III. It supplies the kingdom for its consumption, with pepper, indigo, calicoes, and several useful drugs, to the value of from 150,000*l.* to 180,000*l.* per annum.

IV. It also supplies materials for carrying on our trade to Turkey, viz., pepper, cowries, calicoes, and painted stuffs; as also for our trades to France, Spain, Italy, and Guinea, to the amount of near 300,000*l.* per annum, most of which trades we could not carry on with any considerable advantage but for those supplies. And those goods exported do produce in foreign parts, to be returned to England, six times the treasure in specie which the Company export to India. He therefore concludes:—

"That although the East India Company's imports greatly exceed its exports of our manufactures, yet for the above reasons it is clearly a gainful trade to the nation." He subjoins also, "1st.—That if we had not this trade ourselves, the single article of saltpetre, so absolutely necessary for making gunpowder, would cost a vast annual sum to purchase it from the Dutch. 2nd.—The loss of so many stout ships and mariners would be a great detriment to the nation. 3rd.—Were we forced to buy all our pepper, calicoes, &c., from the Dutch, they would make us pay as dear for them as we do for their nutmegs, mace, cloves, and cinnamon; and if we did not use calicoes, we should fall into the use of foreign linens."

About this period muslins were first introduced into England, instead of cambrics, lawns, and other linens from Flanders and Germany, for which immense sums were annually paid, and we find the Levant Company, complaining against the East India Company "for the great quantities of raw silk which they imported, and which had formerly been brought solely from Turkey."

In 1672, the English East India Company obtained a grant of the remaining moiety of the customs at Madras, on paying the Nabob the annual sum of 1,200 pagodas. In 1674, the East India Company having erected fortifications and plantations at St. Helena, previous to its capture by the Dutch, and it being retaken by the King's ships and forces, the King, by grant dated December 16, 1674, "re-granted and confirmed the same to the said Governor and Company in perpetuity, to be held in socage tenure, as of the manor of East Greenwich, with the same powers and privileges for the safety and protection thereof, and for the government of the inhabitants, and with the like declarations in favour of the Company and the inhabitants, as were contained in the grant of Bombay; and, with this further privilege, that the Company were permitted to export to the said Island all kinds of clothing, provisions, or victuals, ammunition, ordnance, and implements, without payment of custom, subsidy, or other duty, and also to transport thither such numbers of men, willing to go, as the Company should think fit.

Complaints were about this time very general against the East India Company as lesseners of the consumption of English manufactures whereby it was observed that the annual exportation of bullion to India, which formerly did not often exceed 40,000*l.*, was greatly increased; These complaints continued to increase until Parliament enacted a *total and absolute prohibition of the wear of all Indian cotton fabrics in England, muslins only excepted.* An unsuccessful attempt was made to open a trade at this time with Formosa, a vessel was also sent to Japan, but it is asserted that from the King of England having married a princess of Portugal, permission was refused to trade; the ship then proceeded to Macao, but from the opposition of the Portuguese the cargo was with difficulty sold. The Company presented to Parliament the following account of all bullion, gold, and silver, shipped to India from the years 1667—8 to 1674, inclusive.

	£	s.	d.
In 1667—8	125,000	17	5
1668—9	162,491	9	10
1669—70	187,458	3	8
1670—1	186,149	10	11
In 1671—2	186,420	8	3
1672—3	131,300	5	11
1673—4	182,983	0	6
Total	1,105,811	16	5

In lieu whereof, and of several sorts of manufactures sent out by the Company, it was stated there had been paid unto His Majesty for customs the sum of about 35,000*l.* per annum. "And for increasing the navigation and strength of this kingdom, there hath been built within that time, and are now in building, twenty-four sail of ships, from 350 to 600 tons' burden; and they have paid for freight and wages yearly to the amount of 100,000*l.* per annum. And have furnished His Majesty's kingdoms of England, Scotland, and Ireland with all sorts of East India commodities (excepting cinnamon, cloves, nuts, and mace), which, had they not done, would have cost the kingdom far greater rates to have been supplied from other nations. And besides which, there are exported East India goods to other countries, by moderate estimate, double the value of what they have exported in bullion, which is a very great increase to the stock of this kingdom, and the proceed of a greater part thereof is from time to time returned in gold and silver. And as for the permissions granted to others to send on their ships, the Company not finding it convenient for themselves to trade in diamonds, bezoar stones, ambergris, musk, pearls, and other fine goods, they have given leave to others to trade therein, paying only a small acknowledgment to the Company for freight, to the end that trade might not only be preserved, but increased to the kingdom's advantage; by which also this kingdom is not only furnished with those commodities, but there is also sent out from hence of those fine goods to a very great value unto other countries, for increasing the stock of this kingdom."

In 1676, from the prosperous state of the Company's affairs, it was agreed instead of making a dividend, to add the profit to their capital, and every share of 50*l.* was doubled, or made 100*l.* Their capital was estimated at 739,782*l.* 10*s.* Sir Josiah Child, in reply to a work written against the Company, states, "that the Company now employed to and from India thirty to thirty-five ships, from 300 to 600 tons' burden, twenty-eight of which had been built within the last seven years; that their exports in 1674—5 consisted of bullion 320,000*l.*, and in woollens and other goods about 100,000*l.* The returns from that adventure were calicoes, pepper, saltpetre, indigo, raw and wrought silks, drugs, &c., which, on sale in England, produced 860,000*l.*, from which deducting 60,000*l.*, for the maintenance of factors, forts, garrisons, &c., they added annually to the stock of the kingdom 370,000. There were also exported in the private trade of their officers and servants:—

	£	£
British manufactures and other goods, from	40,000	to 50,000
Bullion	80,000	to 100,000

the returns for which were made in diamonds, pearls, musk, ambergris, &c., to the amount of from 250,000*l.* to 300,000*l.* The amount of India commodities consumed in England was estimated at, raw and wrought silks, 30,000*l.*; pepper, 180,000 lbs. at 8*d.* 6000*l.*; indigo and drugs, 15,000*l.*; saltpetre, 30,000*l.*; and calicoes, 160,000*l.* Their stock, which in 1665, was at 70 per cent., was now at 245. The ships sent to India in 1676 were thirteen, seven of which to Bantam, three to Surat, and three to the coast and bay, their chartered tonnage amounted to 6,015 tons. The King granted a new charter (being the fourth), dated October 5, 1677, by which he confirmed for ever all rights, liberties, and franchises granted by their former charters, notwithstanding any misuser, nonuser, or abuser and gave them the benefit of all damages they should recover from their servants or ship-owners, for breach of covenant, and a general pardon to the Company and their servants of all debts and demands (except customs and subsidies which accrued since September 1676), directing that all prosecutions depending in respect thereof should be surceased and withdrawn. The Governor and Company were also authorised to coin money at Bombay, and in all other places mentioned in any of the King's charters, so that any of such coins were not called by the name of any coin current in the King's dominions, except in the East Indies. Permission was obtained in 1678 to establish a factory at Tonquin; but from the exactions of the Mandarins it was abandoned. Of the nine ships that were sent to India this year, three were to Bantam, three to the coast and bay, and three to Surat; tonnage of all, 4,835 tons.

In 1679, ten ships were sent to India, three were to Bantam, four to the coast and bay, and three to Surat; tonnage 5,400 tons. A British factory was established at Amoy, in China, about this time. In 1680, of the ten ships sent to India this year, five were destined to Madras, three to Surat, and two to Bantam; their chartered tonnage was 4,975 tons, and the bullion and merchandise exported on them were 248,212*l.* From this period the exports by the East India Company will be found regularly stated in the tables of trade and navigation hereafter. In 1681, the silk-weavers of London petitioned unsuccessfully the House of Commons against the wear of East India silks, Bengal, &c. It was stated by one of the members of the House, "that we consumed 300,000*l.* yearly in those East India manufactured goods, including printed calicoes for cloths, bed-hangings, &c." The Turkey Company complained also to the council, of the Company's interference in the article of raw silk, and thereby lessening the demand for woollens in the several trades. The Turkey Company were heard in support of their complaint before the Lords of the Privy Council, to which the East India Company made what was considered a satisfactory defence. A private ship, commanded by Sands, being now about to proceed to sea with a cargo valued at 50,000*l.*, the King, at the request of the Company, laid an embargo upon her; and after a long trial a decision was made in favour of the Company, and the ship and cargo sold off, to the great loss of the proprietors. Interlopers, however, continued to trade to India, *several eminent lawyers freely declared that the King could not legally obstruct them by any charter whatever granted to the Company, unless their exclusive powers had the sanction of an Act of Parliament.*

In August 1682, the English were expelled from Bantam, in consequence of a dispute between the old King and his son. The English took part with the father, and the Dutch with the son, and sent their forces to his assistance from Batavia, whereby the old King was vanquished and shut up in prison. The young King gave the Dutch possession of a castle which commanded the town and fort; the English Company's factors were then driven out, and this was the origin of the Dutch tenure to Bantam. The King granted the East India Company their fifth Charter, dated August 9, 1683, and empowered the Company, their factors, &c., to seize all ships and goods brought from, or carried to any place within the limits of the Company's exclusive trade, granting to the Company one-half of the forfeiture and reserving the other to the crown. The charter also provided that the Governor and Company should have the government of all forts, factories, and plantations, already or thereafter to be settled by the Company within the limits aforesaid, with the power of making and declaring peace and war with the *heathen nations*, and the appointment of Governors, &c., which Governors, &c., might muster forces and execute martial law in India, the King, nevertheless, reserving the sovereign right over the said forts, &c., and power of making peace and war, when he should think fit to interpose his royal authority. Also the power to erect courts of judicature in any of their settlements, and to appoint judges thereof, who should determine, according to equity and good conscience, and the laws and customs of merchants. And, lastly, that the Company should enjoy all privileges in the city of London, in as large a manner as could be enjoyed by any Company of merchants erected by charter. A mutiny broke out this time among the military at Bombay. Captain Keigwin, who commanded the garrison, seized the members of Government on the 27th of December 1683, annulled the Company's authority by proclamation, and declared the island under the King's protection; and it was not till November 1684, that the island of Bombay was brought again under the Company's authority. The inhabitants of St. Helena having refused to pay taxes, or acknowledge the Company's authority, the powers were put in execution by which they were invested by the new charter. Some prisoners were tried and executed, and the relatives of the parties appealing to Parliament, the latter voted the Company's proceedings arbitrary and illegal: in other respects the affairs of the Company were in a flourishing state, and their stock increased in value from 340 to 500 per cent. The profits in the nine years, from 1676 to 1685, are stated as amounting to 963,639*l.*

In 1686, the interlopers in India declared themselves the "true East India Company," and incited the Mogul's people to make war on the Company in Bengal; a ship of war was, in consequence, despatched to India, with the King's proclamation, "enjoining all his subjects in India to repair to the Company's forts and factories, and to submit to their jurisdiction, with orders to seize all interlopers;" and for enlarging and corroborating the Company's authorities, the King granted them a new charter, being the sixth, dated April 12, 1686, whereby he ratified all the preceding charters for ever in their fullest extent, notwithstanding any nonuser, misuser or abuser. And further granted to the Company, and their respective presidents, agents, chiefs, and councils in India, or to any three of them (whereof such president, agent, or chief, to be one) power to administer to all persons employed by the Company, the oath taken by the freemen of the Company, and such other lawful oaths as the Court of Directors should prescribe. And also a power to exercise martial law at St. Helena, and the Company's fort at Priaman on the west coast of Sumatra, as well as in all their other limits. And the King having been given to understand, that many of the native princes and Governors of India, &c., taking advantage of the divisions, distractions, or rebellions amongst the English, occasioned by the late licentious trading of interlopers had violated many of the Company's privileges, surprised their servants, ships, and goods, besieged their factories, invaded their liberties, and by many other ways, without just cause, abused their chiefs and factors, to the dishonour of the English nation, for all which the Company intended to demand satisfaction in a peaceable way; and if not obtained that way, to use force of arms, wherein they would have occasion to use their ships in a warlike manner: wherefore the King granted full powers to the Company to appoint admirals, captains, &c., from time to time, who might raise and muster seamen and soldiers on board their ships, as should be directed by the Company, or by their Captain-general in India, to whom authority was granted for seizing all English interlopers, and compelling them to submit, and for taking their ships and goods. Also to make war on such Indian, princes as might hurt the Company; with power in time of open hostility, with any Indian nation, to exercise on the other side of the Cape of Good Hope, martial law, as well on board their ships as on land; reserving, however, liberty to the King at pleasure to revoke this grant of martial law in their ships.

"The Company might also coin in their forts any species of money usually coined by the princes of those countries, so that it should be agreeable to the standards of those princes in weight and fineness, and so that they did not coin any European money; and it was declared that all such money so to be coined, should be current in any city, town, port, or place within the limits of the Company's charter, but not elsewhere." This was the last East Indian measure of the Stuart dynasty.

In the year 1690, a report of the Company's affairs was published, from which it appears that during the previous seven years they had built sixteen large ships, from 900 to 1,300 tons' burden; that in *lieu of Bantam*, of which they had been unjustly deprived by the Dutch, they had erected and garrisoned three forts for the protection of the pepper trade; that they had at sea, in India, and on the voyage home, eleven ships and four *permission ships*, whose cargoes amounted in value to 360,000*l.*; that they had then outward-bound, for coast and bay, thirteen ships valued at 570,000*l.*; seven for China and the South Seas, 100,000*l.*; and that they possessed goods *unsold* to the value of 700,000*l.*; that they had also restored to order the revolted settlements of Bombay and St. Helena, had brought the war with the Mogul to a successful termination, and obtained a confirmation of their former privileges. The interlopers, and the friends of those put to death at St. Helena, joined at this time, and managed by their representations to bring the Company into great discredit; printed papers were distributed, exposing their crimes and miscarriages, and proposing the dissolving of the existing, and erecting a new Company. The House of Commons appointed a committee to inquire into all matters connected with the East India trade, before which the evidence of the different parties was heard. The committee resolved on the 10th of January 1690, "that it is the opinion of this committee, that the best way to manage the East India trade is to have it in a new Company, and a new joint-stock, and this to be established by Act of Parliament; but the present Company to continue the trade, exclusive of all others, either interlopers, or permission ships, till it be established." King William replied, "that it being a matter of very great importance, it required some time to consider their address;" and he referred it to a Committee of the Privy Council, which decided that the capital stock of a new Company should be made up 1,500,000*l.* at least, and not to exceed 2,000,000*l.*, of which the then Company's stock of 740,000*l.* was to constitute a part, and that they and the new subscribers should be incorporated for twenty-one years. The existing Company objected, on the ground, that their quick stock and revenue were really worth more than 1,500,000*l.*, and that the current price of their stock at market was 150 per cent.; that all their forts, towns, and territories were their own for ever by their charters, and had cost them, first and last, upwards of 1,000,000*l.* The King then informed the Commons that, upon consultation, he found he could not dissolve the Company without giving them three years' notice, during which time they could not be hindered from trading, nor could a new Company trade till the three years were expired: he therefore recommended to them to prepare a bill for settling the business. From the diversities of opinion in the House, nothing was determined upon except an address to the King, to dissolve the Company at the end of three years.

The Company, in 1694, not having paid a duty of five per cent. imposed on their capital stock, by an Act of the 4th and 5th of William and Mary, chap. 15, a doubt arose, whether their charter had not become void, in law, under a proviso contained in the Act. To prevent disorders and inconveniences, the King granted to the Company a new charter, restoring their former privileges, subject to a proviso, "that if they should not except of, and in all things conform to, such orders and constitutions as the King, with the advice of his Privy Council, should express and direct by any instrument under the great seal, the King should be at liberty to resume the charter." By separate patents under the great seal, dated November 11, 1693 and 28th of September 1694, the King prescribed rules and orders for the Company's observance, by which it was provided that,—

All subscribers were to be members of the Company. That 744,000*l.* shall be added to the present capital stock of the Company by a fresh subscription. That none shall subscribe above 10,000*l.* That, in general courts, 1,000*l.* stock to give one vote, and none to have above ten votes. "That such as shall become proprietors by purchase, shall pay 5*l.* for their freedom; who (as also the new subscribers) shall take the oaths appointed by law, and also the freeman's oath. The Governor, or in his absence, the Deputy-Governor, to have a casting vote in all courts; each of them to have 4,000*l.* stock in their own right; and each director and committee-man to have 1,000*l.* No permission shall be granted for ships to India on a private account, under the penalty of forfeiting the charters. No private contract shall be made for the sale of goods, saltpetre for the Kings' use only excepted; but all to be openly and publicly sold, and no one lot (jewels excepted) to exceed 500*l.* value. The Company shall annually export goods to India, of the growth and product of England, to the value of at least 100,000*l.* The Company shall annually supply the crown with 500 tons of saltpetre, at 38*l.* 10*s.* per ton in time of peace, and 45*l.* in time of war. All dividends of the Company's profits shall for the future be made in money only. A book shall be kept by the Company, wherein the value of their stock shall be entered, and attested upon oath, and lay open to the view of all persons concerned; and the like as to mortgages, alienations, transfers, and assignments. The joint-stock of the Company shall continue for a term of twenty-one years, and for the space of one year before its expiration, books shall lie open for new subscriptions, to a new joint-stock. The Company may license their own commanders and mariners (but none other) to trade on their own private account, in such commodities and to such value as a general court shall direct. To the intent that the Company's annual exports of English goods to India, to the value of 100,000*l.* may be proved, a true account thereof in writing, signed by the Governor or Deputy, shall be annually laid before the King and council, attested on the oaths of the proper officers; and no part of such goods shall be re-landed, or carried anywhere out of the Company's limits. Neither the Governor, Deputy, nor committee, shall lend out the Company's money, without the authority of a general court. If this and the two last charters shall not appear to be profitable to the crown and realm, then, after three years' warning, all the said three charters shall be determined and void, and the said Governor and Company shall no longer continue a corporation. And that the Company shall, by a writing under their common seal, declare their acceptance of, and submission to, the said two charters; or, in their default, no longer act as a corporation."

In 1695, the Parliament of Scotland passed an Act, on the 26th of June, empowering the King (as King of Scotland) to constitute a Scottish Company, "with powers to trade to Africa and the East Indies, and not only to trade to the countries within the East India Company's limits, but to America and the West Indies." This act was repealed, in consequence of representations from the East India Company and others.

In 1697, the silk-weavers of London became outrageous, on the ground that silks, calicoes, and other Indian manufactures, imported by the East India Company, were worn by all sorts of persons. They even attempted to seize the treasure at the East India House. Several valuable ships belonging to the Company were taken by the French privateers during the war which was terminated by the treaty of Ryswick.

In 1698, the private merchants applied to Parliament for an Act to create another and new Company, and the Court of Directors offered to advance 700,000*l.* at 4 per cent. interest, for the public service, provided their charter should be confirmed by Act of Parliament. The private merchants then offered to raise 2,000,000*l.* at eight per cent. interest, provided they might have the exclusive trade to India vested in them. This last offer was considered the most advantageous to the public, and a bill was consequently prepared and introduced into the Commons by which they were incorporated by the name of English Company to the East Indies, the old, or London Company, to be permitted to trade till the 20th of September 1701.

Two East India Companies were now constituted under Parliamentary authority. But, as might have been foreseen, numerous difficulties arose, as the old Company were in possession of the forts and of the privileges granted in India by the Moguls, &c. The English Company soon made offers to the London Company to unite their stock and trade: the offers were rejected. On the 19th of January 1699-1700, the old, or London Company, obtained an Act of Parliament, continuing them a corporation; and on the 8th of March, the King recommended an union of the two Companies, as it was his opinion "that it would be most for the interest of Indian trade.

The Company's stock fluctuated during this period from 300 to 37 per cent. From the extensive wear in England of India wrought silks, stuffs, and calicoes at this time, it was thought proper, in consequence of the complaints, to remedy what was termed so "great an evil." A Parliamentary fallacy was in consequence committed under a statute, enacting "that from Michaelmas, 1701, all wrought silks, Bengals, and stuffs mixed with silk or herba, of the manufacture of Persia, China, or the East Indies; and also all calicoes, printed, painted, dyed, or stained there, should be locked up in warehouses appointed by the Commissioners of the customs, till re-exported; so as none of the said goods should be worn or used, in either apparel or furniture in England, on forfeiture thereof, and also of 200*l.* penalty on the person having, or selling any of them."

During the same year, the new, or English Company, established a factory at Borneo, and a ship was also despatched by the Company to China.

In consequence of King William's recommendation a court of proprietors of the London Company was called on the 23rd of December 1700, at which it was resolved, "that this Company, as they have always been, so are they still, ready to embrace every opportunity by which they may manifest their duty to His Majesty, and zeal for the public good, and that they are desirous to contribute their utmost endeavours for the preservation of the East India trade to this kingdom, and are willing to agree with the new Company upon reasonable terms."

The court were informed that, "His Majesty was glad to find that the London Company were disposed to unite with the English Company on reasonable terms, and that he would willingly know from themselves what those terms were." A general court resolved, "that what terms may be judged reasonable, they do humbly conceive must arise from a treaty, and that they have appointed seven persons of this Company to treat with the like number of the English Company, in order to an union." In January 1702, the general terms of union were agreed on by both Companies, and approved by their respective general courts on the 27th of April 1702. A tripartite indenture between the Queen and the two East India Companies, dated the 22nd of July 1702, was passed under the great seal. This Indenture was called the "Charter of Union." Under it the London Company was to purchase as much of the stock of the English Company, at par, as would vest in each an equal proportion of the 2,000,000*l.*, for the advance of which to Government the charter had been originally granted to the English Company. The interests of the London and English Companies and private traders were then stated as follows:—

	£	£
The London Company's subscription	315,000	
The English " "	1,642,000	
Separate traders' " "	23,000	
		2,000,000

By this agreement the interests of the two Companies were fixed as follows:—

	£	£
Purchase of stock by the London Company, 673,000, in addition to their former stock, making their share together	988,500	
English Company's proportion	988,500	
Separate traders' proportion	23,000	
Total.		2,000,000

The Company's stock acquired two designations before this period; that is to say, the fixed capital in forts, factories, buildings, &c., which was termed *Dead Stock*, and money, ships, and merchandise, which was called *Quick Stock*. The dead stock of the London Company was now valued at 330,000*l.*, that of the English Company at 70,000*l.*; the latter were bound to pay 130,000*l.* to the former, in order to make up the half of the whole dead stock, valued at 400,000*l.*, as total dead stock on joint account.

It was agreed that the London Company should retain their dead stock in England; that it is to say, their offices, warehouses, &c., for seven years: after which they were to belong to the United Company. Each Company for these seven years to hold distinct courts, to raise money, either for their respective shares of the United trade, or for separate transactions. All debts contracted for the joint trade were to be paid out of the United Company's stock. Each Company were required to bring to England their separate properties, and to realise and make dividends to their respective stock-holders: after which, ships, bullion, or goods could only be sent to India on joint account.

Twenty-four managers, twelve by each Company, were to form a council to carry on the trade according to such rules as might be agreed upon by general courts of both Companies, authorised to make bye-laws for the joint trade. "Each Company were to furnish an equal part of the stock of the United trade, and to export one-tenth of their cargoes in goods of the growth or manufacture of England, an account of which was to be annually delivered to the Privy Council; hereby releasing both Companies from all former covenants, saltpetre excepted, of which merchandise they were obliged to deliver to the office of ordnance 494¼ tons, at 45*l.* per ton in time of peace, and at 53*l.* in time of war, the refraction thereof settled at 15 per cent.; but no transaction on the joint trade was to be adopted without the concurrence of both Companies, the general courts of which, and the Court of Managers were to have the sole government of all their forts, factories, &c., in India, and to appoint Governors and officers, with powers to build forts, &c., and to raise, train, and muster a military force for the defence of the same, and with authority to coin foreign money in India.—*Milburn.*

The London Company agreed to convey, in virtue of the Queen's license, the Islands of Bombay and St. Helena to the English Company, and resign their charters to the Queen in two months after the expiration of the said seven years; after which the charter of the English Company (granted in 1698) was to constitute the charter of the joint East India Companies, under the name of "The United Company of Merchants of England trading to the East Indies," to be conducted by Directors, according to the 10th of William III.

The next Act was the Quinque-Partite Indenture of conveyance of the dead stock of the two Companies. This was an indenture of conveyance made between the London Company on the one part; the English Company on the second part; Sir Jeremy Sambrooke, trustee of the London Company's freehold warehouses in Great St. Helen's, London, on the third part; Sir Thomas Davall, and others, trustees of the London Company's leasehold warehouses in Great St. Helen's, on the fourth part; and Sir James Bateman and others, trustees for the English Company, on the fifth part. By this deed the London Company agreed to transfer the charters by which they held the Islands of Bombay and St. Helena, to the English Company, in consideration of 200,000*l.*, credit in the United trade, and the sum of 130,000*l.*, paid to them in money, and also their rights to all their several forts and factories, within the limits of their charter, in the East Indies, of which the following was the statement made:—

1. The factories depending on the Presidency of Bombay, Surat, Broach, Ahmedabad, and Agra. 2. On the Malabar coast, the forts and factories of Carwar, Tellicherry, Anjenjo, and Calicut. 3. In Persia, the factories of Gombroon, Schiraz, and Ispahan, including the annual sum of 1,000 *tomans*, 3,333*l.* 6*s.* 8*d.* paid by the *Sophi* of Persia at Gombroon. 4. On the coast of Coromandel, Gingee and Orixa, the factories depending on the Presidency of Fort St. George, viz. St. George, and the city of Madras, Fort St. David, Cuddalore, Porto Novo, Petapole, Masulipatam, Madapollam, and Vizagapatam, and connected with them, the settlements on the island of Sumatra; or York Fort, Bencoolen Indrapore, Prisanan, Sillebar, and the stations dependent on Bencoolen; and also the factory of Tonquin. 5. The factories dependent on the Presidency of Fort William; or Fort William, Chutanuttee, Balasore, Cossimbuzar, Dacca, Hughley, Malda, Rajmahal, and Patna, with all their claims or title to Bantam, or any other settlement they might have had in the Southern Seas; and all the stores and ammunition belonging to the said forts and factories respectively, and comprehending all the rents and customs arising from those settlements, and all the grants or firmans by which the same were sold to them. This transfer also included their warehouses in London, and their House in Leadenhall-street.

The English Company declared the following settlements constituted their dead stock, which were valued at 70,000*l.*, in the United stock; viz. the factories at Surat, in the Bay of Bengal, at Maysulipatam, Madapollam on the island of Borneo, and on the island of Pulo Condore, with the stores and ammunition belonging to each of them; and it was mutually covenanted that both Companies should enjoy the respective forts, and pay the respective charges of all their settlements, up to the date of the deed, July 22, 1702.

In 1793 the bullion exported from England to the East Indies in six years from 1698 to 1703 inclusive was, in silver, 2,171,406*l.*, gold 128,229*l.*, total 3,299,634*l.*; or, on an average, 549,939*l.* per annum. By an account made up by the Inspector General of the customs, the East India goods re-exported from England in the four years, 1698 to 1702, amounted in value to 2,538,094*l.*, being on an average 507,727*l.* per annum. The first public sale by auction in England is said to have been effected by Governor Yale, of Madras, of the goods he brought home.

In 1704, the Council of Pulo Condore obtained a grant of the island from the King of Cochin-China, and on the 23rd of March 1705, an insurrection took place among the Malay soldiers, who set fire to the Company's warehouses, and massacred the chief and most of the English on the island. The Malays were suspected to have been instigated by the Cochin-Chinese, in order to get possession of the Company's treasure, estimated at 22,000 tales.

(To be Continued.)

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RISE AND PROGRESS OF THE BRITISH TRADE, NAVIGATION, AND POWER IN THE EAST INDIES.

(*Continued from our last.*)

In 1707, by the Act, 6th Anne, chap. 2, for better securing the duty on East India goods, security was to be given, pursuant to the Act of the 9th of King William, that the East India Company *should cause all the merchandise in any ship from India to be brought to some port in England, without previously breaking bulk*, at the rate of £500*l.* security for every 100 tons of each ship sent to the Indies (necessary provisions, stores, and merchandise for the people and garrison of St. Helena, for their own proper consumption, only excepted); and except also where the breaking of bulk, or landing of goods should happen by the danger of the seas, enemies, restraint of princes, &c., under penalty of forfeiting such goods or their value, &c. On the 27th of June 1707, the English settlement at Banjar Massin was suddenly attacked by the natives; most of the English were killed, and the survivors escaped to the ships. Treasure belonging to the Company lost at this place was estimated at 50,000 dollars.

In 1709, the Earl of Godolphin having been constituted arbiter of the rights and privileges of the two Companies, and empowered to examine and ascertain the reciprocal credits and debts of each, awarded, that all debts or money due to the old or London Company in India, China, Persia, St. Helena, &c.; and also all debts due to the English Company in India, China, &c., and the separate merchandise of both Companies laden in ships at India, and which might not arrive in the river Thames before the 1st of September 1708, should become the stock or property of the United Company.

That the London Company should transfer to the Queen all their foreign debts, or debts due to them in India before the 31st of October 1708 that the Queen might re-grant the same, within ten days after that date, to the United Company. That after such re-grant by the Queen, the United Company should be liable for the separate debts both of the London and English Companies in India. That as the estate and effects of the London Company would not be sufficient to pay their foreign debts, or debts in India, to which debts the United Company would become liable; it was therefore decreed that the London Company should pay to the United Company the sum of 96,615*l.* 4*s.* 9*d.* That the state and effects of the English Company in India would exceed their separate debts, and it was therefore decreed that the United Company pay 66,005*l.* 4*s.* 2*d.* to the directors of the English Company.

That the London Company were indebted to a large amount in England, and were to be empowered to call on their proprietors to raise 200,000*l.*, in two instalments before the 1st of February 1709, and such further sum before the 1st of March 1709, as would be sufficient to pay off all their home debts; and then, that when the London Company should have raised the first 100,000*l.*, the United Company should repay to them one-third of the said money, or additional stock, advanced by them at the union, for carrying on the United trade; and when they should have raised the second 100,000*l.*, another third part of the said additional stock should in like manner be repaid; and when they should have raised a sum sufficient to defray all their debts in Great Britain, the remainder of the said additional stock should be repaid; with the exception of 70,000*l.*, which was to be reserved as a security that the London Company should surrender all their charters to the Queen, on or before the 25th of March 1709, which sum, on their failing to make such surrender, was to be forfeited to the United Company; but in the event of such surrender being made, the said sum of 70,000*l.* was to be vested in trustees, to pay any remaining debts of the London Company; and should any surplus remain, to be distributed among the members of the London Company.

And, lastly, that the London Company should transfer, before the 19th of March 1709, to their respective members all such stock, in the proportion of their respective shares, as the said London Company might have in the stock of the United Company; and that the members having right to it, should be admitted to all the privileges of members of the United Company. This award, on the authority of the Act of Parliament was to be confirmed in all its parts by a decree of the High Court of Chancery.

By the account appended to this award, it appears that the debts of the London Company amounted to 1,249,807*l.* 7*s.* 6*d.*, and their assets to only 850,011*l.* 18*s.* 5*d.*, being a deficiency of 399,795*l.* 9*s.* 1*d.*. By the Act 6th Anne, chap. 17, the Company advanced a further sum of 1,200,000*l.* to the Government, without additional interest: that is to say on consenting to receive five per cent. interest for the former and present loan, making together 2,700,000*l.* On these conditions, the term of their exclusive trade was prolonged to fourteen years and-a-half; or, to three years' notice after Lady Day 1726. The Company, to make good this loan to the public, were by the same Act empowered to borrow 1,500,000*l.* on bonds, over and above what they were legally authorised to borrow before, and also to make calls for money from their proprietors. The proprietors of the 7,200*l.* in the separate trade, were allowed to continue so to trade till Michaelmas 1711, when the United Company might, on three years' notice, pay the same off, and their privileges would then be solely vested in the Company. By this Act it was also declared that part of the Act of the 12th of King William, which laid a duty of five per cent. on goods exported to India, was to cease from Michaelmas 1714.

1710. The following is a list of various places in which English factories were established at different periods, from the commencement of the trade to the East Indies, till the union of the two Companies in 1708. In the Red Sea, or Arabian Gulf, the factories of *Aden* and *Mocha*. In the Persian Gulf, the factories of *Bussorah Bushire, Gombroon, Ispahan*, and *Schiraz*. On the western coast of India, the factories of *Cutch, Cambay, Amedabad, Brodera, Baroach, Surat, Bombay, Raybag, Rajahpore, Carwar, Baticaloe, Onore, Barcelore, Mangalore, Durmapatam, Cananore, Tellichery, Calicut, Cranganore, Cochin, Porca, Carnoply, Quilon*, and *Anjengo*. On the eastern side of India, that is to say, Coast of Coromandel, the factories of *Tuticorin, Porto Novo, Cuddalore, Fort St. George, Pulicat, Pettipole Mausulipatam, Verpsheroon, Ingoram, Vizagapatam, Bimliapatam*, and *Ganjam*. In Bengal, the factories of *Balasore, Calcutta, Hughley, ossi Cmbuzar, Rajahmal, Patna, Lucknow, Brampore, Agra, Lahore, Malda*, and *Dacca*. On the Malay Peninsula to the southward, the factories of *Siam, Pegu, Quedah, Cambodia Cochin China, Patany, Johore*, and *Ligore*. On the Island of Sumatra and Java, the factories of *Acheen, Passaman, Sillebar, Tivoo, Jambee, Bantam, Japara*, and *Jacatra*. On the Island of Borneo, at *Banjar Massin* and *Succadana*; and on Celebes, *Macassar*. In the Moluccas, on *Banda, Amboyna*, and *Pulo Roon*.

In the China Seas; *Pulo Condore, Tywan, Chusan, Amoy*, and *Macao*; *Magindanao* on the island of the same name, and *Firando* in Japan. A factory was then simply a house of agency for the sale and purchase of goods on commission. Factories of this description were frequently established in different places, with a view of ascertaining the markets, and the situations best adapted for trade. The minor factories were subject to the authority and control of the superior factory, consisting of a chief and council, in whom all instructions originated, and to whom the factors were accountable. A subordinate factory seldom consisted of more than a factor, and a writer or assistant, with a few [illegible] assistant labour. Of those factories thirty-two were at different periods established for procuring articles of piece-goods only, [illegible] and eastern side of India, eleven on the coast of Coromandel, and eleven in Bengal. And in procuring pepper, twenty-nine factories were settled at various times in different places, viz., sixteen on the coast of Malabar, six in Sumatra, three in Java, and four in the Eastern Islands, most of which not paying the expense of maintenance, were abandoned.

1711. By the Act 9th of Anne, chap. 7, it was declared that no person should serve as a director of the East India Company and the Bank of England at one and the same time. The same regulation was enforced with regard to the South Sea Company, established this year. East India Stock in the month of November this year was sold at 124.

1712. By the Act 10th of Anne, chap. 23, the exclusive privileges of the Company were further prolonged until three years after Lady Day [illegible] and they were directed to "continue trading in their corporate capacity although their funds should be redeemed." The Company presented a petition to Parliament against a bill for laying additional duties on calicoes, tea, coffee, drugs, &c., in which it was stated that the [illegible] woollen and other British products to the extent of 180,000*l.* per annum.

In this year Charles VI granted commissions to ships fitted out at Ostend, for trading to the East Indies, and it was soon discovered [illegible] English or Dutch property, under the Emperor's flag, and both the English and Dutch Governments complained [illegible] of this interference to the repose of Europe, as a breach of the treaty of Munster.

In 1715 the English Company sent a deputation to Delhi, to solicit redress for past losses, and security against future oppressions on the part of the Mogul authorities. A firman was granted January 6th 1716, exempting the Company's trade from duties, on the payment of a *peshcush* of 10,000 rupees per annum. This firman recited, "That customs on English goods are only payable at Surat; that in Shah Jehan's time these were only two per cent.; in the time of Aurungzebe 3½ at Surat, and none at other places; in Behsuder Shah's time they were 2½; that by reason of the Government officers' oppressions, it is three years since they have withdrawn their factory. In Bahar and China they have no customs. In Hughley they give 3,000 rupees a year in lieu. By this firman they are allowed to possess forty biggahs of land (about fifteen acres) wherever they established a factory."

In 1716 a proclamation was issued by the King, strictly prohibiting His Majesty's subjects from trading to the East Indies under foreign commissions, contrary to the privileges of the English East India Company, and also from serving on board foreign ships. By the 5th Geo. I., chap. 11, goods from the East Indies were prohibited to be landed in Ireland, on penalty of forfeiture of goods and vessel. About this time a scarcity of silver coin in England was attributed to the exportation of silver bullion to the East Indies, "whereby silver had become scarcer, and gold more plentiful, by the profit of bringing gold from India and China. It was asserted that the East India Company had exported in one year near 3,000,000 ounces of silver to India, which was more than was imported from all parts.

In 1718 the trade from Ostend to India, under the Emperor's flag being still carried on, an Act was passed, whereby it was enacted, that "whereas it is of great importance to the welfare of the kingdom, that the trade to and from the East Indies be regulated according to Acts of Parliament and the royal charters; and that particularly by an Act of the 9th of King William III., the East Indies should not be visited nor frequented by any British subjects, other than such as might lawfully trade thither, under the penalties therein set forth; and that the goods laden from India should, without breaking bulk, be brought to some port in Great Britain to be laden. Notwithstanding which restrictions, and the proclamation of the year 1716, several British subjects, not entitled under the said laws, have presumed to trade to India, in foreign and other ships, to the diminution of His Majesty's customs, and the trade of this kingdom; wherefore the contravenors are hereby declared liable to all the penalties of the laws in being. And, moreover, the East India Company are hereby authorised to seize on the persons of all such British subjects as shall be found within their limits, and to send them prisoners to England; and that all or any British subjects, acting under a commission from any foreign potentate, shall forfeit 500*l.* for every such offence." This Act was further continued by the 5th of George II. chap. 29, for seven years from the 1st of May 1732.*

* Ostend Company.—When the Seven United Provinces of the Netherlands became a free State, in 1598, the inhabitants of the remaining provinces were excluded by the King of Spain from carrying on any trade with either the East or West Indies; until 1638, when the King of Spain granted them the liberty of trading to those parts of India which were possessed by the Portuguese, then his subjects; but before any benefit could be derived from this grant, Portugal revolted, and again became independent. From this period, for near sixty years, during which time these provinces remained subject to Spain, they carried on no trade with India.

In 1698 Charles II., the last of the Austrian Kings of Spain, granted a charter for erecting a Company to trade in such parts of the East Indies as were not in the possession of other nations. The capital was to consist of 2,000,000 florins one-fourth to be raised in October 1698, the rest in 1700 and 1701; but they were prevented from taking any advantage of their charter, in consequence of the death of the King in 1700, and the long war for the succession to the crown of Spain. When the Netherlands fell under the dominion of Austria, the merchants were debarred from trading to India in any other manner than that which had been allowed to the subjects of Spain, which was by the way of Cape Horn and no further west in the Indian Seas than the Philippine Islands.

In 1717 some private merchants obtained permission from the Government to send a ship or two to India; they returned with valuable cargoes, and their success encouraged others to fit out others. Foreign merchants then made proposals to the court of Vienna for the establishment of a regular Company, with the Emperor's charter for a term of years, which were favourably received.

The Dutch soon after captured one of the licensed ships, under the plea that she was engaged in an illicit trade. The Emperor made a demand for satisfaction, which not being attended to, he issued a commission of reprisal, and the ship was retaken and brought into Ostend.

In 1720 the merchants, encouraged by the patronage and support of the Emperor, despatched five ships to India, and in the year following six more; three for China, one for Mocha, one for the coast of Malabar, and the last for Bengal. The Dutch seized one of the ships, and ordered her cargo to be sold, notwithstanding the remonstrances of the Imperial minister at the Hague. An English privateer captured one of the homeward bound ships, very richly laden. In May and June 1731, two ships arrived safe at Ostend from India, and in September two more, the cargoes of which sold so well, as to indemnify the merchants for former losses.

In August 1723, the Emperor published the letters-patent to the Ostend Company, in which the Emperor, in addition to the titles of the House of Austria, styled himself King of the East and West Indies, the Canary Islands, &c. This grant was for thirty years, with license to trade to the East and West Indies, and on all the coasts of Africa, on both sides of the Cape of Good Hope, their ships observing the usual customs.

The capital was fixed at 6,000,000 florins, in 6,000 actions or shares.—Twelve of these shares were to entitle the proprietor to a vote, but foreign proprietors were entirely excluded from voting.—The Company were authorised to ship military stores, and all kinds of merchandise, without any exception whatever.—They were permitted to build forts in whatever parts of the Indies they should think fit, and also to furnish them with all kinds of arms, artillery, and ammunition that they thought convenient.—They were likewise allowed to build and equip ships, of whatever size they thought proper, in any of the ports of his Imperial Majesty's dominions.—They were authorised to make leagues, treaties, and alliances, with the princes and states in India, in the name of His Imperial Majesty with this restriction, that they should not make war without the leave of His Imperial Majesty, and his successors first had and obtained. In consideration of all of which grants and privileges, the Company bound themselves to offer as a homage to the Emperor and his heirs, on every succession, a golden lion crowned, of the weight of twenty marks, holding under his two fore-paws the arms of the Company, which were a spread eagle displayed, with the terrestrial globe between his two heads, surmounted by an imperial crown. Lastly His Imperial Majesty undertook to protect and defend the said new Company against all who should unjustly attack them, and would even, in case of necessity, employ the whole force of his dominions to support and maintain them in the full and free possession and entire enjoyments of the commerce and navigation granted them by these letters-patent, and obtain for them full damage and satisfaction from any nation, state, or potentate, that should presume to trouble or disturb them; and likewise, for the future, provide in every respect for their safety and welfare, by any treaties, alliances, or leagues, into which His Imperial Majesty, or his successors, should hereafter enter into with any power whatever.

As soon as those letters-patent were published and registered, the directors took possession of their offices, and held their first general court; in which it was resolved that the books of the Company should be opened at Antwerp on the 11th of August, which was accordingly done, and with such success as surprised all Europe; for the next day by noon the capital was entirely subscribed, and by the 1st September the Company's stock was fifteen per cent above par.

The Company in full confidence of obtaining this charter, had despatched a ship to India in January 1723, to take possession of a piece of ground which they had obtained from the great Mogul on the banks of the Hughley, where they built a small fort; and to form an establishment on the coast of Coromandel, which they did at Covelong as their principal settlement. Their factors, being chiefly persons who had before served either the English or Dutch East India Companies, managed their affairs with considerable success, and obtained permission to establish a factory at China.

In 1726, notwithstanding the opposition of all the European nations engaged in the East India trade, the affairs of the Ostend Company appeared to be in a prosperous state. Several ships arrived from India and China with valuable cargoes, the sale value of which was about 5,000,000 florins. In the month of September a meeting of the proprietors was called, when the directors stated to them that their trade had been so successful that they were enabled to carry 250 florins to the account of every share in the capital, of which 750 had already been paid in, which completed the original amount of the share, 1,000 florins.

In 1727 the court of Vienna, dreading war by persevering in supporting the Ostend East India Company concluded a treaty with the maritime powers, which was signed at Paris on the 26th of May 1727, the first article of which stipulated, "His Imperial and Catholic Majesty, having no other view than to contribute to the public tranquillity of Europe, and observing that the commerce of Ostend has given birth to jealousy and uneasiness, consents that there shall be a suspension of the charter of the Ostend Company, and of all the traffic between the Austrain Netherlands and the Indies during the term of seven years. By the fifth article it was agreed, "That the ships which sailed from Ostend before this convention, the names whereof were to be given in a list on the part of His Imperial Majesty, were to be permitted safely to return home; and in case any of them should be taken, it was agreed that they should be *bond fide* restored with their cargoes."

The proprietors of the Ostend Company, aware that their patent would be withdrawn, proposed to establish themselves in some other part of His Imperial Majesty's dominions, where it might not be liable to those objections raised against them in the Austrian Netherlands. Trieste and Fiume, both in the Gulf of Venice, were the chief seaports in the Austrian dominions. The Emperor, desirous of participating in the East India Trade, did his utmost to render these ports commodious; but natural obstacles, and especially geographical position interposed, and the project was given up.

In 1730, the directors of the Ostend Company attempted to carry on a trade under the passports of the Kings of Prusia and Poland. One ship, the *St. Theresa*, under Polish colours, proceeded to Bengal for a cargo, where she was taken by the English; another, the *Apollo*, from China, under Prussian colours, arrived safe at Hamburgh in September 1731. The ministers of the maritime powers resident in that city, presented a strong memorial to the Senate, insisting that the vessel should be sequestered; the Senate prohibited the citizens from having any concern with the vessel or cargo, but the proprietors were allowed to remove their goods away clandestinely.

In 1732, the Emperor, in a rescript to his minister at Hamburgh, dated October 1st 1732, states, "that being informed that the late Company of Ostend, notwithstanding the signification of his pleasure, had caused a ship, freighted with commodities from the Indies, to be sent thither in order to be exposed to sale in that city, His Imperial Majesty being resolved not to permit either the late Company, or any of the subjects of his hereditary countries, to carry on a trade contrary to treaties, declared that they would sequester any goods which might be brought thither." This put an end to all the attempts of the Ostend Company to carry on a commerce with the East Indies.

In 1775, Mr. William Bolts, who had formerly been in the service of the English East India Company, presented a proposal to the Empress of Germany for establishing a trade with Africa and the East Indies from her ports in the Adriatic. "The Empress approved of his proposal, and on the 5th of June 1775, signed a charter, whereby she authorised him, during the space of ten years to carry on a trade with vessels under the Imperial flag, from her ports in the Adriatic to Persia, India, China, and Africa; to carry negro slaves from Africa and Madagascar to America; to take goods on freight, either for the Imperial ports or any others, for account of foreigners, whose property should not be liable to confiscation, even if they should belong to nations at war with her; to take possession, in her name, of any territories which he might obtain from the Princes of India; and she declared that the vessels belonging to him, or freighted by him, and the people belonging to them, should be exempted from arrest to detention at all times, whether of peace or war; that she would provide him with all the necessary passports, and would take care to obtain redress for him, if attacked or molested."

Mr. Bolts formed a connexion with a mercantile house at Antwerp, which agreed to fit out and load two ships at Leghorn and Trieste, and that Mr. Bolts should proceed to India, in order to establish factories, and conduct the business, leaving the charter in the hands of his partners, with authority to form an India house of trade at Trieste. He then proceeded to London, where he purchased a ship and sailed for Leghorn in March 1776, from whence he departed for India. Having settled factories at Delagoa Bay, the Nicobar Islands, and on the Malabar coast, he returned with three ships to Leghorn, where he arrived in May 1781.

The arrival of these ships laden with East India goods, induced the Grand Duke of Tuscany to encourage Mr. Bolts, and gave him a charter, dated May 29, 1781, for an exclusive trade between Tuscany and all the countries beyond the Cape de Verd Islands, to be conducted in two ships under Imperial or Tuscan colours, and to continue till the expiration of the Imperial charter.

When Mr. Bolts's arrival at Leghorn became known to his creditors in various parts of Europe, they managed to get the ships and their cargoes seized. This was done in consequence of the treachery of his partners, who had refused to honour the bills he had drawn on them from India, and left him liable for all the charges he had incurred; and he was compelled to transfer the Imperial and Tuscan charters to his partners, in order to raise a joint-stock of 2,000,000 florins. He renounced any right he might have in any ships they had sent to China during his absence, except a commission of two per cent. on the gross sales of the cargoes; and he took upon himself the property of a ship called the *Grand Duke of Tuscany*, with her cargo, which had been seized at the Cape of Good Hope in 1781. In return, they advanced him a sum of money to liquidate some of the most pressing demands upon him, for which they took security upon his property in the trade; it was also stipulated that he might for once send two ships to India or China on his own sole account, only paying to them six per cent. on the gross amount of the sales of their cargoes in Europe.

This agreement was confirmed by the Emperor Joseph II., who authorised them to raise the sum of two millions of florins, the proposed capital of the new "Imperial Company of Trieste for the Commerce of Asia." Proli and Co. immediately opened subscriptions to complete their capital, valuing the present stock of the Company at 1,000,000 florins, whereof 600,000 were their own, and 260,000 the property of Mr. Bolts; and for the remaining 1,000,000 they invited subscribers to take shares of 1,000 florins each. They appointed themselves directors at Antwerp, and Mr. Bolts, with another, directors at Trieste; and they reserved, as a compensation to themselves, a commission of two per cent. on the gross sales in Europe.

In 1712, the Company having abandoned York Fort, on the west coast of Sumatra, commenced erecting Fort Marlborough, two or three miles distant, but were hindered by the natives. In the following year they, without opposition, completed the fort.

In 1721, the general use of printed Indian calicoes, as wearing apparel and drapery, was considered "a great detriment and obstruction to the woollen and silk manufactures of the kingdom" and occasioned several riots and tumults of the weavers in London, &c. An Act of Parliament was in consequence passed, "to preserve and encourage the woollen and silk manufactures, &c., which prohibited the wear of Indian printed calicoes, under the penalty of 5*l.* for each offence on the wearer, and of 20*l.* on the seller." Parliament passed also an Act for further preventing His Majesty's subjects from trading under foreign commissions, and prohibiting the importation of tea from any part of Europe, over and above all former restraints laid on British subjects from resorting or trading to the East Indies under foreign commissions; with sundry other additional restraints and penalties. 7 (Geo. I. chap. 20.) The Dutch government punished with death their subjects if concerned therein.

In 1722, the competition of the Ostend Company, and other difficulties, obliged the Company to reduce their half-yearly dividend from five to four per cent.

In 1726, George I. granted the Company a new charter, with full powers to erect corporations at Bengal, Madras, and Bombay, and to establish courts of judicature there. This year the East India house in Leadenhall Street was built.

In 1727, by the 13th of George I., chap. 8, the South Sea Company, with the license and consent of the East India Company, were allowed to buy negroes at Madagascar, giving security not to break bulk, or to proceed to any other place within the Company's limits, under forfeiture of ships and cargoes, and of double the value. This act was to continue for six years only, and the South Sea Company were thereby limited to four ships annually, and to carry to Madagascar nothing but what was solely necessary for the purchase of negroes. The English and Dutch at length succeeded in obtaining from the Emperor the withdrawal of the charter to the Ostend East India traders. The Company's term for the redemption of their capital, and of their exclusive trade, being near its expiration, that is, on three years' notice from Lady Day 1733, a powerful opposition to its renewal was raised in 1730 by certain merchants and gentlemen, who, in February, presented to the House of Commons their petition and proposals, wherein they offered to advance 3,200,000*l.*, to redeem the fund of the Company, by five several payments, the last to be at Lady Day 1733, to be allowed an interest of four per cent. till that term, and only two per cent. after it; provided—

I. That they might be incorporated, and in all respects vested with all the exclusive privileges and trade of that Company; yet so as not to trade in one joint-stock, or in their corporate capacity, but that the trade should be free and open to all His Majesty's subjects, who should pay one per cent. of the value of their exports to India, in consideration of their taking out a license from the proposed corporation.
II. That this trade be solely carried on from the port of London.
III. That the proposed Company's term be thirty-one years, and be redeemed on three years' notice.
IV. That, moreover, for enabling the proposed corporation to defray the expenses of forts and settlements in India, as well as the preservation and enlargement of the trade, they were to be empowered to levy a duty of five per cent. on the gross value of all the merchandise which should be imported from India.

The House of Commons rejected the petition, and passed a bill, entitled "An Act for reducing the annuity or fund of the United East India Company, and for ascertaining their right of trade to the East Indies, and the continuance of their corporation for that purpose," upon the terms therein mentioned; whereby, after a full recital of former statutes and charters, the Company agreed, and it was enacted, that their yearly fund should be reduced from five to four per cent. from Michaelmas 1730; in consideration whereof, and of 200,000*l.* to be paid by them for the public service of the year 1730, all their exclusive privileges of trade to the East Indies were continued and prolonged from Lady Day 1736 to Lady Day 1766, and three years' notice then to be given, being in all 33 years, including the said three years' notice to Lady Day 1769; when, on payment of their entire capital of 3,200,000*l.*, their exclusive privileges of trade were to cease and determine. Yet the Company were to continue as a corporation for ever, to enjoy the East India trade in common with all other subjects. The Company, moreover, at any time, on one year's notice after Lady Day 1736, might be paid off their whole capital by any payments, not less than 500,000*l.* at a time, and so on from time to time, on such yearly notices by Parliament. The Company were likewise hereby debarred from possessing in Great Britain lands, tenements, &c., exceeding 10,000*l.* yearly rent. The rate of interest on the debt due to the Company from Government was this year reduced, and 200,000*l.* having been paid for the renewal of the charter, the court of directors recommended to the general court that the half-yearly dividend due at Christmas 1734, should be reduced from eight to six per cent. The court of proprietors resisted, and by ballot resolved to reduce it to seven per cent. About the year 1736, Kouli Khan, the Persian usurper, who had assumed the title of Nadir Shah, ravaged the empire of Hindostan. Mahomed Shah the mogul, ceded to him all the provinces to the westward of the Indus. On his return to Persia in 1739, Kouli Khan is said to have carried off treasure and effects to the value of 125,000,000*l.* sterling. During these troubles, the Nizam ul Mulck established himself in the Soubahship of the Deccan. Bengal also became independent under Anaverdy Cawn in 1738, and about the same time the Rohillas formed themselves into a distinct Government on the east of the Ganges. The Mogul empire, thus divided, became almost powerless.

In 1740, or at this period, an attempt was made to renew the trade formerly carried on with Persia through Russia. The importation of silk from Persia through Russia being considered an infraction of the Navigation Act, a new Act was passed to carry on this trade as had been done before the Act of Navigation was passed. Considerable quantities of woollen manufactures were in consequence exported to Persia by the way of Russia, in return for Persian raw silk. This trade continued until 1747, when the transit of goods through Russia to Persia was prohibited by a Russian ukase. The navigation of the Caspian Sea was also prohibited to the British, and several vessels which had been built by the Russian Company in the ports of that sea, were sold at a great loss. By these losses and others resulting from the civil wars in Persia, the British merchants lost about 100,000*l.*

In 1744 the East India Company, in consideration of the prolongation for fourteen years of their exclusive privileges, advanced 1,000,000*l.* to the crown at three per cent. interest; the Company borrowed this money by creating a million of new bonds at three per cent. interest. The debt due by the public to the Company was then as follows, viz.:—

Loan to Government	in 1698, in consideration of the charter of incorporation	£2,000,000
,,	in 1707, advanced on an interest of five per cent	1,200,000
,,	in 1744, in consideration of the extension of their exclusive privileges	1,000,000

In 1746 the French besieged Madras, which surrendered to them on the 10th of September; from which period the British East Indian Government was transferred to Fort St. David, until Madras was restored.*

In 1748 the English unsuccessfully attacked the French settlement of Pondicherry, and by the treaty of Aix-la-Chapelle on the 7th of October this year, all places that had been taken by France since the commencement of the war in the East Indies, should be restored. Madras became again in consequence, the seat of the British Indian Government.

At a meeting of proprietors, held at Antwerp in September 1781, it was recommended, in consequence of the maritime powers being engaged in war, to send out as soon as possible six ships to China and India, two for the East coast of Africa, and three for the Southern whale fishery. The directors immediately began to equip the ships they already had at Trieste and Leghorn, and contracted for the purchase of others in England. In April 1782, they reported that they had 6,000,000 florins and six ships under the Imperial flag all in active service. In the meantime their factory at Delagoa Bay was destroyed by the Portuguese, who claimed the sovereignty and exclusive commerce of the East coast of Africa.

In 1784 five ships arrived at Ostend, which had been declared a free port in 1781, from China, having on board 3,428,400lbs. of tea, exclusive of China-ware and other commodities. This profitable importation was counterbalanced by the Company's ship, the *Imperial Eagle*, having on board a very valuable cargo, being seized by their creditors in the harbour of Cadiz. Many of the proprietors were so disheartened by this disaster, that they sold out their stock at near forty per cent. below par, and the purchasers on those terms were greater sufferers than the sellers; and in the same year the Company were declared bankrupts to the amount of 10,000,000 florins.

In 1787 several ships were sent to India from Hamburgh, Ostend, Trieste, Leghorn, and several other ports, laden with large quantities of British manufactures, and in which merchants resident in London were interested, by which the markets were so overstocked, that most of those concerned in these adventures were ruined; and the commanders and officers of the English East Indiamen were great sufferers by this unexpected interference. Ships have occasionally visited India under some of the above-enumerated flags, but the regulations which took place on the renewal of the English East India Company's charter in 1793, put a stop entirely to the foreign trade carried on to India with British capital.

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* In 1746, an action was fought on the 25th of June on the Coromandel coast, between eight French ships of war, mounting 398 guns, under M. de la Bourdonnais, and an English squadron of six ships, mounting 270 guns under Commodore Peyton. Neither gained a victory, and the French sailed to Pondicherry and the English to Bengal.

On the 3rd of September the French fleet anchored about four leagues to the southward of Madras, where the troops, artillery, and stores were landed: the first soldiers consisted of 1,100 Europeans, 400 Caffres, and 400 native troops, and there remained on board the fleet 1,800 European seamen. On the 7th of September they bombarded the town, and on the 10th it surrendered, giving themselves up as prisoners of war. Madras was delivered up on condition that it should be afterwards ransomed. The Company's ships in the roads were also taken possession of.

The French made two unsuccessful attempts to capture Cuddalore. The Nabob of Arcot made an attack upon the French at Madras; but his army was repulsed, and a peace was concluded between them in February 1747.

In 1748, an English fleet, under Admiral Boscawen, was sent to India. He attacked the Mauritius in his way to the coast of Coromandel, but did not succeed. He determined to lay siege to Pondicherry, the garrison of which consisted of 2,000 Europeans and 3,000 native troops, under M. Dupleix. The English army being quickly increased to 9,000 men, they commenced the siege, during which the English lost 1,065 Europeans in action and by sickness. M. Dupleix ordered Madras to be given up as soon as the siege was raised, and wrote to all the native princes on the coast, and the great Mogul, informing them that he had repulsed the most formidable European armament which had ever appeared in India. Those princes replied, extolling his prowess and the military bravery of this nation.

A general peace was signed at Aix-la-Chapelle on the 7th of October, whereby it was agreed "that there should be a christian, universal, and perpetual peace, as well by sea as land; that there should be a general oblivion of whatever had passed during the war; that each party should be put into the possession of all his effects, honours, and revenues, which they either actually enjoyed, or ought to have enjoyed, at the commencement of the war, notwithstanding all disposals, alienations, or confiscations occasioned by the war; that all prisoners and hostages should be returned without ransom; and that all the conquests that had been made since the commencement of the war in the East Indies or any other part of the world, should be restored without exception." Madras was accordingly restored to the English; but the French had demolished the greater part of what was termed the Black Town.

In 1750 the interest on the debt of 4,200,000*l.* due to the Company was reduced to three per cent. and the Company were empowered to grant annuities towards the discharge of their bond debt. On the death of Nizam ul Mulck, Soubah of the Deccan, which took place in 1748, the succession was contested between Nasir-jing the son, and Muzapher-jing, the grandson of Ul Mulck. The Nabobship of Arcot was also contested for by Chunda-saib against Anaverdy Khan, who had been appointed Nabob by the late Nizam. Nasir-jing and Anaverdy Khan united their forces against Muzapher-jing, who had been joined by Chunda-saib. M. Dupleix, on the part of the French, engaged to aid the latter, on a promise, in case of success, being granted the town of Vilanour with its dependencies, consisting of forty-five villages. Hostilities followed, during which Anaverdy Khan was killed in battle; Nasir-jing was assassinated, and Muzapher-jing appointed Soubahdar of the Deccan. The French East India Company acquired, in consequence, a territory near Pondicherry, producing annually 96,000 rupees; that of Karical, valued at 106,000 rupees; the city of Mausulipatam with its dependencies, yielding a revenue of 144,000 rupees; in all a revenue of 42,250*l.* sterling. Chunda-saib was declared Nabob of Arcot. The treasures of Nasir-jing were computed at 2,000,000*l.*, and the jewels at 500,000*l.* The new Viceroy gave 50,000*l.* to the French troops, and as much to the French East India Company for the expenses they had incurred in the war. M. Dupleix then assumed the power and title of an eastern prince, held his court as such, and was publicy proclaimed Nabob. Muzapher-jing, who was soon after killed, was succeeded by Salabat-jing, who confirmed the grants and benefices to the French. Chunda-saib lost his life, and the French continued to support Salabat-jing as Prince of the Deccan, the provinces of Mustaphanagur, Ellore, Rajahmundy, and Chicacole were given up to the French East India Company in full sovereignty. These acquisitions, added to Mausulipatam, rendered the French masters of the sea-coast of Coromandel and Orixa for 600 miles from Mootapillo to Jaggernaut. The revenues of these territories were computed at 42,87,000 rupees; and the French now ruled over a greater dominion in extent and value than had up to this period, ever been possessed by Europeans in India.

In 1754 the directors of the English East India Company, represented to the British Government the state of hostilities in which they were involved on the coast of Coromandel, and solicited aid either to terminate or carry on a war against the French Company, which was supported by their Government. The British ministry opened negotiation with the Government of France on the subject, and at the same time ordered a squadron of men-of-war to be equipped, and with one of His Majesty's regiments to proceed to the East Indies. The Government of France then agreed that the disputes between the two Companies should be adjusted by Commissaries in India. The French Company appointed M. Godeheu, one of their directors, their commissary, and at the same time commander-general, with authority over all their settlements in the East Indies. The English Company appointed Mr. Saunders, Governor of Madras, to treat with M. Godeheu, who arrived at Pondicherry, August 2, 1754. The arrival of an English fleet under Admiral Watson, induced M. Godeheu to be moderate in his proposals, and a suspension of arms was agreed upon. This suspension, including the allies of both Companies, was proclaimed at Madras, Pondicherry, and all other places on the coast of Coromandel where the English and French had troops. A treaty was afterwards signed, which was published on the 11th of January 1755, the day on which the suspension of arms ended, consisting of eleven articles, by which it was agreed—First, that the two Companies should renounce for ever all Moorish Government and dignity, and should never interfere in any difference that might arise between the princes of the country. The second, third, fourth, fifth, sixth, and seventh articles, relate to the settlements of both nations and their districts, whereby it was agreed that all places, excepting those which should be stipulated in the definitive treaty, to remain in the possession of the two nations, should be delivered up to the Government of Hindostan. The Governors then proceeded to give their opinion what places each might retain without a risk of engaging them in future wars, either one another, or with the princes of the country. In the Tanjore country the English were to possess Devicottah, and the French Karical, with their districts; on the coast of Coromandel the English were to enjoy Fort St. David and Madras, and the French to keep Pondicherry, with districts of equal value; and if it should appear that the English possessions in the kingdom of Tanjore and in the Carnatic together, were of more value than the French possessions in those countries, then the French were to be allowed an equivalent for this difference in a settlement to be chosen between the River of Gondecama and Nizampatam. Mausulipatam and Divi were to be ceded; or if the French held one, the English were to retain the other. The rivers of Narsipore and Ingeram were to be free; and as the English had Vizagapatam, in the Chicacole country, the French were to settle a factory there on an equality with it. By the eighth article it was agreed that these conditions, accepted on both sides, although they were not to be law for a definitive treaty in Europe, should nevertheless produce a truce between the two nations and their allies, until news were received in India of the answers made in Europe concerning this agreement. By the ninth article, neither nation was allowed to procure during the truce any new grant or cession, or to build forts for the defence of new establishments, but only to rebuild and repair the fortifications then subsisting in the establishments they possessed at that time, in order to prevent their entire ruin. By the tenth article it was agreed, that until the arrival of answers from Europe to these articles, which were to be despatched by the first ships, to be submitted to the decision of the two Companies, under the pleasure and approbation of the two crowns, the two nations should not proceed to any cession, retrocession, or evacuation of what they then possessed; and, lastly, that, in regard to any indemnification the two nations might expect for the expenses of the war, this article should be amicably adjusted in the definitive treaty. This convention was little more than a cessation of hostilities for eighteen months. The French were to enjoy the revenues of all those territories which they had acquired during the war. These were as follow:—from Karical 96,000 rupees; from Pondicherry and the villages in its district, 105,000; from Mausulipatam and its dependencies, and from the contiguous territories of Divi, Nizampatam, Devicottah, and Condavir, 14,41,000; from the four provinces of Ellore, Mustaphanaghur, Rajahmundrum, and Chicacole, 31,00,000; from lands in the Carnatic, 17,00,000; and from the Island of Seringham and its dependencies, 4,00,000; in all 68,42,000 rupees, or 855,250*l.* sterling. The accessions acquired by the English during the war produced only a revenue of 8,00,000 rupees, or 100,000*l.*, drawn from lands mortgaged by the Nabob, to refund outlays of the Company in aiding him. The two Companies being now at peace with each other, gave their whole attention to the management of their respective territories, revenues, and alliances, to the best advantage, without infringing the truce. M. Godeheu, having fulfilled his commission, quitted Pondicherry, and returned to France, leaving the power of the Governor much more limited than it had been under M. Dupleix. The war in India between the English and French was the cause of assembling a great European force in that country, which, after the peace of Aix-la-Chapelle, led to their joining in the quarrels between the native princes. The English and French were from 1749 to 1754 opposed to each other as auxiliaries of those princes.

In 1755, the Company, in consequence of the expenses incurred in India on account of the war, were under the necessity of reducing their dividends from eight to six per cent. The *Doddington*, outward-bound East Indiaman, was lost on the 17th of July this year, off the east coast of Africa, and the greater part of her crew and passengers were drowned.

In 1756, an expedition which was fitted out from Bombay, under Commodore James, against the pirate Angria's possessions on the Malabar coast, sailed from Bombay on the 22nd of March, capturing Severndroog on the 2nd of April, Bancoote on the 8th, and after reconnoitering Gheriah, the pirate's capital, returned to Bombay the 31st of December. During this year Surajah Dowlah, Nabob of Bengal, attacked and took Calcutta, but on the arrival of reinforcements from Madras, the English regained possession of it, and large districts were granted them by Jaffier Ally Cawn, whom they had enabled to become Nabob of Bengal. James sailed again on the 27th of January 1757, and on the 13th of February, Gheriah surrendered to the English and Mahratta forces, and was delivered up to the latter. Angria's fleet was destroyed, and his tower or fort was plundered.

In 1757, the French captured the British factories at Ingeram and Bandermanlanka, and besieging Vizagapatam with a large army, the place surrendered by capitulation, by which the French became possessed of the whole coast from Ganjam to Mausulipatam. Three homeward-bound East Indiamen were attacked by two French ships, one of sixty-four guns, the other a frigate of thirty-six guns, off the Cape of Good Hope; the Indiamen formed into a line: and fought for above three hours: the French made repeated attempts to board, but at last sailed off with the loss of 146 men killed and wounded. The East India Company on the 27th of September, ordered a gratuity of 2,000*l.* to each ship's company, as a reward for their courage. The Parliament, in the supplies for the service of the year, granted the Company 20,000*l.* towards enabling them to defray the expense of a military force in their settlements, in lieu of His Majesty's troops.

In 1757, the English East India Company having received intelligence, by way of Aleppo, that war had been declared between France and Great Britain in the preceding month of May, prepared. On the 24th of March the English attacked the Fort of Chandernagore, which surrendered by capitulation "on condition that the officers of the garrison were to be prisoners on their parole of honour, with liberty to carry their effects where they pleased, on promising not to serve against the English during the war; that the soldiers of the garrison should be prisoners of war so long as the war continued; that the sepoys were not to be prisoners; that no European should reside at Chandernagore, but the French Jesuits might travel at pleasure, with all the ornaments of their church; and that the French Directors and Counsellors should go where they pleased." The French had in this fort 183 pieces of artillery, with great quantities of ammunition. Besides the ships and vessels sunk below, to obstruct the channel, they sunk and ran ashore five large ships above the fort, and the English captured four sloops and a brig: the plunder amounted to upwards of 100,000*l.* sterling. A fleet of twelve ships arrived at Pondicherry from France, September 8th following, and, after landing upwards of 1,000 Europeans, and large quantities of cannon, mortars, and ammunition, sailed to the Mauritius. M. Bussy, who commanded the French forces at Mausulipatam, attacked and captured the English fort of Vizagapatam.

In 1758, a fleet of nine ships of the line and two frigates, under M. de Aché having a large body of troops on board under M. Lally, arrived at Pondicherry on the 22nd of April, in order to drive the English squadron off the coasts. The troops brought by this fleet from France, with those at Pondicherry, were to attack and destroy the English settlements. M. Lally marched from Pondicherry with an army of 3,500 Europeans and a large body of sepoys, to the district of Fort St. David on the 29th of April, and invested Cuddalore, which surrendered on the 3rd of May. The French then besieged Fort St. David, which surrendered upon capitulation on the 2nd of June. The garrison consisted of 200 Europeans, 117 invalids and artillery, and 200 seamen, together with their officers, the Deputy-Governor, and Council, were carried prisoners to Pondicherry. The French demolished the fortifications of Fort St. David, and the villas and buildings in the neighbouring country. On the

4th of June Devicottah was abandoned by the English on the approach of a detachment of the French army. The French then besieged Madras with an army of 3,000 Europeans, 2,000 sepoys, and 2,000 cavalry; the siege commenced on the 12th of December 1758, and continued till the 17th of February 1759, when it was abandoned, after sustaining great loss in men, ammunition, and stores, by which retreat on the part of the French, the English acquired much reputation in the opinion of the natives. They soon after took Mautulipatam by storm, which was furnished with 120 pieces of cannon and abundance of military stores. This success induced Salabat-jing to desert his allies, the French, and enter into a treaty with the English, by which he agreed "to oblige the French troops then in the Deccan, to evacuate that country; never to permit them to settle there; to keep none of them in his service; and neither to protect them, nor to call them to his assistance." All the revenues collected by the French, when their possessions were most extended, had never sufficed for the expenses of their forces. No money remained in the treasury at Pondicherry, and the discontent of the French army had convinced the Government they could not be trusted any longer than they were regularly paid. A small squadron under Count d'Estaing, captured the English factory at Gombroon, on the 14th of October 1759. From thence D'Estaing proceeded to the west coast of Sumatra, to attack the English settlements there. Natal surrendered at discretion on the 7th of February following; Tappanooly shared the same fate; and Bencoolen was attacked, but defended till the inhabitants had secured their most valuable articles. It then surrendered to the French, who carried off all the effects they could obtain to Batavia and the Isle of France.

In 1760, the English under Colonel Coote, defeated the whole of the French force under M. Lally at Vandewash in January, with great loss; their cannon, tents, stores, and baggage were taken, and the remainder of the army retreated to Pondicherry. The English afterwards took Alemparvah, Arcot, and Karical, in which last were 155 pieces of cannon, with a large store of ammunition, &c. This loss deprived the French of their route into the territories of Tanjore; and by various purchases and cessions from the Government they had acquired districts round the fort of Karical, containing 113 villages, of which the farms, with the customs of the town and port, yielded 30,000 pagodas per annum. Cuddalore and most of the other places in possession of the French, were also taken by the English.

In 1761, Pondicherry had been blockaded by land and by sea for many months, and surrendered on the 16th of January 1761, to the British forces under Colonel Coote. The number of European troops taken were 2,072; the civil inhabitants, 381; the artillery taken consisted chiefly of 500 pieces of cannon, and 100 mortars and howitzers; besides great quantities of ammunition and military stores. Mahé, on the Malabar coast, surrendered on the 13th of February 1761; and on the 5th of April, Gingee was surrendered to the English. This terminated the long-contested hostilities between the two great European powers in Coromandel, which commenced in 1746, and continued from that time, with scarcely the intermission of one year.*

The English factory at Surat, having been oppressed by the native governors, a force was detached to take possession of the fort, which was accomplished on the 4th of March, by which the English were re-established in the trade of that place. During the same year, and when hostilities had been in full vigour between England and France, the Dutch embarked upwards of 1,500 men on board seven vessels, viz., the *Vlessingen*, *Bleiswyk*, *Welgeloegen*, and *Princess of Orange*, of thirty-six guns each; *Elizabeth Dorothea*, and *Waereld*, of twenty-six guns each; and *Mossell* of sixteen guns, to invade the British settlement in Bengal. The English had only three East Indiamen to oppose this formidable force: the *Calcutta*, Captain Wilson; the *Duke of Dorset*, Captain Forrester; and the *Hardwicke*, Captain Sampson. On their approaching each other in the river, the Dutch drew up in line of battle to receive the English, who followed their example; and after a severe action of two hours, the Dutch commodore struck and the others followed his example, except his second, who got off by fighting his way, and fell down the river to Culpee, where he was intercepted by the *Oxford* and *Royal George*, who had arrived two days before. The Dutch commodore had thirty men killed, and many wounded: the ship *Duke of Dorset*, on the English side, which was more immediately engaged, was almost shattered to pieces, and yet had not a man killed: nor did the other ships suffer any loss of life. The Dutch, it is asserted, had above a hundred killed and wounded. The rest were made prisoners, and carried to Calcutta. This gallant action, which saved the province of Bengal, received the warmest thanks from the Court of Directors on the return of the ships to England. A fleet of seventeen East Indiamen arrived also safely before the peace, under protection of Admiral Pococke, on the 20th of September 1760. This was the richest convoy that had ever arrived together from India. Jaffier Ally Cawn, who had been placed on the throne of Bengal in 1757, was deposed, and his son-in-law, Cossim Ally Cawn, promoted to that dignity, who granted the English a considerable extent of country, and confirmed all the privileges given by his predecessors.

In 1762, Government granted the East India Company 20,000*l.* in lieu of affording them a regiment for the protection of their settlements in India. War having been declared against Spain, an expedition was fitted out from India against Manilla, the principal settlement belonging to the Spaniards in the Philippine Islands. The fleet sailed from Madras on the 1st August, and arrived in Manilla Bay on the 23rd of September. The place was taken by storm on the 6th of October, and a capitulation agreed upon, by which the town and port of Cavite, with the islands and forts dependent on Manilla, were to be given up to His Britannic Majesty, and they were to pay 4,000,000 dollars for the preservation of the town and their effects, for which bills were afterwards given. The Spaniards however never paid the ransom.

In 1763, the conduct of Cossim Ally Cawn the new Soubah, being considered ungrateful to the English, a war took place, which was carried on with uninterrupted success on the part of the latter, who defeated the Nabob in several actions, and became entirely masters of the province of Bengal. The Company, by treaty concluded with Mahomed Ally Cawn, Nabob of the Carnatic, dated the 29th of October 1763, obtained possession of certain districts, called the *Jaghire Lands* which were confirmed to the Company by the Mogul's firman, dated the 12th of August 1765. The revenues of these lands were entered in the Mogul's books at 4,00,494 pagodas. The Company made a demand upon Government for the following sums advanced, viz.:—

	£
Subsistence of French prisoners in India	260,687
Expenses incurred on the expedition to Manilla	139,877
Hospital expenses, on account of His Majesty's forces	21,447

making a total of 422,011*l.*, of which sum they afterwards received from the Lords of the treasury only 28,366*l.*

In 1765, Lord Clive, who was appointed Governor-General of India, obtained from the Great Mogul a formal grant to the Company of the administration of the provinces of Bengal and Orixa, on condition of paying an annual quit-rent of 26,00,000 rupees for the expenses of the civil government, and the support of his dignity, 53,00,000 rupees yearly. The remainder of the revenues were allotted to the Company for supporting their armies and other charges. This territory, much larger than Great Britain and Ireland, produced a revenue estimated at 1,700,000*l.* per annum, and contained upwards of 10,000,000 of inhabitants. The Mogul also confirmed to the Company the provinces of Burdwan, Midnapore, and Chittagong.—*McGregor's Commercial Statistics.*

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* In 1763, a definitive treaty of peace between France and Great Britain was concluded at Paris, on the 10th of February.

"Article II.—In the East Indies, Great Britain shall restore to France, in the condition they now are, the different factories which that crown possessed, as well on the coast of Coromandel and Orixa as on that of Malabar, as also in Bengal, at the beginning of the year 1749. His most Christian Majesty shall restore on his side, all that he may have conquered from Great Britain in the East Indies during the present war, and shall expressly cause Natal and Tappanooly, on the Island of Sumatra, to be restored; and shall further engage not to erect fortifications, or to keep troops in any part of the dominions of the Soubah of Bengal. And, in order to preserve future peace on the coast of Coromandel and Orixa, the English and French shall acknowledge Mahomet Ally Khan for lawful Nabob of the Carnatic, and Salabat-jing for lawful Soubah of the Deccan; and both parties shall renounce all demands and pretensions of satisfaction with which they might charge each other, or their Indian allies, for the depredations or pillage committed on the one side or the other during the war."†

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† In 1764, the disasters of the French East India Company abroad were aggravated by their distressed situation at home. Among the causes which had occasioned their distress, the principal was the dependence in which they had been kept by the Government. Ever since 1723, the directors had been chosen by the court. In 1730, a commissary, appointed by the king, was introduced into the administration of the Company; and from this period there was an end to all freedom of debate; all was directed by the influence, and according to the views of the court. In 1764, the proprietors represented to the Government that their misfortunes might, in a great measure, be attributed to the undue interference of the Government, and to the management of their affairs having been taken out of their own hands, and that they would be ruined, unless the Company were brought back to its original form, by restoring its freedom. In consequence of this representation, the freedom of the Company was secured by an Edict, dated in August 1764, and some regulations were made to put the direction of it under a new form.

Before this period, the number of shares amounted to 50,208. The Government, to indemnify the Company for the expenses they had incurred during the war, gave up 11,666 shares, their property, which were cancelled; there then remained only 38,433. The Company made a call of 400 livres per share. Upwards of 34,000 shares answered the call; and the remainder were reduced by the terms of the Edict, which empowered the Company to make the call to five-eighths of the value of those which had been paid, so that by this operation the number was reduced to 36,920⅝ shares. The dividends paid on the shares of the Company varied according to circumstances. In 1732, it was 100 livres; from 1733 to 1745, it was 150 livres; from 1746 to 1749, it was 70 livres; from 1750 to 1758, it was 80 livres; from 1759 to 1763, it was 40 livres; and in 1764, it was but 20 livres; from the fluctuation in dividends, the value of the stock varied from near 4,000 livres to 700 livres. The proprietors were desirous to secure the fortunes embarked in the trade in such a manner that the shares should at all times bear a settled price, and an interest that could be depended upon. The Government settled this matter by the Edict, which expressly says that, to secure to the proprietors a settled income independent of all future events of trade, a sufficient fund should be detached from that portion of the contract which was then free, to secure to each share a capital of 1,600 livres, and an interest of 80 livres; and that neither that interest nor that capital should, in any cause or for any cause whatsoever, be answerable for such engagements as the Company might enter into after the date of this Edict. The Company therefore owed for 36,920⅝ shares at the fixed rate of 80 livres each, an interest amounting to 2,953,650 livres. They paid for their several contracts 2,727,506 livres; making in all 5,681,166 livres of perpetual annuities. The life annuities amounted to 3,074,899 livres, forming in the whole a total of annual payments of 8,756,065 livres.

By the Peace of 1764, the Isles of France and Bourbon became the property of the government, whereby the Company saved 2,000,000 livres per annum. They were likewise relieved from the expenses of Port l'Orient.

* [illegible]

N ACCOUNT OF BULLION AND MERCHANDIZE EXPORTED BY THE EAST INDIA COMPANY TO INDIA AND CHINA RESPECTIVELY, FROM 1708 TO THE LATEST PERIOD; DISTINGUISHING EACH YEAR AND THE SEVERAL PRESIDENCIES: WITH A STATEMENT OF THE MODE IN WHICH THE VALUE OF MERCHANDIZES IS CALCULATED.

	Madeira.			Saint Helena.			Madagascar and the Cape of Good Hope.			Mocha and Combroom.			Borneo and Batavia.		
	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.
EASON 1708	....	....	....	....	....	....	....	....	....	8,008	3,918	11,926	....	....	....
" 1709	....	....	....	....	4,602	4,602	....	....	....	11,991	49,197	61,188	....	....	....
" 1710	....	....	....	....	1,847	1,847	....	....	....	21,167	48,718	69,885	....	....	....
" 1711	....	....	....	....	2,720	2,720	....	....	....	5,232	608	5,920	....	....	....
" 1712	....	....	....	....	1,143	1,143	....	....	....	11,456	2,130	13,586	8,339	285	8,624
" 1713	....	....	....	104	2,598	2,702	....	....	....	....	....	....	....	....	....
" 1714	....	....	....	....	2,148	2,148	....	....	....	11,415	2,662	14,077	....	....	....
" 1715	....	....	....	....	3,005	3,005	....	....	....	10,182	715	10,897	5,559	245	5,804
" 1716	....	....	....	....	2,054	2,054	....	....	....	27,657	2,205	29,862	4,637	224	4,861
" 1717	....	....	....	....	2,238	2,238	....	....	....	29,212	2,333	31,545	....	....	....
" 1718	....	....	....	....	1,935	1,935	....	....	....	23,021	1,404	24,425	13,482	372	13,854
" 1719	....	....	....	....	1,004	1,004	....	....	....	37,409	532	37,941	8,655	190	8,845
" 1720	....	....	....	....	2,322	2,322	....	....	....	71,213	2,585	73,798	18,866	605	19,471
" 1721	....	....	....	....	1,940	1,940	....	....	....	73,030	5,938	78,968	5,861	176	6,037
" 1722	....	....	....	....	1,108	1,108	....	....	....	99,967	10,597	110,564	....	....	....
" 1723	....	....	....	....	2,032	2,032	....	....	....	75,573	7,487	83,060	9,483	265	9,748
" 1724	....	....	....	....	2,666	2,666	....	....	....	90,778	4,437	95,215	....	....	....
" 1725	....	....	....	....	2,298	2,298	....	....	....	....	137	137	....	....	....
" 1726	....	....	....	....	1,474	1,474	....	....	....	....	....	....	....	....	....
" 1727	....	....	....	....	910	910	....	....	....	22,697	314	23,011	....	....	....
" 1728	....	....	....	....	534	534	....	....	....	24,434	305	24,739	....	....	....
" 1729	....	....	....	....	1,097	1,097	....	....	....	31,276	1,840	33,116	....	....	....
" 1730	....	....	....	....	835	835	....	....	....	29,103	4,550	33,653	....	....	....
" 1731	....	....	....	....	704	704	....	....	....	67,398	3,166	70,564	....	....	....
" 1732	....	....	....	....	1,586	1,586	....	142	142	28,776	1,058	29,834	....	....	....
" 1733	....	....	....	....	1,853	1,853	....	644	644	28,340	704	29,044	....	....	....
" 1734	....	....	....	....	2,088	2,088	....	....	....	31,792	2,605	34,397	....	....	....
" 1735	....	....	....	....	2,456	2,456	1,831	846	2,677	25,637	1,241	26,878	....	....	....
" 1736	....	....	....	....	3,157	3,157	....	732	732	33,092	2,557	35,649	....	781	781
" 1737	....	....	....	....	500	500	....	20	20	28,013	328	28,341	9,373	407	9,780
" 1738	....	....	....	....	1,117	1,117	....	892	892	23,480	1,427	24,907	23,480	579	24,059
" 1739	....	....	....	....	3,304	3,304	....	629	629	22,846	1,528	24,374	....	....	....
" 1740	....	....	....	2,448	3,194	5,642	....	570	570	23,500	1,427	24,927	....	....	....
" 1741	....	....	....	....	5,527	5,527	492	244	736	9,846	14,932	24,778	11,815	584	12,399
" 1742	....	....	....	1,951	3,016	4,967	487	329	816	9,755	18,898	28,653	11,707	1,077	12,784
" 1743	....	....	....	1,944	1,970	3,914	....	....	....	34,017	23,903	57,920	13,607	1,255	14,862
" 1744	....	....	....	....	2,978	2,978	....	....	....	34,081	30,881	64,965	17,527	1,590	19,117
" 1745	....	....	....	....	4,734	4,734	....	....	....	27,080	3,365	30,445	9,338	256	9,594
" 1746	....	....	....	....	3,837	3,837	....	....	....	28,449	28,386	56,835	....	....	....
" 1747	....	....	....	....	5,835	5,835	....	....	....	28,776	17,802	46,578	....	....	....
" 1748	....	207	207	....	4,449	4,449	....	831	831	....	....	....	....	....	....
" 1749	....	353	353	....	3,707	3,707	465	179	644	....	26,428	26,428	....	....	....
" 1750	....	288	288	....	3,676	3,676	....	....	....	....	42,737	42,737	....	....	....
" 1751	....	252	252	....	3,410	3,410	....	1,744	1,744	....	245	245	....	....	....
" 1752	....	253	253	....	2,837	2,837	952	2,055	3,007	....	21,284	21,284	....	....	....
" 1753	....	263	263	....	3,870	3,870	....	....	....	....	....	....	....	....	....
" 1754	....	260	260	....	6,740	6,740	....	....	....	....	289	289	....	....	....
" 1755	....	285	285	....	4,745	4,745	....	....	....	....	22,341	22,341	....	....	....
" 1756	....	296	296	....	5,869	5,869	....	....	....	....	20,159	20,159	....	....	....
" 1757	....	....	....	2,021	11,047	13,071	....	....	....	....	14,434	14,434	....	....	....
" 1758	....	624	624	1,996	6,338	8,334	....	....	....	....	148	148	....	....	....
" 1759	....	....	....	....	10,337	10,337	....	....	....	....	....	....	....	....	....
" 1760	....	....	....	2,003	4,766	6,769	....	1,167	1,167	....	226	226	....	....	....
" 1761	....	310	310	1,635	5,326	7,261	....	....	....	....	....	....	....	....	....
" 1762	....	....	....	2,813	9,832	12,645	....	....	....	....	184	184	....	....	....
" 1763	....	711	711	1,864	5,362	7,226	....	....	....	....	....	....	....	....	....
" 1764	....	258	258	1,820	6,753	8,573	....	3,493	3,493	20,918	372	21,290	....	....	....
" 1765	....	755	755	1,876	10,921	12,797	....	....	....	....	....	....	....	....	....
" 1766	....	....	....	....	10,662	10,662	....	....	....	....	206	206	....	....	....
" 1767	....	....	....	....	11,062	11,062	....	....	....	....	....	....	....	....	....
" 1768	....	....	....	....	9,175	9,175	....	....	....	....	312	312	....	....	....
" 1769	....	....	....	....	13,131	13,131	....	....	....	....	....	....	....	....	....
" 1770	....	....	....	....	16,628	16,628	....	....	....	....	323	323	....	....	....
" 1771	....	....	....	....	10,076	10,076	....	....	....	....	....	....	....	....	....
" 1772	....	....	....	....	14,031	14,031	....	....	....	....	284	284	....	....	....
" 1773	....	....	....	....	11,335	11,335	....	....	....	....	....	....	....	....	....
" 1774	....	....	....	....	13,002	13,002	....	252	252	....	....	....	....	....	....
" 1775	....	....	....	....	17,213	17,213	....	....	....	....	....	....	....	....	....
" 1776	....	....	....	....	15,377	15,377	....	....	....	....	....	....	....	....	....
" 1777	....	....	....	....	15,569	15,569	....	....	....	....	....	....	....	....	....
" 1778	....	....	....	....	13,937	13,937	....	....	....	....	....	....	....	....	....
" 1779	....	....	....	....	15,226	15,226	....	....	....	....	....	....	....	....	....
" 1780	....	....	....	....	18,785	18,785	....	....	....	....	....	....	....	....	....
" 1781	....	....	....	....	11,276	11,276	....	....	....	....	....	....	....	....	....
" 1782	....	....	....	....	20,590	20,590	....	....	....	....	....	....	....	....	....
" 1783	....	....	....	....	14,394	14,394	....	....	....	....	....	....	....	....	....
" 1784	....	....	....	....	9,518	9,518	....	....	....	....	....	....	....	....	....
" 1785	....	....	....	....	13,978	13,978	....	....	....	....	....	....	....	....	....
" 1786	....	....	....	....	9,629	9,629	....	....	....	....	....	....	....	....	....
" 1787	....	....	....	....	14,908	14,908	....	....	....	....	....	....	....	....	....
" 1788	....	....	....	....	14,642	14,642	....	....	....	....	....	....	....	....	....
" 1789	....	....	....	....	9,634	9,634	....	....	....	....	....	....	....	....	....
" 1790	....	....	....	....	14,832	14,832	....	....	....	....	....	....	....	....	....
" 1791	....	....	....	....	20,964	20,964	....	....	....	....	....	....	....	....	....
" 1792	....	....	....	....	15,169	15,169	....	....	....	....	....	....	....	....	....
" 1793	....	....	....	....	30,567	30,567	....	....	....	....	....	....	....	....	....
" 1794	....	....	....	....	28,506	28,506	....	....	....	....	....	....	....	....	....
" 1795	....	....	....	....	30,301	30,301	....	....	....	....	....	....	....	....	....
" 1796	....	....	....	....	36,354	36,354	....	....	....	....	....	....	....	....	....
" 1797	....	....	....	....	36,828	36,828	....	....	....	....	....	....	....	....	....
" 1798	....	....	....	....	38,024	38,024	....	....	....	....	....	....	....	....	....
" 1799	....	....	....	....	32,577	32,577	....	....	....	....	....	....	....	....	....
" 1800	....	....	....	....	60,872	60,872	....	....	....	....	....	....	....	....	....
" 1801	....	....	....	....	51,178	51,178	....	....	....	....	....	....	....	....	....
" 1802	....	....	....	....	48,535	48,535	....	....	....	....	....	....	....	....	....
" 1803	....	....	....	....	53,616	53,616	....	....	....	....	....	....	....	....	....
" 1804	....	....	....	....	73,166	73,166	....	....	....	....	....	....	....	....	....
" 1805	....	....	....	....	75,830	75,830	....	....	....	....	....	....	....	....	....
" 1806	....	....	....	....	96,351	96,351	....	....	....	....	....	....	....	....	....
" 1807	....	....	....	....	66,890	66,890	....	39	39	....	....	....	....	....	....
" 1808	....	....	....	....	22,939	22,939	....	....	....	....	....	....	....	....	....
" 1809	....	....	....	....	38,476	38,476	....	....	....	....	....	....	....	....	....
" 1810	....	....	....	....	31,467	31,467	....	....	....	....	....	....	....	....	....
" 1811	....	....	....	....	50,310	50,310	....	....	....	....	....	....	....	....	....
	....	5,175	5,175	22,778	1,477,860	1,500,638	4,227	14,808	19,035	12,206,617	467,941	1,678,558	171,329	34,727	206,056

AN ACCOUNT OF BULLION AND MERCHANDIZE EXPORTED BY THE EAST INDIA COMPANY TO INDIA AND CHINA RESPECTIVELY, FROM 1708 TO THE LATEST PERIOD, DISTINGUISHING EACH YEAR AND THE SEVERAL PRESIDENCIES: WITH A STATEMENT OF THE MODE IN WHICH THE VALUE OF MERCHANDIZE IS CALCULATED.

		Bencollen.			Bombay.			Madras.			Bengal.		
		Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.
SEASON	1708	9,987	932	10,919	117,218	53,701	170,919	209,853	33,803	243,656	70,133	8,079	78,212
"	1709	12,517	1,541	14,058	94,390	18,592	112,982	196,882	29,174	226,056	41,856	12,377	54,233
"	1710	19,820	2,582	22,402	79,316	73,922	152,268	132,415	36,954	169,369	47,745	12,887	60,632
"	1711	21,000	1,383	22,452	31,382	83,770	115,152	129,782	34,285	164,067	47,044	23,877	70,921
"	1712	12,541	482	13,023	....	35,165	35,165	115,542	34,369	149,911	42,704	23,526	66,230
"	1713	21,970	863	22,835	26,730	24,236	50,975	129,291	30,667	159,958	65,044	18,381	83,425
"	1714	11,424	2,035	13,459	79,010	16,128	95,138	155,105	35,541	190,646	57,116	11,012	68,128
"	1715	4,631	213	4,844	52,418	3,117	55,535	140,635	29,044	169,679	120,917	16,202	137,209
"	1716	27,881	895	28,776	91,343	6,982	98,325	131,798	23,581	155,377	139,520	18,949	158,469
"	1717	21,102	3,715	24,817	81,141	22,044	103,185	275,313	32,243	307,556	140,441	15,239	155,680
"	1718	17,266	638	17,904	134,283	35,984	170,272	194,548	37,510	232,058	212,359	16,539	228,898
"	1719	29,066	8,738	37,804	99,919	75,996	175,915	122,117	26,768	148,885	77,319	3,575	80,894
"	1720	4,040	182	4,221	114,718	57,260	171,978	84,196	28,509	112,705	61,524	14,981	76,505
"	1721	13,632	121	13,753	82,062	60,311	142,373	193,550	34,642	228,192	128,658	24,261	152,919
"	1722	11,423	155	11,578	57,515	47,350	104,895	157,771	35,608	193,379	162,215	23,332	185,547
"	1723	9,446	50	9,496	56,738	34,056	90,794	134,425	36,413	170,838	132,253	25,125	157,378
"	1724	11,467	57	11,524	114,068	19,604	134,272	153,390	36,408	189,798	152,890	26,990	179,880
"	1725	13,581	993	14,574	55,206	14,168	69,404	228,574	31,598	260,172	126,113	21,673	147,786
"	1726	11,598	614	12,212	51,122	29,367	80,189	196,063	7,919	204,012	183,629	32,229	215,858
"	1727	9,457	126	9,583	28,371	21,261	49,632	96,574	28,535	125,109	94,569	38,911	133,480
"	1728	9,774	171	9,945	42,439	28,850	71,289	78,234	29,223	105,457	225,772	30,974	256,746
"	1729	11,728	184	11,912	68,978	43,671	112,649	190,586	35,934	226,520	131,944	37,740	169,684
"	1730	11,641	195	11,836	....	40,692	40,692	190,893	34,237	225,130	109,621	41,167	150,788
"	1731	11,554	229	11,783	57,770	32,220	89,999	318,006	45,934	363,940	....	51,708	51,708
"	1732	9,592	289	9,881	57,552	40,344	97,896	211,102	46,085	257,187	86,355	39,842	126,197
"	1733	15,115	395	15,510	28,340	45,571	73,911	127,891	13,254	141,145	127,520	40,629	168,158
"	1734	27,250	1,101	28,351	55,123	39,692	95,115	276,610	12,268	288,878	....	52,458	52,458
"	1735	18,312	1,528	19,840	47,532	56,548	104,080	137,884	39,618	177,502	141,918	63,063	204,981
"	1736	19,304	1,031	20,335	59,750	45,767	105,517	156,269	49,928	206,197	156,270	106,035	262,305
"	1737	33,591	1,310	34,901	57,217	56,907	114,124	140,120	17,945	158,065	84,038	47,731	131,769
"	1738	30,056	2,241	32,297	43,836	33,636	82,472	171,918	35,420	210,338	103,314	65,280	168,594
"	1739	25,702	1,786	27,188	34,270	47,574	81,844	111,370	34,019	175,389	109,472	26,357	135,869
"	1740	27,417	1,876	29,293	44,601	89,080	133,681	142,165	30,400	172,564	156,669	98,554	255,223
"	1741	19,758	1,051	20,809	63,928	61,381	125,312	137,180	19,252	156,432	143,328	36,991	180,319
"	1742	14,682	2,118	16,800	110,635	72,495	183,130	284,863	30,598	315,461	107,475	123,437	230,912
"	1743	14,579	2,691	17,280	62,676	47,521	110,200	247,440	43,936	291,376	92,796	83,207	176,003
"	1744	14,606	1,727	16,333	38,865	57,506	96,371	321,333	21,899	343,232	....	75,618	75,618
"	1745	9,338	653	9,991	56,231	73,875	130,106	158,876	18,571	207,447	112,342	55,932	168,274
"	1746	14,224	2,102	16,326	9,483	48,706	58,189	235,060	26,456	312,096	89,140	51,507	140,647
"	1747	19,184	1,106	20,290	7,671	34,731	42,408	235,261	35,553	270,814	488,362	26,555	514,917
"	1748	14,252	518	14,800	95,011	49,190	144,210	369,599	56,139	425,738	138,016	29,438	162,454
"	1749	13,843	2,204	16,047	173,314	59,990	233,334	230,887	44,735	275,622	273,732	92,882	366,614
"	1750	14,252	518	14,770	85,511	79,159	164,670	188,944	39,689	228,633	368,528	94,583	463,111
"	1751	18,972	1,154	20,086	113,794	89,369	203,163	282,895	65,092	347,987	331,269	116,187	447,756
"	1752	19,038	2,424	21,462	81,769	108,063	189,831	264,288	75,826	339,114	201,809	123,885	325,694
"	1753	19,257	1,679	20,936	77,027	118,960	195,987	400,255	103,769	504,024	171,384	109,457	280,841
"	1754	19,707	3,841	23,551	121,692	113,212	234,904	151,087	57,125	208,212	157,656	48,890	206,552
"	1755	19,438	1,327	20,765	108,855	85,088	193,943	309,364	51,258	360,622	40,820	33,600	74,420
"	1756	19,434	1,647	21,081	180,736	94,430	275,166	192,555	57,798	250,353	157,415	92,555	249,970
"	1757	30,363	3,842	34,205	35,423	104,578	140,001	153,624	28,221	180,845	....	85,042	85,042
"	1758	30,929	2,836	33,765	....	123,560	123,560	....	65,892	65,892	....	87,494	87,494
"	1759	19,990	9,322	29,312	....	100,358	100,358	....	48,104	48,404	....	115,015	115,015
"	1760	36,052	10,849	46,901	....	197,546	197,546	....	62,962	62,962	....	135,969	135,969
"	1761	....	7,418	7,418	....	198,168	198,168	....	67,013	67,013	....	125,952	125,952
"	1762	15,917	12,558	28,195	....	127,318	127,318	....	158,310	158,310	....	64,308	64,308
"	1763	37,290	9,739	47,025	....	173,601	173,601	....	69,192	69,192	....	95,534	95,534
"	1764	36,390	6,983	43,361	....	160,328	160,328	....	80,966	80,966	....	78,127	78,127
"	1765	18,760	6,423	25,183	....	213,369	213,369	....	119,890	119,890	....	72,195	72,195
"	1766	....	7,466	7,466	....	212,219	212,219	....	93,320	93,320	....	117,790	117,790
"	1767	....	5,149	5,149	....	147,419	147,119	....	105,533	105,533	....	140,058	140,058
"	1768	....	7,613	7,613	....	141,736	141,736	....	118,315	118,315	....	169,069	169,069
"	1769	9,702	9,072	18,864	....	119,892	119,892	....	115,334	115,334	....	119,020	119,020
"	1770	9,774	7,523	17,297	....	133,715	133,715	....	53,265	53,265	....	115,503	115,503
"	1771	....	8,676	8,676	....	155,750	155,750	....	81,126	81,126	....	72,000	72,000
"	1772	40,386	3,312	43,698	....	151,888	151,888	....	95,435	95,435	....	78,183	78,183
"	1773	9,930	4,768	14,698	....	100,729	100,729	1,806	130,183	131,989	....	92,043	92,043
"	1774	10,134	7,632	17,766	....	105,973	105,973	....	103,826	103,826	....	121,357	121,357
"	1775	10,008	3,854	13,862	....	95,402	95,402	....	85,945	85,945	....	175,808	175,808
"	1776	20,050	7,008	27,058	....	105,622	105,622	....	102,767	102,767	....	179,646	179,646
"	1777	10,827	8,635	19,462	....	106,320	106,320	....	137,315	137,315	....	147,972	147,972
"	1778	10,657	6,158	16,815	....	139,217	139,217	....	61,183	61,183	....	110,349	110,349
"	1779	9,939	5,036	14,975	....	110,016	110,016	....	111,383	111,383	....	193,038	193,038
"	1780	14,874	3,607	18,481	....	40,188	60,488	....	140,895	140,895	....	196,286	196,286
"	1781	....	1,367	1,367	....	188,570	188,570	....	82,154	82,154	....	65,601	65,601
"	1782	....	3,961	3,961	....	123,759	123,759	....	127,304	127,304	....	165,352	165,352
"	1783	....	2,436	2,436	....	76,249	76,249	....	59,798	59,798	....	132,481	132,481
"	1784	....	2,499	2,499	....	86,604	86,604	....	57,207	57,207	....	85,439	85,439
"	1785	20,058	5,447	25,505	....	74,113	74,113	....	95,129	95,129	....	70,394	70,394
"	1786	38,668	5,291	43,959	16,204	123,147	139,351	....	90,869	90,869	....	76,851	76,851
"	1787	19,901	11,064	30,965	....	140,696	140,696	....	101,663	101,663	....	130,854	130,854
"	1788	19,784	3,179	22,963	....	118,346	118,346	....	96,598	96,598	....	138,298	138,298
"	1789	19,544	3,969	23,513	53,301	180,018	233,319	....	88,905	88,905	....	171,197	171,197
"	1790	20,557	4,272	24,829	....	140,471	140,471	512,147	94,791	606,938	....	153,244	153,244
"	1791	17,985	3,812	21,797	....	127,279	127,279	131,888	68,987	203,875	....	179,915	179,915
"	1792	10,943	1,330	12,273	....	132,164	132,164	....	67,411	67,411	....	134,968	134,968
"	1793	10,289	2,363	12,652	....	127,594	127,594	....	141,812	141,812	....	193,382	193,382
"	1794	....	2,785	2,785	....	54,916	54,916	....	121,620	121,620	....	185,571	185,571
"	1795	....	9,996	9,996	....	204,484	204,484	....	184,057	184,057	....	199,624	199,624
"	1796	20,343	7,527	27,870	....	199,579	199,579	....	158,442	158,442	....	192,840	192,840
"	1797	17,629	2,428	20,050	41,838	190,608	232,446	158,932	148,272	305,204	....	233,590	233,590
"	1798	17,803	89	17,892	802,054	280,797	782,851	99,699	82,860	182,559	99,699	232,675	332,374
"	1799	....	497	497	100,592	187,922	288,514	20,563	149,362	169,925	....	358,645	358,645
"	1800	21,073	16,722	37,795	138,853	270,800	409,653	210,384	133,409	343,793	231,666	288,190	519,856
"	1801	....	5,819	5,819	....	332,669	332,669	122,859	239,158	362,017	312,736	407,024	719,760
"	1802	....	14,247	14,247	101,292	297,633	398,925	31,059	263,096	294,155	1,005,549	894,366	1,899,915
"	1803	....	19,136	19,136	....	203,454	203,454	207,063	145,183	352,246	586,634	247,453	834,087
"	1804	....	22,706	22,706	200,000	113,911	313,911	400,320	153,727	554,047	1,131,219	342,039	1,474,295
"	1805	....	18,485	18,485	....	288,965	288,965	....	129,948	129,948	499,483	244,257	743,740
"	1806	....	14,671	14,671	....	413,381	413,381	....	217,017	217,017	....	404,944	404,944
"	1807	....	5,651	5,651	....	246,391	246,391	....	189,808	189,808	200,163	374,086	574,249
"	1808	....	9,990	9,990	....	274,259	274,259	....	151,035	151,035	....	410,643	410,643
"	1809	....	3,495	3,495	....	286,402	286,402	....	152,085	152,085	....	349,886	349,886
"	1810	....	10,049	10,049	....	359,652	359,652	....	207,220	207,220	....	392,755	392,755
"	1811	....	12,291	12,291	....	304,987	304,987	....	192,667	192,667	....	390,401	390,401
		1,446,143	456,854	1,906,002	4,632,509	11,945,297	16,577,806	11,022,530	8,253,630	19,866,160	10,478,171	12,499,644	22,972,815

AN ACCOUNT OF BULLION AND MERCHANDIZE EXPORTED BY THE EAST INDIA COMPANY TO INDIA AND CHINA RESPECTIVELY, FROM 1708 TO THE LATEST PERIOD, DISTINGUISHING EACH YEAR AND THE SEVERAL PRESIDENCIES: WITH A STATEMENT OF THE MODE IN WHICH THE VALUE OF MERCHANDIZE IS CALCULATED.

		Prince of Wales' Island.			Total India.			Total China.			Total India and China.		
		Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.	Bullion.	Merchandize.	Total.
SEASON	1708	....	.....	.....	415,199	100,433	515,632	32,387	1,571	33,958	447,586	102,004	549,590
"	1709	....	.....	.....	357,636	114,483	472,119	41,837	9,055	50,892	399,273	123,538	522,811
"	1710	....	.....	.....	300,493	175,910	476,403	71,770	8,170	79,940	372,263	184,080	556,343
"	1711	....	.....	.....	234,509	146,723	381,232	90,478	2,662	93,140	324,987	149,385	474,372
"	1712	....	.....	.....	190,582	97,100	287,682	30,694	3,545	34,239	221,276	100,645	321,921
"	1713	....	....	.....	243,118	76,745	319,893	17,616	2,289	19,905	260,764	79,034	339,798
"	1714	....	.....	.....	314,070	69,520	383,590	47,597	4,492	52,089	361,667	74,018	435,685
"	1715	....	....	.....	334,342	52,631	386,973	81,642	5,234	86,876	415,984	57,865	476,847
"	1716	....	.....	.....	422,834	54,890	477,724	62,577	9,898	72,475	485,411	64,788	550,199
"	1717	....	.....	.....	547,209	77,812	625,021	55,634	5,369	61,003	602,843	83,181	686,024
"	1718	....	.....	.....	594,984	94,382	689,346	58,291	6,993	65,284	653,255	101,375	754,630
"	1719	....	.....	.....	374,485	116,825	491,308	113,588	8,327	151,915	518,073	125,150	643,223
"	1720	....	....	.....	354,086	106,474	560,560	96,439	7,278	103,717	450,525	113,752	564,277
"	1721	....	.....	.....	496,783	127,389	624,182	127,670	10,084	137,754	624,463	137,473	761,936
"	1722	....	.....	.....	488,921	118,150	607,071	115,505	8,030	123,535	604,426	126,180	730,606
"	1723	....	.....	.....	417,918	105,428	523,346	43,455	4,899	48,354	461,373	110,327	571,700
"	1724	....	.....	.....	523,193	90,162	613,355	69,230	1,136	70,366	592,423	91,298	683,721
"	1725	....	....	.....	423,564	70,867	494,431	38,804	4,372	43,176	462,368	75,239	537,607
"	1726	....	.....	.....	445,442	68,603	514,045	38,659	3,603	42,267	484,101	72,211	556,312
"	1727	....	.....	.....	251,868	90,057	341,725	113,481	4,340	117,824	365,152	94,397	459,549
"	1728	....	....	.....	378,653	90,057	463,710	136,453	5,693	142,146	515,106	95,750	610,856
"	1729	....	.....	.....	434,512	120,466	554,978	195,751	5,345	201,096	630,263	125,811	756,074
"	1730	....	.....	.....	341,257	121,678	462,935	193,810	4,860	198,670	535,067	126,538	661,605
"	1731	....	....	.....	454,728	133,961	588,689	159,101	5,595	164,696	613,829	139,556	753,385
"	1732	....	.....	.....	393,377	129,346	522,723	.....	1,154	1,154	393,377	130,500	523,877
"	1733	....	.....	.....	327,215	103,050	430,265	75,571	4,646	80,220	402,789	107,696	510,485
"	1734	....	.....	.....	391,075	100,495	501,570	99,916	6,032	105,948	490,991	116,527	607,518
"	1735	....	.....	.....	373,211	165,300	538,414	109,872	6,078	115,950	482,986	171,378	654,364
"	1736	....	.....	.....	424,685	209,938	634,623	133,289	9,303	142,592	557,974	219,241	777,215
"	1737	....	.....	.....	352,655	124,851	477,509	140,065	12,476	152,541	492,720	137,330	630,050
"	1738	....	.....	.....	404,084	140,592	544,676	70,141	10,886	81,027	474,525	151,178	625,703
"	1739	....	.....	.....	333,660	115,237	448,897	94,241	8,379	102,620	427,901	123,616	551,517
"	1740	....	.....	.....	396,800	225,200	622,000	88,126	11,787	99,913	484,926	236,987	721,913
"	1741	....	.....	.....	386,347	139,965	526,312	51,203	8,346	59,549	437,550	148,311	585,861
"	1742	....	.....	.....	541,855	251,968	793,823	39,024	7,460	46,484	580,879	259,428	840,307
"	1743	....	....	.....	507,059	204,186	711,545	40,820	6,780	47,600	547,879	211,266	759,145
"	1744	....	.....	.....	426,412	192,202	618,614	32,133	8,758	40,891	458,545	200,960	659,505
"	1745	....	....	.....	373,205	187,386	560,591	103,648	13,535	117,283	476,853	200,971	677,824
"	1746	....	....	.....	426,956	160,974	587,930	133,064	13,742	146,806	560,020	174,716	734,736
"	1747	....	.....	.....	779,257	121,585	900,842	.....	.....	.....	779,257	121,585	900,842
"	1748	....	....	.....	611,878	140,811	752,682	95,012	14,012	109,024	706,890	154,823	861,713
"	1749	....	....	.....	694,271	228,178	922,749	205,798	27,639	233,437	900,069	256,117	1,156,186
"	1750	....	....	.....	657,235	260,650	917,885	152,017	21,438	173,455	809,252	282,088	1,091,340
"	1751	....	.....	.....	746,890	277,753	1,024,643	189,295	38,455	227,750	936,185	316,208	1,252,393
"	1752	....	....	.....	566,855	336,627	903,482	266,539	41,590	308,129	833,394	378,217	1,211,611
"	1753	....	.....	.....	667,923	337,998	1,005,921	279,333	44,936	323,269	944,256	384,934	1,329,190
"	1754	....	.....	.....	450,142	230,366	680,508	218,751	29,236	247,987	668,893	259,602	928,495
"	1755	....	.....	.....	478,477	198,644	677,121	141,901	27,488	169,389	620,378	226,132	846,510
"	1756	....	.....	.....	550,140	272,754	822,894	244,868	42,193	287,061	795,008	314,947	1,109,955
"	1757	....	....	.....	220,434	247,164	467,598	235,818	37,907	273,725	456,252	285,071	741,323
"	1758	....	....	.....	32,925	286,892	319,817	139,679	40,440	180,119	172,604	327,332	499,936
"	1759	....	....	.....	19,990	283,436	303,426	122,932	50,980	173,912	149,922	334,416	477,338
"	1760	....	.....	.....	38,055	413,485	451,540	53,081	60,019	113,100	91,136	473,504	564,640
"	1761	....	.....	.....	1,935	404,217	406,152	25,154	81,335	106,489	27,089	485,552	512,641
"	1762	....	.....	.....	18,750	372,510	391,260	28,126	59,218	87,414	46,876	431,798	478,674
"	1763	....	.....	.....	39,150	354,174	393,324	.....	72,729	72,729	39,150	426,903	466,053
"	1764	....	.....	.....	59,118	337,281	396,399	307,410	70,281	377,691	366,528	407,562	774,090
"	1765	....	.....	.....	20,636	423,553	444,189	294,526	73,842	368,368	315,162	497,395	812,557
"	1766	....	....	.....	.....	441,663	441,663	946	54,718	55,664	946	496,381	497,327
"	1767	....	....	.....	.....	409,221	409,221	.....	136,384	136,384	.....	545,605	545,605
"	1768	....	....	.....	.....	446,220	446,220	162,137	154,467	316,604	162,137	600,687	762,824
"	1769	....	....	.....	9,792	376,450	386,242	233,045	179,246	412,291	242,837	555,696	798,533
"	1770	....	....	.....	9,771	326,957	336,731	203,210	152,798	446,008	302,984	479,755	782,739
"	1771	....	....	.....	.....	327,727	327,727	199,615	147,082	346,697	199,815	474,809	674,424
"	1772	....	....	.....	40,386	343,083	383,469	.....	132,553	132,553	40,386	475,636	516,022
"	1773	....	....	.....	11,736	348,058	359,794	....	80,051	80,051	11,736	428,109	439,845
"	1774	....	....	.....	10,134	352,012	362,176	....	92,810	92,810	10,134	444,852	454,986
"	1775	....	....	.....	10,008	378,222	388,230	.....	99,114	99,114	10,008	477,336	487,344
"	1776	....	....	.....	20,050	410,420	430,470	88,574	107,848	196,422	108,624	518,268	626,892
"	1777	....	....	.....	10,827	415,811	426,638	.....	126,233	126,233	10,827	542,044	552,871
"	1778	....	....	.....	10,657	330,844	341,501	.....	92,745	92,745	10,657	423,589	434,246
"	1779	....	....	.....	99.39	434,699	444,638	.....	104,846	104,846	9,939	539,545	549,484
"	1780	....	....	.....	14,874	420,061	434,925	.....	182,066	182,066	14,874	602,117	616,991
"	1781	....	....	.....	.....	348,968	348,968	.....	67,151	67,151	....	416,119	416,119
"	1782	....	....	.....	....	440,966	440,966	....	106,126	106,126	....	547,092	547,092
"	1783	....	....	.....	.....	285,358	285,358	.....	120,084	120,084	....	405,442	405,442
"	1784	....	....	.....	....	241,267	241,267	....	177,480	177,480	.....	418,747	418,747
"	1785	....	....	.....	20,058	259,061	279,119	704,254	270,109	974,363	724,312	529,170	1,253,482
"	1786	....	....	.....	54,872	305,787	360,659	694,962	245,529	940,491	749,834	551,316	1,301,150
"	1787	....	....	.....	19,001	399,185	419,086	626,897	368,442	995,339	645,798	767,627	1,414,425
"	1788	....	....	.....	19,781	371,061	390,847	469,408	401,199	870,607	489,192	772,262	1,261,454
"	1789	....	.....	.....	72,845	453,723	526,568	714,238	470,480	1,184,718	787,078	924,203	1,761,281
"	1790	....	....	.....	532,701	387,610	920,314	....	541,174	541,174	532,704	928,784	1,461,486
"	1791	....	....	.....	152,873	400,957	553,830	377,685	574,001	951,686	530,558	974,958	1,505,516
"	1792	....	.....	.....	10,943	351,042	361,985	....	680,219	680,219	10,943	1,031,261	1,042,204
"	1793	....	....	.....	10,280	495,718	506,007	....	760,029	760,029	10,289	1,255,747	1,266,036
"	1794	....	....	.....	....	393,398	393,398	.....	744,140	744,140	.....	1,137,538	1,137,538
"	1795	....	....	.....	.....	628,462	628,462	38,150	632,310	670,460	38,150	1,260,772	1,298,922
"	1796	....	....	.....	20,343	594,742	615,085	200,656	496,758	697,414	220,999	1,091,500	1,312,499
"	1797	....	....	.....	216,392	611,726	828,116	411,466	499,925	911,391	627,858	1,111,651	1,739,509
"	1798	....	....	.....	719,255	634,445	1,353,700	496,493	782,309	1,280,802	1,217,748	1,416,754	2,634,502
"	1799	....	....	.....	121,155	729,008	850,163	140,308	830,079	970,987	261,463	1,559,087	1,821,145
"	1800	....	.....	7,242	601,976	777,235	1,379,211	....	925,575	926,575	601,976	1,702,810	2,304,786
"	1801	....	....	.....	435,595	1,035,848	1,471,443	....	1,041,337	1,041,337	435,595	2,077,185	2,512,780
"	1802	....	....	.....	1,137,900	1,017,877	2,155,777	572,038	1,098,935	1,670,973	1,709,938	2,116,812	3,826,750
"	1803	....	.....	.....	793,607	668,842	1,462,539	193,085	1,205,413	1,398,498	986,722	1,874,255	2,861,087
"	1804	....	.....	69,733	1,732,039	776,319	2,508,358	201,499	1,049,370	1,250,869	1,933,538	1,825,689	3,759,227
"	1805	....	.....	25,109	499,483	782,584	1,282,067	200,503	1,114,484	1,314,987	699,986	1,897,068	2,597,054
"	1806	....	.....	37,005	.....	1,183,369	1,183,369	.....	1,134,226	1,134,226	.....	2,317,594	2,317,594
"	1807	....	.....	69,551	200,163	952,416	1,152,579	....	1,093,111	1,093,112	200,163	2,045,528	2,245,691
"	1808	....	.....	50,695	.....	919,544	919,544	.....	995,686	995,686	....	1,915,180	1,915,180
"	1809	....	.....	34,763	.....	866,153	866,153	.....	858,326	858,326	....	1,724,479	1,724,479
"	1810	....	.....	29,679	....	1,010,815	1,010,815	.....	866,057	866,057	.....	1,876,872	1,876,872
"	1811	....	.....	36,174	.....	1,033,816	1,033,816	....	921,316	921,316	.....	1,955,132	1,955,132
		.....	359,951	359,951	29,583,210	35,528,886	65,112,096	13,295,092	24,012,856	37,307,748	42,878,302	59,541,742	102,419,844

AMOUNT OF THE PRINCIPAL ARTICLES OF EXPORT IN THE UNDER-MENTIONED PERIODS, VIZ:—

From	Woollens.	Lead.	Copper.	Iron.	Tin.	Stores.	Foreign Goods.	Char es.	Total Merchandize	Bullion.	Total.
	£	£	£	£	£	£	£	£	£	£	£
1709 to 1720.....	968,574	74,309	....	53,977	32,906	162,507	33,369	38,168	1,358,915	5,516,907	6,875,722
1721 to 1730.....	699,334	71,681	....	54,100	3,590	143,341	48,246	34,922	1,055,222	5,274,742	6,329,964
1731 to 1740.....	904,024	126,455	175,513	65,632	....	229,548	99,278	30,564	1,534,009	4,822,018	6,356,027
1471 to 1750.....	1,190,201	133,261	242,395	72,520	....	198,287	124,065	49,546	2,010,365	6,257,194	8,267,459
1751 to 1760.....	1,768,749	127,816	750,873	62,823	....	428,477	109,749	51,876	3,300,363	5,661,028	8,961,391
1761 to 1770.....	2,583,389	311,315	822,709	85,314	....	951,354	135,142	38,091	4,927,334	1,503,709	6,431,043
1771 to 1780.....	2,129,910	147,125	1,448,406	55,895	....	930,722	187,842	31,905	4,926,305	426,800	5,353,105
1781 to 1790.....	3,345,103	292,095	1,230,709	73,617	137,814	908,931	213,572	58,921	6,260,762	8,929,918	16,190,680
1791 to 1800.....	7,414,135	353,707	1,506,197	223,111	726,124	1,975,635	271,708	92,056	12,542,673	3,519,984	16,062,657
1801 to 1811.....	12,652,709	787,960	1,982,985	568,593	420,345	3,936,389	808,217	468,566	21,625,794	5,966,002	27,591,796
TOTAL £..	33,551,093	2,404,804	8,152,847	1,315,082	1,320,685	9,865,191	2,031,235	900,660	59,541,542	42,878,302	102,419,844

MEMORANDUM.—The value of the Merchandize is the Prime Cost of the Goods: an additional half per cent. for Shipping charges is cast on the amount of each Invoice, and is stated in the column of charges. This column also includes the £4 per cent. War Duty paid since the year 1803, amounting to £319,426.

A BRIEF HISTORY OF BENGAL COMMERCE. SUBSTANCE OF A PAPER READ BEFORE THE BRITISH INDIAN ASSOCIATION, CALCUTTA.

[BY KISSEN MOHUN MULLICK.]

Two hundred and seventy-one years ago, in the time of Queen Elizabeth, the East India Company obtained a Charter from the British Parliament which was renewable from time to time. The amazing success which the Company's adventures achieved in India roused the jealousy of others in England unconnected with the Company, and in 1688-89, during the reign of William III., a new Company was instituted, the rivalship of which caused no little mischief to the previous Company, till 1702, when both Companies were amalgamated, and since then, their designation was "The United Company of Merchants of England trading to the East Indies." I shall now confine myself to the operations of this Company in the Bengal Presidency, to which alone my personal experience extends; that is, as far back as the renewal of the Charter in 1813. The commercial, in common with other affairs of the Company, were, as you know, conducted in England by a Court of Directors under a Board of Control, and in Bengal by a Board of Trade, composed of Members of the Civil Service under direction of the Local Government, and there were Import and Export Ware-houses, under separate officers who also belonged to the Civil Service. Before the renewal of the Charter of the Company in 1813, its Indian possessions had far extended, and it had laid the foundation of its Indian Empire on a firmer basis, and hence the attention of its Directors was evidently diverted towards the administrative and political functions imposed upon them, and trade must have therefore become then a secondary object with the leading Members of the East India Company.

The Company's monopoly of trade of India ceased in 1814, when both the internal and external trade was thrown open to the public with the laudable view of supplying the wants of the people of India, and improving their condition as to Commercial and Agricultural interests. The Company's import and export business in India was however continued till 1834, when the exclusive privilege to trade with China which it had enjoyed down to that period, was withdrawn by the Charter of 1833, under which the Company was practically debarred from trading any further, and allowed to retain only the salt and opium monopolies in India. It may be in your recollection, gentlemen, that since 1834, the East India Company, in order to meet its Home requirements, made it a rule to advance money to private merchants at the exchange of the day, upon their Drafts favouring the Court of Directors, secured by shipping documents for certain descriptions of imperishable articles of merchandize, such as indigo, silk, silk piece-goods, sugar, saltpetre, lacdye, &c., leaving a margin of 25 per cent. of the valuations made by a European broker, subject to the approval of the Export Ware-house keeper. As this mode of negotiation of bills by the Company interfered with the remittances by mercantile Houses, remonstrances were rife both in this country and England, and the practice was therefore abolished about the year 1850.

The East India Company's import from Europe chiefly comprised metals, woollen cloth and Madeira wine in wood, all to a large extent. They used to be sold at a prompt of 3 months, by auctions held under the supervision of the Import Ware-house keeper, subject to a deposit of 25 per cent. of the amount value payable by the purchaser to ensure clearance at due date. During the Company's monopoly, the European community of those days relied for the supply of their wants on the investments of English eatables, drinkables, provisions, dry goods, &c., brought out by the commanders and officers of the Company's Indiamen, to whom were allotted by the Company certain amounts of tonnage for shipping on their private accounts respectively. The investments which generally amounted to from £8,000 to £10,000 sterling were readily sold by wholesale to European and native merchants at a profit of 25 to 50 per cent. upon Invoice costs, at a fixed rate of Exchange, say 2*s.* 6*d.* per *sicca* rupee. As for the Company's exports by sea, which went forward in its Indiamen through the Company's Export Ware-house, the principal articles were raw silk, silk piece-goods, cotton-wool, cotton fabrics, rice, sugar, saltpetre, indigo, &c. To the extension of the manipulation and manufacture of these commodities, the Company's Government had in no small a degree directed its attention, as well for the sake of securing an immediate profitable return as for that of prospectively improving its Indian resources under reformed processes and European care and diligence. I shall lay before you, gentlemen, some statistics of the staples I have named:—

RAW SILK.

The Company had its own filatures at Cossimbazar, Commercolly, Maldah, Bauleah, Radhanagore and Hurripaul, under the superintendence of separate Agents from the Civil Service.

In days of yore the process of its manufacture in Bengal was extremely rude, and consequently too faulty to be adapted for European purposes. In or about the year 1770, as I learnt from an authentic source, the Court of Directors deputed to Cossimbazar, an Italian for teaching the natives the art of reeling after the Italian fashion, and to the introduction of this improved method, is to be attributed the vast improvement both in make and quality which this valuable fibre has attained in this country. In former days, the Company's Bengal silk chiefly manufactured by contractors, took the precedence in the London market, and freely sold there at upset prices. A moderate quantity of Nankin and Canton silks was then carried forward from Canton, and Italians ruled in England as high as 32*s.* to 36*s.* per lb., whilst Bengal, which was not so fine, but exceedingly clean, even and without ends, and of a round thread, a quality now called "crape silk," sold for much easier rates, say 16*s.* to 20*s.* according to qualities, and hence well-suited for English manufactures, which are thick and substantial. Of late unfortunately, Bengal silk has lost its former position in England, or I may say, been almost superseded by the enormous imports there of China, both from Shanghai and Hong Kong, as well as from Japan, ports which were opened after the Chinese war in 1841. Their variety of qualities and prices are far more tempting to the manufacturers, and hence preference is invariably given to these descriptions to the neglect of Bengal, the consumption of which has been materially checked as you must be aware, while on the other hand that of China and Japan has beyond all proportions, increased. For instance, according to the leading English brokers, Messrs. Kilburn Kershaw and Co's Circular of January last, the deliveries of China and Japan in 1870 were 47,011, and those of Bengal 4,364 bales; and in 1869, the year before the hostilities broke out on the Continent of Europe, they were 45,772 China and Japan, and 5,496 Bengal, whereas according to the Circular of another respectable English firm, the deleveries of China and Japan in 1866 were 36,839, and of Bengal 7,508, and; mark gentlemen in 1865 they were 44,056, and 9,654 respectively. Hence you see, gentlemen, during the last 6 years the consumption of Bengal has been steadily falling off, that is to say, from 9,600 to 4,300 bales or from 19,200 to 8,600 maunds which is a reduction of 55 per cent. in 1870, as compared with the deliveries of 1865. Messrs. Kilburn & Co., observe that "the difficulty of getting Bengal silk thrown is as great as ever, and that the common kinds are dead letter." Evidently owing to the rivalship of China silk, the Calcutta export duty of 3½ annas per seer upon our silk was removed, and the article declared free in March 1859. In the face of the above discouraging statistics the ruling on this side of chronic high prices as compared with those current in England, is certainly a riddle to many. It is worth-while mentioning, however, that owing to the diminution in the European produce of late seasons, Bengal filatures have been generally in request for certain purposes from the superiority of their qualities, which are held in high estimation in all Europe, and are a credit to our country, but their high cost renders them at times precarious also.

SILK PIECE-GOODS.

Choppas, bandanoes, and corahs, come under this head. In the time of the East India Company choppas and bandanoes were printed at Cossimbazar of various colors and choice patterns, supplied by the Company's Agent, and were in those days favorite articles with the English and foreigners, used as handkerchiefs and neck cloths. Their exports were heavy and would find a ready

market in England. But a taste for novelty so common in Europe as well as in other countries, which from time to time influences change of fashions, materially interfered with our printed goods, and printers both in England and France, were busy in their designs, and printing there was thus stimulated to an enormous degree, upon plain cloths called corahs imported to a large extent from this country for that purpose. Unfortunately however for our native manufacturers, the weavers in Europe stood in their way as regards the silk corahs with which they took upon themselves to supply the markets of Europe for printing purposes. Although their make and texture are by far inferior to ours, specially in point of durability, yet preference is given to them by the mass of the people there, for the sake of cheapness, resulting from the cloths being made of *chussum* or waste silk, the exports of which both from here and China of late have materially augmented, and hence our exports to Great Britain of choppas and bandanoes as well as of corahs have dwindled down to mere trifles, as the following comparative statement will shew :—

	1819-50.	Value in Rs.	1869-70.	Value in Rs.
Corahs in pieces	6,33,720	31,63,000	80,373	6,21,164
Choppas and bandanoes in pieces	69,764	4,01,700	2,167	18,198

On the other hand the exports of *chussam* to Great Britain have materially increased. In all 1861, 953, and in 1869, 14,000 maunds. This refuse in earlier days was as worthless as jute cuttings were, but now both are treated as important articles of merchandize.

COTTON WOOL.

I shall now, gentlemen, take the liberty to encroach a little upon your valuable time with a statistical account of this most important staple, which affects the interest of almost the whole world, especially at the present moment, when its incidents both as regards the raw material and manufactures, demand the very serious consideration of landholders, growers, dealers, shippers, manufacturers, and merchants generally. In the earlier days of the East India Company, cotton wool was grown with much care and attention in the districts of Bundelcond or Banda, Jaloun, Bhomurghur, Kutchowra, Agra, Cawnpore, and Furruckabad, under the superintendence of the Government Agents from the Civil Service. The pods were deligently gathered after they had been fully ripe, and their wools carefully dried and picked before they were baled and sent down hither for shipment. The best assortments went forward to England, the manufacturing districts of which then chiefly depended upon our Indian cotton both from this side and Bombay, the American not having at that time interfered much with it, if at all. All cotton goods were than made in England by the hand-loom, the mills not having come into full operation till a later period. In my younger days, I remember to have seen the cotton wool produced in the Upper Provinces, which was by far superior to any now visible, in color, staple, strength, fineness, softness, and above all in its cleanliness. The inferior sorts, I believe, used to go forward to China in the Company's Chinamen *viâ* India, and these even were such as would excel in quality the fair Bengal of these days. In 1834 when, as I have already said, the Company's monopoly or trade with China ceased, the stock in Canton of its cotton had been quite exhausted, owing to diminished exports in the preceding year, in anticipation of the extinction of the Company's trade, and hence shipments by private merchants to that country were directed on liberal scales both from this country and Bombay, and as the effect of a free trade at its opening, the results proved highly satisfactory. This circumstance gave an impetus to the trade in all India, and as the Chinese were not so nice as the English manufacturers as to the staple and strength of this wool, but would be content if its color was bright, further regard to quality began to fall off, both with our shippers and growers, so much so, that I learnt that boys and girls instead of adults were employed in gathering the pods even before they were fully ripe, and hence little care was taken in extracting the wools and collecting and drying them, picking was out of question. All manner of adulteration found its way in screwing the bales here, which were shipped under fictitious trade marks, such as B. B. indicating Best Banda, though in fact the goods packed were common Agra, Cawnpore, or Kutchowra, with all faults imaginable. As a natural consequence of over-speculation, fraud, and chicanery, the markets in China were in a few years not only glutted with very indifferent qualities in spite of her large consumption, but the prices fell rapidly, say from Taels 14 to 7 for Bengal, and still less for Bombay, *i.e.*, 5 to 6 Taels per picul of one maund, and 31 seers of the factory weight, a Tael being nearly equal to 3 Rupees. When the mills at Manchester came into full operation, the growth of cotton in America steadily increased year by year. As this description of cotton is, as you are aware, vastly superior to our Indian cottons in every respect, and therefore gained a popularity which at once tended to annihilate the prospects of our staples, particularly Bengal, the proportions of the consumption of the American outweighed largely in its favour, while in point of value it exceeded by far that of Indian cottons. How far then Bengal was affected I shall prove by the following statistics. In 1839-40 its export to Great Britain was only 25,575 Indian maunds, or 7,000 bales, value 2,36,600 Company's Rs. or 9-4 per maund, and in 1849-50, 332 maunds or about 90 bales, value Rs. 3,324 or Rs. 10 per maund. In the year before the Civil War broke out in America, that is, in 1859-60, 3,200 maunds or about 850 bales were shipped to Great Britain, value Rs. 24,400 or 7-10 per maund, a price too low for any useful quality, and therefore these goods probably were exported for waddings. Its operations in subsequent years I shall notice hereafter.

The great deterioration in the qualities of Indian cottons, failed not to attract the serious notice of the Manchester merchants and manufacturers, apparently under the apprehension of any eventual interruption in the imports from America, upon the efficacy of which England chiefly relied, and this apprehension unhappily was confirmed not long ago. They prevailed upon the Court of Directors of the East India Company to impress upon the Indian Governments, the expediency of improving the qualities of Indian cotton, an object, which even to this day, is not lost sight of by our present Government. The Government of the East India Company left nothing untried in its power to ensure that successful result which the English manufacturers sought, but unfortunately the attempts of all the local officers failed to meet their views, the production of an unexceptionable quality being no longer the object of the cultivators or landholders, nor were they in a position to appreciate the advantage of a really good article, or the stability of the traffic in it. The Court of Directors then about the year 1844 deputed to India a band of American cotton planters to exhaust the question as to whether India could, or could not, produce cottons of qualities equal to, or approaching those of America. These planters were distributed all over the growing districts within the Company's territories, and the Native States with peremptory instructions to the local officers to afford them every aid and assistance in the prosecution of the object of their mission. The planters tested the soils of the countries they were employed in, and tried the new Orleans and other American seeds which had been sent round for a fair experiment, but unluckily for India, their efforts for producing the best cotton suited for the purposes of the English manufacturers proved abortive. Certain districts in Lower Bengal, Dacca for one, were also resorted to by them, but with no better success. The planters then returned to their country, to the utter despair of those interested in the cause of Indian cotton, after sending up to the Government their full and elaborate reports on the subject. I may add here, the correctness of these reports was doubted by many well-wishers of this important branch of our trade, but it is a question which yet remains to be justly and impartially solved. Before the middle of 1861, when the Civil War broke out in America, the cotton trade in England bore a steady and uniform character, and any remarkable variations in its value were rare, except when influenced by rumors of the failure or abundance of the crops in the United States. In ordinary times, the shippers and dealers would be generally content with profits of ¼ of a penny or a farthing at best. But since the ominous year I have just named, the position of this branch of important trade assumed an aspect unknown at any period of its history. The dread of an entire cessation of imports from the United States, the consequent excitement among speculators in England and abroad, and the unnatural ambition which prevailed among them of amassing fortunes in a day, soon brought on a mania, and tended to force up prices to a height almost fabulous. At times while the war was raging, namely, in August 1864, the price had touched 32½*d.* for fair New Orleans, 25*d.* for Dhollera, and 17½*d.* for Bengal. About this time the stock of all kinds was 648,000 in London and Liverpool, and the weekly delivery 33,810 bales. Whereas in December 1860, the year before the American War, New Orleans ranged from 4½*d* to 7½*d.*, and Dhollera 4½*d.* to 5*d.* per lb., whilst the stock in all Great Britain at the lastmentioned time, was 5,72,000 bales of all kinds with a weekly consumption of 50,126 bales. Bengal there was none at that time, and therefore no quotation is given. In January 1871 the price for Dhollera varied from 5½*d.* for middling to 7*d.* for good, Bengal 5¼ for ordinary to 6¼*d.* for good, fair American Upland 7½*d.* for ordinary to 8½*d.* for middling fair. Of finer American qualities there were none. Stock in Great Britain 4,47,000 bales or, 1,26,000 less than in 1860. The average weekly deliveries in 1870 were 66,450 bales, or 16,344 more than in 1860.

COTTON PIECE-GOODS.

I am aware that the East India Company had its manufactories at Santipore, and, I believe, at Dacca, Tandah, and Beerbhoom. The exports consisted of Dacca Muslins, Mullmulls, and Subnums, Luckipore Baftahs, and Tandah khasas. The qualities of the latter were like those of cambrics and thick jaconets, but of much higher values than those of the British fabrics. Subnums esteemed for their extraordinary fineness and durability were popular in every part of the world, and in those days the pride of our Eastern manufacturers, sold as high as 90 to 120 Rs. per piece of 20 yards by 36 inches, fitted for the garments of even Princes.* Soon after the abolition of the Company's monopoly in 1813,

* I have since been informed that at Dacca, this sort of cloth is still made to the particular order of the Government Officers, but not more than 2 or 3 pieces in the year. They weigh 12 to 13 tolahs, or about 5 ounces each. The country threads with which they are made, are said to be worth 6 or 10 Rs. per tolah.

agents of certain respectable Liverpool Houses set up here with a view to take an active part in the import and export business of this country, and successful as their operations proved, others followed them, and in a few years several Houses were established in Calcutta with London and Liverpool connections noted for their wealth and influence. Manifold were then the imports and exports as compared with those of the Company's time, and certain experienced and enterprising merchants and agents exerted themselves to improve upon our Indian resources, as also to supply the requirements of our countrymen more liberally and economically. I can speak from my personal knowledge that Mr. David McIntyre, whose name must be familiar to you, busily employed himself for some years in collecting information regarding the cotton fabrics most in use and demand among the natives, and through the assistance of his Banian, the late Baboo Bissumbhur Sen, whose name doubtless is also well-known to you, procured samples of all kinds and species of cloths in use among the various classes of natives both in Bengal and the Upper Provinces. You may be aware, gentlemen, that his efforts did not end in vain, as within a few years he not only reaped a rich harvest for himself, but paved the way of all Indian merchants for following his example. White jaconets, cambrics, long-cloths (an imitation of a species of Madras cloth), dhootees, scarfs, chintzes, lappets, Japan spots, and honeycombs were then imported on large scales which would find a market as soon as landed, at highly remunerative prices, and the imports were multiplied as the consumption increased. The grey goods did not come into fashion till after the year 1840, being commended to the notice of the natives by reason of a difference in favour of buyers of 3d. to 6d. ₱ piece for jaconets and shirtings, being the costs of bleaching them respectively, and these have now materially checked the use of the white cloths. In earlier days there was a feature of great importance in favour of this branch of trade unlike that of the present time, which renders it worth mentioning here prominently. In those days the shroffs and koot-hials, all men of capital intact, directly dealt in these goods, either on their own account, or to meet orders of their constituents, and they were also accustomed to accommodate dealers on the spot on the pledge of the goods purchased by them, at a moderate rate of interest. In fact the cotton goods, like metals, were then treated as good as bullion. A discount of 8 per cent. per annum for 3 months was in itself a sufficient temptation to the buyers for paying on delivery hard cash to any extent, though in those days, the modes of transit of goods to, and remittances from, the interior were tedious.

I have said that the importers of former days sold their goods with facility on arrival to the great advantage of their constituents and themselves; and this was manifest from the constituents paying their agents cheerfully a commission of 5 per cent. and a delcredere of 2½ per cent. upon the proceeds of sale, besides the usual charges. This was not all. The agents had another advantage of no less importance, for no invoice of goods reached them, but was accompanied by orders for sending the returns in our country produce, which added no little to the agent's benefit. In former times there was no other medium for remitting funds, Bills of Exchange to any large extent not being then available.

The following comparative statement which I have compiled from the Commercial annuals will show how far the imports of British cotton goods have increased within the last 30 years.—

1839-40.			1849-50.			1859-60.			1869-70.		
Description of Goods.	Pieces and Dozens.	Value.	Description of Goods.	Pieces and Dozens.	Value.	Description of Goods	Pieces and Dozens.	Value.	Description of Goods.	Pieces and Dozens.	Value.
		Rs.			Rs.			Rs.			Rs.
White cotton goods.	21,25,127	75,75,605	White and Grey Cotton goods	48,84,685	1,56,54,011	White and Grey Cotton goods	1,79,75,520	5,40,16,236	White and Grey Cotton goods	2,46,16,086	7,01,52,980
Printed & coloured goods.....	3,18,080	21,85,306	Printed and coloured goods.	57,098	24,71,013	Printed and coloured goods	10,75,828	1,08,15,184	Printed and coloured goods.	32,67,068	1,11,21,502
		97,60,911			1,81,27,027			6,48,61,620			8,12,54,482

Thus you see, gentlemen, in thirty years the value of imports of British plain and colored goods increased from rupees ninety-seven lacs and sixty-one thousand, to eight crores twelve lacs and fifty-five thousand, a fact which at once shows how wonderfully the Import trade has improved on this side alone. Looking to the gradual rise it must be taken for granted that the heavy influx keeps pace with the demand and consumption. But unfortunately, gentlemen, it is admitted on all hands, importers as well as dealers, that this ostensibly flourishing branch of our trade has been of late years anything but a paying, if not a losing one.

COTTON TWIST AND YARN.

In 1859-60, the total imports were 2,03,95,000 lb., value Rs. 1,06,60,000; in 1869-70, 1,39,11,000 lb, value Rs. 1,14,15,760. The only remarkable feature in this trade is the difference between the present value and that of the last decade. In 1859-60 the average value was eight-and-half annas, and in 1869-70, thirteen annas per lb. for white and colored. Though prices have since receded, this trade is also in a languid condition, especially as regards 40s. which, I learn, are much affected by the heavy imports of grey dhotees.

SUGAR.

In former times, our white Benares was in great favor with the consumers in the United Kingdom, and therefore took the lead in the English market. Before 1836 our Bengal sugar was subject to a differential duty of 32s. per cwt, whilst British Colonial to 24s. only. Through the strenuous efforts of the E I. merchants and the Court of Directors in the Parliamentary Sessions of that year, the duty on our sugar was equalized with that on the West India and Mauritius sugars. The duties upon Foreign slave-grown sugars continued prohibitory. This favourable change produced an extraordinary stimulus in this branch of our trade here. Our exports to England increased strikingly, and at immense cost mills were set up by our Calcutta English Houses at Dhoba, Balli, Dacca, and Tirhoot, for the manufacture of refined sugars. The result of the working of some, viz., Dhoba and Balli was remunerative for a time, but that of others ruinous, the duties in England upon refined sugars being higher by 3 or 4 shillings per cwt. Our raw sugars however proved lucrative enough, and at one time reached so high as 90s. per cwt. for best Benares; other qualities were relatively lower. English refined sugars having much attracted the notice of consumers in Europe, our low sugars, khaur and goor, were liberally exported at comparatively high prices, say 7 to 8 Rs. per maund for good dry khaur for refining purposes in England. About the year 1847, when the question of Free trade was most enthusiastically advocated, and the eventual equalization of duties upon all slaves and free-grown sugars by graduated scales was consequently in the contemplation of the British Parliament, our Calcutta Chamber of Commerce requested the Government of India to procure from the local officers, statistics of sugar, khaur, and goor, in all British India, and the Company's Straits' Settlements. In 1848, when the returns were received from all directions, I had the honor of digesting those statistics, and was at some pains in collecting informations from private sources. The quantity of goor produced then in Bengal and the North-West Provinces yielded as much sugar for our home consumption as was exported by sea. In submitting the statistics to the Government when completed, I took the liberty of accompanying them with my humble views as to the danger awaiting the future of that important trade, under the indiscrimate duties which had then come into operation in Great Britain. In or about August 1848, an article of a London journal highly esteemed for its opinion, appeared in the late *Bengal Hurkaru*, in which that Journal was of a different opinion on a reliance upon the cheap labour in India, and assured us that India could not therefore lose the trade, though even at that time, as I learnt from the enquiries which I had made, best Benares sugar could not then be laid down in Calcutta even in bumper seasons at less than Rs. 9-8 per maund, a cost which must have of late been by far exceeded owing to the high price for labour in the Behar and other Provinces. The following comparative statement of exports as regards Great Britain will show at a single glance how this trade has suffered:—

1849-50.		1859-60.		1869-70.	
Quantity of Sugar and Khaur.	Value.	Quantity of Sugar and Khaur.	Value.	Quantity of Sugar and Khaur.	Value.
Maunds. 19,94,900	Rs. 1,65,16,900	Maunds. 5,37,700	Rs. 53,42,000	Maunds. 1,22,900	Rs. 9,05,800

Thus you see gentlemen, since 1849-50 or in 20 years, the export to Great Britain has fallen from 18 lacs to 1 lac 23 thousand maunds and though in May 1870 the duties were reduced from 11s. 3d. to 5s. 8d. per cwt. for first class, and other qualities proportionally less, yet

since the last 8 months of 1870, say from May to December, the export did not exceed 84,250 maunds, value Rs. 5,11,700. Of this quantity 64,500 maunds were exported in May 1870, probably on receipt of advice by the telegraph of the reduction of duty in England, but the exports soon after fell off, and in December it was only 1,400 maunds. From the values given above, the sugars exported of late, it would appear that they comprised only the lower kinds, dates, and other inferior classes, the average values being about Rs. 7.5 per maund of the exports of 1869-70, and Rs. 6 of those of the last 8 months of 1870. In speaking of date sugar, I remember to have read the remarks of the revenue Collectors of the eastern districts, where that description of sugar is grown, that at the time when their returns were sent in, they were of opinion that in the course of time those districts would be in a position to supply largely, as immense tracts of land were then covered with young date trees which would eventually yield vast quantities of juice for goor and sugar. This expectation, I believe, is now fully realised.

INDIGO.

Apparently with a view to avoid collision with the zemindars and ryots, the East India Company did not cultivate the article on its own account, but would occasionally supply its wants by inviting tenders for given quantities of good Bengal only. In the earlier days the production was principally in the hands of zemindars and other native planters; the European manufacturers were not permitted by the Government till I believe, Lord William Bentinck's administration, to hold lands in the Mofussil directly themselves, and consequently Talook, and Ijarahs, were held in the names of their native managers. Although the Bengal dye has rivals in Madras, Guatemala, Java, and Manillas Bengal has ever had and will doubtless have an ascendancy over the qualities of the produce of every other country. In former times its average produce was 1,20,000 maunds a year, under the influence of liberal accommodations afforded to planters by our Calcutta English merchants, and some of our local Banks of those days, but of late years, owing to the high prices of labour, enhanced rents of lands, and limited accommodations, the average produce does not exceed 1,00,000 maunds as you must be aware. The following statistics will, I hope, show the present position of this trade in this and the London markets. Our export to Great Britain in 1859-60 was 72,430 Indian maunds, average value about Rs. 143 per Fy. maund, and in 1869-70 we exported to that country 48,090 maunds, average value about Rs. 240 per Fy. maund, whilst in England the actual delivery in 1859 (Home and Export) was 24,748 chests, and the actual London stock at the end of that year was 13,738, and the price of best Bengal was 7*s.* 9*d.* per lb. In 1870 the total delivery was 18,538, and the London stock at the end of that year 18,146, the price for best Bengal 10*s.* to 10*s.* 3*d.* per lb. So it appears that as compared with 1859, the delivery in 1870, decreased by 6,210 chests, the stock increased 4,408, but the price, nevertheless, was 2*s.* 6*d.* per lb. higher than in 1859.

RICE.

In the earlier days this grain suited for export to great Britain was chiefly procured from Patna, and hence it was called Patna table rice. The grain was white, large, and bold. The supplies however were not so extensive as we now have from the villages in our neighbouring districts of 24-Pergunnahs and Barasct. Latterly white table rice called Pachery, a corruption of Peshwaree, and other sorts here produced, took the place of Patna. The cargo kinds, *viz.*, Ballam and Monghy were at first exported to a limited extent, but since the famine in the United Kingdom in 1845 and 1846 their exports increased largely, and have ever since continued to go forward on a liberal scale, chiefly for distilling purposes. The low kinds now-a-days are heavily imported into England from Akyab, Rangoon, Saigon and Bankok, which have in some measure affected similar kinds from our port, but nevertheless our exports on the whole have not diminished; on the contrary increased since the last decade, as will be perceived from the following comparison. In 1859-60 our export to Great Britain was 3,44,400, and in 1869-70, 5,28,900 maunds, showing an increase of 1,84,500 maunds, but our exports to certain other ports, especially those which are nearer to Saigon and Bankok, have fallen off very materially, as you will see from the following comparative statement :—

In 1869-70 our export Mds. to Bourbon was.....	Mds. 3,23,600	against	Mds. 7,39,600 in 1959-60.		
„ China..	36,800	„	1,17,400 „		
In 1869-70 our export Mds. to Singapore	17,400	against	41,800 in 1859-60.		
„ Penang.....	2,300	„	35,300 „		

These deficiencies were however relieved in a great measure by heavy exports to Bombay, which took from us in 1869-70, 21,74,400 maunds against nil in 1859-60, and to Ceylon we exported in 1869-70, 7,41,100 maunds, against 2,51,400 in 1859-60. Our total export of rice to all ports was 63,79,800 in 1869-70, against 43,71,300 in 1859-60, showing an increase of 20,08,500 maunds in 1869-70. Saigon and Bankok being growing rivals of Bengal in respect of this grain, it is to be hoped that the interests of those of our districts such as Bakergunge, Dinagepore, &c., whose whole length and breadth of area are almost cultivated with the low descriptions, will not be lost sight of, but watched with care, in order that this trade may not suffer like our other staples. The abundant produce in the Bengal districts I have named, is chiefly influenced by the export demand in Calcutta, and assists the ryots in no small a degree in paying rents to their Zemindars, and the latter their quotas of revenue to the Government.

SALTPETRE.

This article has almost lost its position, at least in Europe, from a cause which I need scarcely remind you of. In March 1860, when its market in England was unusually healthy, with a price of 42*s.* the cwt. for 5 per cent. refraction, the duty was increased here to Rs. 2 per maund from 3 per cent. upon a fixed value of 5 Rs. 12 Ans. per Indian maund, whilst the market value was 11 Rs. per factory maund; a corresponding decline in price here was an immediate consequence of the rise in the rate of duty, and at the close of the year its export to Great Britain fell off heavily, say to 3,03,300 against 4,96,500 maunds in the preceding year. On the other hand, the English Market was very little affected by the increase of duty; after a temporary rise the prices varied from 37 to 40*s.* for low refractions till 1865, when they fell considerably, *viz.*, to 25*s.* for the best quality. This unhappy result was owing to the new process of manufacturing this salt in Europe, which was vigorously pursued with the composition of nitrate of soda and potash. This circumstance led to the reduction of duty on this side in March 1865, to 1 rupee, which however was of little avail to enable our manufacturers to compete with the European substitute. In April 1866, the duty was replaced on its original footing 3 per cent., which produced no better effect, as the European manufacturers could afford to sell their production at a value which brought down in England ours to a price never before heard of, *viz.*, 19*s.* 6*d.* per cwt. for 5 per cent., and hence this article was declared free of export duty in May 1867. The export in 1859-60 was 4,35,200 and in 1869-70, 3,53,860 maunds. Any reaction which may have recently taken place in England, is to be ascribed to the perturbed state of the continent, and it is a question whether after peace and tranquillity have been fully restored there, the present position of this article in England will be maintained.

JUTE.

Never to my recollection, has our trade in any description of goods flourished so well and attained so remarkable an attitude within a few years, as this fibre has. In 1859-60 we exported to Great Britain 10,74,640 Indian maunds, value 26,52,800 Rs., but in 1869-70, 33,61,860 maunds, value 1,54,73,000 Rs. The average value in 1859-60 was about 2 Rs. 8 Ans.; whereas in 1869-70 it rose to 4 Rs. 9 Ans. per maund, a price which our purchasers paid without any murmur. This article, which in former days was used in making gunny cloths and coir, has now, I understand, become a substitute in England for more valuable threads and fibres, and used in manufacturing various kinds of cloths, carpets, &c. It is not unlikely that from all appearances it has room yet for admitting of further increased exports, and perhaps further advance in price. As a proof of the usefulness of jute, I shall not omit mentioning its cuttings, which are sought with no less eagerness. In 1869-70 the export was 73,225 Indian maunds, value 1,85,700 Rs. or about 2 Rs. 8 Ans. per maund, against nil in 1859-60.

LINSEED.

This seed in earlier days was cultivated in this country to a very limited extent. Its oil was chiefly used here in painting wood-works of houses, and coarse furniture, and in seasons of scarcity of mustard seed, its oil was mixed with that of the last-mentioned cereal for local consumption. It then sold for 12 to 14 annas per maund. In or about 1835 a German house of this city under the name of Messrs. Hodgkinson Schlatter & Co., first tried it in the English market, which previously had its supplies from Russia alone. The result being highly successful, larger quantities were shipped by them till others came into the market, and forced up the price to nearly twice as much as it before was. Since the Crimean War in 1856, which interfered with its imports into England from the Russian Ports, the shipments were heavier from this side under favourable accounts for our seeds. Ever since that time, this seed has obtained a better footing in England, and gone on freely, and its cultivation has been extended both in Lower Bengal and the Upper Provinces. This oil-seed has of late years been steadily advancing in price, which has led to a diminished export to Great Britain. In 1859-60 its export was 17,11,600 maunds, value 34,67,000 or about 2 Rs. per maund, and in 1869-70, 9,13,140, value 33,20,000 Rs. or 3-12 per maund; so an equivalent of the sum paid in 1859-60 for 17,11,600 maunds was paid in 1869-70 for nearly half of that quantity. You are aware, gentlemen, that the market for this seed is also influenced by the demand of North America

INDIAN TEA.

This is the last, but not the least article of importance which I have to notice as one which holds out the fairest prospects under its present aspect. I shall take the liberty, gentlemen, to detain you a few minutes on this subject, in order to submit before you its antece-

dents, though many of you, I daresay, may be acquainted with them. In or about 1830, that able and energetic political officer, Colonel Jenkins, the then Governor-General's agent at Cachar, brought to the notice of the Government, the discovery of the indigenous tea plants in the neighbourhood of Assam, from the accounts he had obtained from the Chinese Caravan which periodically visited that country. The co-operation of Dr. Wallich, the well-known botanist and late Superintendent of our Botanical Garden, was invited, and a number of shrubs procured from Assam, and tried in that garden in the first instance, and on the experiment being successful, a committee was formed at the Presidency composed of a Secretary to the Government, and certain European merchants, among whom was the late Mr. David Jardine, a member of the firm of Messrs. Jardine Skinner & Co. of this city, who took an active part in forwarding the laudable object of the committee, Dr. Wallich acting as their Secretary. With a view to give a fair trial to the capability of the soil to produce desirable kinds and qualities, tracts of land in Assam were placed under a systematic cultivation, and through the agency of Messrs. Jardine Skinner & Co., not only seeds and seedlings were procured from their China agents, Messrs. Jardine Matheson & Co., with the local aid of a gardener, named Mr. Fortune, sent out thither from England, but also planters, carpenters, and other workmen, with all sorts of necessary implements at the cost of the Government. All the processes of cultivating and manipulating teas were taught to the natives, and Dr. McCleland, a geologist of high abilities in the medical service, was deputed by the Government to Assam to furnish, after a scientific investigation, a report on all matters connected with tea plantations. His report which contained various important suggestions, was favourable. Samples of Assam tea of all descriptions, blacks and greens, were from time to time forwarded to the care of the Court of Directors, the reports of whose brokers were very flattering, but so far as I recollect, Greens were not much approved of. Small quantities were exhibited at public sales which fetched fancy prices, such as 5s. to 6s. per lb. for blacks, perhaps more. In March 1840, the tea cultivation was thrown open by the Government to public enterprize. The Assam Tea Company took over the Government plantation, but its management at the commencement failed to be as encouraging as it ought to have been. On its changing hands the result proved highly beneficial to the shareholders, and led to the extension of plantations under care of the agents of other Companies. It will be seen from the following statement how much this promising trade has progressed within the last ten years. In 1859-60, 16,000 packages only were despatched to Great Britain, value Rs. 9,87,600, and in 1869-70, 1,46,000 boxes, value 1,00,93,300 Rs. Thus within 10 years there was an increased export of 1,30,000 packages, and in value an increase of Rs. 91,05,700. From the English circular I have before referred to, I see the total delivery of Assam in 1870 was thirteen million four hundred seventy-two thousand and eight hundred, and the stock only four million three hundred ninteen thousand and two hundred lbs. The total delivery in Great Britain of tea of all descriptions in 1870 (China included) was one hundred forty-eight million five hundred ten thousand and two hundred lbs., of which the delivery of Assam formed a proportion of nearly ten per cent. This result is not a little encouraging to those interested in a trade now in an incipient state with hopeful prospects in store. The opinion expressed in the circular I have alluded to, is no less pleasing, *viz.*, "Indian tea gains favour with consumers, who have absorbed 13 million pounds." Had it not been for the immense sums lavished away during the mania in tea shares in 1863 and 1864, a greater success might have been achieved by this time. It is not however too much to expect that in course of time China may have as much reason to be jealous of Indian tea, as India is now of her silk. Our own tea has in a manner already extirpated China tea from India, Indian black tea being now universally preferred to the other.

Gentlemen, I shall take leave of you after saying a few words, as the result of my knowledge and experience of half-a-century on the subject of opium. I know from the year 1820-21 to 1863-64 the produce gradually rose from about 4,200 to 64,000 chests, Behar and Benares. In earlier days it once sold so high as 4,500 Rs., and in 1839 so low as 195 Rs. per chest, the latter was owing to the capture and destruction in China at that time by a Chinese Commissioner named Lin, of 20,000 chests of Bengal and Malwa opium. Before the legalization of its import into China, a few years since, all foreign opium was sold by smuggling, as it must be well-known to you. In those days there would always be a stock in China on first hands of about 20,000 chests of Indian opium, but after the destruction, I have referred to, the exports of each year from India were nearly exhausted, as is the case now, for of late, as you may have observed, the export of our each sale's opium is nearly all sold off and delivered on arrival, and old stocks are very light there at the end of each year. We have been aware since these 25 or 30 years, that opium was grown in China and that its cultivation increased whenever the prices of Indian opium was high, and that on the other hand it was checked by a fall in the prices of that opium. It was the knowledge of these circumstances that induced the Government here to augment the cultivation in this country. Our merchants were conversant also with the notorious fact, that the strength of the opium of China was 2 to 1 of Indian opium. The additional fact now elicited by the Memo. I have alluded to are, that the cultivation had extended to almost all parts of China, and certain divisions of the country where opium was never smoked before; that the quality of the growth of several districts had improved; that the mass of the people had a taste for it, and that native opium was preferred on account of its cheapness, being 40 to 50 per cent. lower in value than foreign opium, with all charges of transit into the interior. It is likewise stated that consumption had increased in a much greater proportion than in former years. In the face of all these discouraging accounts, China consumed last year no less than 46,000 chests of Bengal, and about 39,000 of Malwa opium, in all 85,000 chests, at higher prices than those of the preceding year, and owing to this favorable out-turn an average of 1,121 Rs. was obtained at the Calcutta public sales, or Rs. 149 per chest more than the Budget Estimate of 1870. This may be, as it is said, attributed to short produce in China, if so, it cannot have been so universal as to affect the prices of native opium throughout the country, so as to give an impetus to foreign opium in those parts where the latter is used. At any rate, since it is admitted that the standard qualities of Bengal and Malwa are superior to those of the produce of China; that the dealers and speculators of China have a faith in the genuineness of Bengal opium in preference to any other; and that the consumption of all kinds is evidently increasing, it is not possible that foreign opium will be, if at all, ousted at least for years to come. To prevent such a mishap for India, the Government has always one infallible remedy at its command, which is to extend the cultivation as it is now doing, till the prices of Indian opium reach a point at which it would be beyond the possibility of China to compete with us, taking into account the difference between the relative qualities of Indian and China opium. Referring to the comparative low price cost of the opium on this side, say within 400 Rs. per chest, for qualities twice as good as China, India can well afford to sell in China for 800 Rs. with all charges included, instead of the high price at which Bengal is now selling there, and what our Government might lose in prices it would make up by the increase of quantity, and thereby check further progress in the cultivation in China. It is not in the nature of things that because the Chinese have now a taste for native opium, they will prefer inferior drugs at relatively higher prices than those of Indian opium. Should our Government actually find it indispensable to force down the prices of its own growth, it may, under such circumstance, deem it advisable to reduce the present rate of duty on Malwa, in which case the extension at the same time of its cultivation may be an inevitable consequence.

Since the Budget Estimate of this year, three public sales have taken place, April, May, and June—the general averages were Rs. 1,162, 1,254, and 1,352 respectively, the last showing an excess of Rs. 277 over the Budget Estimate, Rs. 1,075. This unexpected advance is owing to a deficiency in the produce in Behar and Benares of the season 1871-72* From all appearances it is more than probable that in March 1872, this estimate will be by far exceeded.

EXTERNAL COMMERCE OF BENGAL AND BOMBAY.

[By Walter R. Cassels.]

The annexed statistics of the external trade of Bengal and Bombay during 12 years ending 30th April 1866, show, amongst others, the following results:—

Comparing the last three years before the increase of capital (1861-62 to 1863-64) with the first three years (1854-55 to 1856-57), the trade of Bombay shows the following *increase*:—

Exports	193.65 per cent.
Imports	158.34 „
Aggregate Exports and Imports	177 82 „

Comparing the last 3 years (1863-64 to 1865-66) with the first three years (1854-55 to 1856-57), the trade of Bombay shows the following *increase*:—

Exports	308.21 per cent.
Imports	218.22 „
Aggregate Exports and Imports	261.70 „

In 1863-1864, the year preceding the increase of capitals, the trade of Bombay, as compared with that of Bengal, was:—

Exports	57.80 per cent. more than Bengal.
Imports	111.11 „ „ „
Aggregate Exports and Imports	76.86 „ „ „

During the four years ending 30th April 1864, the trade of Bombay averaged:—

Exports	42.40 per cent., more than Bengal.
Imports	57.97 „ „ „
Aggregate Exports and Imports	46.49 „ „ „

* The averages of the July and August Sales were Rs. 1,324, and 1,364 respectively.

To show that these comparative results were not momentary, it may be added that during the six years ending 30th April 1866, a period before and after the increase of capital, the trade of Bombay averaged :—

Exports	46.6 per cent. more than Bengal.
Imports	56.02 " " "
Aggregate Exports and Imports	51·73 " " "

Extract from letter addressed to Government by the Bank of Bombay, dated 23rd January 1865 :—"The Bank originally opened Branches in full faith that the present agreement would have been carried out as originally proposed, that at each Branch where there was a treasury the same should be handed over to the Bank ; that a minimum Government balance would be fixed for each treasury, and that the amount of expenses incurred by Government would be paid to the Branch Bank for conducting the treasury business. Up to this day the Bank has not received charge of a single treasury, and the result is, as has been frequently pointed out, that the Branches of the Bank of Bombay, instead of proving feeders to the head office (as the Directors had every reason to expect they would be, had they been placed on an equal footing with the Bank of Bengal), have required to be fed constantly by the parent Bank, and that invariably to the greatest extent when money was most useful in Bombay.

COMPARATIVE STATEMENT OF THE VALUE OF THE IMPORTS BY SEA INTO BENGAL AND BOMBAY RESPECTIVELY DURING 12 YEARS ENDING 30TH APRIL 1866.

Converted into sterling at Exchange 2*s.* per Rupee.

Years.	Bengal.			Bombay.			Bengal.			Bombay.		
	Merchandise.	Treasure.	Total.	Merchandise.	Treasure.	Total.	Merchandise.	Treasure.	Total.	Merchandise.	Treasure.	Total.
	£	£	£	£	£	£	£	£	£	£	£	£
1854—1855..	6,921,278	694,887	7,616,165	6,313,935	1,337,479	7,651,414	11,516,333	551,012	12,067,345	7,465,783	704,099	8,169,881
1855—1856..	8,186,162	6,011,226	14,197,388	6,430,637	4,973,380	11,414,017	13,633,030	255,961	13,888,991	8,942,899	1,349,016	10,291,915
1856—1857..	8,157,512	6,660,644	14,818,156	7,282,833	6,854,998	14,137,831	14,166,818	662,957	14,829,775	10,983,020	1,596,373	12,579,393
1857—1858..	7,647,769	8,246,898	15,894,667	8,366,560	7,498,597	15,864,157	14,329,863	502,842	14,832,705	12,392,654	2,282,705	14,675,359
1858—1859..	10,585,313	6,310,313	16,895,626	11,607,150	6,424,822	18,031,972	15,711,200	266,120	15,977,320	14,364,423	1,586,459	15,950,882
1859—1860..	13,168,917	8,003,554	21,172,501	11,798,470	7,539,418	19,337,888	13,983,385	1,017,786	15,001,171	14,196,684	1,318,767	15,515,452
1860—1861..	12,432,159	4,218,117	16,650,336	11,762,045	6,389,214	18,151,259	14,859,665	1,767,385	16,627,050	13,138,727	1,349,312	19,488,039
1861—1862..	11,106,926	4,634,795	15,832,721	11,625,527	9,501,106	21,126,633	15,460,855	1,007,328	16,468,183	19,600,672	1,699,287	21,299,959
1862—1863..	11,366,439	4,909,621	16,276,054	14,658,957	13,981,779	28,640,736	18,270,872	1,274,554	19,544,426	27,656,850	2,482,353	30,139,203
1863—1864..	11,445,966	5,611,103	17,057,071	18,916,682	17,093,728	36,010,410	23,167,557	2,979,643	26,147,200	39,231,554	2,046,491	41,268,025
1864—1865..	12,331,303	8,810,186	21,141,489	21,709,307	12,578,087	34,287,394	24,507,064	2,333,016	26,840,080	42,025,647	3,295,180	45,320,827
1865—1866..	13,700,498	9,181,041	22,881,539	18,404,392	16,955,175	35,359,567	24,741,565	4,446,595	29,188,160	37,053,790	3,071,073	40,124,803

STATEMENT OF THE VALUE OF IMPORTS AND EXPORTS BY SEA INTO BOMBAY DURING THD UNDER-NOTED PERIODS AS COMPARED WITH BENGAL.

Years.	Annual per centage.		Years.	Periods of 3 years—per centage.				Annual per centage.		Years.	Periods of 3 years—per centage.			
	More than Bengal.	Less than Bengal		3 Years' Imports Bengal.	3 Years' Imports Bombay.	More than Bengal.	Less than Bengal.	More than Bengal.	Less than Bengal.		3 Years' Exports Bengal.	3 Years' Exports Bombay.	More than Bengal.	Less than Bengal.
	per cent	per cent		£	£	per cent.	per cent.	per cent.	per cent.		£	£	per cent.	per cent.
1854—1855..	0 46	..	1854—1855	36,631,709	33,202,262	...	9 36	..	32·29	1854—1855	40,785,511	31,041,189	..	23·89
1855—1856..	..	19 61	to					..	25 89	to				
1856—1857..	..	4·59	1856—1857					..	15 17	1856—1857				
1857—1858..	..	0·19	1857—1858	53,962,794	53,234,017	..	1·35	..	1·06	1857—1858	48,811,196	46,141,692	0·72	..
1858—1859...	6 72	..	to					..	0·16	to				
1859—1860..	..	8 66	1859—1860					3·42	..	1859—1860				
1860—1861..	9·01	..	1860—1861	48,759,111	67,918,628	39 29	..	17·20	..	1860—1861	52,639,659	70,927,201	34·74	..
1861—1862..	33 43	..	to					28 73	..	to				
1862—1863..	75·96	..	1862—1863					54·20	..	1862—1863				
1863—1864..	111 11	..	1863—1864	61,080,099	105,657,371	72 98	..	57·80	..	1863—1864	82,175,440	126,713,655	54·19	..
1864—1865..	62·18	..	to					68·85	..	to				
1865—1866..	54·53	..	1865—1866					37·46	..	1865—1866				

COMPARATIVE STATEMENT OF THE *aggregate* VALUE OF EXPORTS AND IMPORTS BY SEA, BENGAL AND BOMBAY, DURING 12 YEARS ENDING 30TH APRIL 1866.

Converted into sterling at Exchange 2*s.* per Rupee.

Years.	Bengal.			Bombay.		
	Exports.	Imports.	Total.	Exports.	Imports.	Total.
	£	£	£	£	£	£
1854—1855..	12,067,345	7,616,165	19,683,510	8,169,881	7,651,414	15,821,295
1855—1856..	13,888,391	14,197,388	28,085,779	10,291,915	11,413,017	21,704,932
1856—1857..	14,829,775	14,818,156	29,647,931	12,579,393	14,137,831	26,717,224
1857—1858..	14,832,705	15,894,667	30,727,372	14,675,359	15,864,157	30,539,516
1858—1859..	15,977,320	16,895,626	32,872,946	15,950,882	18,031,972	33,982,854
1859—1860...	15,001,171	21,172,501	36,173,672	15,515,451	19,337,888	34,853,339
1860—1861..	16,627,050	16,650,336	33,277,386	19,488,039	18,151,259	37,639,298
1861—1862..	16,468,183	15,832,721	32,300,904	21,299,959	21,126,633	42,426,592
1862—1863..	19,544,426	16,276,054	35,820,480	30,139,203	28,540,736	58,779,939
1863—1864..	26,147,200	17,057,071	43,204,271	41,268,025	36,010,410	77,278,435
1864—1865..	26,840,080	21,141,489	47,981,569	45,320,827	34,287,394	79,608,221
1865—1866..	29,188,160	22,881,539	52,069,699	40,124,803	35,359,567	75,484,370

STATEMENT OF THE *aggregate* EXPORTS AND IMPORTS OF BOMBAY DURING THE UNDER-NOTED PERIODS AS COMPARED WITH THOSE OF BENGAL.

Annual per centage.		Years.	Period of 3 years—per centage.			
More than Bengal.	Less than Bengal.		3 years' Exports & Imports Bengal.	3 years' Exports & Imports Bombay	More than Bengal.	Less than Bengal.
per cent.	per cent.		£	£	per cent.	per cent.
...	19 62	1854—1855	77,417,220	64,243,451	...	17·01
...	22·71	to				
..	9·88	1856—1857				
..	0·61	1857—1858	99,773,990	99,375,709	..	0·38
3·37	..	to				
..	3 64	1859—1860				
13·10	..	1860—1861	101,398,770	138,845,839	36·93	..
31·34	..	to				
64·09	..	1862—1863				
78·86	..	1863—1864	143,855,539	232,371,026	62·20	...
65·91	..	to				
44·96	..	1865—1866				

STATEMENT OF THE EXPORTS, IMPORTS, AND *aggregate* EXPORTS AND IMPORTS OF BOMBAY, AS COMPARED WITH THOSE OF BENGAL, DURING PERIODS OF SIX AND TWELVE YEARS RESPECTIVELY.

Years.	Per centage on Exports.		Per centage on Imports.		Per centage of aggregate Imports and Exports.	
	More than Bengal.	Less than Bengal.	More than Bengal.	Less than Bengal.	More than Bengal.	Less than Bengal.
1854—1855 to 1859—1860	..	10·67	..	4·58	..	7·65
1860—1861 to 1865—1866 6 years.	46·60	..	58·02	..	51·73	..
1854—1855 to 1865—1866 12 years.	24·12	..	29·79	..	26·78	..

STATEMENT OF THE VALUE OF EXPORTS, AND IMPORTS, *aggregate* EXPORTS AND IMPORTS OF BOMBAY RESPECTIVELY DURING 4 YEARS PRECEDING INCREASE OF CAPITAL OF THE BANK OF BOMBAY, AS COMPARED WITH THOSE OF BENGAL.

	Years.	Bengal.	Bombay.	Per centage more than Bengal.
Exports ..	1860—1861 to 1863—1864	78,786,859	113,195,226	43·40
Imports ..	1860—1861 to 1863—1864	65,818,149	106,929,066	57·99
Aggregate Exports and Imports.	1860—1861 to 1863—1864	144,603,041	216,124,964	49·46

STATEMENT OF EXPORTS, OF IMPORTS, AND OF *aggregate* EXPORTS AND IMPORTS, BOMBAY, DURING 12 YEARS ENDING 30TH APRIL 1866, SHOWING PER CENTAGE OF INCREASE ON PERIODS OF THREE YEARS RESPECTIVELY.

Years.	EXPORTS. Total Value Periods of 3 years.	EXPORTS. Per centage of Increase.	IMPORTS. Total Value Periods of 3 years.	IMPORTS. Per centage of Increase.	AGGREGATE EXPORTS AND IMPORTS. Total Value Periods of 3 years.	AGGREGATE EXPORTS AND IMPORTS. Per centage of Increase.	Years.
	£	On preceding 3 years.	£		£		
1854—1855 to 1856—1857	31,041,169		33,202,262		64,243,451		1854—1855 to 1856—1857
1857—1858 to 1859—1860	46,141,692	48·64	53,234,017	60·33	99,375,709	54·68	1857—1858 to 1859—1860
1860—1861 to 1862—1863	70,937,201	53·71	67,918,628	27·58	138,845,829	39·71	1860—1861 to 1862—1863
1863—1864 to 1865—1866	126,713,655	78·65	105,657,371	21·62	232,371,026	67·35	1863—1864 to 1865—1866
1861—1862* to 1863—1864	92,707,187		85,777,779		178,484,966		1861—1862* to 1863—1864
1854—1855 to 1856—1857 compared with first three years.		198·65		158·34		177·62	1854—1855 to 1856—1857
1863—1864 to 1865—1866 compared with 1854—1855 to 1856—1857 first three years.		308·21		218·22		261·70	1863—1864 to 1865—1866 compared with 1854—1855 to 1856—1857

* Three years before capital was increased.

STATEMENT SHOWING THE IMPORTS AND EXPORTS OF TREASURE IN EACH OF THE PRESIDENCIES OF INDIA, FROM 1814-15, (BEING ACCOUNT NO. 2, IN APPENDIX 42, TO LORDS' REPORT ON THE PETITION OF THE EAST INDIA COMPANY.)

	BENGAL. Imports.	Exports.	Net Imports.	Net Exports.	MADRAS. Imports.	Exports.	Net Imports.	Net Exports.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1814-15	1,06,86,144	1,54,625	1,05,31,819	.. .	10,08,970	1,00,649	9,08,321	....
1815-16	1,80,34,071	15,750	1,80,18,321	.. .	11,17,010	1,07,559	10,09,451	....
1816-17	3,18,51,985	1,69,000	3,16,82,985	....	17,42,272	2,44,169	14,98,103	....
1817-18	3,20,27,029	3,17,250	3,17,09,779	....	17,28,422	45,774	16,82,648	....
1818-19	4,71,92,494	2,79,538	4,69,12,956	....	23,79,668	98,087	22,81,581	....
1819-20	4,06,46,025	30,98,921	3,75,47,104	....	18,05,953	1,89,286	16,16,667	....
1820-21	2,36,17,241	11,39,363	2,24,77,978	..	24,92,462	14,250	23,78,212	....
1821-22	2,14,54,536	1,23,96,395	90,58,141	..	25,34,990	1,69,898	23,65,092	....
1822-23	1,70,68,452	15,945	1,70,52,507	....	31,21,737	1,52,860	29,68,877	....
1823-24	1,20,05,420	75,65,828	54,29,592	....	12,39,691	7,02,298	5,37,592	....
1824-25	94,02,249	16,79,497	77,92,752	....	43,01,554	21,76,819	21,24,735	....
1825-26	1,04,09,972	1,38,704	1,02,71,268	....	22,47,356	50,50,007	....	28,02,651
1826-27	1,22,88,328	11,15,032	1,11,73,296	....	28,31,624	7,02,230	21,29,394	....
1827-28	1,41,39,582	44,80,987	96,58,595	.. .	25,18,685	39,13,817	....	13,95,132
1828-29	65,58,526	17,64,193	47,95,333	.. .	14,78 895	11,03,083	3,75,812	....
1829-30	98,10,264	16,10,332	81,89,932	....	10,93,057	54,01,232	....	43,08,175
1830-31	60,12,147	33,05,035	27,07,112	.. ..	11,37,557	11,27,702	9,705	....
1831-32	35,44,838	1,14,45,476	.. .	79,00,638	9,21,854	38,99,860	....	29,78,006
1832-33	51,71,083	78,33,535	.. .	26,62,152	13,46,370	30,14,689	..	16,68,319
1833-34	56,84,766	24,75,527	32,09,239	..	11,45,375	20,13,851	..	8,68,576
1834-35	64,62,248	6,65,549	57,96,699	. ..	15,31,150	10,64,776	4,66,374	....
1835-36	68,71,687	5,65,904	63,05,693	...	11,27,602	3,15,289	8,12,313	....
1836-37	61,25,274	16,13,164	45,12,110	. ..	7,59,580	7,26,158	33,422	....
1837-38	1,04,88,830	14,04,337	90,84,493	...	12,85,429	10,64,318	2,21,111	....
1838-39	1,21,90,314	16,27,600	1,05,62,714	....	13,11,340	9,12,371	3,98,969	....
1839-40	1,23,67,867	20,00,174	1,02,67,693	.. ..	11,24,062	12,74,464	.	1,50,402
	39,30,01,662	6,88,36,741	33,47,28,011	1,05,63,090	4,52,32,764	3,55,85,556	2,38,18,469	1,41,71,261

	BOMBAY.				BENGAL, MADRAS, AND BOMBAY.			
1814-15	29,71,700	6,51,680	23,20,020	....	1,46,67,114	9,06,954	1,37,60,160	....
1815-16	60,47,888	77,430	59,70,458	....	2,51,98,969	2,00,739	2,49,98,230	....
1816-17	80,12,743	42,163	79,70,580	....	4,16,07,000	4,55,332	4,11,51,668	....
1817-18	1,16,66,852	2,64,172	1,14,02,680	....	4,54,22,303	6,27,196	4,47,95,107	....
1818-19	1,53,14,090	57,635	1,52,56,455	....	6,78,86,252	3,35,260	6,75,50,992	....
1819-20	70,59,032	6,16,395	64,42,637	....	4,95,11,010	39,04,602	4,56,06,408	....
1820-21	67,02,319	4,66,244	62,36,075	. ..	3,27,12,022	16,19,857	3,10,92,165	....
1821-22	52,02,765	4,67,997	47,34,768	....	2,91,92,291	1,30,34,290	1,61,58,001	....
1822-23	56,05,933	3,90,148	52,15,785	.. ..	2,57,96,122	5,58,953	2,52,37,169	....
1823-24	69,79,401	15,66,527	54,12,874	....	2,12,14,711	98,34,653	1,13,80,058	....
1824-25	71,57,033	6,52,352	65,04,681	....	2,08,60,836	44,38,668	1,64,22,168	....
1825-26	1,13,28,783	1,95,978	1,11,92,805	....	2,39,86,111	54,34,689	1,85,61,422	....
1826-27	96,45,945	3,66,192	93,79,753	....	2,47,65,897	20,83,454	2,26,82,443	....
1827-28	1,25,01,908	7,03,271	1,17,98,637	....	2,91,60,175	90,98,075	2,00,62,100	....
1828-29	1,27,04,920	20,00,940	1,07,03,980	....	2,07,42,341	48,67,216	1,58,75,215	....
1829-30	1,10,23,000	23,97,468	87,24,532	....	2,19,25,311	93,39,022	1,25,86,289	....
1830-31	1,01,53,126	16,19,385	85,33,743	....	1,73,02,832	60,52,182	1,12,50,650	....
1831-32	73,55,868	20,35,147	53,20,721	....	1,18,22,560	1,73,80,483	.	55,57,923
1832-33	49,49,618	18,58,270	30,91,348	....	1,14,67,071	1,27,06,494	...	12,39,423
1833-34	1,19,34,387	11,53,484	1,07,80,903	....	1,87,64,418	66,42,362	1,31,21,566	....
1834-35	1,17,72,807	3,24,801	7,14,47,706	....	1,97,65,705	20,54,926	1,77,10,779	....
1835-36	1,40,19,617	4,01,170	1,36,18,447	....	2,20,18,906	12,82,453	2,07,36,453	....
1836-37	1,34,76,818	3,00,018	1,31,76,800	....	2,03,61,672	26,39,340	1,77,22,332	....
1837-38	1,46,26,754	9,37,998	1,36,88,846	....	2,64,01,073	34,06,563	2,29,94,450	....
1838-39	1,66,07,541	9,39,087	1,56,68,454	....	3,01,09,195	34,79,058	2,66,30,137	....
1839-40	60,60,713	14,30,593	46,30,120	....	1,94,52,642	47,05,231	1,47,47,411	....
	25,38,80,065	2,16,56,285	23,22,23,808	....	69,21,14,489	12,60,78,552	57,28,33,283	67,97,346

The Consignments of Treasure between the several Ports and Presidencies in India are excluded from the above Statement.

STATEMENT OF THE VALUE OF THE IMPORTS AND EXPORTS BETWEEN THE SEVERAL PRESIDENCIES OF BRITISH INDIA AND THE UNITED KINGDOM, AND OTHER COUNTRIES, IN EACH YEAR, FROM 1834-35 TO 1849-50.

	Merchandise.					Treasure				Merchandize and Treasure.			
	Bengal.	Madras.	Bombay.	Total	Of which from England	Bengal.	Madras.	Bombay	Total	Bengal	Madras.	Bombay	Total.
	Rs.	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs	Rs.	Rs.	Rs.
1834-35	1,99,91,307	50,32,900	1,75,86,858	4,26,11,065	2 68,22,216	64 62 248	15 31 150	1,09,36,835	1,49,30 233	2.64.53,555	65 64,050	2,85,23,693	6,15,41,298
1835-36	2.17,03,613	47,23.285	2,13,91,580	4,78,18 478	3,13,74,106	68 71 657	11,27,662	1,34,65,362	2,14,64,651	2,85,75 300	58,50,587	3,48,56,942	6,92,83,129
1836-37	2,78,23,965	59,70,276	2,15,70,661	5,53,69,902	3,83,05,042	61,25,274	7,59,580	1,34 76,818	2,03,61,672	3,39,54,239	67,29,856	3,50,47,479	7,57,31,574
1837-38 . .. . ..* ..	2,46,39,050	60,39,238	1,96,46,423	5 03,24 711	3 21,06,633	1,01,98 830	12 85,429	1,46,26,754	2,64,01,013	3,51,27,880	73,24,667	3,42,73,177	7,67,25,724
1838-39	2,63,21,522	64,74,021	1,96,11.224	5,24,06 767	3 50 79,300	1 21,90,314	13,11,340	1 66 07 541	3,01 09,195	3,85,11,836	77,85,361	3,62,18,765	8,25,15,962
1839-40	3,34,15,915	68 33,079	1,80,63,374	5,83,12,368	4,28,94,992	1,22,67,867	11 24,082	60 60 715	1,94,52,643	4 56,83,782	79,57,141	3,41,24,087	7,77,65,010
1840-41	4,59.07.555	78,89,328	3,05,82,522	8 41,59,405	6 01 43,308	91,38,079	6 81,465	7 92 989	1,78 62,533	5 50,96,634	83,70,793	3,85,56,511	10,20,21,938
1841-42	4,26,29,101	67 83,268	2,94,73,234	7 78,35 653	5 43,95 648	98,96,176	6 7 ,909	73 41,563	1,84,13,353	5,25,25,277	74,58,877	3,63,14,852	9,62,98,006
1842-43	3,91,51,858	58,11,805	3,10,72,366	7 60,36 029	5,30 49 012	1 64,87,117	7 94,130	1 71,51,669	3,44,32,916	5,56,38.975	66,05,935	4,82,24,035	11,04,68,945
1843-44	4,47,44,726	65,22,637	3,69,10,611	8,81,77,974	6 34 73,490	1,75,23,763	11,52,499	2,92,70,609	4,79 46,731	6,22,68,489	76,75,046	6,61,81,220	13,61,24,755
1844-45	5,93,39,902	1,04,68,940	3,77,31,817	10,75 40 659	7,9 21 795	1,58,13 651	18,55,612	1 98,25,455	3 75,24,718	7,51,53,553	1,23,24,552	5,75,57,272	14,50,35,377
1845-46	5,23,26,174	84,99,134	3,00 49,486	9,08 74,794	6 47,71 431	99,10 058	17,22,976	1,33,26,552	2,49,59,586	6,22,36,232	1,02,22,110	4,33,76,038	11,58,34,380
1846-47	5,31,34,429	88,18,041	2,70,14.175	8,89,66 645	6 42,04 045	1,33,62 297	14 71,994	1,45,64,943	2 93 99,224	6,64,96,716	1,02,90,035	4,15,79,118	11,83,65,869
1847-48	4,67,13,614	97,66,641	2,94,95,915	8 79,76,170	5 79,02,231	74,72.234	13.21,533	1 09 40,147	1 97,33 914	5,41,85,848	1,10,88,174	4,04,36,062	10,57,10,084
1848-49	4,35,60,144	94,80,720	3,04,07,173	8,34 48,042	5,51,21 104	1 41,46,091	11,71 992	2,67,26,950	4,20,45,033	5,77,06,235	1,06,52,712	5,71,34,128	12,54,93,075
1849-50	5,28,31,701	90,60,046	4,11,07,139	10 29 98 886	7 57,39,807	1,21,48,654	12,14 371	2,06,05,050	3,39,68,074	6,49,80,354	1,03,74,417	6,17,12,189	13,69,66,960
1834-35	4,09,20,438	88,61,079	3,01,52,688	7,99,34,203	3,05,69 730	6 65 549	10,63,776	2,18,082	19,47,407	4,15,85,985	99,24,855	3,03,70,770	8,18,81,610
1835-36	5,53,72,967	1,12,14,395	4,44,77,593	11,10.64.955	3,97,53,038	5,65,994	3,15,289	1,99,810	10,81,093	5,59,38,961	1,15,29,684	4,46,77,403	11,21,46,048
1836-37	6,68,82,110	1,27,98,009	5,27,31,713	13,24,01,832	4,91,54,702	16,13,164	7,36,158	6,00,018	26,39,340	6,84,95,274	1,35,14,167	5,30,31,731	13,50,41,172
1837-38	6,76,53,780	93,62,085	3,51,11,956	11,24,27,801	4,35,38,221	14,04,337	10,64,318	9,37,908	34,06,563	6,90,58,097	1,07,26,403	3,60,49,864	11,58,34,364
1838-39	6,79,16,215	1,02,04,828	3,96,26,650	11,77,47,693	4,51,32,093	16,27,600	9,12,371	9,39,087	34,79,058	6,95,43,815	1,11,17,199	4,05,65,737	12,12,26,751
1839-40	6,80,09,258	1,22,84,678	2,83,33,520	10,86,27,456	5,96,99,519	20,00,174	12,74,464	14,30,593	47,05,231	7,00,09,432	1,35,59,142	2,97,64,113	11,33,32,687
1840-41	8,08,35,851	1,04,41,658	4,53,08,533	13,45,55,942	7,05,43,881	14,62,061	8,93,005	13,09,793	36,64,859	8,20,67,712	1,13,34,663	4,48,18,326	13,82,20,701
1841-42	8,06,63,841	1,24,25,824	4,51,62,511	13,82,52,176	7,12,07,484	15 91,555	13,04,817	17,54,385	51,50,757	8,22,55,396	1,42,30,641	4,69,16,896	14,33,52,933
1842-43	7,36,34,357	1,30,19,916	4,88,63,973	13,55,18,246	5,82,09,658	7,19,341	2,53,172	11,75,453	21,57,966	7,43,63,698	1,32,73,089	5,00,39,426	13,76,76,213
1843-44	9,89,11,998	1,30,86,551	6,15,37,123	17,25,35,672	7,76,01,283	18,57,947	2,16,000	53,86,816	74,60,763	10,07,69,045	1,33,02,551	6,69,23,939	17,99,95,535
1844-45	9,82,31,971	1,64,14,627	5,12,85,256	16,59,02,124	7,24,06,197	39,65,434	6,50,533	64,53,435	1,10,68,402	10,21,87,405	1.70,65,160	5,77,17,691	17,69,70,526
1845-46	9,81,56,759	1,41,12,172	5,80,17,805	17,02,86,736	6,65,99,433	23,70,792	6,57,644	46,31,848	81,60,284	10,10,27,551	1,47,69,816	6,26,48,653	17,84,47,020
1846-47	9,29,33,284	1,51,61,468	4,59,46,973	15,35,54,375	6,51,16,965	28,54,043	6,91,699	36,02,954	71,38,696	9,51,97,977	1,58,53,167	4,95,49,927	16,06,93,071
1847-48	7,96,18,571	1,27,73,963	4,07,33,436	13,31,23,970	5,68,38,167	90,50,711	21,42,626	30,67,043	1,42,60,380	8,86,69,282	1,49,16,589	4,37,99,479	14,73,84,350
1848-49	9,68,33,499	1,31,24,629	5,86,71,750	16,06,85,018	6,19,19,693	78,08,785	73,38,483	1,03,50,157	2,55,97,426	10,47,42,284	1,94,63,112	6,90,21,907	18,62,82,444
1849-50	10,14,84,397	1,27,26,643	5,89,13,764	17,31,22,993	7,02,64,706	35,42,058	7,26,378	54,44,005	97,12,441	10,50,22,445	1,34,55,220	6,43,57,769	18,28,35,434

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INDIAN RAILWAYS.—CONTINUED.

SYSTEM OF GUARANTEE BY THE INDIAN GOVERNMENT.

The following sketch of the guarantee system and its origin, as applied to railways in India, has been extracted from Mr. Juland Danvers' "Report on Railways in India" to the end of the year 1859:—

"Two private associations, under the designation of the 'East Indian' and the 'Great Indian Peninsula Railway' Companies, were formed in the year 1845,* but the projectors found it impossible to raise the necessary funds for their proposed schemes, without the assistance of Government. The application for this assistance led to a protracted discussion, which ended in the determination of the late Court of Directors of the East India Company to grant pecuniary assistance, in the shape of guaranteeing interest upon the Railway capital.

"Railways are accordingly being constructed in India under what is popularly termed the 'guarantee' system, *i. e.* through the instrumentality of Companies, who receive from the Government a guarantee of a certain rate of interest upon the capital expended, with the approval of Government, upon their undertakings. The direct pecuniary interest which, under this arrangement, the Government have in the success of each railway involved the necessity of some supervision and control, which is provided for in the contracts with the several Companies. The land required for the railway and works connected therewith is also given to the Companies, free of expense, by the Government.

"The guarantee, which is for a term of 99 years, applies to all monies paid into the Government Treasury, and expended with the sanction and approval of the Government. When the capital account, which consists of expenditure so sanctioned, is closed, such portion of the subscribed capital as shall not have been required for the purpose of the undertakings is to be returned to the Companies.

"The Railway Companies repay the amount advanced by Government on account of the guarantee from the profits of the railways, and the following arrangement is made for the application of those profits. The net † receipts from the railways are paid into the Government Treasury If they amount to less than the sum due for guaranteed interest, such an addition is made to them from the revenues of India as makes up that sum, if they amount to more, half the excess is added to the dividend of the shareholders, and the other half is applied to the repayment of the sums previously paid by Government on account of guaranteed interest; if the receipts should not reach the amount paid for working and maintaining the railways, the deficiency is chargeable ‡ against the guaranteed interest. If at any time the whole of the monies paid by Government for interest (with simple interest § thereon) shall have been repaid and discharged, the Companies are entitled, so long as this is the case, to the whole of the profits.

"For example, if the railway, upon completion, yields a net profit of 4 per cent., the Government would have to add 1 per cent. (supposing the guarantee to be five per cent.) to make up the rate of interest guaranteed; if it yields a profit of 7 per cent., the Government would then pay nothing, but would receive 1 per cent., and the remaining 6 per cent. would be paid as dividend to the shareholders; and when by this process the whole of the sums previously advanced by Government (with interest) is repaid, the shareholders would receive a dividend of 7 per cent. If, on the other hand, the following should be the result of a year's traffic operations, viz., that the working expenses were 100,000*l.*, and the receipts only 90,000*l.*, 10,000*l.* of the sum paid by Government on account of the guaranteed interest would go to make up the deficiency, and the dividend to shareholders would be rateably reduced.

"The Railway Companies have the power of surrendering the works at any time after any portion of the line has been opened for a period of three months, upon giving six months' notice to the Government, who would have to repay the whole amount that has been expended, with their sanction, on the undertaking.

"Government has the power, within six months after the expiration of 25 or 50 years respectively from the date of the contracts, of purchasing the railway at the mean market value in London of the shares during the three previous years.

"Government is entitled, in the event of the Railway Companies failing to complete the railroads, or to work them satisfactorily, to take possession of them, repaying, within six months, the sums which have been properly expended.

"At the expiration of 99 years the land reverts to Government, and if the Railway Companies have not availed themselves of the power of surrendering before that period arrives, the works also lapse to the Government, who would have to purchase the stock of engines, carriages, &c., at a valuation.

"In any case in which, under these provisions, the Government becomes bound to repay the capital, or to purchase the railway works and stock, it can, instead of paying the gross sum declare its option to pay an annuity, to be reckoned from the time when the gross payment would be payable, and to continue during the residue of the 99 years, the rate of interest used in calculating such annuity being determined by the avarage rate of interest during the preceding two years received in London upon securities of the Indian Government.

"In adition to the powers above described, that of supervising the expenditure and all preceedings of the Companies (with the exception of communication with their law officers), as well as the right of selecting the line, was reserved to Government.

"With regard to the regulation of fares, they are, in the first instance, fixed with the approval of Government, and alterations in them can only be made by the Railway Companies with the concurrence of the same authority. In the event of the profits exceeding 10 per cent., the Government can order a reduction in the rates, but to such an extent as to bring the net receipts below 10 per cent. upon the capital expended.

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* It appears that Mr. Vignoles had written a paper on Indian Railways, which was in the India Office many years before; and that Mr. G T. Clark had, on the invitation of Sir George Arthur, visited Bombay in 1843 in view to the introduction of railways. Mr. Clark's scheme coalesced with that of Mr. Chapman, by whom the Great Indian Peninsula Railway Company was originated. In the same year, Sir Macdonald Stephenson visited Calcutta with a similar object, having endeavoured to draw public attention to the importance of undertaking railways in India since 1841. His mission eventuated in the construction of the present East India Railway from Calcutta to Delhi.

† The gross receipts are.

‡ But this has not been done. The deficiency has been added to the debt on account of guaranteed interest, to be a first charge against surplus profits.

§ The simple interest debt is, under the contract, the first charge against the share of excess profits.

"The Railway Companies are also bound, under the contracts, to convey the Mails and Post Office servants free of charge, to take military officers in first class carriages at second class fares, and soldiers when on duty in second class carriages at the lowest fares; also horses, guns, waggons, and military stores, &c., at the lowest rate for the time being chargeable for the carriage of such animals, goods, &c.,

SUPERVISION EXERCISED BY THE GOVERNMENT IN VIRTUE OF THE GUARANTEE.

The following extracts from Mr. Danvers' Report for 1859 show the nature of the supervision exercised by the Government for the protection of the public interests:—

"The supervision is exercised by the Government both in this country and in India. An Official Director is appointed, who attends each board of the Railway Companies in London, and posesses, under the deed of contract, a power of *veto* on all the proceedings of the directors. * * * At the same time, questions involving expenditure, which have not been considered by the local Governments in India, and all matters of importance, are referred to the Secretary of State for India in Council, with whom also the financial arrangements of the Companies are made.

"The supervision in India is exercised by the Government, principally through officers appointed for the purpose, the following rules having been established with the view of preventing delay and collision:

"1st. All questions of general importance shall be referred to Government for decision.

"2nd. Under the above will be included the general direction of all lines of railway, the position of stations, the general arrangements of the more important stations and works; but after the general sanction of the Government has been given to any project all questions of detail may be disposed of within the limit of the original sanction, by the consulting engineer.

"3rd. All matters of routine, or payments, or acts in accordance with rule, precedent, or special agreement duly sanctioned, or undisputed contingent expenditure, may be dealt with by the consulting engineer without reference to Government.

"4th. All designs, estimates, and indents, whether for works or for establishments, for carrying into effect objects already generally sanctioned by Government, may also be disposed of finally by the consulting engineer.

"5th. The consulting engineer may, without reference to Government, reduce the amounts of indents, or direct designs, or proposed operations to be modified, if he thinks it necessary; but the Agent in such cases, if dissatisfied with the decision of the consulting engineer, may always request that the matter may be referred for final orders of the Government.

"6th. In all cases in which the consulting engineer has any doubt as to the decision to which he should come, the question should be referred to the Government for orders.

"7th. When the sanction of the consulting engineer is given to any proposals of the Agent, in which both these officers concur, excepting in those matters of great importance specially excepted above, the sanction so given shall, so far as the Government is concerned, be considered final.

"8th. The consulting engineer shall submit to the Secretary of the Government a weekly schedule of his proceedings in the usual form, in which shall be explained concisely the nature of all sanctions or directions given under the authority now granted to him."

OBJECTIONS URGED AGAINST THE GUARANTEE SYSTEM IN GENERAL.

"The most obvious objection" to the system of unlimited guarantee in force in India "is the financial one, that there is no limit to the sum that may be invested in railways, and so no limit to the liabilities to which the extension of such works under a system of guarantee might lead."

"The guarantee being without limit, it leads in spite of the best intentions, to the removal of much of the check on proper economy in construction It being usually advantageous to invest at par under a Government guarantee of 5 per cent., it becomes at the same time directly advantageous to invest the largest possible amount in such a stock. Hence, so long as the works are under construction, and the general state of the money market keeps a guaranteed stock of this sort above par, there is a direct inducement to the Railway Board to spend as much money as possible on their works, instead of the exact reverse. Next, the unlimited nature of the guarantee further forces the Government, with a view to keeping down its liabilities, to enter upon a very close scrutiny of all the expenditure, and to attempt to replace from without those internal incentives to economy, which cease to be effective from the cause just explained. Practically, however, the Government control is not very successful in keeping down expenditure, while it leads to the exercise of a constant interference on the part of the Government with the Railway Company's officers, which produces a mischievous effect by weakening their proper sense of responsibility, and obstructing their freedom of action, besides causing much administrative annoyance and complication."*

The late Lord Canning had, in 1858, objected to the present operation of the guarantee system, or in reality to the details of the guarantee conceded rather than to the principle of a guarantee, and had proposed, as a remedy, that a strict limit should be placed upon the capital to be guaranteed for any undertaking, and also upon the time to be allowed for its completion. Sir J. P. Grant, then President of the Council, in the absence of the Governor General from the Presidency, had objected radically to the principle of guarantee, as well as to its present working, as will be seen from the following extracts from his Minute, dated 4th September 1858:

"I entirely agree in this proposition of his Lordship. I also am strongly impressed with a sense of the disadvantages which in practice (and, I would add, in reason), attach to the guarantee system. On this very important subject, I would beg to refer to the following paragraphs of my Minute on the Eastern Bengal Railway, in which my general views of the subject of the duties of Government in respect to railway extension in India are explained.

"I contend that, where Government is convinced that on the highest commercial, social, military, and political considerations, a particular railway is greatly wanted by the country, and will be, if under the general control of Government, a directly remunerative work, it is not proper to leave it to any set of capitalists to say whether the country shall have that want supplied or not. I cannot see how a Government can leave it absolutely to private persons to rule what railways shall be made, and what shall not, consistently with its duty to the people, any more than it could abandon the ordinary highways similarly to their fate; for railways now are exactly what main highways were. England has bitterly to repent that it left its new highways, like private speculations, to capitalists looking after their own interests; nor have the capitalists reason to rejoice.

"My own opinion is, that whatever may be the case as to the working of a railway, the construction of a railway extending beyond a man's own estate, ought in every country to be treated in principle as a national work, to be judged on national considerations. And this is the conclusion of Europe, based upon the dear-bought experience of England. But most of those who may differ from this principle in a country of capitalists will accept it for a country so far separated from the capitalists that the course of post between the two takes three months. Either our Indian railways must be constructed by Government with public money, which is a system that has been determined against, or they must be constructed with the money of English capitalists. Here then, at once, we have a fundamental difference between English and Indian railways. A managing board sitting

* Extracted from a "Memorandum regarding the Proposed Construction of a Railway from Delhi and Agra to Jeypore, to be called the Rajpootana Railway."

in London can very well overlook a railway with a terminus in London; but how can it rationally expect to overlook, unless the local Government will come to its help, a railway whose nearest terminus is in Calcutta. It may have a delegated management in Calcutta, but it can no more effectively manage its delegate, than it can manage the railway itself. Life and health are so precarious in India, that the evils of a distant agency for the transaction of a gigantic business are tenfold greater than usual where that agency is in India. I state it as the conclusion I have drawn from what has passed under my own eyes for some years during which I have given watchful attention to the subject, that the rapid commercial success of the East Indian Railway Company's experimental line would not have been achieved without the general control of Government, exercised through its able and indefatigable consulting engineer."

The Right Honourable S. Laing, in his Minute of the 1st April 1861, expressed himself unfavorably of the guarantee system as applied in India, in these terms :—

"In India there are two circumstances which mainly affect the consideration of the guarantee system :

"1st. That the management is non-resident.

"2nd. That the date of cost and traffic are so uncertain, that the Companies look almost exclusively to the guarantee.

"These two facts go far to neutralise all the advantages to private enterprise.

"Why is private enterprise, as a general rule, better than Government agency ?

"Because all the resources of experience and all the stimulus of self-interest are brought to bear upon affairs untrammelled by official rules and routine.

"Because there is unity of management by men who understand their business, and who stand or fall by its success.

"But in the case of a large Joint-stock Company, this is a good deal weakened, and many Companies have managed no better than Government would have done, even when the affair was under their own eyes.

"Still, as a general rule, it may be admitted that, under ordinary circumstances, and in commercial matters, joint-stock management is as superior to that of Government as individual management is to that of a joint-stock Company.

"But when the Company is 5,000 miles off, and the guarantee absolute, none of these considerations apply.

"What conceivable inducement have the engineers and agents of these Companies to do their work economically ? Even the shareholders have the faintest possible interest in it, for they have their 5 per cent. in any case, which is all they ever looked to. But the interests of all practically concerned in carrying out the work are the other way.

"Without imputing positive dishonesty, for which there is great scope, and of which I am led to believe from many things I hear, there has been a gread deal among the lower class of employes, the directors at home like the patronage of buying millions' worth of rails and rolling stock, and freighting thousands of tons of shipping. The Engineer here, like all Engineers whom I ever heard of, likes doing his work well and expensively as long as anyone will find the money. Why should he risk his professional reputation by building a slight bridge, or a mean station, when Government are good enough to guarantee 5 per cent. on the money requisite to enable him to do something worthy of Brunel or Stephenson ?

"Why should he hurry on work when the result of completing the railway will be to deprive him of a post of importance and emolument.

"I do not doubt that there are many men who do their duty in such cases, though against their interest. Happily, there are always such to be found among Englishmen. But it is a bad system where the whole of the Agents, through whose hands passes the expenditure of some 30 or 40 millions of money, have their interests pulling one way and their duty the other.

"And even if resolved to do his duty, how stands the Company's Engineer as compared with a Government Engineer in India ?

"He knows nothing of the country, and has to purchase all his experience. Except in the case of railways, he knows nothing of the special sort of work to be done.

"He has not the advantage of Government authority, which in many cases goes a great way in India. In short, the balance of advantage seems to be, for the Government Engineer, perfect probity, knowledge of the country, influence of a Government Officer.

"Against him—

"Perhaps a little less special knowledge of some points connected with railways, and a little more rigidity and formality in his mode of doing business.

"But these latter advantages, if important, can readily be secured, as it is just as easy for the Government as for the Company, to employ a Railway Engineer.

"Another great evil of the present system is the divided control. With an absolute guarantee, the Government must in self-defence, exercise a very considerable control over the expenditure of what is virtually its own money.

"But in cases of this sort the only real control is to be able to send every one about his business who *neglects his duty*, or who *fails*. No man should have the spending of a sixpence of our money to whom we cannot say, 'Now, mind, this is what you have undertaken to do or get done, for this money, and if you don't, you may be a very good sort of man, but you don't suit us.'

"This, with liberal treatment of those who do succeed, is the only way of getting work of this miscellaneous sort well done; and here the Company's system stands directly in the way, and introduces, wheel within wheel, divided responsibility and diplomatic correspondence, when there ought to be prompt action."

OTHER TERMS THAT HAVE BEEN SUGGESTED FOR THE ENCOURAGEMENT OF RAILWAYS IN INDIA,

(From Parliamentary Papers.)

In consequence of the objections entertained to the guarantee system in force, it was declared some years ago, under the highest authority, that it should not be extended further than was necessary to complete the main trunk lines.

The question of promoting the extension of railways in some other manner had, therefore, to be considered, and it was decided, after much deliberation, to encourage the construction of approved lines on the standard guage by the grant of land free of cost and of a maximum subsidy of 100*l.* a year per mile open for 20 years from the date of opening. This system involved no interference on the part of Government, except such as is usual in all countries in the interests and for the safety of the public, while it made it incumbent on the projectors, in their own interests, to complete their works economically and rapidly, a limit of time being fixed, failure to open the line within which, carried with it a reduction of the period for which the subsidy was payable.

It seemed, at first, that this system was likely to find favour with the public, but later experience demonstrated that the terms are not sufficiently liberal.

PRINCIPLES ON WHICH RAILWAYS HAVE BEEN ENCOURAGED IN OTHER COUNTRIES.

The following extract from Mr. Laing's Minute, already referred to, sketches the systems pursued in the projection and construction of railways in England, the United States, France, and Belgium :—

"Different systems succeed in different countries. In the United States the system has been to leave the making of Railways, as entirely as the building of Cotton Mills, to unlimited competition and private enterprise. The result on the whole has been a complete success. The United States have got thousands of miles of cheap Railways, when the old countries of Europe have got hundreds of miles of dear ones. They carry life and civilization into the wilderness, by ricketty railways thrown on cobweb timber structures across great rivers, with all sorts of curves and gradients, but they answer the purpose. Every now and then there is a great smash, sometimes among the speculators who build the line, sometimes among the travellers who use it, but in the long run the end is attained. The line is straightened, levelled, ballasted, and made solid by degrees as traffic increases ; and the district is peopled, cultivated, and becomes the starting-point for a fresh advance in the great westward march of the Anglo-Saxon race.

"In the widest possible contrast to the American system stands that which perhaps affords the next most signal instance of complete success.

"Years ago, while other countries were talking of Railways, the little kingdom of Belgium set to work and made a complete network, uniting every considerable town with Brussels the capital, Antwerp the seaport, and with the neighbouring Railways of France and Prussia.

"They have been the main cause of the steady advance of Belgium in wealth and prosperity. Although worked purposely at low rates for the benefit of the nation, they pay on the average 5 per cent., or more than the interest on the loans raised for their construction.

"They did not cost more than lines constructed by private enterprise, and their management by the State, though somewhat slow and unbending, is safe, solid, and has, on the whole, given satisfaction.

"Between these two extremes of the American and Belgian systems, there are all sorts of intermediate systems.

"France has adopted the system of guarantee with great success ; but here there were peculiar seasons to make it succeed.

"France waited for her Railways until other countries had pioneered the way. She thus lost the advantage of early communications, but gained that of experience, and by the time she began to make her railways in earnest, the cost of construction and probable traffic were reduced to such a certainty that the guarantee was purely nominal, and the system was in effect that of private Companies making railways under a general control of the State, which secured their particular districts and prevented competition.

"Under these favourable circumstances, and in a country so rich and populous, and so destitute of water communications as France, Railways have been signally successful.

"They have paid on the average more than 10 per cent., and they have increased the wealth and activity of the country beyond calculation.

"It is owing to the Railways, and the Railways alone, that France has been able to stand a taxation heavier than that of England, to run up a National Debt second only to ours, and still to show no signs of exhaustion whenever there is a fresh speculation to be engaged in, or a fresh war to be waged.

"In England railways simply improved what already existed. They turned the 10 miles an hour of the coach into the 30 miles an hour of the train, and the week's transit by sea or canal into the 24 hours' delivery by rail.

"But in France, and generally throughout Continental Europe, railways have *created* what did not previously exist, viz., a possibility of locomotion for populations tied to the soil, and a possibility of interchange between provinces separated as by a wall of iron.

"Our English Railway System has halted between the two principles of regulated monopoly and unrestricted competition.

"Lord Dalhousie and I attempted in 1846 to introduce a system like that of France, on which the country would have been parcelled out into certain districts, fed naturally by one main Railway and its branches, and this assigned to the Company which would offer most advantage to the public in the shape of low fare and limitation of profits beyond 10 per cent., and of the period of the concession.

"Had this been carried out, I make no doubt that the value of English Railway capital would have been at this day 100 millions more than it is, and that the State might have readily secured the reversion after 99 years (no very long period in the life-time of a nation) of a property which would have paid off half the National Debt. But the tide set too strongly the other way. Every speculator (and at that time who was not a speculator ?), every lawyer, landowner, and engineer was against us, and the only man whose influence might possibly have sustained us, Sir Robert Peel, had never applied his mind to the subject of Railways, and what vague impressions he had were those of the *Member for Tamworth* rather than of the *Statesman*, and all for unlimited competition and direct lines, regardless of cost.

"Accordingly our reports were completely upset, and English Railways have been made neither on the French system of a regulated monopoly, nor on the Amerian system of unrestricted competition, but by a sort of scramble between the two, conducted very much after the manner of an old-fashioned country election, with armies of rival Attorneys, Agents, and Engineers, and decided by the chances of two Select Committees, one of the Commons, and one of the Lords, whose verdicts were regulated by no precedent or principle, and were proverbially as uncertain as the turning up of a die.

"During a considerable experience in practising before those Committees, I never could arrive at any rule to guide me in guessing at what might be the probable decision of a Committee on any given case except this—that an Irish Member was certain to vote for a competing line.

"The result has been that, on the whole, in England the system of competition has triumphed, though with just enough of opposition to make each case worth fighting at a cost which, in the aggregate, has been enormous.

"It is only fair, however, in looking back on the past, to observe that although the failure of Lord Dalhousie's policy in 1846 has undoubtedly caused an immense waste of National Capital, much individual suffering, and much discouragement to the disposition to invest capital, in useful enterprizes, yet, on the other hand, the multiplication of Railways regardless of expense under the stimulus of periodical spec
sufficed, may ruin the shareholders in b
does good ; I am by no means certain
evils by which it has been purchased."

It was not till 1845 that the projection of railway communications received any great impetus in any part of the world. In France this did not occur till 1852, and it is since the Crimean War that Russia has turned her attention to the matter in earnest

COURSE OF AN INDIAN RAILWAY, UNDER CONSTRUCTION.

Generally, it would seem that in considering any development of the existing system of railways, we may proceed on the following data :—

The first section of railway up to 100 miles in length can generally be opened in India within four years from date of turning the first sod.

Other sections can thereafter be opened at the rate of 100 miles per annum.

Sections may be opened when about 85 per cent. of their total cost has been laid out, and they will ordinarily be completed within six years from date of commencement at the following annual rates of outlay :—

Preliminary expenses	2 per cent. of the total cost.
1st year	20 „ „ „ „
2nd „	33 „ „ „ „
3rd „	20 „ „ „ „
4th „	13 „ „ „ „
5th „	7 „ „ „ „
6th „	5 „ „ „ „

The interest on the total capital expended on any section of line may be expected to amount to 12 per cent thereof before it is opened, and the net demands on the State for interest under a guarantee during the first few years may be expected to be somewhat as follows, it being understood that capital paid up in excess of present wants is not permitted to remain idle :

In the 1st year ..	1¼	per cent. of the cost,	excluding interest	during construction.
„ 2nd „ ..	2½	ditto	ditto	ditto.
3rd „ ..	3¾	ditto	ditto	ditto.
4th „ ..	4¾	ditto	ditto	ditto.
5th „ ..	4	per cent. of the cost,	including interest	during construction.
6th „ ..	3·5	ditto	ditto	ditto.
7th „ ..	3·3	ditto	ditto	ditto.
8th „ ..	2·9	ditto	ditto	ditto.
9th „ ..	2·4	ditto	ditto	ditto.

In the fifth year the section would be opened, and it may be expected, from the results obtained on the present lines, that the net receipts on its cost would amount to

0·8	per cent.	in the first year.
1·5	„	„ second „
1·7	„	„ third „
2·1	„	„ fourth „
2·6	„	„ fifth „

Omitting the lines which have been exceptionally costly, the average cost of the present system with a single line of rails has been 13,000*l.* per mile. Reducing this by 15 per cent. the cost of future ordinary lines might be reckoned at 11,000*l.* per mile, and the Government or an uncontrolled Company acting with the energy of private enterprise, might construct them for that sum. It would be safer to assume that they may be constructed for 12,000*l.* per mile, on an average, under a modified guarantee, the formation being for a double line as at present. On this assumption the cost, excluding any contribution by the State in the way of exchange, would be 12,600*l.* ; including interest during construction, 14,100*l* ; including cost of land, 14,600*l.*

The cost of laying down a second line of rails may be taken at 5,000*l* a mile.

THE INDIAN RAILWAY GUARANTEE.

The conditions under which the Government is liable for the repayment of the capital sunk in these works, either at the option of the shareholders, or of that of the State, are the same in all. The most important of these, stated briefly, are as follows :—

1. The Company can, at any time, by giving six months' notice, abandon the line and compel the Government to restore their capital intact.
2. The State can at any time within six months after the expiration of the first twenty-five years, or fifty years, assume the proprietorship of the line, by paying the Company a sum equivalent to the mean market value of their shares in London for the previous three years.
3. The State has the option in both the above cases of paying the Company by an issue of annuity bonds, instead of a gross sum of money down.
4. All the works revert to Government at the expiry of the 99 years' lease granted to each Company, without any payment whatever ; except that the rolling stock is to be taken over at a fair valuation price.

This information, is taken from the parliamentary returns, and corrects some prevailing misconceptions as to the relations subsisting between the State and the shareholder.

MR. LAING ON THE WISDOM OF AN IMPERIAL GUARANTEE FOR THE RAILWAY CAPITAL.

"There is a special capital which stands on a different footing from the national debt of India, viz,—the guaranteed railway capital. 1. The amount is known to be limited. 2. It is held exclusively in England. 3. It is applied exclusively to an object in which English commerce has a vital interest. 4. The liabillty is slight, for it only extends to guaranteeing a certain return in case the traffic should be insufficient to pay it.

"It is, I believe, probable, that these railways, when finished, will earn on the average 4 per cent. or upwards on their cost and am morally certain that they will not earn less than 2½ or 3 per cent. If, therefore, the capital were raised under a guarantee of 4 per cent., the liability under that guarantee could not well exceed 1,000,000*l.* a year, and in all probability, would be much less.

"Now the risk to England of endorsing the guarantee of the Indian Government to this extent would be practically nothing. The finances of India are on the soundest possible footing. With a gross revenue of 43,000,000*l.*, which is rapidly increasing, the interest of debt is not one-seventh of the income, while that of England is two-fifths. England has no reserve, and bareley meets the necessary expenses by the taxes of the year. India invests annually out of surplus revenue, at least 2,000,000*l.* in reproductive public works. England has no cash balance beyond what is required to carry on current business; India has a reserve of at least 8,000,000*l.* in hard cash in her treasury. The risks, therefore, to England of endorsing a guarantee by the Indian Government to make up in case of deficient traffic a sum of, at the outside, not above 1,000,000*l.* a year to the subscribers of railway capital, who, be it recollected, are all English, is practically no risk at all."

A FORMAL GUARANTEE ACCOUNT WANTED.

(Economist 1870*)*

There ought to be a formal guarantee account—that is an account showing from year to year the gross receipts from railways, the working expenses, the amount of the guarantees, and the final net charge upon the Budget. What is still more important, a distinction should be drawn in such an account between guarantees on capital employed in the construction of works actually opened for traffic, and guarantees on capital which has either just been received or has been spent on unfinished works. It is constantly assumed that the railways must be profitable financially, and that if they do not pay as soon as opened they steadily approach the paying point. But there is no account which shows this, and for want of it, so far as the public know, the Indian Government has been indulging in railway expenditure very much in the dark. By mixing up all the guarantees it is impossible to see what is being done, or to compare properly the annual charges in the net charges for railways with the charges in the gross amount of the guarantees. Some years will be more favourable than others, but unless the accounts are separated the fact may either indicate an improvement of lines previously opened, or the addition of new traffic by the opening of the lines for which guarantees have long been paid, and it is important to see what is really the case—whether and how far the opened lines progress. If each railway is shown separately so much the better. Such an account was lately published by the Russian Government and was very instructive; and it would only be doing for the guaranteed railways what the Indian Government is going to do for its own State lines. The following form of account will perhaps show best what we mean :—

Year.	Length of Lines Opened.	Capital Expended on Lines Opened.	Amount of Guarantee on Capital Expenditure.	Gross Receipts.	Working Expenses.	Payment under Guarantee.

A return in this form would show from year to year what improvement, if any, was taking place, and some member of the House would do good service by moving for it if the Indian Government should not volunteer the information.

THE RUSSIAN RAILWAY GUARANTEES.

(Economist 1870.*)*

Among the reports just issued by the Foreign Office from Her Majesty's Secretaries of Legation is one on Russia Railways, by Mr. Rumbold. As a complete account of the Russian system and its working, the report is perhaps the best which has yet appeared in English. The account is not unfavourable, considering what great national benefits result from railways, and how necessary they are in a country like Russia to make a beginning of material prosperity. The contrast with India is interesting, from the likeness of the result and the similarity of the two Empires in their railway position. In Russia the whole amount of the guarantees is:

	£
Amount guaranteed	3,564,000
Gross receipts	2,129,000
Amount paid under guarantee	1,435,000

And in India it is, according to the latest complete year—

	£
Amount guaranteed	3,704,000
Gross receipts	2,207,000
Amount paid under guarantee	1,497,000

The comparison would not hold on many points, but in the matter of railways, from the point of view of the Finance Minister, Russia and India are not very unlike.

COMPARATIVE Abstract of Traffic on the Guaranteed and State Railways throughout India, for the years 1868 and 1869.

	East Indian. Main Line.		East Indian. Jubbulpore Line.		Eastern Bengal.		Calcutta and South-Eastern (State) Railway.		Oudh and Rohilkhund.		Punjab.		Delhi.	
	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£
First Quarter.														
Total earnings	709,439	540,974	30,924	20,244	43,006	38,345	2,238	2,412	5,750	5,795	29,540	23,327	30,726	2,928
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	174	53
Average receipt per week ...	54,572	41,613	2,378	1,557	3,308	2,950	172	185	445	446	2,272	1,794	2,363	224
Average receipt per week per mile open	48·2	36·8	10·7	6·9	29·2	26·1	6·1	6·6	10·6	10·6	9·2	7 3	13·5	4·2
Second Quarter.														
Total earnings	633,617	542,528	23,757	21,373	38,905	39,373	2,410	1,971	5,139	6,151	27,967	28,820	28,776	3,910
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	174	53
Average receipt per week ...	48,739	41,732	1,827	1,644	2,992	3,029	185	151	395	473	2,151	2,217	2,213	301
Average receipt per week per mile open	43·1	36·9	8·2	7·3	26·5	26·8	6·6	5·3	9·4	11·3	8·7	9·3	12·7	5·7
Third Quarter.														
Total earnings	491,870	473,978	16,700	15,349	41,689	40,117	1,460	1 583	4,672	5,919	19,966	20,251	23,712	3,622
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	187	53
Average receipt per week ...	37,836	36,460	1,284	1,180	3,206	3,086	112	121	359	455	1,536	1,555	1,824	278
Average receipt per week per mile open...	33 4	32·2	5·7	5·3	28·3	27·3	4·0	4·3	8·5	10·8	6·2	6·3	9·7	5·2
Fourth Quarter.														
Total earnings	628,027	591,677	24,558	28,945	41,245	44,438	1,440	1,951	5,684	6,886	20,130	30,435	46,195	5,642
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	271	53
Average receipt per week ..	48,310	45,513	1,889	2,226	3,173	3,418	111	150	437	529	1,548	2,343	3,553	434
Average receipt per week per mile open	42·7	40·2	8·5	9·9	28 0	30 2	4·0	5·3	10·4	12·5	6·3	9·5	13·1	8 1
Total for the year.														
Total earnings	2,462,953	2,149,157	95,939	85,910	164,845	162,273	7,548	7,917	21,275	24,751	97,603	102,833	129,409	16,097
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	201	53
Average receipt per week ...	47,364	41,329	1,845	1,652	3,170	3,120	145	152	409	476	1,877	1,977	2,488	309
Average receipt per week per mile open...	41·8	36·5	8 3	7·4	28·0	27·5	5·2	5·4	9·7	11·3	7·6	8·0	12·3	5·8

	Madras South-West Line.		Madras North-West Line.		Great Southern-of-India.		Conjeveram Tramway		Great Indian Peninsula.		Bombay, Baroda, and Central India.		Sindh.		Total of all Lines with the exception of Conjeveram Tramway.	
	1869.	1868.	1869.	1868.	1869.	1868.	1869	1868	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
First Quarter.																
Total earnings	94,823	91,150	23,086	22,499	16,346	16,321	1024	...	499,958	427,676	130,409	107,189	16,804	26,007	1,633,079	1,324,862
Mean mileage open ...	494	492	185	153	168	168	19	.	874	862	307	306	107	109	4,090	3,926
Average receipt per week	7,294	7,012	1,776	1,731	1,257	1,255	79	...	38,458	32,898	10,031	8,245	1,292	2,000	125,620	101,912
Average receipt per week per mile open	14·8	14·2	9·6	11·3	7·5	7·5	4·2	..	44·0	38·2	32·6	26 9	12·0	18 3	30·7	25·9
Second Quarter.																
Total earnings	104,692	111,139	35,195	50,332	17,189	17,950	1659	...	383,013	435,965	122,541	140 955	25,129	32,165	1,448 330	1,482,632
Mean mileage open ..	492	492	185	153	168	168	19	...	874	873	307	306	106	109	4,089	3,937
Average receipt per week	8,053	8,549	2,707	3,871	1,322	1,382	128	...	29,462	33,536	9,426	10,843	1,933	2,474	111,410	110,202
Average receipt per week per mile open	16·3	17·3	14·6	25·3	7·8	8·2	6·7	...	33·7	38·4	30·7	35·4	18·2	22 7	27·2	28·0
Third Quarter.																
Total earnings	101,973	91,585	45,503	31,447	17,871	17,354	979	. .	202,077	230,337	60,621	46,944	12,519	21,034	1,040,633	999,520
Mean mileage open ...	492	492	204	163	168	168	19	...	873	874	308	306	106	109	4,121	3,948
Average receipt per week	7,844	7,045	3,500	24,19	1,374	1,335	75	...	15,544	17,718	4,663	3,611	963	1,618	80,049	76,886
Average receipt per week per mile open	15·9	14·3	17·1	14·7	8·1	7·9	3·9	...	17·8	20·3	15·1	11·8	9·0	14·8	19·4	19·4
Fourth Quarter.																
Total earnings	97,345	108,437	36,402	40,509	11,324	21,754	778	...	340,867	376,618	114,280	114,391	16,377	17,260	1,390,874	1,388,948
Mean mileage open ...	492	492	215	185	168	168	19	...	870	874	308	306	106	109	4,216	3,970
Average receipt per week.	7,488	8,341	2,800	3,116	1,409	1,673	60	...	26,221	28,970	8,791	8,799	1,260	1,327	107,050	106,841
Average receipt per week per mile open	15·2	16·9	13·0	16·8	8·4	9·9	3·2	...	30·0	33·1	28 5	28·7	11·9	12·1	25·4	26·9
Total for the year.																
Total earnings	398,833	402,311	140,186	144,787	62,730	73,379	4440	...	1425915	1470596	427,851	409,479	70,829	96,467	5,512,916	5,145,957
Mean mileage open ...	492	492	197	168	168	168	19	...	873	871	308	306	106	109	4,128	3,945
Average receipt per week	7,670	7,737	2,696	2,784	1,341	1,411	85	...	27,421	28,280	8,228	7,874	1,362	1,855	106,017	98,960
Average receipt per week per mile open	15·6	15·7	13·7	17·0	8·0	8·4	4·5	...	31·4	32·4	26·7	25·7	12·8	17·0	25·7	25·1

COMPARATIVE ABSTRACT OF TRAFFIC ON THE GUARANTEED RAILWAYS.

Comparative Abstract of Traffic on the Guaranteed Railways throughout India for the first quarter of 1869 *and* 1868.

	East Indian.				Eastern Bengal.		Calcutta and South-Eastern.		Oudh and Rohilkund.		Punjab.		Delhi.		Madras.				Great Southren of India.		G. I. P. Railway.		B. B. & C. I. Railway.		Sindh.		Total, all Lines.	
	Main Line.		Jubbulpore Line.												South-West Line.		North-West Line.											
	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.
First Quarter.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Total earnings	709,439	540,974	30,924	20,244	43,006	38,345	2,238	2,412	5,780	5,795	29,540	23,327	30,726	2,923	94,523	91,150	23,086	22 499	16,346	16,321	499,950	427,676	130,409	107,189	16,804	26,007	1,633,071	1,324,862
Mean mileage open.	1,131	1,131	223	223	113¼	113¼	28	28	42	42	246	246	174	53	492	492	185	153	168	168	874¼	562	307¼	306	107	109	4,090¾	3,926¼
Average receipt per week..	54,572	41,613	2,378	1,557	3,308	2.950	172	185	445	446	2,272	1.794	2,363	224	7,294	7,012	1,776	1,731	1,257	1,255	35,458	32,898	10,031	8,245	1,292	2,000	125,620	101,912
Average receipt per week per mile open	48·2	36·8	10·7	6·9	29·2	26·0	6·1	6·6	10·6	10·6	9·2	7·3	13·5	4·2	14·8	14·2	9·6	11·3	7·5	7·5	44·0	38·2	32·6	26·9	12·0	18·3	30·7	25·9

COMPARATIVE ABSTRACT OF TRAFFIC ON INDIAN RAILWAYS FOR THE QUARTER ENDING 31ST MARCH 1870.

	East Indian.				Eastern Bengal.		Calcutta and South-Eastern (State) Railway.		Oudh and Rohilkhund		Punjab.		Delhi.		Madras.				Great Southern of India.		Conjeveram Tramway.		Great Indian Peninsula.		Bombay Baroda and Central India.		Sindh.		Total of all Lines.	
	Main Line.		Jubbulpore Line.												South-West Line.		North-West Line.													
	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Total earnings...	718,404	709,439	36,986	30,924	41,869	43,006	2,023	2,238	6,572	5,780	27,523	29,540	58,748	30,726	97,250	94,823	30,491	23,086	17,330	16,346	767	1,024	510,207	499,958	142,436	130,409	19,779	16,804	1,710,368	1,634,103
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	246	246	284	174	492	492	251	185	168	168	19	19	1,063	874	312	307	106	107	4,442	4,109
Average receipt per week	55,572	55,572	2,845	2,379	3,221	3,308	156	172	505	445	2,117	2,272	4,519	2,363	7,481	7,294	2,345	1,776	1,333	1,257	59	79	39,247	38,458	10,957	10,031	1,521	1,292	131,568	125,700
Average receipt per week per mile open	48·8	48·2	12·8	10·7	28·5	29·2	5·6	6·1	12·0	10·6	8·6	9·2	15·9	13·5	15·2	14·8	10·9	9·6	7·9	7·5	3·1	4·2	36·9	44·0	35·1	32·6	14·3	12·0	29·6	30·6

LENGTH of OPEN LINE, Gross Traffic Receipts, Working Expenses, and Net Traffic Receipts of all Railways, also Net Revenue of each Railway in India up to 1860-61 *from the commencement, and for each year ending* 30th *June from* 1861-62 *to* 1868-69.

	YEARS ENDING 30TH JUNE.								
	Up to 1860-61.	1861-62.	1862-63.	1863-64	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.
	Miles.	Miles.	Miles	Miles	Miles.	Miles.	Miles.	Miles.	Miles.
ALL RAILWAYS IN INDIA—									
Double Line	100		..		124		143½		
No. of Miles open ...	1,028	1,609¼	2,527½	2,691½	3,190¼	3,340¾	3,646¾	3,958¾	4,081
	£	£	£	£	£	£	£	£	£
Gross Traffic Receipts ..	2,319,133	1,057,988	1,714,818	2,248,622	3,198,552	4,662,043	4,883,974	4,831,395	
Expenses (Working and Maintenance) .	1,192,153	624,989	1,008,960	1,375,086	1,765,452	2,323,865	2,550,213	2,731,273	
NET TRAFFIC RECEIPTS	1,126,980	432,999	705,888	873,536	1,433,100	2,338,178	2,333,761	2,100,122	
	NET REVENUE OF EACH RAILWAY IN INDIA								
BENGAL PRESIDENCY—									
East Indian	700,404	280,996	380,999	500,727	772,099	1,080,885	1,172,693	1,002,047	
Eastern Bengal .. .	...	.	15,863	41,025	58,746	57,786	71,999	76,064	
Calcutta and South-Eastern		— 194	— 574	1,821	— 3,045	— 1,347	—3,539	...	
Delhi .. .	..		.		..			— 6,610	
Punjab			4,372	4,763	6,009	35,395	20,532	24,645	
Oude and Rohilkhund ..	...	..					1,500	7,937	
BOMBAY PRESIDENCY—									
Great Indian Peninsula..	325,289	86,568	143,048	154,817	314,626	683,438	633,045	508,907	
Bombay, Baroda and Central India ...	7,262	20,778	62,331	..	75,187	175,776	124,078	132,811	
Sind		5,442	18,994	6,657	3,507	14,738	22,156	23,898	
Indus Steam Flotilla ...	...	.	15,035	34,653	16,549	22,283	.	..	
MADRAS PRESIDENCY—									
Great Southern of India	..,	7,229	14,196	13,717	17,785	19,852	30,240	32,650	
Madras	94,025	32,180	61,624	118,998	171,637	249,372	261,057	297,773	
TOTAL NET REVENUE..	1,126,980	432,999	705,888	873,536	1,433,100	2,338,178	2,333,761	2,100,122	

—*Finance and Revenue Accounts*, 1870.

GROSS TRAFFIC RECEIPTS and Working Expenses of each Railway in India up to 1860-61 *and for each year ending* 30*th June from* 1861-62 *to* 1868-69.

—*Finance and Revenue Accounts* 1870.

GROSS TRAFFIC RECEIPTS.

NAMES OF RAILWAY COMPANIES.	Years ending 30th June.								
	Up to 1860-61.	1861-62.	1862-63.	1863-64.	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.
	£	£	£	£	£	£	£	£	£
East India Railway	1,297,634	553,205	800,552	1,119,482	1,442,104	1,920,308	2,157,134	2,065,902	
Eastern Bengal Railway	..	..	33,748	88,548	112,840	124,892	140,357	148,684	
Calcutta and South-Eastern Railway	.	1,545	2,844	6,559	8,367	11,211	8,862	..	
Punjab Railway	..	..	12,715	17,166	25,250	90,269	91,846	96,600	
Delhi Railway	..	..		..	..	..	..	8,778	
Oudé and Rohilkhund*	..	..	..	..	..	..	2,660	29,288	
Indian Tramway Company	..	...	..	..	..	..	...	.	
Madras Railway — S.-West or Main Line.	259,203	123,775	185,067	256,854	322,347	438,787	465,586	398,192	
Madras Railway — N.-West or Bellary Line	...	..	9,053	13,782	27,109			116,816	
Great Southern of India Railway	..	13,199	26,447	27,340	35,236	37,880	55,352	63,445	
Great Indian Peninsula Railway	743,255	279,258	387,627	532,877	870,296	1,430,726	1,417,160	1,379,699	
Bombay, Baroda and Central India Railway	19,041	46,933	102,928	..†	198,552	429,996	433,725	412,439	
Sind Railway	..	40,073	89,913	98,811	82,493	97,334	111,292	111,552	
Indus Steam Flotilla	..	..	63,954	87,203	73,958	80,640	Not	shown.	
Indus Valley Survey	...	..	...	..	...	..	..	.	
TOTAL	2,319,133	1,057,988	1,714,848	2,248,622	3,198,552	4,662,043	4,883,974	4,831,395	

EXPENSES FOR WORKING AND MAINTENANCE.

East Indian Railway	597,230	272,20[illegible]	419,553	618,755	670,00[illegible]	839,423	984,44	1,063,85[illegible]
Eastern Bengal Railway			17,885	47,523	54,094	67,106	68,35[illegible]	72,62[illegible]
Calcutta and South-Eastern Railway		1,73[illegible]	3,418	8,380	11,412	12,55[illegible]	12,40	..
Punjab Railway			8,343	12,403	19,24	54,874	.1,31	71,95[illegible]
Delhi Railway								15,388
Oude and Rohilkhund Railway							1,160	21,351
Indian Tramway Company								
Madras Railway — S.-West or Main Line.	165,178	91,595	136,574	144,787	165,959	189,415	204,529	176,736
Madras Railway — N.-West or Bellary Line.		..	5,922	6,851	11,860			40,499
Great Southern of India Railway		5,970	12,251	13,623	*17,451	18,028	25,112	30,795
Great Indian Peninsula Railway	417,966	192,690	244,579	378,060	555,670	747,288	784,115	870,792
Bombay, Baroda and Central India	11,779	26,155	40,597	Not received	123,365	254,220	309,647	279,628
Sind Railway		34,631	70,919	92,154	78,986	82,596	89,136	87,654
Indus Steam Flotilla			48,919	52,550	57,409	58,357	Not	shown.
Indus Valley Survey								
TOTAL	1,192,153	624,989	,008,960	,375,086	,765,452	2,323,865	,550,213	,731,27[illegible]

* For nine weeks only, *viz.*, from 9th April.

† Receipts for 1864 omitted, the expenses for working, &c., not having been shown.

DETAILS of the Gross Receipts and Payments at Government Treasuries in India on the Revenue Account of each Railway Company for the year 1867-68-69.

	REVENUE ACCOUNT IN 1867-68.								REVENUE ACCOUNT IN 1868-69.							
	GROSS RECEIPTS.				GROSS PAYMENTS.				GROSS RECEIPTS.				GROSS PAYMENTS.			
	Traffic earnings paid into Government Treasury.	Transfers from capital account.	Interest allowed on Revenue balance.	Total	Withdrawals from Government Treasuries on account of working expenses.	Transfers to Capital.	Total.	Total Net Revenue in 1867-68.	Traffic earnings paid into Government Treasury.	Transfers from capital account.	Interest allowed on Revenue balance.	Total	Withdrawals from Government Treasuries on account of working expenses.	Transfers to Capital.	Total	Total Net Revenue in 1868-69.
BENGAL PRESIDENCY.—	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
E. I. Railway. { Main Line	2,431,782	20,944	.	2,452,726	1,315,562	..	1,315,562	1,137,164	2,456,770	..	17,192	2,473,962	1,356,635	41,708	1,398,343	1,075,619
E. I. Railway. { Jubbulpore Line ..	36,708	...		36,708	...	...		36,708	114,475	..	445	114,920	79,433	..	79,433	35,487
Eastern Bengal Railway	208.972	10,000	..	212,972	97,500	...	97,500	115,472	208,733	..	..	208,733	100,253	..	100,253	108,480
Calcutta & South-Eastern Railway..	9,302	8,381	...	17,683	24,593	..	24,593	—6,910	1,224	710	..	1,934	3,010	..	3,000	—1,066
Punjab Railway..	101,717	...		101,717	68,000	25,589	93,589	8,128	126,216	..	..	126,216	120,814	..	120,804	5,402
Delhi Railway	6,083			6,083	9,500	.	9,500	—3,417	49,991	..	..	49,991	39,677	..	39,677	10,314
Oude and Rohilkhund	8,392	.	...	8,392	4,800	...	4,800	3,592	42,268		..	42,268	33,600	..	33,600	8,668
Indian Tramway Company ..	...	...	..	..	..	.	...	...	3,200	..	..	3,200	1,322	..	1,322	1,878
Total ..	2,796,956	39,325	.	2,836,281	1,519,955	25,589	1,545,544	1,290,737	3,002,877	710	17,637	3,021,224	1,734,734	41,708	1,776,442	1,244,782
MADRAS PRESIDENCY—																
Madras Ry. { South-West or Main Line	422,673	599	4,708	427,980	106,500	75,743	184,243	243,737	463,521	1,537	766	465,824	168,500	37,670	206,170	259,654
Madras Ry. { North-West or Bellary Line	98,666		1,156	99,822	24,700	34,344	59,044	40,778	160,308	125	368	160,801	45,000	8,304	53,304	107,497
Great Southern of India Railway	66,442	23	819	67,284	16,581	17,980	34,561	32,723	80,441	18	172	80,631	31,187	13,412	44,599	36,032
Total ..	587,781	622	6,683	595,086	149,781	128,067	277,848	317,238	704,270	1,680	1,306	707,256	244,687	59,386	304,073	403,183
BOMBAY PRESIDENCY—																
Great Indian Peninsula Railway ...	1,560,103	19,357	13,328	1,592,788	738,320	380,587	1,118,907	473,881	1,688,527	205,553	3,268	1,897,348	856,500	406,072	1,262,572	634,776
Bombay, Baroda and Central India Railway	504,461	49,654	2,515	556,630	230,754	218,654	449,408	107,222	481,645	..	1,366	483,011	314,050	51,894	365,944	117,067
Sind Railway	168,570	35,963	...	204,533	150,554	28,413	178,967	25,566	196,875	130,581	..	327,456	151,368	297,951	449,319	—121,863
Indus Flotilla	120,457	2,892	601	123,950	92,580	8,272	100,852	23,098	185,294	65,307	..	250,601	96.440	120,150	216,590	34,011
Indus Valley Survey	.	...			...		...	...	..	..	..	..	..	..	..	..
Total ..	2,353,591	107,866	16,444	2,477,901	1,212,208	635,926	1,848,134	629,767	2,552,341	401,441	4,634	2,958,416	1,418,358	876,067	2,294,425	663,991
Grand Total ..	5,738,328	147,813	23,127	5,909,268	2,881,944	789,582	3,671,526	2,237,742	6,259,488	403,831	22,577	6,686,896	3,397,779	977,161	4,374,940	2,311,956

—*Finance and Revenue Accounts* 1870.

STATEMENT of TRAFFIC showing the number of passengers of each class and amount from each source of traffic collected for all Railways for each of the years 1866, 1867, and 1868, and for each Railway for the year 1868; also showing mileage results for 1868.

	Total for the Year 1866	Total for the Year 1867	1868. East Indian Railway. Main Line	East Indian Railway. Jubbulpore Line	Eastern Bengal Railway	Calcutta South Eastern Railway	Punjab Railway	Delhi Railway	Oude and Rohilkund Railway	Madras Railway. Main Line	Madras Railway. Bellary Line	Great Southern of India Railway	Indian Tramway	G I P Railway	B B & C I Railway	Sind Railway.	Total.
Total miles open	3,522¾	3,907¾	1,354		113¼	28	246	53	42	492	185	168	18¾	874	307¼	109	3,990¼
Passengers—Number of	Nos.	Nos.	Nos		Nos.	Nos.	Nos.	Nos	Nos	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.	Nos.
First Class . ..	149,435	148,143	34,994		38,112½	2,128	6,487½	5,433½	2,893	10,034	997	1,632	268	33,497	10,196	1,890	148,562½
Second ,, ..	534,734	919,154	88,875		35,157½	5,556	48,512½	16,680	2,061	60,419	5,782	7,504	6,906	202,211	64,322	4,688	555,583
Intermediate ,, ...	611,462	381,537	412,685		.	.	.	.	411½	..	.	..	..	..	..	..	412,726½
Third ,, ...	11,640,428	11,425,816	4,641,354		300,811½	172,532	616,590	278,028	326,058½	1,600,834	447.987	820,480	86,522	2,068,223	1,521,497	140,861	13,021,778
Fourth ,, . .	170,322	2,017,577	.....		923,461½	131,999	..	..	..	..	..	..	..	1,189,380	..	.	2,244,840½
Total	13,106,311	14,892,227	5,177,808		1,297,543	312,215	671,590	300,150½	338,054	1,671,287	454,766	829,616	93,696	3,493,311	1,596,015	147,439	16,383,490½
Receipts from	£	£	£		£	£	£	£	£	£	£	£	£	£		£	£
Passengers .. .	1,335,659	1,491,453	673,345		74,487	5,978	41 201	12,340	15,590	150,405	30,949	46,273	3,852	363,960	183,546	19,480	1,621,406
Luggage, Parcels, &c.	177,174	195,687	119.614		5,887	512	3,305	1,010	1,507	24,905	4,366	2,647	73	49,973	21,066	1,551	236,475
Merchandize and Live stock ..	2,867,623	3,120,632	1,382,010		80,284	2,045	64.617	3,817	6.918	247,324	89,587	27,810	468	1,022,646	194,626	81,816	3,204,041
Railway Materials . ..	235,388	306,722	66.814		9,689	20	540	78	.	17,423	33.094	2,427	...	139,870	20,232	1,653	291,840
Minerals	222,890	213,209	165,228		3,721	6	.	230	..	.	..	..	..	19,679†	18,409†	..	207,273
Miscellaneous	67,614	112,334	31,238		7,490	228	2,521	88	2,190	18,524	1,033	894	179	18,455	19,991	1,730	104,561
Total Receipts	4,906,348	5,440,047	2,438,319		181,558	8,788	112,184	17,563	26.265	458,581	159,029	80,051	4,572	1,614,586	457,870	106,230	5,666,596
Working Expenses .. £	2.580,090	2,932.778	1,094,382		82.139	15,213	85,516	25,093	16 952	201,480	54,802	36,655	4.509	997,921	337,267‡	115,207	3,067,136
Net Profits .. .. £	2.326,258	2.507,269	1.343,937		99,419	—6,425	26.668	—7,530	9,313	257,101	104,227	43,396	63	616,665	120,603	—8,977	2,598,460
European and East Indian Staff No.	3,413	2,409	1,732		184	20	293		41	615		100	9	..	Return not received.		3,002
Native Staff .. ... ,,	42,403	28,716	20.390		3,999	295	1,023		432	7,405		1,535	110	..	..	..	35,189
Capital expended up to 31st Dec. £	61,712,020	72,946.748	2,899.764		2.540,612	614,359	2.608,572	3,819,168	152,742	9,031,413		1,400,230	100,000	19,132,254	7,337,587	2,005,787	51,943,288
Mileage Results—																	
Train Mileage No. ..	10,644,494	11,924,094	5,165.617	250,101	351,410*	41,038	345.116	81,322	65,220	1,416,471		308,893	28,709	2,935,154	793,713	172,702	11,955,472
Engine ,, ...	13.362,048	14,253.271	6,557,523	305,238	383,828	.	428,883	110,947	not given	1,739,023		309,525	30,218	3,252,651	884,742	...	14,022,578
	Rs. a. p.	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs a. p.*	*Rs. a. p.*		*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*	*Rs. a. p.*
Gross Earnings per Train Mile .	3 15 7	3 11 3	4 8 7	3 11 11	5 2 7	2 2 3	3 4 0	2 2 7	4 0 5	4 5 9		2 9 5	1 9 5	5 8 10	5 12 3	6 2 5	3 14 9
,, Expenses	2 8 0	2 11 7	1 15 8	2 13 9	2 5 4	3 11 3	0 7 8	3 1 4	2 9 7	1 13 0		1 3 0	1 9 1	3 6 3	4 3 11	6 10 8	2 14 8
,, Profits	1 8 2	1 2 4	2 8 11	0 14 2	2 13 3	..	0 12 4	.	1 6 10	2 8 9		1 6 5	0 0 4	2 1 7	1 8 4	..	1 3 9
,, Loss	0 0 7	3 2 8	..		..	1 9 0	..	0 14 9		..		..	.	.	..	0 8 3	0 3 8
Percentage of Expenses on earnings..	65·88	84·30	47·6	76·3	45·2	173·1	76·2	142 8	64·5	41·5		45·7	98·6	61·8	73·	108·4	80·77
,, of Profits on total Capital expended	2·33	1·68	4·6	0·6	3·6	Loss	0·9	Loss	2·0	3·6		2 8	..	3·0	1·5	Loss	1·74
,, of Profits of cost on open line	2·84	2·07	5 4	0·6	4·6	..	1·0	.	2 0	4·1		3·23	.	4 66	1·8	do	1·93

* From Directors' Report.—*Finance Revenue Accounts* 1870.

† Earth Trains.

‡ Including £40,000 reserved under orders of Bombay Government to meet charges for renewals of fencing.

RECEIPTS and Payments at Government Treasuries in India on the Revenue Account of each of the Railway and other Guaranteed Companies for each of the years 1867-68 and 1868-69, also the Amount of Net Revenue of each Company from the commencement of the Railway System to 31st March 1869. —*Finance and Revenue Accounts* 1870.

NAMES OF RAILWAY COMPANIES.	REVENUE ACCOUNTS. RESULT IN 1867-68. Gross Receipts	Gross Payments	Net Revenue.	Total Net Revenue from commencement of the Railway System.
	£	£	£	£
East Indian Railway .. Main Line	2,452,726	1,315,562	1,137,164	6,455,368
East Indian Railway .. Jubbulpore Line	36,708	.....	36,738	36,708
Eastern Bengal Railway	212,972	97,500	115,472	332,712
Calcutta and South-Eastern Railway..	17,683	24,593	—6,910	—13,321
Punjab Railway	101,717	93,589	8,128	40,817
Delhi Railway	6,083	9,500	—3,417	—3,417
Oude and Rohilkhund Railway	8,392	4,800	3,592	3,592
Indian Tramway Company	.....	.	.....	.....
Madras Railway .. South-West or Main Line	427,980	184,243	243,737	1,141,310
Madras Railway .. North-West or Bellary Line	99,822	59,044	40,778	158,467
Great Southern of India Railway	67,284	34,561	32,723	145,156
Great Indian Peninsula do.	1,592,788	1,118,907	473,881	2,166,808
Bombay, Baroda and Central India Railway	556,630	419,408	137,222	728,261
Sindh Railway	204,533	178,967	25,566	40,162
Indus Steam Flotilla	123,950	100,852	23,098	6,678
Indus Valley Survey	.....	.....	... ..	.....
TOTAL	5,909,268	3,671,526	2,237,742	11,939,301
RESULT IN 1868-69.				
East Indian Railway ... Main Line	2,473,962	1,398,343	1,075,619	7,530,619
East Indian Railway ... Jubbulpore Line	114,920	79,433	35,487	72,105
Eastern Bengal Railway	208,733	100,253	108,480	441,192
Calcutta and South-Eastern Railway...	1,934	3,000	—1,066	—14,387
Punjab Railway	126,214	120,814	5,402	46,220
Delhi Railway	49,991	39,677	10,314	6,954
Oude and Rohilkhund Railway	42,268	33,600	8,668	12,260
Indian Tramway Company...	3,200	1,322	1,878	1,878
Madras Railway ... South-West or Main Line	465,824	206,170	259,654	1,430,964
Madras Railway ... North-West or Bellary Line	160,801	53,304	107,497	265,964
Great Southern of India	80,631	44,599	36,032	181,189
Great Indian Peninsula	1,897,348	1,262,572	634,776	2,501,584
Bombay, Baroda and Central India	483,011	365,944	117,067	845,329
Sindh Railway	327,456	449,319	—121,863	—81,701
Indus Steam Flotilla	250,601	216,590	34,011	40,688
Indus Valley Survey	.....	.. .	... ..	.....
TOTAL ...	6,686,896	4,374,940	2,311,956	14,251,316

GUARANTEED INTEREST PAID in England and in India, Net Traffic Receipts brought to Account in each Presidency in India, and Net Amount of Guaranteed Interest paid for all Railway Companies in each year from their commencement.

Finance and Revenue Accounts.

YEARS.	Amount of Guaranteed Interest Paid.			Net Traffic Receipts brought to Account.				Net Amount Paid.
	From the Home Treasury.	In India.	Total.	Bengal.	Madras.	Bombay.	Total.	
	£	£	£	£	£	£	£	£
1849-50	3,960	..	3,960	..	..	..	..	3,960
1850-51	23,792	..	23,792	....	..	..	..	23,792
1851-52	47,734	5,181	52,915	..	..	..	..	52,915
1852-53	62,489	6,153	68,642	..	..	..	..	68,642
1853 54	79,936	6,842	86,778	..	..	..	..	86,778
1854-55	129,197	8,064	137,261	10,078	..	9,411	19,489	117,772
1855-56	297,042	10,588	307,630	43,877	..	1,483	45,360†	262,270
1856-57	496,039	15,284*	511,323	64,639	19,165‡	25,164	108,968	402,355
1857-58	655,854	17,126*	672,980	76,611	21,761	37,545	135,917	537,063
1858-59	819,009	17,785*	836,794	110,240	18,872	59,581	188,693	648,101
1859-60	1,154,624	23,295	1,177,919	255,997	37,457	76,015	369,469	808,450
1860-61	1,454,519	28,625	1,483,144	224,521	51,033	80,879	356,433	1,126,711
1861-62	1,757,574	30,579	1,788,153	216,453	78,547	96,092	391,092	1,397,061
1862-63	2,135,137	31,619	2,166,756	342,940	140,005	142,670	625,615	1,541,141
1863-64	2,422,426	33,756	2,456,182	599,832	79,861	141,856	821,549	1,634,633
1864-65	2,649,008	34,779	2,683,787	727,650	178,592	223,609	1,129,851	1,553,936
1865-66	2,854,246	34,995	2,889,241	1,049,641	273,491	1,542,442	2,865,574	23,667
1866-67	2,995,841	35,247	3,031,088	1,472,826	278,430	595,830	2,347,086	684,002
1867-68	3,444,470	36,207	3,480,677	1,176,751	290,802	521,559	1,989,112	1,491,565
1868-69	3,841,400	36,614	3,878,014	1,263,312	369,736	594,583	2,227,631	1,650,383

* These amounts were paid to the Bombay Railways only, interest for the Bengal Railways not occurring in these years in the General Books of the Government of India.

† Net Receipts for half the year only, received from the Great Indian Peninsula Railway, were credited in this year.

‡ These are payments of gross earnings, which were included in the Capital Account, and are not separable in India.

AMOUNT paid into and withdrawn from the Treasuries in each Presidency, with Total for British India for all Railways, in each year from 1849-50 to 1868-69.

—Finance and Revenue Accounts.

YEARS.	Bengal Presidency.		Bombay Presidency.		Madras Presidency.		Total British India.	
	Paid in.	Withdrawn.	Paid in	Withdrawn.	Paid in.	Withdrawn.	Paid in.	Withdrawn.
	£	£	£	£	£	£	£	£
1849-50	...	...	10,770	2,196	...	..	10,770	2,196
1850-51	31,796	29,817	47,095	9,224	...	..	78,891	39,041
1851-52	21,616	143,458	36,744	53,653	...	..	58,290	197,111
1852-53	4,674	170,650	15,842	81,113	...	2,615	20,516	254,378
1853-54	5,715	295,769	17,375	78,755	...	50,507	23,090	425,031
1854-55	84,493	543,041	30,713	103,285	...	139,794	115,206	783,120
1855-56	39,220	1,031,676	134,292	186,751	...	219,106	173,512	1,437,533
1856-57	28,966	911,722	45,872	431,367	...	433,776	74,838	1,776,865
1857-58	13,928	222,404	36,913	650,196	...	537,201	49,841	2,109,801
1858-59	14,257	2,086,036	31,228	949,947	...	529,351	45,485	3,565,334
1859-60	6,645	2,590,526	13,307	1,422,087	1,221	679,215	21,173	4,691,828
1860-61	27,082	2,563,824	8,067	1,903,903	529	725,753	35,678	5,193,480
1861-62	5,324	2,541,063	13,800	1,897,717	.	562,273	19,124	5,001,053
1862-63	6,977	1,832,974	3,592	1,818,778	...	448,442	10,569	4,100,194
1863-64	98,503	1,654,620	3,266	1,600,087	97,893	390,221	199,662	3,644,928
1864-65	48,043	1,157,484	1,698	1,314,957	39,809	318,707	89,550	2,791,148
1865-66	3,980	1,480,704	8,900	1,580,771	...	336,943	12,270	3,398,418
1866-67	10,976	1,983,812	7,076	1,341,511	...	284,696	18,052	3,610,019
1867-68	36,732	2,015,406	590,216	1,503,574	125,020	380,467	751,968	3,899,447
1868-69	27,768	1,316,571	2,274	964,679	...	243,137	30,062	2,524,387

EXTENSION OF INDIAN RAILWAYS BY THE STATE.

"On the subject of the extension of the Indian Railways, it was recommended by Lord Lawrence, the late Governor-General in Council, that such a system should be commenced 'as appeared likely to give a tolerably complete network of main lines traversing all parts of India, in which considerations of policy, or the probable requirements of the trade and internal convenience of the country, indicated the utility of opening such lines,' whilst giving 'sufficient grounds to anticipate the eventual growth of a traffic which would pay the interest on the cost of construction.

"The Government propose to expend a sum of about 3,500,000*l.* per annum on railways, and to spread the construction of the lines about to be enumerated over a period of from twenty-five to thirty years, the gross amount proposed to be so spent being 100,000,000*l.* The outlay on the Indian railways by the guaranteed companies, for the past nine years, has averaged 7,000,000*l.* per annum, or twice the amount now proposed to be spent.

"The new lines and extensions are—

"1. The Indus Valley, to connect the present Scinde, at Kotree, with the Punjab, at Mooltan, with a proposed branch to the Bolan Pass. This line is the 'missing link' in the Scinde system, designed by that company to supersede the uncertain and inefficient navigation of the Indus, now carried on by the Indus Steam Flotilla. After the most urgent representations by the directors, a survey was sanctioned and undertaken by the Scinde as far back as 1863, and the necessity for the construction of the line has since been repeatedly pressed on the Government. When this line is completed, the cost of conveying the same number of passengers and quantity of goods from Kotree to Mooltan and back, will be reduced from 1,500*l.* in the case of a steamer and barges to 360*l.* in the case of a train, as regards money, while as regards time the average journey will be reduced from thirty to two days.

"2. Rajpootna lines, to connect Agra and Delhi with Bombay, by way of Ajmeer and Neemuch, also by Indore.

"3. Branches from the Bombay, Baroda, and Central India to Veerumgaum and Wudwan, into the province of Kattywar.

"4. A West Coast railway, to commence at the port of Carwar, to proceed to Hoobloe, and then on to join the Madras at Bellary, and northwards to the Great Indian Peninsula, at or near Decksal.

"5. A junction line to connect the north-east and south-east lines of the Great Indian Peninsula above the Ghats.

"6. A line from Kulburga on the Great Indian Peninsula to Hyderabad.

"7. Branches to the Madras.

"8. An extension of the Great Southern of India to Tinnevelly and Tuticorin.

"9. East Coast lines between Calcutta and Madras, *via* Midnapore, Cuttack, and the port of Coconada, and south of Madras towards Pondicherry.

"10. A system of lines for Mysore.

"11. A line from the Eastern Bengal at Kooshtea to Darjeeling.

"12. A line from Rangoon to Prome.

"These proposed lines generally received the approval of the Home Government in July last, and the immediate commencement of the most important of them was sanctioned by the Secretary of State, viz.—

"1. The Indus valley, 480 miles, to be completed in fifteen to twenty years.

"2. The Rajpootana, 1,700 miles, to be completed in twenty-five to thirty years.

"3. The line from Kulburga to Hyderabad, 116 miles, to be compeleted in five years.

"4. The line from Carwar to Hoobloe, 95 miles, to be completed within ten years.

"The execution of the works being undertaken by the Government.

"It may be well to say here that the Government had already undertaken the construction of a line from Lahore to Peshawur, originally designed and surveyed by the Scinde, termed the Punjaub Northern State, which will be referred to hereafter.

"The following exceptions were made to the new policy:—The extension of the Bombay, Baroda, and Central India to Veerungaum and Wudwan, and of the Great Southern of India to Tuticorin, were intrusted to the companies interested; and the Indian Tramway received sanction to extend their line to Cuddalore.

"The change in policy, by which it has been decided that the future railways of India shall be constructed by the Government originated, as already stated, with the late Viceroy, Lord Lawrence, and the primary grounds on which this change is based may be said to be a general condemnation of the guarantee system. But, whilst the Government were perfectly justified in making alterations appearing to tend to economy and efficiency in the principle on which India had hitherto been furnished with railways, it may be confidently asserted that the arguments adduced in support of the new system are utterly untenable.

"In the statement regarding the finances of India, laid before the House of Lords on the 23rd July last, it was said in substance, in regard to railways, that it was commonly supposed the lines had hitherto been constructed by private enterprise; but the Government hardly thought it could be called so, the money being raised by the credit of the State, on an absolute guarantee of 5 per cent, and under the conditions of which the Government took every chance of loss while unable to share in a particle of the profits, the shareholders sacrificing nothing under this arrangement; that the money was raised at a rate of about 1 per cent. higher than that at which the Government could borrow by direct loans in the market, and that the Government could not see why it should not raise the money directly on its own credit at 4 per cent, instead of 5 per cent. thus saving 1 per cent. That the Council of India, after prolonged discussion, had agreed that the experiment ought to be tried of a less extravagant mode of raising money for Indian railways, and a less extravagant mode of spending it; and that despatches received from the late Governor General, Lord Lawrence, and the present Governor General, Lord Mayo, took the same view, urging it with irresistible force. That whether the guaranteed railway companies were regarded as agents for raising money, or as agents for expending it, no advantage was obtained by the Government, for they could raise money at least 1 per cent cheaper. Regarding them as agents for expending the money, it must be remembered that the directors in London were gentlemen who employed contractors to make the lines, or sent out engineers to hire labour. Why could not the Government take the same course, contracting when desirable, or employing labour themselves?

The Government believe that it was unanswerable that it could raise money better, and expend it better, than the guaranteed companies. Instances of faulty construction were adduced in some of the railways; the guaranteed system was condemned as a most extravagant one (there being, it was alleged no incentive to economy), and as leading to great delays; the divided responsibility that existed, as between the companies and the Government, was objected to; and, finally, it was stated that if the Government undertook the construction of the lines, single responsibility and single management would be secured, and a considerable reduction in the cost of Indian railways would follow.

"The facts contained in this paper go far to show how erroneous these opinions are, but a perfect and consecutive answer could be made to them, did time permit. It will only be necessary, however, in this case, to state that the utter fallacy of the basis of the argument—viz., that the Government could raise enormous sums of money for railway works at 4 per cent., whether as regards the past or the future, has been satisfactorily demonstrated by some of the most eminent city authorities; that the allegations made as to the excessive cost of the railways hitherto constructed, the delay in their execution, and the inefficiency of the works, cannot be sustained. There have been occasional shortcomings and mistakes no doubt, for in the execution of vast and costly works how can they be avoided? But practical people will be disposed to look the facts in the face and to judge from results. If this is done—if consideration is given to the difficulties that have been encountered and successfully overcome, to the energy and capacity displayed by those who have had the administration of our Indian railways, and above all, if figures are consulted and impartially analysed, it will be seen that those lines will bear favourable comparison with similar works in any part of the world.

"Captain Davidson, R. E., to whose work on Indian railways reference has already been made, says,—'Many have thought and still think it would have been better had railways been constructed on a loan raised by Government, by the instrumentality of officers immediately subordinate to itself. It is possible that some improvement in administration and discipline, and perhaps economy, might have been thus secured, but on a review of the whole question, the problematical advantages, overweigh the certain disadvantages. The great, the immense advantage which the guarantee to the capital of joint-stock companies has given, has consisted in the ready and unfailing supply of money needed for construction. All Government works of utility, such as canals, or roads of acknowledged importance, hardly inferior to that of railways, are seldom duly fed, even when Indian finances are prosperous, but are sure to be totally suspended or starved during years of turbulence or of pecuniary pressure. The grant for public works is the first to be reduced, without reference to capital sunk in undertakings that remain unprofitable because unfinished: and had the loan for railways been raised directly by Government, it would not have escaped the rapacious hands of some needy Indian Minister of Finance. The Indian railway joint-stock companies have, for the most part, been able to raise without difficulty on the faith of the guarantee, sufficient funds, and the money so subscribed, though deposited with Government, is still only put in their treasury for a specific purpose, and cannot be touched; and thus it has happened that, even during years of great anxiety and commotion, funds sufficient for the annual outlay on railways have always been forthcoming. This advantage will be acknowledged by all, but can only be fully appreciated by those who have seen with dismay canals almost useless for want of distributing channels, roads entirely so from the absence of bridges over torrents and streams, and buildings half-erected falling to ruin for want of a roof. The steady and unfluctuating supply of needful funds is a great and decided benefit, for which Indian railways have to thank the guarantee system. Had they been constructed on funds raised by a direct loan by Government, the Indian railway system would not, in all probability, have been half completed by this time, instead of being nearly finished as it is.'

"Captain Davidson, of course, refers to the original lines sanctioned.

"One very distinguished person, writing recently, considered it desirable that arangements should be made 'for the ultimate transfer to the Government of India of the whole of the Indian railways constructed by English capital, with a view to the prevention of a too great investment of such capital in India;' whilst Mr. S. Laing, writing in 1861, when Finance Minister of India, after bringing forward certain objections to the guarantee system, added:—'On the other hand, there are some real advantages in the companies. The greatest is that where the money is raised in shares, with a proper deposit paid at first, you are safe of getting your money as you want it by making calls. But for this, the Indian railways must inevitably have been stopped on many occasions, from the sheer inability of the Government to find the funds. A Government cannot be perpetually raising small loans, and if it can create, through the agency of companies, a share capital of 10 or 20 millions, with 5 millions paid up, and a certainty of getting the other 15 millions by calls just as you want it, and whether the money made is good or bad, it is an important advantage and worth paying for. Again, I attach considerable importance to having a large body of English shareholders connected with India. A man who holds a share in an Indian railway is far more likely to listen to a prospectus of some other Indian enterprise than an entire stranger. The first instance of decided success, *i.e.*, of earning a dividened far beyond the guarantee, will bring in numbers of subscribers to Indian schemes, and tend to multiply bonds of connection between India and England. I estimate these advantages so highly, that I incline on the whole to think it is worth the sacrifice of, say, the additional 1 per cent. to keep the companies.'

"It cannot but be regretted, however strongly the Government felt the desirability of a change, that little or no credit was given to the guaranteed companies.

"In the debate which followed the statement of the Secretary of State for India, however, the Marquis of Salisbury and Viscount Halifax, former Secretaries of State for India, bore handsome testimony to the value of the work performed by the original companies, and Lord Lawrence, the author of the new system and its most powerful advocate, frankly stated that 'but for the energy and spirit with which the companies took up the subject, the railways could never have been in existence.'

"In the House of Commons, on the same occasion, Mr. R. W. Crawford, one of the members for the City and Chairman of the East Indian, made a spirited defence of the old system as being characterised by sound knowledge and judgment. Sir Stafford Northcote, a late Secretary of State for India endorsing much that had fallen from Mr. Crawford, said that he could not but sympathise in the want of cordiality and generosity displayed by the Government towards the companies in the despatches laid before the House, and considering the work done which had been carried on so successfully, there should have been every acknowledgment of the services rendered by the guaranteed companies.—*W. P. Andrew*, 1870.

RAILWAY EXTENSION IN INDIA.

Abstract of the Political-Commercial lines proposed by Local Governments in 1868.

Serial No.	By what Government recommended.	Proposed Lines. From	To	Length in Miles.	Political or Commercial.	Estimated cost, &c. Total.	Per Mile.	Nature of line.	Inclusive or exclusive of Rolling-stock.	More Probable cost.
						£	£			£
16	Bombay, Central Provinces G. G's Agent, C. India.	Khundwa .. .. (or near it)	Indore...	96	Political and Commercial.	982,000 (Baghlee route)	10,200	First Class	Not known, probably exclusive.	1,500,000
20	N. W. P. Govt	Moradabad.. .	Mozuffernuggur ..	90	Ditto	1,200,000	13,000	Standard gauge, slow speed	Inclusive	1,200,000

"Political and Commercial."—This classification implies that the Commercial grounds are considered of much, though not of chief, importance.

RAILWAY EXTENSION IN INDIA.

Abstract of the Commercial-Political lines proposed by Local Governments in 1868.

	By what Government recommended.	Proposed Lines. From	To	Length in Miles.	Political or Commercial.	Estimated cost, &c Total.	Per Mile.	Nature of line	Inclusive or exclusive of Rolling-stock.	More probable cost.
						£	£			
	Bombay	Dharwar or Hooblee.	Karwar.. .		Commercial and Political	1,100,000 to 1,800,000	15,000 to 20,000	First Class	Inclusive	1,800,000
14	Ditto	Ahmedabad..	Wudwan ..	73	Ditto	500,000	7,000	Ditto .. .	Exclusive	500,000
19	N. W. P. Govt..	Moradabad	Ramnuggur	44	Ditto	308,000	7,000	Ditto	Ditto	350,000
23	Bengal.....	Kooshtee .	Darjeeling	248	Ditto .. .	3,000,000	12,100	Ditto .. .	Inclusive .	3,000,000
25	Burmah.....	Rangoon .	Prome...	166	Ditto	1,885,000	11,350	Ditto ...	Ditto	2,000,000

"Commercial and Political"—This classification implies that the recommendation is based more on Commercial than on Political grounds, and that the latter only are perhaps not sufficient by themselves to justify the construction of the line.

RAILWAY EXTENSION IN INDIA.—*Gazette of India.*

Particulars of Railways already sanctioned.

RAILWAYS.	Date when commenced.	LENGTH IN MILES. Open 31st			Total	Probable date of completion of line.	ESTIMATED COST. Expenditure up to 31st March 1868	Remaining to be expended on 31st March 1869.	Percentage of return on approximate capital outlay on open line 1865.	1866.	1867.	REMARKS.
East India (Main Line).....	Jany.	1,132	148		1,279	1870	29,362,397	1,737,603	4·5	5·3	4·8	On those lines that are shown as complete there is much construction work yet to be done.
„ (Jubbulpoor Line)....	Feby. 63	223	..		223	Complete			...	..	..	
Eastern Bengal	April 59	113	45		158	1870	2,562,286	237,714	3·8	3·7	4·3	
Punjab.....	Feby. 59	246	..		246	Complete	2,686,391	313,609	1·1	1·0	1·1	
Delhi	Early 64	54	249		303	1870	3,869,145	2,130,855	...	..	..	
Lahore and Rawulpindee.....	69	..	..	73	173	1874	50,000	3,300,000	...	..	..	
Oude and Rohilkhund	64	42	39	361†	742	1874	721,319	4,808,681	..	..	..	
Madras. South West Line*....	June 53	492	..		492	Complete	9,285,962	1,714,038	3·6	3·5	3·7	
Madras. North West		185	157		342	1871			3·2	2·9	3·4	
Great Southern of India	May	168	..		168	Complete	1,404,077	295,923	2·3	2·6	2·7	
Great Indian Peninsula.....	Oct.	875	397		1,272	1871	19,231,252	2,768,748	6·0	5·5	5·9	
Bombay, Baroda and Central India.	May	306	6		312	Practically complete.	7,476,626	273,374	2·4	2·1	2·5	
Sindh.....	April 58	109			109	Complete	2,144,573	105,427	0·3	1·0	*Nil.*	
Calcutta and South-Eastern .	59	28			28	....	625,000	*Nil.*	*Nil.*	*Nil.*	*Nil.*	
Arconum-Conjeveram *(Light)*.		19			19	Complete	100,000	*Nil.*	?	?	?	
Total.		3,991	1,041	834	5,866		79,519,028	17,685,972	..	..	..	

* Excluding the branch from Poothanoor to Coimbatore and the foot of the Neilgherries which awaits the sanction of the Secretary of State, Length 86 miles.

† Includes the Allyghur branch.

RAILWAY EXTENSION IN INDIA.

Area and Population of Provinces of India contrasted with the existing Railway systems.

Provinces.	Area in Square Miles	Population.	Population to Square Mile.	Miles of Railway sanctioned.	Per mile of existing Railway	
					Square Miles.	Population.
Bengal	214,313	39,813,276	185·77	906	236	43,944
North West Provinces.	.83,380	30,110,615	361·12	1,108	75	27,175
Punjab	100,411	14,820,845	147·55	610	165	24,296
Oudh	22,456	8,838,151	393·57	331	68	26,701
Central Provinces	114,718	9,104,511	79·36	436	264	20,882
British Burmah	90,070	2,330,453	25·87	.....	.....	.....
Madras	141,719	24,206,509	170·80	955	148	25,358
Bombay	87,639	11,093,512	126·58	952	92	11,653
Sindh	60,900	1,945,594	31·94	109	559	17,849
Coorg	2,116	119,118	56 29	.....	.....	.....
Berars	17,334	1,586,047	91·55	145	119	10,938
Mysore	27,000	4,013,601	148·65	46	587	87,252
Hyderabad	78,003	10,000,000	128·20	147	530	68,027
Rajpootana	122,938	9,706,079	78 95	.....	.....	.....
Central India	84,114	7,650,137	90·95	120	701	63,751

RAILWAY EXTENSION IN INDIA.—*Gazette of India.*

Abstract of the various proposals submitted by Local Governments in 1868.

	By what Government recommended.	Proposed Lines. From	To	Length in Miles	Political or Commercial.	Estimated Cost, &c. Total.	Per Mile.	Nature of line.	Inclusive or exclusive of Rolling-stock.	More probable cost.
						£	£			£
	Madras ..	Caroor	Tinnevelly and Tuticorin.	210	Commercial	1,680,000	8,000	First Class.. ..	Inclusive ..	1,680,000
	Ditto..	Bellary.. ..	Dharwar	140	Ditto ..	1,400,000	10,000	Ditto	Ditto ..	1,400,000
	Ditto..	Conjeveram.. ..	Cuddalore	81	Ditto ..	405,000	5,000	Narrow guage, light line.	Ditto ..	405,000
		Four branches to the S. W.	*Madras Line.*	(14)						
4	Ditto	Arconum	Raneepett	4	Ditto	91,000	6,500	First Class.. ..	Exclusive ..	100,000
		Cautpady	Vellore	4						
		Sooramungalum ..	Salem . ..	3						
		Kauvalpad ..	Paulghât ..	3						
5	Ditto ..	Beypoor	Cannanore.. ..	60	Ditto ..	640,000	10,666	Ditto	Inclusive ..	640,000
6	Mysore ..	Bangalore	Tippatoor	83	Ditto ..	400,000	5,000	Narrow guage, light line	Ditto	450,000
7	Bombay .	Dharwar *or* Hoobloe.	Karwar	95	Commercial and Political.	1,400,000 to 1,800,000	15,000 to 20,000	First Class ..	Ditto	1,800,000
8	Ditto..	Hoobloe.. ..	Patus	230	Political ..	Not given	Not given	Not given	Not given ..	3,000,000
		Six branches to the	*G. I. P. Railway.*	(100)						
	Bombay..	Campoolee.. ..	Hog Island .	32	Commercial	337,100	10,235	First Class.. ..	Exclusive ..	*350,000
	Ditto ..	Callian .. .	Bassein Road .	16	Ditto ..	Not given	Not given	Not given	Not given ..	100,000
	Ditto ..	Barsee Road Station,	Barsee .. .	21	Ditto ..	105,000	5,000	First Class... ..	Exclusive ..	210,000
9	Resident Hyderabad.	Jullum	Khamgaum .	7½	Ditto ..	35,000	4,667	Ditto	Ditto	70,000
	Ditto	Budnaira	Oomrawuttee .	5½	Ditto ..	25,000	4,667	Ditto	Ditto	55,000
	Central Provinces	Wurdah ..	Hingunghât ..	18	Ditto ..	Not given	Not given	Not given	Not given ..	180,000
01	Resident Hyder-	Kulburga ..	Hyderabad.. ..	116	Political ..	1,028,000	8,860	First Class.. ..	Inclusive ..	1,200,000
11	Bombay ..	Dhoond..	Munmar ..	132	Ditto ..	1,650,000	12,500	Ditto	Ditto	1,650,000
12	Central Provinces	Nagpoor	Raepore ..	180	Commercial	600,000	3,200	Standard guage, light line.	Ditto	1,200,000
		Three branches to the	*B. B. and C. I. Railway.*	(67)						
13	Bombay .	Broach..	Jumboosur.. ..	27½	Ditto ..	Heavy 250,000 Light 207,000	9,000 7,540	Standard guage.	Exclusive	210,000
	Ditto ..	Wassud..	Barsud	13½	Ditto	Not given	Not given	Not given	Not given ..	100,000
	Ditto..	Neriad..	Kupperwunj ..	26	Ditto	150,000	5,800	Standard guage, slow speed.	Including light engines, but no vehicle stock.	200,000
14	Ditto ..	Ahmedabad	Wudwan	73	Commercial and Political.	500,000	7,000	First Class.. ..	Exclusive ..	500,000
15	Central Provinces Bombay ..	Nagpoor	Etawah	450	Political ..	Not given	Not given	Ditto	Not given	6,750,000
	Central Provinces G. G.'s Agent, C. India.	Khundwa *(or near it)*	Indore	96	Political and Commercial.	982,000 (Baghlee route)	10,200	Ditto	Not known, probably exclusive	1,500,000 10,000,000
	Bombay .. .. G. G.'s Agent,	Wassud .. *or alternative*	Delhi and Agra ..	708 or	Political	9,745,000 or	13,764 or	Ditto	Exclusive ..	* or
17	Rajpootana.	Ahmedabad	Ditto ditto ..	(692)	Ditto ..	8,929,000	12,900	Ditto .. .	Ditto ..	9,000,000
18	N. W. P. Govt.	Etawah..	Furruckabad ..	55	Commercial	500,000	9,000	Standard guage, slow speed.	Inclusive ..	500,000
19	Ditto	Moradabad..	Ramnuggur ..	44	Commercial and Political.	308,000	7,000	Ditto	Ditto ..	350,000
20	Ditto	Ditto ..	Mozuffernuggur ..	90	Political and Commercial.	1,200,000	13,000	Ditto	Ditto ..	1,200,000
21	Punjaub	Rawul Pindee .	Peshawur	97	Political	1,650,000	17,000	First Class.. ..	Inclusive of a small stock.	1,750,000
22	Punjaub .. Bombay ..	Mooltan ..	Kotree	489	Ditto ..	6,000,000	12,400	Ditto	Inclusive ..	6,000,000
23	Bengal ..	Kooshtee ..	Darjeeling	248	Commercial and Political.	3,000,000	12,100	Ditto	Ditto ..	3,000,000
24	Ditto ..	Sonapoor..	Bishtopoor.. ..	22	Commercial	200,000	9,000	Ditto	Ditto ..	250,000
25	Burmah ..	Rangoon..	Prome	166	Commercial and Political.	1,885,000	11,350	Ditto	Ditto ..	2,000,000
	Totals..			4,046						

* Exclusive of branch from Chowk to Penn, 17 miles, recommended, but no particulars afforded.

RAILWAY EXTENSION IN INDIA.

Abstract of the Political Lines proposed by Local Governments in 1868.

Serial No	By what Government recommended	Proposed Lines: From	Proposed Lines: To	Length in Miles	Political or Commercial	Estimated cost, &c.: Total	Per Mile	Nature of line	Inclusive or exclusive of Rolling-stock	More probable cost
						£	£			£
8	Bombay	Hoobleo	Patus	2 0	Political	Not given	Not given	Not given	Not given	1 000,000
10	Resident Hy derabad	Kulburga	Hyderabad	110	Ditto	1,028,000	8,860 00	First Class	Inclusive	1,200,000
11	Bombay	Dhoond	Munmar	132	Ditto	1,650,000	12 5	Ditto	Ditto	1,650,000
15	Central Provinces	Nagpore	Etawah	1 450	Ditto	Not given	Not given	Ditto	Not given	6,750,000
17	Bombay G G s Agent, Rajpootana	Wassud	Delhi and Agra	708	Ditto	9,745,000	13,761	Ditto	Exclusive	10,000,000
		or alternative		o		*or*	*or*			*or*
		Ahmedabad	Ditto ditto	(0 92)	Ditto	8,929,000	12 900	Ditto	Ditto	9,000,000
21	Punjaub	Rawul Pindee	Peshawur	97	Ditto	1,650,000	17,000	Ditto	Inclusive of a small stock	1,750,000
22	Punjaub Bombay	Mooltan	Kotri	189	Ditto	6,000 000	12,100	Ditto	Inclusive	6,000,000

N B —The claims of lines classified as Political are considered to be so strong as to entitle them to acceptance, irrespective of any advantages they may confer on commerce

RAILWAY EXTENSION IN INDIA

Abstract of the Commercial lines proposed by Local Governments in 1868

Serial No	By what Government recommended	Proposed Lines: From	Proposed Lines: To	Length in Miles	Political or Commercial	Estimated Cost, &c: Total	Per Mile	Nature of line	Inclusive or exclusive of Rolling stock	More probable cost
						£	£			£
1	Madras	Carooi	Tinnevelly and Tuticorin	210	Commercial	1 680 000	8 000	First Class	Inclusive	1,680,000
2	Ditto	Bellary	Dharwar	140	Ditto	1 400 000	10 000	Ditto	Ditto	1,400,000
3	Ditto	Conjeveram	Cuddalore	81	Ditto	405 000	5,000	Narrow guage light line	Ditto	405,000
5	Ditto	Beypoor	Cannanore	0	Ditto	640 000	10 666	Ditto	Ditto	640,000
6	Mysore	Bangalore	Tippatoor	81	Ditto	4 50 000	5 000	Ditto	Ditto	450,000
12	Central Provinces	Nagpoor	Rajoor	181	Ditto	600 000	200	Standard guage, light line	Ditto	1,200,000
18	N W I Govt	Etawah	Lurruckabad		Ditto	90 000	9 000	Standard guage, slow speed	Ditto	500,000
24	Bengal	Sonapoor	Light poor	-	Ditto	200 000	9,000	Ditto	Ditto	250,000
		From Branches	*to the Main*							
		Arcanum	Tanjore	4						
4	Madras	Cauljady	Vellore	4	Ditto	31 000	6,500	First Class	Exclusive	100,000
		Seorinungalum	Salem	3						
		Kanyalpaul	Pulghaut							
	See branches of the G I P Railway			(1 0)						
	Bombay	Camp Okee	Hog Island	2	Ditto	417 100	10 215	First Class	Exclusive	450,000*
	Ditto	Cullian	Bassein Road	16	Ditto	Not given	Not given	Not given	Not given	160,000
9	Ditto	Barsee Road Station	Barsee	21	Ditto	105 000	5 000	First Class	Exclusive	210,000
	Resident Hy derabad	Jellum	Khamgaun	7	Ditto	35 000	4 667	Ditto	Ditto	75,000
	Ditto	Budnaira	Omrawuttee	4	Ditto	25 000	4,667	Ditto	Ditto	55,000
	Central Provinces	Wurdah	Hingunghaut	18	Ditto	Not given	Not given	Not given	Not given	180,000
	Three	*branches to the B Railway*	*B a r o d a*	(17)						
	Bombay	Broach	Jumbusur	24	Ditto	Heavy 250,000 / Light 207,000	9,000 / 7,540	Standard guage	Exclusive	210,000
13	Ditto	Wassud	Bassul	1 ¼	Ditto	Not given	Not given	Not given	Not given	100,000
	Ditto	Neriad	Kaipeewuhj	1	Ditto	150,000	5,800	Standard guage, slow speed	Including light engines, but no vehicle stock	200,000

* Exclusive of branch from Chowk to Icon 17 miles, recommended, but no particulars afforded.

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Statistical Reporter,

A MONTHLY JOURNAL OF STATISTICAL ENQUIRIES CONCERNING INDIA.

Vol. II.] CALCUTTA, SATURDAY, 15TH OCTOBER, 1870. [No. 3.

INDIAN RAILWAYS.—CONTINUED.

EXTENSION OF RAILWAYS IN HYDERABAD AND CENTRAL INDIA.

FROM THE GOVERNMENT OF INDIA, TO THE SECRETARY OF STATE FOR INDIA

29th March, 1870.

We are greatly gratified to be able to inform your Grace that certain negotiations which have been in progress for some months past relating to the extension of railways in two important Native States, have recently been brought to conclusions which appear to us in every respect highly satisfactory.

2. The first of these cases is that of the line from the Great Indian Peninsula Railway to Hyderabad.

3. In the earlier discussions regarding this Railway, it had been intimated that the British Government would expect the Nizam's Government to bear at least one-half of the cost of construction. When during last year we received the authority of [illegible] partly from the means of the Hyderabad State, partly by aid of subscriptions of local capitalists. It may amount to about one million sterling. The Railway will be considered to be the property of the Hyderabad State, and the profits of the working will go entirely to that State. But the construction, management, and working of the Railway will be carried on exclusively by the British Government, under the general supervision of the Resident at Hyderabad, acting in communication with the Nizam's Government.

5. Thus the construction of this important line will be provided for without placing any charge or liability on the British Government or the revenues of India, a result which we do not doubt your Grace will agree with us in regarding as highly satisfactory.

6. The surveys for this line of railway, as your Grace has already been informed, are in progress, and the commencement of work may be expected in the course of the present year.

7. The other case refers to his Highness the Maharaja Holkar, who has intimated to the Governor-General's Agent in Central India that he is desirous of placing at the disposal of the British Government a sum of one million sterling as a contribution for the construction of a railway to unite the Great Indian Peninsula Railway with Indore.

8. The terms which the Maharaja has proposed are, that he shall receive from the British Government 4½ per cent. interest on the capital thus to be contributed by him, and shall share in half the surplus net profits in excess of that amount. We have readily assented to this, which practically places His Highness in the position of a holder of guaranteed capital, under terms financially the same as those granted to the existing Guaranteed Companies.

9. The Maharajah proposes to contribute the million as follows :—

	£
In 1870-71	250,000
„ 1871-72	200,000
„ 1872-73	110,000
„ 1873-74	110,000
„ 1874-75	110,000
„ 1875-76	110,000
„ 1876-77	110,000
Total..	1,000,000

10. The yearly sums are to be paid in quarterly instalments. The capital is left at the disposal of the British Government in perpetuity.

11. The necessary measures will at once be taken by us for commencing the survey of the line of railway in question The country is difficult, and part of it extremely unhealthy for several months of the year; but we hope to be able to make arrangements under which some part of the line at least may be fixed in time to admit of the commencement of actual operations after the close of the ensuing rainy season.

12. We are at present unable to say what the railway to Indore is likely to cost, but it is not improbable that the outlay will exceed the sum to be given by the Maharajah. The intrinsic importance of the line, however, is so great, and the political advantage to be secured by the arrangement proposed so manifest, that we have not hesitated to give our assent to the Maharajah's terms, and to undertake to proceed at once with the construction of the line, accepting the liability of finding the sum, whenever it may be necessary for completing the junction between Indore and the Great Indian Peninsula Railway It will be our chief aim to take every precaution for keeping down the cost of first construction, so as to ensure, as far as possible, the early financial success of the undertaking.

13. We may, we think, properly congratulate your Grace on those events. Two Native Governments have, of their own accord and without solicitation on our part, offered to subscribe £2,000,000 of capital for railway construction in their own territories. It is satisfactory to us to note that in the first year, after the Government had announced its intention of carrying out further extensions of railways in India by its own agency, two Native States should have subscribed such a sum, on terms so favorable as those that we have described, for the construction of lines of railway which, while they will benefit considerably their own States, may also be regarded of primary importance to India as a whole. We cannot but trust that the example set by the Maharajah of Indore and Sir Salar Jung will be followed by other enlightened rulers, and that we may for the future hope for the more active co-operation of the Native Chiefs and Princes of India in all works of industrial enterprize.'

14. We shall take care to keep your Grace informed of our further proceedings in these matters, and of the formal conclusion of the arrangements, an outline of which we have now had the honour to report.

FROM THE SECRETARY OF STATE FOR INDIA, TO THE GOVERNMENT OF INDIA.

9th June, 1870.

I have learnt, with much gratification, from your despatch No 40 of 29th March last, to how great an extent their Highnesses Sir Salar Jung, on the part of the Nizam, and the Maharajah Holkar, have agreed to co-operate with your Government in the construction of Railways through their respective territories.

2. The arraugment made by Sir Salar Jung, on behalf of the Hyderabad State, is especially satisfactory. That the Government of the Nizam should voluntarily take upon itself the entire cost and risk of a railway to connect the capital of Hyderabad

with the Great Indian Peninsula line, and should at the same time propose to entrust the construction and subsequent management of the work to the British authorities, exhibits at once very enlightened liberality on His Highness's part, and affords a very gratifying proof of the confidence which he has learnt to repose in the British Government. The most appropriate return that can be made to His Highness will be the construction of the railway within the shortest time and in the most efficient manner possible, and every exertion will, no doubt, be made for the purpose.

3. The undertaking of the Maharaja Holkar to place a million sterling at the disposal of your Government, in aid of the expense of a railway to unite the Great Indian Peninsula line with Indore is also entitled to cordial recognition. The terms on which he has arranged to make this contribution, *viz.*, the annual payment to him of 4½ per cent. on its amount, and one moiety of any surplus profits realized, although, as you say, practically placing His Highness in the position of a holder of guaranteed stock, constitute at the same time an example of a form of guarantee free from some of the worst defects of the system. It will be no small advantage to your Government to have under its own exclusive control funds obtained on guarantee.

4. I heartily concur with your Excellency in regarding it as a matter for congratulation, that two Native Governments should, of their own accord, and without solicitation, have already exhibited so decided an interest in railway extension, and I concur similarly in accepting the example set by them as an earnest of active co-operation in future on the part of the Native Princes of India generally, in all works of industrial enterprise.

PROGRESS OF RAILWAYS IN INDIA

Compared with other parts of the world, as also the Mileage open compared with Area and Population.

COUNTRIES.	Year in which Railways worked by Locomotives were first opened.	Total Length in Miles open in			Per Mile of Railway open in 1865-66.		Average cost per Mile, excluding assistance.	REMARKS.
		1845.	1852.	1865-66.	Square Miles.	Population.		
							£	
England and Wales.	1830.....	/	/	9,251	6·25	2,186	41,033	First class, and 57 per cent. of double line.
United Kingdom ...	1830	2,210	6,890	13,289	9·11	2,190	34,300	The greater part of single line, and not solidly constructed.
United States ...	1832 (?)	4,522	11,027	35,361	15	866	7,800	A very large proportion of single line.
France	1832.....	545	2,398	8,113	26	4,607	28,800	About one-fourth of double line.
Germany	1834 35	1,941	5,097	12,321	33	5,298	16,400	
Belgium	1835....	347	720(?)	1,350	8	3,625	21,546	
Russia	1838.....	122(?)	/	1,862	..	..	?	
Italy	1839.. ...	/	/	2,389	41	9,084	/	
Holland	1848 ...	Nil	/	372	29	9,066		
Denmark	1849....			470(?)	..	...		
Switzerland ..	1849....			778	19	3,257		
Spain	1849....			2,721	67	5,991		
Sweden and Norway	1852.....		10	830	..	..		
Portugal	1854.....		Nil	419	87	8,555		
Turkey	?		/	81	..	...		
British N. America.	?	/	/	2,539	136	987		
Central & S. America		/		550(?)		..		
British India	1853 ..	Nil	Nil	3,323	287	43,537	16,500	Eventual probable cost; one-third about being of double line.

AMERICAN LINES.

1830...	41 miles.
1835.	918
1840...	2,197
1845...	4,522
1850.	7,475
1855...	17,398
1860...	28,771
1865...	34,442
1870...	48,860 „

The Americans have now completed the Pacific Railway, 3,300 miles long, between New York and San Francisco, connecting the Atlantic with the Pacific, crossing two great chains of mountains higher than any other line in existence, and a *waterless* tract of considerable width. On the 28th April, 1868, on this line, *ten* miles of permanent way were laid down and *completed* between daylight and sundown

The official report for the year 1869-70, states that there are now 4,628 miles of railway open in India, which have cost about £79,000,000. During the last year 261 miles were opened for traffic, and 347 miles have been added since. The latter included that portion of the Great Indian Peninsula Railway which completes the Great Trans-peninsula line between Bombay and Calcutta, and also the first line—viz. from Jhellum to Khamgaon, which has been undertaken and completed by the State. Other works have been progressing, and several lines are on the eve of completion. The chord line of the East Indian will be finished in the course of this year (1870.) The line between Madras and Bombay, with the exception of the bridge over the Kistna, should also be opened next cold season. The Delhi line will probably be completed. The Oude and Rohilkund Company will open their first section beyond Lucknow, viz. to Byram Ghat; and the extension of the Eastern Bengal Railway to Goalundow will, it is expected, be ready for opening in the course of this year. Progress has been made on the Punjab State line which, with the exception of a few diversions, is to occupy one-half of the trunk road. The lines which form the system of railways for Oude and Rohilkund have now all been sanctioned and staked out, and the earth-works have been formed over many miles The bridges also have been put in hand, and permanent way material taken to different parts of the line. The Bombay, Baroda, and Central India and the Great Southern Railway Companies have made every preparation for carrying out with vigour the extensions committed to them; and the Carnatic Company, which has taken the place of the former Indian Tramway Company, is making the surveys for extension of the line to Cuddalore, and is about to convert the narrow guage line between Arconum and Conjeveram into a first-class railway, with the standard guage of 5 feet 6 inches. The total length of lines sanctioned yet remaining to be finished is 1,59½ miles.

INDIAN RAILWAYS AS RE-PRODUCTIVE PUBLIC WORKS.

Economist, 1870.

It is a constant assumption in defence of the large expenditure on public works in India, that a good deal of it is reproductive. The constant deficit in the Budget, we are told, is due to our folly in charging to revenue what in every other country would be charged to capital. If we acted differently, if we saddled revenue with nothing but what was properly chargeable to it, and borrowed when we wanted to spend money on the public works which the country requires, and which would re-pay their cost, then the Budget would be all right. We have more than once expressed our doubts of this theory, apprehending that the so called expenditure on public works includes so much for repairs and maintenance and other purposes properly chargeable to revenue, that even if all reproductive works were excluded, the Budget without the income tax would still show a very narrow surplus. But we doubt further whether the question of the re-productiveness of expenditure on new works themselves has ever been sufficiently examined. It has hardly been thought necessary to examine it at all. People take for granted that the so-called re-productive works—railways, canals and works of irrigation are in fact reproductive They will "develop" the "resources" of India, enrich its people and increase its revenue. Yet why should all this be taken for granted? Although such works pay as a rule, the condition of profit may be taken in particular cases; and how do we know that the conditions are being complied with in India? It is besides conceivable that some of the results may be obtained while others are indefinitely retarded—that from some peculiarity in the habits of the people, or the financial incompetence of the Government, the people may be getting richer while the revenue does not keep pace with the increasing interest of the Public Works debt. This last point is especially important, for however much the works might benefit our Indian subjects, the price of financial embarrassment would speedily neutralize the benefit. For this reason we have taken some pains to find out how the matter stands with respect to one great branch of the re-productive works, *viz.*, railways. The Indian Government, as we have often remarked, does not publish a proper guarantee account, showing with respect to the open lines whether it shares in a profitable and improving property or the reverse, but failing such an account—which we trust will yet be obtained—some facts are ascertainable throwing a good deal of light on the point. The annual reports of Mr. Juland Danvers, of which the one for the year 1869-70 has just been issued, are a mine of information on the subject, and the facts we now bring together are taken from these reports.

We may say at once that the facts seem to us to prove that the Indian Government not only does not gain by its railways, but that its annual loss on a large portion of the system is increasing, and not diminishing The first obvious fact is, that the net amount of the guaranteed interest annually paid to all the railways, which was as low as £67,000 in 1865-66, has been for the last three years upwards of a million and a half. It was about £200,000 less last year than the year before—the difference being caused by the increase of traffic on one line only; but still things were no better in 1869-70 than they were in 1867-68, or in the four years preceding 1865-66 This is really not a pleasant fact It is easy to say that the system is incomplete, that the charge keeps so high because more capital is being raised for new lines, that with the opening of these lines the burden will be reduced. This is no doubt true to some extent; but is the burden likely to be *proportionately* reduced? The additional charge since 1865-66 represents a capital of £30,000,000—how much of this has been spent on unfinished lines that remained to be open at the close of 1869? Will these lines produce a new revenue of a million and a half? We think it may be affirmed with some certainty that they will not. We cannot make out exactly, from the report, the length of the lines in progress, but they are certainly under a third of the old lines, and as the net receipt of these is £2,500,000, a third would be £800,000, or exactly half the surplus required. In other words, making every allowance, the present position of the railways is about £800,000 a year, worse than it was in 1865-66. Of course the new lines may be profitable beyond former precedent, but if this is the expectation, some reason should be given for it. This is on the assumption, moreover, that no more capital, increasing the annual guarantee, will be required for these unfinished lines, but in fact more capital will be needed.

But that the worse position of the railway since 1865-66 has not wholly arisen from new expenditure on still unfinished works is capable of exact demonstration. Distinguishing as far as possible certain lines to which few additions have lately been made, we have endeavoured to find exactly the state of the account for the last four years during which there has been little change. The result, as will be seen from the details in the subjoined table, is not a little striking. The railways thus selected are five in number—the Great Indian Peninsula (1,353⅜ miles long), the Bombay, Baroda, and Central India (305½ miles), the Scinde (108½ miles), the Punjab (246 miles), and the Eastern Bengal (113¼ miles), comprising altogether 2,127 miles of open line, or about half the entire length of open railway in India, while their gross traffic receipts last year were considerably more than a third of the entire gross traffic. We have thus a very large section indeed of the Indian system before us, and it is plain from the figures we give that they are going from bad to worse The gross traffic is stationary, the working expenses have steadily increased, and the net receipt has diminised about one-third. The following is a summary of the table:

Summary of the Gross Traffic, Working Expenses, and Net Receipt of five Principal Indian Railways.

	Gross Traffic, £	*Working Expenses.* £	*Net Receipts.* £
1865-66	... 2,119,046	1,166,571	952,478
1866-67	.. 2,194,380	1,322,570	871,810
1867-68*	... 2,148,974	1,382,649	766,325
1868*	... 2,266,506	1,407,658	858,848
1869	... 2,227,044	1,543,965	683,078

Nothing more would be needed to prove that the burden of the guarantee so far as these railways are concerned, has been increasing all these years, quite irrespective of any construction of new lines which have yet to be opened. As working railways they have become less and less able to provide for the guarantee, which existed in 1865-66, and to a very material extent—nearly £3,000,000, a sum which would contribute very much to swell a deficit or to reduce a fair surplus to a narrow one.

The account does not stop here. If we had included another principal line, the Madras, which we only avoided on account of the increase of its mileage from 611 to 707 miles, we should have found that the result, as far as the net revenue is concerned, was unaffected. Notwithstanding the increase of its mileage, the net receipt of the Madras Railway, as will be seen from the subjoined statement, has only increased from £249,872 to £286,012—a very inconsiderable addition. The truth is that only one of

* Until now the reports have dealt with the year terminating on the 30th of June, now the year is made to terminate on the 31st of December. The two periods marked with the astorisk have thus one-half year in common.

the great Indian railways—the East Indian—has made any progress at all worth speaking of during the period in question. Its net receipts have risen from £1,080,000 to £1,537,000—an increase of £357,000, tending to counterbalance the diminution of all the other principal lines. But during the period, the length of the East Indian system was increased about a fifth—from £1,129 to 1,353¾ miles; and if we compare the net receipts of 1866-67, the year before this addition was made, with 1869, we find that the increase is only about a fifth also. The conclusion is that while the whole Indian railway system, except one line, has been getting worse, notwithstanding slight additions to its mileage, that line has improved no more than in proportion to its new mileage. It is manifest then that there can be no foundation for the theory that the deficiency which must now be made up under the guarantees will be altogether dissipated by the opening of new lines, It has arisen to a large extent from the increasing unprofitableness of the old lines, and not from the raising of capital for new works.

Nor is this all that could be said. It is notorious that the burden of the guarantees on the old lines has been increasing in another manner. A portion of the capital authorised during the last few years for some of these lines whose net receipt has been diminishing was not for new works, but for expenditure on the old undertaking. The Great Indian Peninsula Railway in particular has added largely to its capital for this purpose. How much the undertakings are worse on this account we cannot say, but coupled with deterioration, we have already shown, we cannot but think that an exact statement would destroy a great many comfortable opinions about the Budget value of our public works. The whole truth should be brought out as speedily as possible for the sake of all concerned with Indian finance. It is evident, however, that there should be an end to the doctrine that all the expenditure under the guarantee is an investment of capital on re-productive works to be met out of loans. The interest on works which do not pay, and which are annually in a worse position, is as clearly a revenue charge as any item could be.

We do not mean to assert that the railways with all their drawbacks may not have been a boon to India. The convenience of the great trunk lines in enforcing peace throughout India, the one clear blessing which our rule confers, can hardly be over-estimated. The railways have also contributed greatly to enrich the masses of the Indian community. We may admit again that traces of progress are discernible if we examine the accounts more narrowly—the progress of the Eastern Bengal line, for instance, being very remarkable. If only the worst lines can be kept stationary, there are apparently some parts which may progress and gradually reduce and extinguish the deficiency on the whole account. But facts like those we have brought out are nevertheless full of warning as to future ventures. It is no slight matter that so large a section of our public works should have resulted in a steady drain on the Exchequer. Now that India has got its trunk lines it should necessitate the absolute refusal to look at anything which does not on the most stringent calculation promise direct and traceable profit to the revenue.

There is one other moral in our facts The deterioration we have described is due to an increase of working expense with a stationary traffic. This is a curious proof of the *direct* effect of the railway expenditure on the Budget. Surely it ought to be "estimated" and controlled exactly like the other expenditure of the Government. The waste of interposing sham companies between the Government and its servants—especially on lines where there is little hope of profit for years to come—would be amusing if the matter were not so serious Yet the Indian Government, without consulting the House of Commons, has just abandoned its right to acquire the lines and abolish the sham for other twenty-five years.

THE STANDARD OF LIVING.—INDIA.

The relation between income and expenditure existing in any given community, affords a fair index to the soundness of it condition, and general prosperity. If the average rate of labour is such as to provide all able-bodied men and their familes with a sufficiency of food, clothing, and shelter, it must be conceded that such a population is in the possession of some of the primary f n ot most important, elements of happiness, as applicable to a certain stage of civilisation.

It has been, and is, the custom to represent the present inhabitant of Bengal as weighed down by the pressure of land taxation to a point at which he can barely support life. That great suffering occassionally arises from the local deficiency of the staple article of food, must be conceded, but such is due to imperfect means of intercommunication, rather than inability to meet its average cost. As far as my own experience goes, the average income of the Bengal peasantry, by which term I desire to express small landed proprietors, day-labourers, and the general mass of the people, suffices for all the necessary outlay of their position It is an incontrovertible fact that debt largely prevails, but this would appear to be due rather to the enormous rate of interest which is taken, and the comparatively excessive sums lavished on occassional ceremonies, than upon any actual necessity, in regard to the necessaries of life.

Desirous of attempting some analysis of the condition of the people, I constructed the followiny table, when in charge of the Civil Station of Chittagong The subjects of inquiry were, patients attending the dispensary. Their ailments were first attended to, and the facts tabulated below, obtained by inquiry immediately afterwards, through the zealous assistance of Bábu Buddhnáth Brimo, the Sub-Assistant Surgeon.

They are not offered as absolute truths. Those who have had any practical experience of the great difficulty of making statistical inquiries in Bengal, will fully understand how far they may deviate from correctness. But examining the facts here noted, seriatim, I think sufficient intrinsic evidence of their reliability will be found to confer upon them the character of approximate truths. The table comprehends every ordinary item of expenditure, except that incurred on account of live-stock, which has been accidentally omitted, and the probable amount of which must of course be deducted from the balance when in favour.

With the view of rendering the questions and consequent information, as clear as possible, it was agreed that the inquiry should embrace the condition of its subjects during the past twelve months only.—*Extracts from a Paper entitled Contributions to the Statistics of Bengal, Income, Expenditure, and Food. By J. R. Bedford, Esq., Bengal Medical Staff.*

TABLE exhibiting the Monthly Income and Expenditure of 100 Families in Zillah Chittagong, Bengal, 1846, in Rupees, Annas, and Pies.

| | Name. | Caste. | Employment. | Number of Dependents. | | | Income per month. | | | | | | Monthly Expenditure of whole Family. | | | | | |

TABLE exhibiting the Monthly Income and Expenditure of 100 Families in Zillah Chittagong, Bengal, 1849, in Rupees, Annas, and Pies.

| | Name. | Caste. | Employment. | Number of Dependents. | | | Income per month. | | | | | | Monthly Expenditure of whole Family. | | | | | |

The mean wages of the husbands amount to Co.'s rupees 3-3-5, whilst those of the wives are 3as. 1p.: columns 12 and 13 show us that, whilst by far the largest proportion of the sums devoted to food is spent in rice, dhal is consumed in very small quantity. The outlay on salt exhibits a large figure in column 14, whilst column 29 was formed with the view of ascertaining whether they obtained a sufficiency of this important condiment.

Having thus endeavoured to determine the average income and expenditure of one hundred families, who may be regarded as types of the great mass of the inhabitants of Bengal, it became a point of interest to ascertain the actual quantity and quality of food consumed daily by the same class. No opportunity for effecting this inquiry occurred during my subsequent stay at Chittagong. As soon as I became sufficiently acquainted with Rajeshaye, however, I put it in operation. Forms of inquiry regarding the separate daily consumption of food of twenty men were accordingly placed in the hands of six darogahs, attached to the same number of separate thannahs of Rajeshaye. These were accompanied by full instructions to the effect that twenty inhabitants of the nearest village should be individually and separately questioned as to the amount and kind of food daily consumed by each. On my receipt of these detailed tables, the totals for every five men were tabulated, and from their total again the mean quantity was computed. The fact of six returns, made by as many separate inquiries, differing so little from each other in mean results, and approximating so closely to the table formed by myself, on which I bestowed considerable care, gives them a claim to reliability, which in the absence of such checks they would have failed to possess.

TABLE showing the Bazaar rate per Sicca Maund of articles of Food in Rampore Baulcah, for each month of 1852, in Rupees, Annas, Gundas

Names of the Months	Rice.	Dhal.	Vegetable	Fish	Salt.	Oil.	Tobacco.	Mussala.	Wood.
	Rs a g	Rs. a. g	Rs a g	Rs. a. g.	Rs a g.	Rs a g.	Rs. a. g.	Rs. a. g.	Rs. a. g.
January	0 15 10	1 9 0	0 4 12	4 9 13	4 0 0	5 5 6¾	2 8 0	2 3 16	0 2 0
February	0 15 8	1 8 11¾	0 4 12	5 2 10	4 0 0	5 0 6½	2 8 0	2 5 0	0 2 0
March	1 0 4¼	1 9 2¼	0 4 11½	3 13 18¼	4 0 0	5 0 6¾	2 8 0	2 6 0	0 2 0
April	0 15 17½	1 3 19	0 4 1¾	4 6 7	4 0 0	5 0 6½	2 8 0	2 5 6¾	0 2 0
May	1 0 3¼	1 3 19	0 5 13¼	4 4 14	4 0 0	5 14 0	2 8 0	2 1 7½	0 2 0
June	1 13 1¾	1 4 0	0 9 0	4 4 0	4 0 0	5 7 17	2 8 0	1 12 2	0 2 0
July	1 1 0	1 4 0	0 7 2	4 3 13	4 0 0	5 8 16	2 8 0	1 13 8	0 2 0
August	1 1 14½	1 3 19	0 7 2	6 1 0	4 0 0	5 6 15	2 8 0	1 9 3¼	0 2 0
September	1 2 18¾	1 6 2¾	0 5 13¼	6 0 0	4 0 0	5 6 14¾	8 0	1 6 0	0 2 0
October	1 6 10	1 7 5	0 4 7	6 13 0	4 0 0	5 6 18¼	2 8 0	1 8 8	0 2 0
November	1 2 0	1 6 6	0 5 13	4 13 10	4 0 0	5 9 6	2 8 0	1 14 13	0 2 0
December	1 4 0	1 7 5	0 2 16½	4 4 0	4 0 0	5 14 15	2 8 0	1 12 0	0 2 0
Average of the year	1 1 14	1 16 2¼	0 5 8	4 14 7	4 0 0	5 6 15¾	2 8 0	1 14 15¼	0 2 0

Sufficiency of food, and income in excess of necessary expenditure, constitute two important elements of the Public weal, and these would certainly appear to have been in existence in the portion of Bengal from which my observations are derived. That many and various social evils yet exist cannot be doubted, but want of means to procure a sufficiency of food for the retention of life and health would not appear to be one of them, except in special famine years, and, so far, Bengal may be considered to exhibit as small an average deficiency of the comforts of life as any modern nation.

TABLES 1 to 4, showing the Average Quantity of Food consumed Daily by Four Classes of Adult Men in Zillah Rajeshaye, in the Month of March, 1852.
N. B.—In Kutcha Weight—Seers, Chittacks, and Kachas.

No. 1.

Number of Men subjected to inquiry.	Names of the Thannas and Ghatees at which inquiry was made.	Total quantity and kind of Food consumed by Hindoo Ryots.																							
		Rice.			Dhal.			Salt.			Fish.			Meat.			Spice.			Vegetable.			Milk.			Oil.			Total.		
1	2	3			4			5			6			7			8			9			10			11			12		
		S.	C.	K.	S	C.	K	S.	C	K	S	C.	K.	S.	C	K.	S.	C	K	S.	C.	K.	S	C.	K	S.	C.	K.	S.	C.	K.
5	Bauleah	5	6	0	1	5	0	0	5	1				...			0	1	1	1	2	0	...			0	4	2	...		
5	Tanore	5	0	0	1	4	0	0	2	2							0	2	2	1	4	0				0	3	3			
5	Bhobaneegunge	4	11	0	1	2	0	0	1	0							0	1	0	2	0	0	...			0	0	2	...		
5	Godagary	5	0	0	1	4	0	0	2	2							0	1	1	0	12	0	.			0	2	2	..		
5	Ghatee Surdah	6	14	0	1	4	0	0	5	0		...		.			0	1	1	0	10	0				0	5	0	..		
5	Do. Pooteah	6	0	0	1	4	2	0	4	0							0	1	0	1	6	2	.			0	2	0	..		
	Total	32	15	0	7	7	2	1	4	1		...		...			0	8	1	7	2	2				1	2	1	..		
	Daily mean for each man	1	1	2	0	4	0	0	0	2	0	1	0				0	0	1	0	3	3	0	1	0	0	0	2	1	12	2

No. 2—By Mussulman Ryots

5	Bauleah	5	6	0	1	4	0	0	5	0		..		..			0	1	1	1	2	0				0	4	2	...		
5	Tanore..	6	0	0	0	15	0	0	3	3		.					0	1	1	1	4	0	..			0	5	0	...		
5	Bhobaneegunge	4	11	0	1	2	0	0	1	0				..			0	1	0	2	0	0	..			0	0	2	...		
5	Godagary	5	0	0	1	2	0	0	2	2		..		..			0	1	1	0	10	0	..			0	2	2	...		
5	Ghatee Surdah	7	8	0	1	4	0	0	5	0		..		..			0	1	1	0	6	0	..			0	5	0	...		
5	Do. Pooteah	5	13	0	1	4	1	0	3	3		..		.			0	2	1	1	5	3	..			0	2	2	...		
	Total...	34	6	0	6	15	1	1	5	0		..		..			0	8	1	6	11	3	..			1	4	0	...		
	Daily mean for each man	1	2	1	0	3	2	0	0	2	0	1	0	0	0	2	0	0	1	0	3	2	0	1	0	0	0	2	1	13	0

Number of Men subjected to inquiry.	Names of Thannas and Ghatees at which inquiry was made.	Total quantity and kind of Food consumed daily by Hindoo Coolies.									
		Rice.	Dhal.	Salt.	Fish.	Meat.	Spice.	Vegetable.	Milk.	Oil.	Total.
1	2	3	4	5	6	7	8	9	10	11	12
5	Bauleah	S. C. K. 5 6 0	S. C. K. 1 2 0	S. C. K. 0 5 0	S. C. K. ..	S. C. K. ...	S. C. K. 0 1 1	S. C. K. 1 0 0	S. C. K. ...	S. C. K. 0 4 3	S. C. K. ...
5	Tanore..	5 0 0	1 4 0	0 2 2	..	...	0 2 2	1 4 0	...	0 3 3	...
5	Bhobaneegunge	5 0 0	2 0 0	0 5 0	..	...	0 1 0	2 0 0	...	0 0 3	...
5	Godagary	5 0 0	1 4 0	0 2 2		.	..	1 0 0	..	0 2 2	...
5	Ghatee Surda...	6 14 0	1 4 0	0 5 0	..	...	0 1 1	0 10 0	...	0 5 0	...
5	Do. Pooteah	5 11 0	1 2 2	0 3 2	*	*	0 4 0	1 5 2	*	0 2 1	...
	Total	32 15 0	8 0 2	1 7 2	...	..	0 10 0	7 3 2	...	1 3 0	...
	Daily means for each man	1 1 2	0 4 1	0 0 3	0 1 0	..	0 0 1	0 3 3	0 1 0	0 0 2	1 13 0

No. 4.—By Mussulman Coolies

5	Bauleah	S. C. K. 5 6 0	S. C. K. 1 5 0	S. C. K. 0 5 0	S. C. K. ..	S. C. K. ..	S. C. K. 0 1 1	S. C. K. 1 2 0	S. C. K. ..	S. C. K. 0 5 0	S. C. K. ..
5	Tanore	5 0 0	0 10 0	0 2 2	..	.	0 1 1	0 10 0	..	0 2 2	..
5	Bhobaneegunge	5 0 0	2 0 0	0 5 0	...	..	0 1 0	2 0 0	..	0 0 3	..
5	Godagary	5 4 0	1 3 0	0 2 2	..	..	..	0 10 0	..	0 2 2	..
5	Ghatee Surda	7 8 0	1 4 0	0 5 1	..	..	0 1 1	0 10 0	..	0 5 0	..
5	Do. Pooteah	5 9 0	0 15 1	0 3 0	*	*	0 3 2	1 5 0	*	0 2 1	..
	Total	33 11 0	7 5 1	1 7 1	...	...	0 8 1	6 5 0	...	1 2 0	..
	Daily means for each man	1 2 0	0 3 3	0 0 3	0 1 0	0 0 2	0 0 1	0 3 1	0 1 0	0 0 2	1 13 0

** The mean quantities of fish, meat, and milk are derived from statements accompanying the detailed Tables. In calculating "totals" and "means" small fractions are omitted. Columns 6, 7, and 10 are left unfilled in consequence of the articles of food therein referred to being consumed only occasionally, and their insertion in a table showing daily consumption thus becomes difficult. The note appended to the Table will, however, show how the means have been obtained. The meat generally consumed by the Moosulmans in this zillah is cow-beef.

I am not disposed to place any great faith in the statistical accuracy of the darogahs, but the fact of the totals from separate thannahs of the district, between the officers of which no intercommunication on the subject is at all likely to have taken place, exhibiting no great discrepency, is intrinsic evidence in favour of the average arrived at, being a fair exposition of the daily food of the people.

With the view of correcting any inaccuracy, however, which might arise from careless inquiry, I personally instituted a similar one amongst twenty men in the Sudder station, which I give in detail in the following Tables A and B :—

Table A

Showing the average quantity of Food consumed daily by 20 Mussulman Coolies in Rampore Baulcah, March, 1852.

N.B.—In kutcha weight Coolies working in private compound

No.	Rice.	Dhal.	Salt.	Fish.	Meat.	Spice	Vegetable.	Milk.	Oil.	Total.
1	3	4	5	6	7	8	9	10	11	12
	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S C. K.
1	1 0 0	0 4 0	0 0 2	0 4 0	0 4 0	0 0 2	0 2 0	0 8 0	0 1 0	..
2	1 0 0	0 4 0	0 1 0	0 2 0	0 2 0	0 1 0	0 4 0	0 8 0	0 0 2	..
3	1 4 0	0 4 0	0 0 2	0 4 2	0 8 0	0 1 0	0 1 0		0 1 0	..
4	1 0 0	0 4 0	0 0 2	0 4 0	0 4 0	0 1 0	0 1 0	0 8 0	0 1 0	..
5	1 0 0	0 2 0	0 0 2	0 1 0	0 2 0	0 0 2	0 2 0	...	0 0 2	..
6	1 0 0	0 4 0	0 0 3	0 4 0	0 4 0		0 4 0	..	0 0 2	..
7	1 0 0	0 8 0	0 1 2	0 4 0	0 4 0	0 1 0	0 4 0	0 8 0	0 1 0	..
8	1 0 0	0 4 0	0 0 3	0 4 0	0 4 0	0 0 1	0 4 0	0 8 0	0 0 2	..
9	1 0 0	0 4 0	0 0 3	0 4 0	0 4 0	0 1 0	0 1 0	0 4 0	0 1 0	..
10	1 0 0	0 2 0	0 0 2	0 2 0	0 2 0	0 0 1	0 2 0	0 4 0	0 0 2	..
Total.	10 4 0		0 7 1	..	.	0 6 2		.	0 7 2	..
Daily means.	1 0 1	0 1 0	0 0 3	0 1 0	0 3 0	0 0 2	0 1 3	0 1 0	0 0 3	1 7 0

Table B

Coolies working in silk filature.

No.	Rice	Dhal	Salt.	Fish.	Meat.	Spice.	Vegetable.	Milk.	Oil.	Total.
1	3	4	5	6	7	8	9	10	11	12
	S. C. K.	S. C. K.	S. C. K.	S. C. K.	S. C. K	S C. K	S C K.	S. C K	S C K	S. C. K.
1	..	0 2 0	0 0 2	0 4 0	0 2 0	0 0 0½	0 2 0	0 1 0	0 1 1	..
2	1 0 0	0 2 0	0 0 2½	0 4 0	0 4 3	0 0 2	0 2 0	0 0 0	0 0 2	..
3	1 3 0	0 4 0	0 0 2	0 3 0	..	0 1 0	0 2 0	0 8 0	0 1 0	..
4	1 0 0	0 2 0	0 0 1	0 2 0	0 4 0	0 0 2	0 2 0	0 8 0	0 0 2	..
5	0 12 0	0 2 0	0 0 2	0 1 0	..	0 0 2	0 1 2	0 2 0	0 0 2	..
6	1 0 0	0 4 0	0 0 2	0 1 2	0 3 0	0 0 1	0 1 0	0 8 0	0 0 2	..
7	1 0 0	0 2 0	0 0 1	0 2 0	0 3 0	0 2 0	0 2 0	0 8 0	0 0 2	..
8	0 12 0	0 2 0	0 0 0½	0 1 0	..	0 0 1	0 1 0	0 0 0	0 0 2	..
9	1 0 0	0 4 0	0 0 1	0 2 0	..	0 2 0	0 2 0	0 8 0	0 0 1	..
10	0 10 0	0 2 0	0 0 1	0 1 0	..	0 0 1	0 1 0	0 4 0	0 0 2	..
Total.	8 12 0	1 10 0	0 3 3	..	..	0 7 0½	1 0 2	..	0 6 0	..
Daily means.	0 14 0	0 2 2	0 0 1	0 1 0	0 2 0	0 0 3	0 1 3	0 1 0	0 0 2	1 6 1

In columns 4, 6, 7, 9, 10, of Tables A and B, the quantities noted were only consumed at varying intervals, and from a calculation based on these the mean has been computed.

Owing to the steady demand for labour in the silk filatures in, and around, Rampore Baulcah, the standard of wages is high. It is probable, therefore, that the results above shown exhibit the maximum of food consumed by the labouring population of Bengal.

With the view of testing what quantity a man could possibly consume at one time, I directed five coolies working in my compound to obtain whatever they pleased for the morning meal. The supply was brought, and carefully weighed in my presence, before and after cooking, with the following results, and was subsequently eaten before me.

Table C

Showing the quantity of Food consumed at their morning meal by 5 Mussulman Coolies, April 3rd, 1852, in kutcha weight seers, chuttaks, and kachas.

Articles.	Weight before Cooking.	Weight after Cooking.	Price.
	S. C. K.	S. C K	R. A P.
Rice	3 2 0	10 2 0	0 1 3
Dhal .. .. :	0 8 0	2 12 0	0 0 3
Salt	0 3 0	0 3 0	0 0 3
Fish	0 3 0	.....	0 0 6
Vegetables	0 6 0	1 7 0	0 0 3
Spice .. :	0 2 2	0 2 2	0 0 1½
Oil	0 2 1	0 2 1	0 0 3
Dhye	1 0 0	1 0 0	0 0 6
Total..	5 10 3	15 12 3	0 3 4½
Evening meal, said to be ⅔ of above	3 14 0	.....	0 2 8
Grand Total	0 8 3	.. ..	0 6 0½
Mean	1 15 0	.....	0 1 2½

STANDARD OF LIVING—INDIA

DIET PROVIDED FOR COOLIES ON BOARD EMIGRANT SHIPS.

From Surgeon S. B. Partridge, Government Medical Inspector of Emigrants, to J. G. G. Grant, Esq., M.D, Officiating Protector of Emigrants, Calcutta,—(dated Calcutta, the 26th March 1870.

From SURGEON S. B. PARTRIDGE, Government Medical Inspector of Emigrants, to J. G. G. GRANT, ESQ., M. D., Officiating Protector of Emigrants, Calcutta,—(dated Calcutta, the 26th March 1870.)

The natives of this country are essentially vegetable feeders, and an abrupt change from their ordinary mode of life is not likely to be beneficial. Dr. Bakewell recommends a large increase in the proportion of salt (or as it really is) dried fish. Now to this recomendation I demur: dried fish, however good, shipped here during the rainy season is very apt to spoil, and I would diminish therefore, instead of increasing, the supply. Dr. Bakewell also recommends that an ounce of rum should be daily issued to each emigrant. This change in the present practice appears to me neither necessary nor advisable. A large supply of alcoholic stimulant is at present provided for medicinal purposes, and can be issued at the discretion of the surgeon in charge, and I am certainly not inclined to advocate any increase, though I think it would be advisable to substitute good rum for brandy.

I will now proceed to point out the changes which I would propose to introduce, and to explain briefly the grounds upon which I advocate them.

It will be unnecessary for me to enter into any elaborate explanation or discussion of the principles which have guided modern scientific observers in their investigations into the amount and nature of the food necessary for the support, under varying conditions, of healthy human life. The conclusions at which they have arrived are so universally received, that I may safely venture to adopt them without comment. It has been proved that, even taking a liberal view of the question, a man living in a state of quietude, such as the life on board ship, requires daily about 20 ozs. of carbonaceous and 2·97 ozs. of nitrogenous food equivalent to 200 grs. of nitrogen and 4,300 grains of available carbon daily: this may therefore be safely taken as a basis of calculation. I believe it to be in excess of the actual requirements of the natives of this country, and I am supported in this belief by the experience of the sufficiency of the labor diets of the Bengal jails, which, as shewn in the following tables, contain considerably less nitrogen than is deemed in Europe to be necessary to support a life of *idleness*.

The truth is, that in this country no physiological observations have yet been made similar to those upon which the calculations of European observers are based, but there can be no reasonable doubt that calculations founded upon European data will not err on the side of insufficiency. The following analysis of the jail labour diets prove them to consist of a mean daily allowance in the diets for Bengalees, Ooryas, and Assamese, of 2·7 ozs. of nitrogenous and 19·77 ozs. of carbonaceous food, equivalent to 180 grs. of nitrogen and 4,689 grs. of available carbon; and in the diets for natives of the North-Western Provinces, Behar, and the Punjab of 2·765 of nitrogenous and 19·155 ozs. of carbonaceous food, equivalent to 187 grs. of nitrogen and 4,639 grs. of available carbon. Even in the central jail at Alipore where the work imposed upon the prisoners is of an arduous character, the two scales of diet, which experience has proved to be amply sufficient, represent only in the case of the rice diet, 198 grs. of nitrogen, and 4,767 grs. of carbon, and in the flour diet, 2,090 grs. of nitrogen and 5,159 grs. of carbon.

Nutritive value of the labour diets given in the Bengal Jails on alternate days to Bengalees, Oorjas, and Assamese.

Articles.	Quantity.	Water.	Albumen, &c.	Starch, &c.	Sugar.	Fat.	Salt.	Nitrogen.	Available Carbon.
	oz.							grs.	grs.
Rice	20·57	2·67	1·3	16 27	08	14	·1	87·42	3512·33
Dhal..	4·114	·62	·95	2 28	08	09	1	63·767	693·98
Vegetables	4·114	3·74	·05	21	09	....	02	3·34	67·62
Animal food.. ..	4·114	2·96	·75	....	....	2	2	48·6	488·53
Oil	·34	·05	....	....	....	28	007	.....	137·2
Salt	·26	.. ..	...	....	....	....	26	.....	.....
Total ..	33·512	10·04	3 05	18 76	25	71	687	203 127	4899·66
Rice..	20·57	2·67	1·3	16 27	08	14	·1	87 42	3512·33
Dhal..	4·114	·62	·95	2 28	08	09	·1	63·767	693·98
Vegetables	8·228	7·48	1	42	18	....	·04	6·68	135·24
Oil	·34	·05	....	....	..	28	·007	.....	137·2
Salt	·26	.	....	....	.....	....	·26	.....	.. ...
Total ..	33·512	10·82	2 35	18 97	134	51	·507	157·867	4478·75
Mean daily value of the scales ..	33 512	10·43	2 7	18 865	295	61	·597	180·497	4689 205

Nutritive value of the labour diets given on alternate days to natives of Behar, the North-Western Provinces, and the Punjab.

Articles.	Quantity	Water.	Albumen, &c.	Starch, &c.	Sugar.	Fat.	Salt.	Nitrogen.	Available Carbon.
	oz.							grs.	grs.
Rice ..	12·342	1·6	·78	9·76	·05	·08	·06	52·466	2107·396
Attah ..	10·285	1 54	1·11	6·82	·43	·21	·17	74·566	1735·6
Dhal ..	2·057	·31	·47	1 14	·04	·045	·05	31 883	346·99
Vegetables	4·114	3·74	05	·21	·09	.. .	·02	3·34	67·62
Animal food	4 114	2·96	·75	.....	....	·2	·2	48·6	488·53
Oil ..	·34	·05	.....		.. .	·28	·007		137·2
Salt ..	·26	.		..	...	....	·26		
Total	33 512	10·20	3·16	17 93	·61	·815	·767	210 855	4883·336
Rice ..	12 342	1·6	·78	9·76	·05	·08	·06	52 466	2107·396
Attah ..	10·285	1·54	1 11	6·82	·43	·21	·17	74·566	1735·6
Dhal ..	2·057	·31	47	1·14	·04	·045	·05	31·813	346·99
Vegetables	1 114	3·74	·05	21	·09	...	·02	3 34	67 62
Oil ..	·31	·05				·28	·007	.....	137 2
Salt ..	·26						·26	.....	... ..
Total	29·398	7·24	2 41	17·93	·61	·615	·567	162 255	4394·806
Mean daily value of the 2 scales	31·455	8·72	2 785	17 93	·61	·715	·667	186·555	4639·071

I now proceed in a similar manner to show the nutritive value of the diets now in use on board the emigrant ships, and of the diets which I suppose to substitute for them. It must be borne in mind that even at present the amount of food at the disposal of the surgeon in charge is considerably in excess of the actual diet scale, because stores are put on board at the scale rate sufficient for a period of 126 days, and *in addition*, an ample supply of dry food, consisting of biscuit, choorah, gram, and sugar, for an additional eighteen days, whilst the voyage rarely exceeds 100 days.

Present scale of rice and flour diets.

Articles.	Quantity.	Water	Albumen, &c.	Starch, &c.	Sugar.	Fat.	Salt.	Nitrogen.	Available Carbon
	oz.							grs.	grs.
Rice	20·	2 6	1 26	15 82	·08	14	1	85	3415·
Dhal	4·	6	92	2·22	08	08	·1	62·	675·
Dried fish...	2·	1 56	36	..	...	·06	·02	24·	109·
Vegetables	4·27	3 89	05	22	·09	..	·03	3·47	70·
Ghee	1·	·15	..	..	..	·83	02	..	403·5
Mustard oil	·5	15	..	..	..	·83	..	...	147·
Salt	1·	..	..	..	..	..	1·	..	...
Total.....	32·77	8 95	2 59	18 26	·25	1·96	1·27	174·47	4819·5
Flour	13·3	1 99	1 44	8 82	56	·27	·23	56·	2244·
Dhal	4·	6	92	2 22	08	08	·1	62·	675·
Dried fish.....	2·	1 56	36	...	..	·06	·02	24·	109·
Vegetables	4·27	3 89	·05	22	09	..	·03	3·47	70·
Ghee.....	1·	15	..	..	..	·83	·02	..	403·
Mustard Oil.....	·5	15	..	..	..	·85	...	..	147·
Salt	1·	..	..	...	...	...	1·	..	...
Total.....	26 07	8 34	2 77	11 26	73	2 09	1 40	185 47	3648·5

Proposed scale of rice and flour diets.

Articles.	Quantity.	Water.	Albumen, &c	Starch, &c..	Sugar.	Fat.	Salt.	Nitrogen.	Available Carbon.
	oz.							grs.	grs.
Rice	20·	2·6	1 26	15·82	·08	·14	·1	85·	3415·
Dhal	6·	·9	1 38	3·32	·12	·13	·15	93·	1012·
Preserved mutton	2·5	1·8	·46	.	...	12	12	29·5	297·
Vegetables	4·27	3·89	·05	·22	·09	...	03	3·47	70·
Ghee	1·	·15		...	...	·83	02	..	403·5
Mustard oil	·5	·15	.	...	.	·85	..	.	147·
Salt	1	...	.		...	..	1·	..	...
Total	35·27	9·49	3 15	19 36	·29	2·07	1·42	210·97	5344·5
Flour	16·	2·4	1·73	10·6	·67	·32	·27	116·	2700·.
Dhal	4·	·6	·92	2·22	·08	·08	1	62·.	675·
Preserved mutton	2·5	1·8	·46	..	..	·12	·12	29·5	297·
Vegetables	1·27	3 89	·05	22	·09	..	·03	3·47	70·
Ghee	1·5	·23	...	..	..	1 25	·03	..	60·525
Mustard oil	··	15	...	..	..	·85	..	..	147
Salt	1·	...	...	..	..	..	1·	..	...
Total.. ...	29·77	9 07	3·16	13·04	84	2·62	1·55	210·97	4494·25

It will be seen from the above analysis that the present rice diet is deficient in nitrogen when compared with the standard I have quoted above, containing 174 47 grs. only instead of 200 grs., whilst the flour diet is deficient in both nitrogen and carbon, containing only 185·47 grs. of the former and 3648·5 grs. of the latter, instead of 200 grs and 4,300 grs. respectively.

The scales of rice and flour diet I have proposed more than meet these deficiences.

I have purposely under-estimated the nutritive value of the vegetables to allow for waste, but with reference to this item I would strongly recommend that preserved potatoes should invariably be shipped in sufficient quantity to allow of an issue twice a week of two ounces to each emigrant.

It will be observed that I have substituted mutton for the fish in the old scale, and that I have increased the quantity by half an ounce. My reasons for this change are briefly the following: dried fish readily spoils and preserved mutton can now be easily obtained from the Australian colonies; I would therefore recommend that dried fish be put on board only in sufficient quantities to allow of an issue of 2 5 ounces daily to each emigrant for the first fortnight, and that preserved mutton be employed for the remainder of the voyage. I have increased the quantity also to allow of the number of the sheep being diminished by half. Sheep rarely thrive well on board ship, and they occupy a considerable amount of deck space; I would therefore recommend that 5 sheep per 100 emigrants be put on board for the future instead of 10.

During the first fortnight, whilst fish is being issued, it would be well to increase the issue of ghee by about half an ounce per man, as fish, as shown by the analysis, is deficient in fat.

The experience of the different emigration surgeons has shown conclusively that Indian emigrants do not object to preserved meat, nor will it be necessary, as Dr. Bakewell seems to suppose, for the meat to be specially prepared with a portion of the bone remaining; preserved meats have long been used freely on board every emigrant ship for the sick and weakly, and therefore their more extended use can scarcely be looked upon in the light of an experiment.

The following analysis shows the nutritive value of the eighteen day's issue of dry provisions at present shipped, and proves it to be in excess of the standard I have quoted:—

Articles.	Quantity.	Water.	Albumen, &c.	Starch, &c.	Sugar.	Fat	Salt	Nitrogen.	Available Carbon
	oz.							grs.	grs
Biscuit .	33·77	12·49	2·74	16·	1·22	54	78	185·735	4168·48
Chioorah.	3·55	·46	·22	2 8	01	02	02	15·09	606·16
Gram.....	2·7	·4	·62	1·49	05	06	07	41 85	455
Sugar...	2·	·1			1·9		.	..	369
Total....	42·02	13·45	3·58	20·29	3 18	62	87	242·675	5598 64

These provisions are intended to be issued during bad weather, when the usual food cannot be cooked, and has eighteen such days are scarcely to be anticipated in even the worst voyage, the arrangement practically places at the disposal of the surgeon in charge a considerable excess of thoroughly nutritious food which he may make use of at his discretion, and this arrangement I think it would be well still to maintain.

It is exceedingly difficult in victualing an emigrant ship to arrange for a proper proportion between the rice and the flour diets. The present rule is that stores are put on board for two-thirds rice and one-third flour, and no doubt when the rule was established this was the usual proportion between the rice-feeders and the flour-feeders. Of late, however, in consequence of changes in the recruiting grounds, the proportions have been nearly reversed, and for the present it would be better certainly to provide for two-thirds flour-eaters and one-third rice-eaters.

I would suggests that the rule should be revised and modified annually on the basis of a careful analysis of the relative numbers recruited from the flour-eating and rice-eating population during the previous season.

Some of the details of the Cooly Emigration from Calcutta to the colonies are of general interest

The total number of emigrants during the season 1869-70 was in excess of the number despatched during the season immediately preceding, increasing emigration to Demerara having been the chief cause. The numbers actually were :—

	In 1868-69.	1869-70.
Demerara	5,014	6,685
Trinidad	2,248	2,935
Jamaica	1,426	924
St. Vincent	349	None.
Mauritius	1,237	1,499
Total ...	10,274	12,043

The proportion of females to every 100 statute adult males despatched during the season was :—

To	Demerara	49·37
„	Trinidad	57·69
„	Jamaica	42·03
„	Mauritius	40·53

There was no emigration from Calcutta to Reunion, Natal, Grenada, St. Lucia, St. Kitts, St. Vincent, and St. Croix.

During the season the following numbers of coolies returned to Calcutta from the colonies, but it is remarkable that none have returned from Jamaica since the year 1848 :—

From	Demerara	418
„	Trinidad	369
„	St. Lucia	294
„	Grenada	75
„	Mauritius	974

The coolies are well-cared for in the Calcutta Depôts, but as regards mortality on the voyage, Dr. Partridge, the Government Medical Inspector, says ;—

"Regarding the causes of mortality among Indian emigrants during transit, there is one point that deserves notice. Observation has led to the general conclusion that, other things being equal, large numbers and large percentage of mortality are practically inseparable. It is in recognition of this truth that Government restricts the number of coolies for steamers to Assam to *five hundred only*.

"As overcrowding into limited space has generally existed where mortality has been heavy, it has justly received most blame and attention ; but the following facts shew that overcrowding into limited time is also a fatal evil."

ORDINARY PROVISION OF COOLY SHIPS.

Daily allowance to each Statute adult. Children above two and under ten years of age to receive half rations.

Class.	Articles.	lbs.	oz.	dr.	Remarks.
Grain	Rice	0	20	0	
	Flour...	0	16	0	
	Dhal ... For rice-eaters	0	6	0	Urhur dhall = one-half... .. ... Gram „ = one-fourth ... ... Kolie „ = one-eighth .. .. Moog „ = one-eighth... ... ... Of the total quantity.
	Dhal ... For flour-eators	0	4	0	
Oils	Ghee ... For rice-eaters	0	1	0	Half an ounce extra allowance of ghee to each adult for every day that dried fish is supplied.
	Ghee ... For flour-eaters	0	1	8	
	Mustard oil	0	0	8	
Meats, &c.	Preserved mutton	0	2	8	In lieu of preserved mutton .. To be supplied at scale rate. Dried fish for two to three weeks. Fresh mutton (sheep*) one week.
Vegetables	1 oz Pumpkins or Yams, 2 „ Potatoes ... ., 2 „ Onions	0	5*	0	In lieu of fresh potatoes, a sufficient quantity of preserved potatoes to allow 2 oz. twice a week to each adult, or about five weeks supply at scale rate.
Curry stuffs, &c. ...	Garlic	0	0	0½	
	Mustard seed	0	0	0½	
	Chillies	0	0	0½	
	Black pepper	0	0	1½	
	Corriander seed	0	0	2	
	Turmeric	0	0	4	
	Tamarind	0	0	8	
Narcotic	Salt	0	0	8	
	Prepared tobacco	0	0	7	
	Leaf...	0	0	3	
	Firewood...	2	0	0	Or in lieu of firewood its equivalent in coal, for half the quantity.
	Water	One gallon			

DRY PROVISION OF COOLY SHIPS.

Total quantity to each Statute adult for remaining two weeks, to be issued at discretion of Surgeon, the quantity being really sufficient for about eighteen days.

Articles.	lbs.	ozs.	dr.	Remarks.
Best coarse biscuit	36	0	0	
Choorah	4	8	0	
Gram	3	8	0	Is usually eaten with salt.
Sugar	2	8	0	Used with biscuit and choorah.

To every hundred adults.

* Sheep, averaging in weight 60 lbs. each ..... Five ... .. As one sheep weighing 60 lbs. yields about 25 lbs. of available flesh, this number is equal to about one week's supply of fresh mutton at scale rate.

* *Memorandum.*—The quantity of vegetables has been purposely increased from 4·27 to 5·0 ozs., in order to make allowance for waste and decay on the voyage.

J. G. G. GRANT, M. D.
Offg. Protector of Emigrants.

Statement of the comparative cost of Patients in the Hospital of Her Majesty's 76th Regiment, Madras; and European and East Indian Patients in the General Hospital.

	Number of Diets.	Pay of Servants.	Diet Ordinary and Extra.	Wines and Spirits.	Bazaar Medicines.	Hospital Necessaries.	Clothing and Bedding.	Hospital Miscellaneous.	Total.	Cost per Diet for a month of 30 days.
				H. M.'s 76th Regiment, Madras.						
		Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Expenditure during the year 1864	31,702	2,412 15 8	13,186 7 2	3,659 6 1	20 15 4	985 6 11	574 1 9	1,534 15 7	22,374 4 6	0 0 0
Cost per Diet		0 1 2·61	0 6 7·86	0 1 10·16	0 0 ·13	0 0 5·97	0 0 3·48	0 0 9·26	0 11 3·50	21 2 9
				General Hospital at Madras, Europeans and East Indians.						
Expenditure during the year 1864	28,207	3,567 0 0	20,517 4 0	3,637 6 6	34 8 5	2,700 2 7	6,133 0 8	1,249 2 1	37,838 8 3	0 0 0
Cost per Diet		0 2 0·28	0 11 7·65	0 2 ·75	0 0 ·23	0 1 6·38	0 3 5·74	0 0 8·50	1 5 5·56	40 3 10

Table of Diets proposed for European and East Indian Patients in the General Hospital, Madras—Articles comprising the different heads of Diet for a day.

AVOIRDUPOIS WEIGHT.

Spoon.	Tea.	Beaf Tea.	Milk.	Chicken.	Low, with Pudding.	Low.	Half.	Fish.	Mixed.	Full.	Infant.
1	2	3	4	5	6	7	8	9	10	11	12
Sago ..... 2 oz Tea ..... ½ „ Sugar .... 2½ „ Milk..... 6 „ Rice, 2oz. } For Conjee water. Salt. 2 drs. }	Bread ..... 8 oz Tea ..... ½ „ Sugar .... 2½ „ Milk..... 9 „ Rice, 2 oz. } For Conjee water. Salt, 2 drs. }	Bread .....12 oz Tea ..... ½ „ Sugar ..... 1½ „ Milk..... 6 „ Beef..... 12 „ Salt ... ... 1 „	Bread ..... 1 lb Rice ..... 3 oz Including 1 oz. for Conjee water. Milk 2 pints, and 6 oz for Tea Butter ..... ½ oz Sugar ..... 2½ „ Including ½ oz for Tea Tea..... ½ oz Salt .... 2 drs	Fowl made into soup or boiled... ... 8 oz Bread .. .. 8 „ Tea. ..... ½ „ Sugar. ..... 1½ „ Milk .... 6 „ Butter ..... ½ „ Salt ... . 1 „ Barley .... 1½ „ Onions ..... 1 „ Flour .. .. ½ „ Milk ..... 1 pint Sugar..... 1 oz Eggs .... 2 No. for custard, pudding. N. B.—The fowl may be roasted or grilled. In such cases the requisite quantity of ghee may be used, and the Barley, Onions, and Flour, excluded.	Mutton in broth ...8 oz Bread ...8 „ Tea ..... ½ „ Sugar .... 1½ „ Milk .....6 „ Butter. ... ½ „ Onions.....1 „ Barley..... ½ „ Flour .... ½ „ Salt..... ...1 „ Rice..... 2 „ Milk..... ½ pt Sugar ..... ½ oz Eggs .....2 No for rice pudding.	Mutton in broth ..8 oz Bread ....12 „ Tea ..... ½ „ Sugar. ... 1½ „ Milk .....6 „ Butter.... 1 „ Onions.....1 „ Barley... ½ „ Flour..... ½ „ Salt ... 1 „	Mutton ... ...8 oz Bread... ....1 lb Potatoes . 8 oz Tea..... ½ „ Sugar..... 1½ „ Milk ..... .6 „ Butter ..... 1 „ Onions .....1 „ Barley . . ½ „ Flour..... ½ „ Salt ... . .1 „	Fish . .....8 oz Bread. ..... 1 lb Potatoes . .8 oz Tea.... ..... ½ „ Sugar.. ... 1½ „ Milk ..... .6 „ Butter . ...2 „ Salt ... ...1 „	Coffee .....1½ oz Hoppers .....No 6* Mutton for curry ...8 oz Rice .....8 „ Curry Powder. ... ½ „ Sugar ... .1½ „ Milk ....6 „ Butter .. ..1 „ Bread ... .8 „ Country vegetables.4 „ Salt .....1 „	Meat, either Beef or Mutton.....12 oz Bread .....1 lb Potatoes .....12 oz Tea .....½ „ Sugar .....1½ „ Milk ..... 6 „ Butter . ..... 1 „ Onions ..... 1 „ Barley ..... ½ „ Flour..... ½ „ Salt ..... 1 „ N. B.—In this diet the meat may be roasted or broiled. In such cases the diet to be marked "Full varied," and Onions, Baley, and Flour to be excluded.	Milk .....1½ pt Sugar.....1½ oz Arrowroot 2 „ or Sago ..... 4 „

N. B.—The meat for the various diets must weigh, in the raw state, exclusive of bone, the weights specified in the Table. An addition at the rate of *one-fourth* of a pound more will be considered an equivalent when meat is issued with bone.

* "Hoppers" to weigh two ounces each when cooked.

COMMISSARIAT DEPARTMENT

MADRAS PRESIDENCY.

VICTUALLING EUROPEANS.—Statement of the Average Cost of Victualling Europeans of the undermentioned Stations, during the month of March 1870.

ARTICLES.	Bangalore.	Bellary.	Calicut.	Cannanore.	Kamptee.	Madras.	Malliapooram.	Palaveram.	Poonamallee.	Rangoon.	Ramandroog.	St. Thomas' Mount.	Secunderabad	Seetabuldee.	Thyetmew.	Toughoo.	Trichinopoly.	Vizagapatam.	Wellington.
	Aggregate Number of Men victualled during the month at each Station.																		
No.	49,595	27,405	2,771	19,614	29,751	22,649½	2,392	6,249	2,991½	21,831	1,418	15,147	62,394	1,565	13,127½	10,398½	7,328½	1,498	7,384
Bread	1 0 91	0 10 67	1 6 18	1 3 28	2 2 48	2 0 0	1 8 21	2 0 0	0 0	1 7 20	1 2 77	2 0 0	1 2 77	1 9 33	1 5 45	2 2 48	1 7 69	2 0 77	2 2 26
Potatoes	0 2 98	....	....	.....	0 5 82	....	....	.....	....	....	....	.....	.....	0 8 5	....	....	.....	1 1 0	0 4 17
Mutton	....	0 6 74	....	.....	0 8 65	....	....	.....	.....	....	1 9 4	.....	.....	0 10 47	....	....	.....	0 8 24	0 10 41
	1 10 76	....	2 3 40	2 5 85	....	1 5 35	2 7 96	1 5 35	1 5 35	....	.. 1	5 35	1 8 62	.....	....	 2	2 63¼	.....	.....
Beef	....	0 8 20	....	.....	1 1 57	..	.....	.....	.....	2 6 30	0 9 64	.....	.....	1 1 70	2 7 5	2 10 0	.....	1 4 53	1 4 33
Rice	0 2 22	0 2 49	0 3 0	0 2 52	0 3 0	0 2 27	0 3 00	2 27	0 2 27	0 1 60	0 3 84	0 2 27	0 2 66½	0 4 80	0 1 88	0 1 77	0 2 46¼	0 2 13	0 3 10
Tea	0 3 79	0 5 92	... ..	.....	0 6 ..	....	...	....	... .	0 4 16	0 6 20	.....	.....	0 6 12	.....	0 3 62	.....	0 7 77	0 4 3
	....	....	0 6 76	0 6 50	....	0 7 0	0 6 37	0 7 0	0 7 0	.....	 0	7 0	0 6 72	.....	0 5 90	 0	6 42½	.....	.....
Coffee	0 1 60	0 1 20	....	.....	0 2 4	...	....	.....	.....	0 2 27	0 1 8	...	....	0 2 0	... ..	0 2 1	.....	.....	0 1 82
Sugar	0 2 93	0 2 9	0 4 80	0 4 14	0 5 60	0 4 12½	0 4 44	0 4 12½	0 4 12½	0 4 77	0 4 62	0 4 12½	0 3 69¼	0 7 51	0 5 10	0 2 90	3 0	0 5 94	0 6 67
Salt	0 0 37	0 0 46	0 0 39	0 0 32	0 0 75	0 0 36½	0 0 41	0 0 36½	0 0 36½	0 0 44	0 0 73	0 0 36½	0 0 59	0 1 20	0 0 50	0 0 30	0 0 36¾	0 1 0	0 0 67
Vegetables	0 1 98	0 8 1	0 7 80	0 9 39	0 1 88	0 5 82	0 8 77	0 5 82	0 5 82	1 6 33	1 7 33	0 5 82	0 8 22	0 3 83	2 0 57	2 0 37	6 71⅞	0 1 88	0 1 60
Salt Beef	....	....	....	...	.....	.....	.....	....	.....	.....	.....	.....	....	.....	.....	0 2 17	.....	.....	.....
Salt Pork	....	....	....	.....	.....	.....	.	....	.....	0 5 15	... .	.....	....	.....	.....	0 2 17	.....	.....	.....
Pickles	....	....	....	.....	.....	.....	.. ...	....	.....	0 0 2	.....	.....	....	.....	.....	.. ...	.....	.....	.....
Dhall	....	....	....	.....	....	.....	... ..	....	.....	0 0 14	.....	.....	....	. ...	.....	.....	.....	.....	.....
Firewood	....	....	....	.....	. ....	0 3 34¾	.....	0 3 34¾	0 3 34¾	....	.....	0 3 34¾	....	.. ...	. ....	.....	.....	.....	.....
Average per man per day	4 3 54	3 9 78	5 8 33	5 8 0	6 1 85	5 4 27¼	6 3 16	5 4 27¾	5 4 27¾	7 2 38	6 9 25	5 4 27¾	4 9 27¾	6 7 1	7 2 45	8 3 79	5 5 29⅛	6 9 26	6 3 6
Add for Servants and Contingencies	0 2 87	0 4 52	0 2 30	0 2 38	0 2 40	0 0 38⅝	.....	0 0 38⅝	0 0 38⅛	0 2 16	0 2 33	0 0 38⅝	0 1 94¾	0 3 82	0 0 91	0 2 22	0 2 23⅛	0 2 25	0 2 52
Total Cost of Ration	4 6 41	4 2 30	5 10 63	5 10 38	6 4 25	5 4 66⅜	6 3 16	5 4 66¾	5 4 66⅜	7 4 54	6 11 58	5 4 66⅜	4 11 22½	6 10 83	7 3 36	8 6 15	7 52¼	6 11 61	6 5 58

Commissary-General's Office, Madras 28th March 1870.

J. LOUDON, Lieut.-Colonel, *Dy. Commissary-General*

3. *In the Central Provinces.*—It is satisfactory, too, to notice that in the Central Provinces the increase in the cultivation has chiefly taken place in the Nagpore, Wurdah, and Chandah districts of the Nagpore division, which supply the best class of, or Hinguughat, cotton.

The Jubbulpore division shows an increase, whilst in the Nerbudda and Chutteesgurh divisions a small decrease is noticeable. In the latter division, however, the settlement has not been completed; and, as the totals include the estimated area under cotton cultivation in the Tributary States, the figures cannot pretend to great accuracy.

4. *In the Berars.*—In the Berars an increase is shown in both divisions, and there can be no doubt that there the crop is a most remunerative and popular one, and likely long to hold its own. The figures now given will be found to differ slightly from the estimates prepared early in the season. The present totals are those most recently received from the district authorities, and are believed to be sufficiently correct to give a fair idea of the area under cotton cultivation. The increase in the Oomraotee district and the decrease in Ellichpore is owing chiefly to territorial exchanges, a considerable cotton-growing tract having, during the past year, been transferred from Ellichpore to the former district.

5. *Damage to the crop by the rain and boll-worm.*—With such a considerable increase in the cultivation, a larger supply of cotton than usual was, of course, looked for. You are already aware of the causes that have led to the disappointment of these expectations, and my monthly reports, and the export statements furnished to you by Mr. Dunlop, will have shown your Chamber the effect on the crop and on the trade, of the unseasonable rain that fell late in the season, and continued with more or less persistency until March. The season opened with excellent prospects. There was at first just enough sun and rain, and the crop throughout the country promised well. Then came the heavy rain when the plant was in flower, which did considerable damage not only in Central India, but in the North-Western Provinces and other cotton-growing tracts. For long it was hoped that the increased area under cotton cultivation would more than counterbalance the damage done by the rain. Even comparatively late in the season, it was felt that continued fine weather would revive the plants, and perhaps give a larger crop than had been known in any former year. But rain, and what was equally destructive to the Cotton, damp, cloudy-weather continued to the end of March, and the crop, already damaged by the rain, suffered most severely from the "boll-worm," too well known in America, but which has never before been regarded with much anxiety in Central India. Although from the first I had been most anxious not to cause unnecessary alarm, still by the commencement of February there had been so little improvement that it then became sufficiently apparent that there would be a decrease in the exports; and writing to your Chamber on the 9th of that month, I was obliged to state that there would probably be a falling off of about one-fifth, or, taking the annual exports from the Central Provinces and the Berars towards Bombay at from 250,000 to 275,000 bales, the exports for the season would probably fall to about 200,000 or 220,000 bales.

6. *Falling off in the exports.*—The result has unfortunately proved this reduced estimate to be only too correct The annexed Statement (B,) shows in detail the exports of cotton by railway from these provinces to Bombay, made up to the 19th instant, according to the calculation explained in my former Reports. The quantity carried by railway this season is taken to represent about 208,884 bales of 400 lbs. each, or 104,000 Bombay kandies. To this must be added the exports by road from Berar across the Sawurgaon ghat into the Bombay territory. The totals then stand thus—

Exports of cotton from the Central Provinces and the Berars towards Bombay, during the season 1869-70.

	Full-pressed bales.	Half-pressed bales.	Dokras or loose bags.
By railway	122,880	69,351	49,959
By road	..	...	17,094
Total bales	122,880	69,351	67,053

Taking the dokra at one-third of a "bale," and the full-pressed bale and half pressed bale to be equal to about half a "Bombay kandy," or a bale of about 400 lbs., the exports towards Bombay for the season 1869-70 are then as follows:—

By railway ..... 208,884 bales.
By road ..... 5,698 „

Total.....214,582 bales.

making a total of 214,582 bales, and showing a decrease on the exports of the previous year of 61,130 bales, or about 22 per cent., as will be explained by Statement (C.) given in the opposite page.

7. *Decrease, season* 1869-70.—An examination of Statement B. will show that this decrease has been distributed pretty evenly over the whole cotton-producing country, and that, as compared with the returns of last year, each station shows a falling off in the exports. In fact, the damage to the crop was general throughout the districts of the Central Provinces and the Berars that supply Bombay with cotton. It will be noticed that "Khangaon" now appears in the list of railway stations, and considering that the season was a bad one, and that the station was opened late in the year, the little line may be considered to have done pretty well, having carried about 40,000 bales of cotton, besides a certain quantity of other traffic. From Nandoorah 25,000 bales were despatched during the season, but nearly the whole of this was exported before the line of Khangaon was opened, and in all probability the whole of this quantity would have been sent from Khangaon had not an unfortunate delay occurred in the construction of the branch line.

8. *Nerbudda valley cotton.*—For the first time, too, some of the stations in the north-east of the Nerbudda valley are included in the annual statement of exports. The quantity of cotton sent to Bombay from these stations is small, and even before the main line to Jubbulpore was opened, they contributed some few bales which were sent down by cart to the railway at Khundwah. But the effect of the opening of the line, and the extension of cotton agencies in the interior will, doubtless, be to stimulate the trade, and encourage the cultivation of cotton in the neighbouring districts. I am sorry I am not able to include in this statement the exports from Jubbulpore towards the West, or to give details of the cotton sent this season by railway from the North-Western Provinces to Bombay. I am unwilling to delay the report for this information, which will, however, be given hereafter in my annual report. I may mention, however, that I learnt at Mirzapore that the imports to that mart, this season, of cotton from Jubbulpore and the neighbourhood had much fallen off. This was to some extent to be attributed to the bad season. But it was generally believed that much of the cotton that would otherwise have come to Mirzapore had been drained off towards Bombay. At Cawnpore and Agra also, I learnt that one or two consignments of cotton had been sent from those markets to Bombay. But this subject will be treated of more at length in my report on the North-Western Provinces.

9. *Cotton from the territory of His Highness the Nizam.*—Some of the cotton, for which credit has been taken in the statement of exports from Central Provinces and the Berars was, doubtless, grown in the Nizam's territory, south of Berar, and sent to our markets for sale. I am not able at this moment to give the exact figures of such imports, but they will be published hereafter, when the trade returns are received. The territory of His Highness the Nizam, which adjoins the Berars, has almost as much interest for your Chamber as the Berars themselves. As much of the very excellent cotton which is exported to Bombay by the Nagpore extension of the G. I. P. Railway, and the Poonah, Sholapore Line is grown in this territory, I availed myself of an opportunity, during the presence in the Berars of His Excellency Sir Salar

Jung, G.C.S.I., the Minister of His Highness the Nizam, to represent to His Excellency how valuable returns of the area under cotton cultivation, and periodical information regarding the condition of the growing crop, would be to your Chamber, and to all interested in the cotton trade. Sir Salar Jung was pleased to express his willingness to consider the matter favourably, and I hope to be able to send you hereafter full information regarding the cotton prospects in that part of India.

10. *Progress in the system of pressing cotton*—Another point to be noticed in the statement of exports is the proportion borne by pressed to unpressed cotton. In my last annual report it was noticed how the system of full-pressing and half-pressing the cotton in the interior had extended throughout the Central provinces and in the Berars. During the season 1868-69, 8 per cent. of the cotton sent by railway went down in *dokras* or loose bags, 66 per cent. in half-pressed bales, and 26 per cent. in full-pressed bales : or 8 per cent. of the quantity was sent down as "loose cotton," and 92 per cent. was "pressed." This season sees a still further advance in the proportion of full-pressed cotton 7½ per cent. only of the exports having been sent down in *dokras* or loose bags, 33½ per cent. in half-pressed bales, and the large quantity of 59 per cent. in full-pressed bales. Indeed, although the total exports this season by railway have fallen short of last year's supplies by 62,404 bales, still 52,699 more full-pressed bales were sent down this year to Bombay than last year, the figures for 1868-69 and 1869-70 being respectively 70,181 full-pressed bales, and 122,880 full-pressed bales.

11 The great progress made during the last few years in pressing cotton in the districts will be seen by the accompanying table :—

Percentage of Cotton exported by Railway during the undermentioned years.

	Dokras or loose bags.	Half-pressed bales.	Full-pressed bales.	Total dokras or loose bags.	Total pressed.
In 1865-66	100	...	...	100	...
„ 1866-67	85	13	2	85	15
„ 1867-68	27½	55½	17	27½	72½
„ 1868-69	8	66	26	8	92
„ 1869-70	7½	33½	59	7½	92½

Or, in other words, in 1866 the whole of our cotton went down to Bombay in loose bags or *dokras*.

In 1867, the system of pressing was commenced. At first "full pressing" did not make much way. 2 per cent. only of the crop passing through the full-presses. The half-presses, however, secured 13 per cent. of the cotton, and the nett result that in that year 15 per cent. of the crop went down pressed, more or less against 85 per cent. of *dokra* cotton.

In 1868, the proportion of full-pressed and half-pressed cotton advanced to 17 per cent. and 55½ per cent. of the crop respectively against 27½ per cent. the figures to which *dokras* had sunk, or nearly three-fourths of the crop was pressed against a balance of one-fourth of loose cotton.

In 1869, the number of full-pressed bales rose to 70,500, and the half-pressed bales to 177,000 of a crop of 270,000 bales ; that is say, 26 per cent. of the crop went to the full-presses, and 66 per cent. to the half-presses, making the percentage of pressed cotton to *dokras* as 92 to 8.

Now, during the season that has just closed, the number of full-pressed bales rose to 122,880 ; the number of half-pressed bales sank to 69,351 ; and only 49,959 *dokras* were sent by rail. That is to say, 59 per cent. of the crop exported went to the full-presses, 33½ per cent. to the half-presses, making the proportion of pressed cotton to *dokras* as 92½ to 7½.

12. *Increase in the number of presses.*—The number of full presses, too, has considerably increased, and the markets of Khangaon, Sheogaon, Akote, Oomraotee, Wurdah, and Hingunghat are now all supplied with machinery for packing the bales for export ; and, as noticed in my last report, the cotton grown in the vicinity of these markets can now be purchased and pressed under the superintendence of European merchants on the spot, and the full-pressed bales may be conveyed by railway from the press-houses in the Berars to the wharf at Bombay, and put on board-ship without any chance of the bales being tampered with, and the Hingunghat or Oomraotee cotton which they contain being mixed with cottons of inferior growths. Believing, as I do, that this system of purchasing the cotton at the fountain-head, and packing it for export on the spot, is calculated to sustain the fair reputation of the cotton supplied by our provinces, and to some extent, at least, to check adulteration, I confess, that, with my present lights, I regard the extension of this system with unmixed satisfaction. I believe that contrary views are held by some gentlemen of great experience, and for whose opinions I have the greatest respect. I am not as yet so prejudiced in favour of any particular system as not to be open to conviction, and I should be glad to receive from your Chamber, which, on all occasions, has been good enough to afford me the most cordial assistance, an expression of opinion regarding the working of this system, and of its effect on the cotton trade.

13. *Satisfactory working of the railway traffic.*—It is but fair that I should here mention that there has been no recurrence of the blocks on the Railway line which some years ago used to form a prominent subject in my report, and that the working of the traffic has been satisfactory.

14. *Measures adopted to improve the cultivation.*—From the reports that have been from time to time submitted to you, your Chamber must be aware of the steps that, under the orders of His Excellency the Viceroy, have been taken during the year to improve the cultivation cotton crop, and to assist the trade in these provinces. It may, however, be convenient to follow the plan pursued on former occasions, and, at the close of the season, to recapitulate briefly the chief measures that have been adopted towards these ends. You will, doubtless, remember that, on the samples of exotic cotton grown in the Berars being submitted to you last season, your Chamber expressed very decidedly the opinion that "no "exotic variety that could be grown in the Berars will equal in value and usefulness the indigenous varieties of the country "known as Oomraotee and Hingunghat ;" and the Committee are of opinion that whatever can be done to maintain the present high character of these varieties, or if possible to improve it, would be one of the most important services that can be rendered to the cause of improved cotton cultivation in the districts of country under the Cotton Commissioner's superintendence.

15. *Failure of the exotic plant.*—The season in which the samples submitted to your Chamber had been grown had not been a favourable one, and it was therefore determined to try these foreign varieties yet once more. And they have now had another and very careful trial during a season which, although unfavourable to the indigenous plant, may, from the excessive moisture, be considered to be unusually in favour of the exotic varieties. But with all the advantages of constant rain, which the plants seemed thoroughly to appreciate, the result has been unfavourable, the out-turn small, and the produce inferior. Your Chamber will, perhaps, reserve its opinion on the subject until the receipt of the samples of the produce which have been prepared for you. But I shall be surprised if the result should affect the views now held by you on the subject. The exotic plants will receive a further trial this season, and, perhaps, with the assistance of the experienced gardeners who have recently arrived, some success may yet be achieved.

16. *The hybrid plants.*—The hybrid plants sent out by Major Trevor Clarke have been watched with great attention. It is almost too early yet to give a decided opinion regarding their merits, but the plants are being most carefully studied by the Seed gardeners, who have already had some experience in such experiments.

17. *Improvement of the indigenous plant.*—In accordance with your recommendation, the greatest attention has been paid to the indigenous varieties. Besides the three Assistants appointed at the commencement of last season, the staff of the Cotton Department has recently been strengthened by the appointment of four experienced European gardeners as superintendents of experiments. These gardeners have been placed under the orders of the Assistants to the Cotton Commissioner at the model farms of Sheogaon, Oomraotee, and Hinguughat, and the fourth has been attached to the farm recently established at Boolundshuhur, in the North-Western Provinces. At these model farms, indigenous seed, selected during the former season on the plan advocated by Major Trevor Clarke, has been most carefully sown and cultivated. Various experiments have been tried, with more or less success, with manures, deep ploughing, &c. Notwithstanding an unusually bad season, the result has been satisfactory, the staple has been pronounced to be excellent, and the out-turn of cleaned cotton to the acre from the selected seed has been large, and in one case the combined effect of good seed and deep ploughing resulted in an out-turn of 255 lbs. of cleaned cotton to the acre. The case was, it is true, an exceptional one, as the soil of the field in which the crop was sown was superior to the ordinary run of the cotton-growing tracts. But from ordinary fields in the farm during this, an unfavourable, season, as much as 176 lbs. of cleaned cotton was picked from the acre. The results are, therefore, encouraging.

18. The greatest care has been taken in selecting the seed on the pedigree system from this season's crop, the inferior bolls being kept separate, and the *kapas*, or cotton in the seed, being divided into four classes. Much of the best selected seed has been distributed among the most intelligent landholders of the neighbourhood, and the remainder has been reserved for sowing in the model farms.

19. *Increase of the out-turn.*—Whilst the most strenous efforts are being made to improve the *quality* of our produce—the length and strength of the staple of the indigenous cotton, at the same time the hardly less important question of the increase of quantity—the out-turn to the acre, has, as will be seen from the above remarks, received some attention; for the measures adopted for the improvement of the staple will, it is hoped, have some effect on the out-turn also; and it may not unreasonably be expected that the produce of the healthy seed, thus carefully selected, may show a marked improvement in quantity as well as in quality. A variety of experiments have been undertaken at the farms to ascertain the means by which the increase of the out-turn may be most successfully and economically ensured. The respective merits of the various manures are being carefully tested: the "fertilizer" sent by the cotton supply Association; the Australian guano, of which a consignment was received from the Government of India; and the jail *poudette*, of which great hopes as an effective and economical manure are entertained, have all been put down at the seed gardens. The imported manures were unfortunately received too late in the season to admit of the experiments being made as thoroughly as could have been desired, and the same difficulty prevented the combined effect of irrigation and manure on the cotton plant receiving a perfectly satisfactory trial.

20. *With irrigation.* During the ensuing season, however, the experiments with irrigation will be conducted on more advantageous terms. The seed farm at Sheogaon has this season been extended to 230 acres. The site is admirably situated, and it is hoped that by damming up the neighbouring stream an effective and economical water supply may be ensured. The Special Irrigation Engineer recently appointed to Berar is now engaged in examining this site. Besides cotton, a variety of experiments will be undertaken at this and the other farms with the Rhea plant, and a variety of other produce.

21. *At Oomraotee.*—The farm at Oomraotee this season consists of 280 acres of land, and arrangements have been made for a variety of experiments with the assistance of irrigation, manure, &c.

22. *In the Hinguughat country.*—The farm in the Hinguughat country has been moved to a village named Mudnee, in the vicinity of Wurdah, the head quarters of the Wurdah district. At Mudnee a special irrigation scheme has been sanctioned and completed, and the experiment will have the advantage of an abundant supply of water.

23. *At Boolundshuhur.*—The farm at the place where I now am (Boolundshuhur, North-Western Provinces), is in the heart of the cotton country, near the great market of Khoorjah, and on the canal, from which a permanent supply of water is available. The site possesses every advantage. About 150 acres are being sown with selected cotton seed.

24. *Deep ploughing.*—So far as can at present be judged, it would appear that deep ploughing is of great benefit to the plant, and those parts of the seed farms which have been thus treated, show very favourably by the side of the fields cultivated according to the ordinary native method. The plants on the well ploughed fields were much stronger and healthier than their neighbours, and, as already noticed, 180 lbs. of clean cotton per acre was picked from these fields. This season an ordinary native field hardly yielded 50 lbs. to the acre. The experments of this season have, indeed, been so encouraging, that it is proposed to order from England a steam plough for use in the Central India country.

25. *Al-fresco Schools.*—The seed farms are also used as Al-fresco Agricultural Schools. The sons of some of the principal cultivators are employed on the farm, and the various experiments are explained to them, and to the villagers who occasionally visit the farm to learn the results of our operations, and who express considerable astonishment at the excellent crops, not only of cotton, but of tobacco, Carolina paddy, and other produce raised at the seed gardens.

26. *Measures to assist the trade.*—The remaining measures adopted by the Cotton Department during the year relate chiefly to the encouragement given to the extension of the trade in Central India. The greatest importance is attached to these measures, as it is believed that the establishment of mercantile firms in the interior, who are willing to pay a good price for good cotton, offers the very best inducement to the landholder to cultivate his crop carefully, and to extend its cultivation as much as possible. At the same time the improved machinery for preparing and pressing the cotton introduced by these firms ensures, there can be little doubt, the arrival of a large portion of the crop in the European market in a creditable condition.

27. *Improvement of the means of communication in the cotton districts.*—Every endeavour has, therefore, again been made to remove obstacles from the path of the trade's progress, and to supply its requirements. Thus the means of communication in the cotton districts have been much improved by the local authorities. The arrangements for the cotton traffic on the Great Indian Peninsula Railway, as already noticed, have been perfected.

28. *The Khangaon line.*—The construction of the branch line of railway to Khangaon was but the commencement of a system for joining our now isolated cotton markets to the main line. As you are aware, this little line was opened in March last, and has already done its share in the carrying of this season's cotton traffic.

29. *The Oomraotee line.*—The branch to Oomraotee has been surveyed, and it is hoped that the line may be ready for next season's work.

30. *The branch of Hinguughat.*—The line through Hinguughat to Chanda also has been surveyed, and there is a hope of that market soon enjoying the advantages of railway communication. I am aware that the importance of the recent discoveries of coal in this quarter are fully appreciated by your Chamber. Besides the cheapening of the carriage of goods by railway which may be expected to follow the employment of this coal, the discoveries will, it is hoped, prove of great advantage to the steam factories for cleaning and pressing cotton which are now at work in the Central Provinces

and the Berars. Surveys of both sides of the Wurdah river are now nearly completed, and it is anticipated that work may be commenced in the early part of 1871. The direction taken by the proposed line of railway will much depend on the result of the further investigations that are now being made regarding the extent and direction of the coal-field.

31. *The Chutteesgurh line.*—The scheme proposed some years ago by Sir Richard Temple for a light railway or tramway from Nagpore to the Chutteesgurh country is again under consideration, and as it has an indirect bearing on the cotton question, it may be noticed here. Chutteesgurh does not produce much cotton, but the available supply of grain in those districts is very large. If this grain-producing country could be tapped by a railway, and the large supplies of grain poured at a cheap rate into the Nagpore country, the cultivators would be able to devote to cotton much of the and which is now taken up with food grains, and the construction of this line, in addition to the other advantages promised, would thus help to extend the cultivation and increase the supply of cotton.

32. *The lines to Indore and Hyderabad.*—The branch railway from Khundwa to Indore, and that from Goolburgah to Hyderabad, have also some interest for the cotton trade, as both these lines will carry some cotton. The surveys are now being pushed on.

33. *Telegraph communication with the cotton districts.*—During the past season the offices of the Government Telegraph were at work in the cotton markets of Khangaon, Akote, Oomraotee, and Hingunghat, and I think it will be generally admitted that, on the whole, the service was well performed. Some delay in the transmission of messages was temporarily caused during the construction of a new line, which was set up by the Telegraph Department with the special object of providing a separate wire for the cotton merchants, and preventing the messages from the cotton districts being delayed by the through traffic between Bombay and Calcutta which sometimes happened when but one wire was available. And some inconvenience was occasioned by the premature closing of the telegraph office at Akote. The latter subject has, however, been brought to the notice of Government, and it is not anticipated that any similar inconvenience will occur in future.

34. *Tour in the North-Western Provinces.*—As your Chamber is aware, I have been for some time past on a tour in Bengal, the North-Western Provinces, and the Punjab. A farm, on the principle which has been found successful in Central India, has, as already noticed, been established in the North-Western Provinces, and it is hoped that other measures conducive to the improvement of the cultivation and the assistance of the trade in cotton may soon be adopted.

35. *Stocks.*—In regard to stocks there is, I believe, very little cotton remaining in the districts. The prices that have ruled throughout the season have been so favourable that there has been little inducement to either the cultivator or the dealer to keep his cotton back, and the improved communications now prevent any delay in transit. My Assistants, who have made careful enquiries on this subject, estimate the quantities in stock as follows :—

In the Hingunghat country	... 2,000 bales.
„ East Berar	... 4,000 „
„ West Berars	... 2,000 „

36. *Conclusion.*—In conclusion, I would notice that although the past season has been, as the preceding paragraphs will have shown, an unfavourable one, and although the exports have fallen short of the supplies of former years, still the prospects of the cotton trade in the Central Provinces and Berars are far from discouraging. A larger quantity of cotton was sown in 1869-70 than in any previous year, and had it not been for the exceptional weather, the crop would, undoubtedly, have been the largest ever exported from Central India. Indeed, the cultivation has been steadily increasing year by year, and prices have ruled so high during the season that has just closed, and, notwithstanding the damage to the crop, the cultivators have done so well, that there is every prospect of even a still larger area being sown with cotton during the season which has just commenced. But on this and other subjects connected with the state of the weather and the prospects of the crops, I shall hope to keep your Chamber fully informed in my future reports.—I have the honor to be, Sir, your most obedient servant,

HARRY RIVETT-CARNAC, Cotton Commissioner.

Dated Camp Boolandshuhur, 25th June 1870.

P. S., dated Simla, 4th July 1870.

This report has been delayed for a few days, in order that the latest information regarding the prospects of the season 1870-71, which may now be considered to have fairly commenced, might be supplied to your Chamber. Abundant rain has fallen, and as yet, at least, the prospects are favourable.

HINGUNGHAT.—The Assistant to the Cotton Commissioner, writing under date the 20th instant, states :—

"On the night of the 17th, we had the first burst of the monsoon, and the weather since then has been almost continuously drizzling rain.

"The cultivators have not yet begun sowing, and will not begin to do so until three or four more heavy showers of rain have fallen, for as yet the rain has not penetrated to any great depth. At the Mudnee farm we are quite ready to begin sowing as soon as a favourable opportunity occurs."

EAST BERAR (OOMRAOTEE).—Writing under date the 23rd instant, the Assistant to the Cotton Commissioner reports :—

"From the 12th up to date, we have had very heavy showers of rain, by which the soil has become so thoroughly saturated that some of the cultivators have now commenced to sow their fields with Cotton. The detail of the rain-fall is given below :—

	Inches.	Cents.
Up to the 12th June	2	33
On the 16th „	0	5
„ 17th „	4	35
„ 18th „	0	25
„ 20th „	0	33
„ 21st „	1	30
„ 22nd „	0	7
Total inches...	8	68

"The rain which fell on the 17th was exceedingly heavy; rain fell continuously for nearly 48 hours, and the water had soaked well into the ground.

"The monsoon has commenced this time earlier than was expected. On account of the heavy unseasonable showers that fell during the past two or three months, the cultivators seemed to fear that the rains might fail us towards the middle or close of the season, when they will be urgently required. This unexpected early rain has hurried on the sowing operations, and many of the fields are yet to be got into order, and the cultivators are now busily engaged in sowing or preparing their fields.

"The work in our seed garden was stopped for four days owing to the heavy rain, as was the case everywhere in the country. I am glad to report that since yesterday at noon the weather has been fine, and the work in our garden is now going on rapidly."

WEST BERAR.—The Assistant to the Cotton Commissioner, under date the 10th, writes :—

"On the night of the 7th, we had 1 inch 90 cents. of rain, consequently the ground has been pretty well saturated; in fact so much so, that I have not been able to do anything with it for the last two days."

And again, under date the 24th, he adds :—

"We have had very heavy rain, as much as 8½ inches."

Very heavy rain has fallen in the North-Western Provinces, and in Central India, and, as far as I can learn, all over the country; and the prospects in every direction are reported to be favourable.

The following reports have just been received by telegraph :—

HINGUNGHAT, 4th July.—Rain-fall up to date 8·49 inches. From the 22nd to the 1st no rain fell. During the last four days the rains have set in again steadily, and the prospects of the crop now look well.

OOMRAOTEE (EAST BERAR), 4th July.—Rain-fall up to date nine inches.

Cotton crop most flourishing.

AKOLA (WEST BERAR), 4th July.—Rain-fall 9·75 inches. Weather fine during last fortnight, and koonbies (cultivators) busy sowing. Rain is now threatening. Prospects could not be more favourable.

HARRY RIVETT-CARNAC,
Cotton Commissioner.

Simla, 4th July 1870.

STATEMENT A.

Statement showing the area under Cotton Cultivation in the Central Provinces and the Berars during the year 1869-70, *as compared with* 1868-69.

Divisions and Districts.	Acres, 1868-69.	Acres, 1869-70.	Increase.	Decrease.
Nagpore.				
Nagpore	86,081	102,919	16,868	.....
Bhundara	.....	.....	.....	.....
Chanda.	39,169	57,527	18,358	.....
Wurdah.	173,514	225,332	51,818	.....
Balaghat.	.....	.....	.....	.....
Total	298,764	385,808	87,044	.....
Jubbulpore.				
Jubbulpore.	28,180	24,963	.....	3,217
Saugor.	24,389	28,995	4,606	.....
Dumoh.	14,200	16,600	2,400	.....
Seonee.	5,317	6,431	1,114	.....
Mundlah.	1,685	1,262	.....	423
Total	73,771	78,251	8,120	3,640
Nerbudda.				
Baitool.	537	.....	.....	537
Chindwara	37,053	29,534	.....	7,519
Hosungabad	16,703	10,896	.....	5,812
Nursingpore	61,828	63,895	2,067	.....
Nimar	25,625	26,946	1,321	.....
Total	141,751	131,271	3,388	13,868
Chatteesgurh.				
Raepore	83,136	85,800	2,364	.....
Sumbulpore	7,951	76,350	.....	3,190
Belaspore	72,922	65,974	.....	6,948
Total.	235,898	228,124	2,364	10,138
Upper Godavery	691	573	.....	118
Total	750,875	824,037	100,916	27,764*
East Berar.				
Oomraotee	182,183	325,692	143,509	.....
Ellichpore	309,172	187,912	.....	121,230
Woon	131,161	134,543	3,382	.....
Total	622,516	648,177	146,891	121,230
West Berar.				
Akola	406,862	411,690	4,828	.....
Booldana	195,123	291,762	96,639	.....
Bassein.	62,211	64,157	1,916	.....
Total.	664,226	767,609	103,383	.....
Total, Berars	1,286,742	1,415,786	250,274	121,230†
Central Provinces	750,875	824,027	100,916	27,764
Berars	1,286,742	1,415,786	250,274	121,230
Grand total, Central Provinces and Berars.	2,037,617	2,239,813	351,190	148,994
Increase in Central Provinces	.....	.....	73,152	.....
Increase in the Berars.	.....	.....	129,044	.....
Total increase in the Central Provinces and Berars	.....	.....	202,196	.....

* Nett increase, acres 73,152.

† Nett increase, acres 129,044.

HARRY RIVETT-CARNAC,
Cotton Commissioner.

Camp Boolundshuhur, 25th June 1870.

STATEMENT B.

Statement showing in detail the quantity of Cotton exported towards Bombay from the Stations of the Great Indian Peninsula Railway in the Central Provinces and the Berars, during the season of 1869-70, *as compared with the exports of* 1868-69.

Stations.	Exports in the season of 1868-69.			Exports in the season of 1869-70.		
	Full-pressed bales.	Half-pressed bales.	Dokras or loose bales.	Full-pressed bales.	Half-pressed bales.	Dokras or loose bags.
Nagpore	.....	.....	680	.....	258	920
Sindee	.....	.....	296	.....	——	——
Wurdah	4,224	17,409	1,095	9,856	10,769	25
Poolgaon	.....	8,759	1,536	.....	6,188	487
Chandoor	.....	4,379	654	.....	1,368	708
Budnaira	23,384	37,608	883	37,986	11,945	132
Moortizapoor	.....	13,980	1,483	.....	11,040	2,931
Akola	.....	4,804	2,237	.....	3,360	733
Sheogaon	14,772	50,860	3,921	18,322	16,691	5,465
Khangaon	.....	.....	.....	36,948	2,553	2,397
Nandoorah	27,801	39,976	17,551	19,768	5,179	1,307
Mulkapore	.....	.....	4,261	.....	——	1,718
Khundwah	.....	.....	35,400	.....	——	10,406
Booranpore	.....	.....		.....	——	6,084
Hurdah	.....	.....	.....	.....	——	626
Seonee	.....	.....	.....	.....	——	649
Etarsee	.....	.....	.....	.....	——	818
Sohagpore	.....	.....	.....	.....	——	7,091
Garrawarra	.....	.....	.....	.....	——	7,462
Total bales	70,181	177,775	70,000	122,880	69,351	49,959

Totals.	1868-69.	1869-70.
Full-pressed bales	70,181	122,880
Half-pressed bales	177,775	69,351
	70,000	49,959
Dokras or loose bags ...	23,333 × 3	= 16,653
	271,289	208,884
Decrease in 1869-70, bales		62,405

STATEMENT C.

Comparative statement of the Cotton exported from the Central Provinces and the Berars towards Bombay during the seasons 1869-70.

	Season 1868-69.	Season 1869-70.
	Bales.	Bales.
By railway	271,289	208,884
By road	4,423	5,698
Total bales	275,712	214,582
Decrease in 1869-70, bales	61,130	

HARRY RIVETT-CARNAC,
Cotton Commissioner.

Camp Boolundshukur, 25th June 1870.

COTTON CROP—NORTH-WESTERN PROVINCES, 1869-70.

Allahabad, 25th April 1870.

From the Board of Revenue, North-Western Provinces, To Government, North-Western Provinces.

I am directed to lay before His Honor the Lieutenant-Governor the following report, with accompanying statements on the actual out-turn of the cotton crop in these provinces during 1869-70.

Up to the middle of September the plants throughout the Provinces were apparently healthy, and gave promise of an abundant yield; but, owing to the heavy unseasonable rain which fell towards the close of that month, the crop was very seriously injured, and the out-turn smaller than in any year since 1861.

The estimated and actual results were :—

Estimate.		Actual.	
Total Acreage sown with Cotton.	Total Out-turn, Maunds.	Total Acreage sown with Cotton.	Total Out-turn, Maunds.
1,127,698	973,440	1,160,898	463,802

From the above it will be seen that, though the area returned as under cotton exceeded the estimate by 33,200

acres, the actual reported yield fell short by 509,638 maunds. Taking the estimated average yield of 1,925,802 for the four great cotton-growing tracts—Meerut, Rohilkund, Agra, and Allahabad—given in para. 6 of my predecessor's letter No. 225, dated 2nd February last, the out-turn this year for those divisions is short by 1,485,618 maunds.

The actuals for the respective divisions are :—

	Total Acreage sown with Cotton.	Total Out-turn.
Meerut ...	211,465	144,858
Kumaon...	241	205
Rohilkhund ...	172,758	78,654
Agra ...	358,868	124,201
Jhansi. ...	71,872	8,068
Allahabad ...	317,550	92,471
Benares...	23,046	9,364
Ajmere ...	8,898	5,981
Total...	1,160,898	463,802 Maunds.

The out-turn of the year under report, in comparison with each of the eight previous years as given in resolution of Government, No. 994, dated 3rd April 1869, is as follows :—

	Pounds.
1861-62	95,980,000
1862-63	114,000,000
1863-64	81,493,200
1864-65	132,257,180
1865-66	62,663,280
1866-67	85,684,920
1867-68	57,875,120
1868-69	44,137,840
1869-70	37,104,160

During the three last months of the year, prices in seven of the principal marts were as below :—

Date.	Meerut.			Agra.			Furruckabad.			Cawnpore.			Allahabad.			Mirzapore.			Ghazeepore.		
	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.	Rs.	As.	Ps.
Close of October 1869.. ..	20	0	0	20	0	0	22	8	0	..			27	0	0	23	2	0	25	11	6
Do. November 1869...	22	13	9	20	0	0	23	4	0	21	0	0	27	0	0	25	0	0	25	11	6
Do. December 1869. ...	22	13	9	22	0	0	24	0	0	23	0	0	24	0	0	26	4	0	25	11	6

the prices of the nine previous months being shown in the report on the estimated out-turn of the year.

The quantity of cotton imported from other districts or from foreign territory is estimated, it will be seen, at maunds 664,060, the greater portion of which found its way to the principal markets, viz. :—

	Maunds.
Mirzapore ..	240,000
Meerut..	29,050
Moradabad ..	20,000
Agra...	60,000
Jaloun	41,000
Cawnpore ..	45,000
Total..	435,050

These figures must be looked on as approximate only, and the Board are not prepared to accept them as of any considerable value. The quantity required for local consumption is roughly given at 290,390 maunds.

In my predecessor's report on the estimated crop was given a calculation putting the home consumption at 750,000 maunds. The yield this year being 163,802, and importation 664,060, there remains for exportation, after home consumption, a balance of 377,862 maunds.

The quality of cotton is described as good in five districts, as average in twelve, and as indifferent in thirteen.

The following gives the number of screws in each district and the work done by them :—

	No. of Screws.	Quantity of Cotton pressed	
Saharunpore City...	2	5,000 maunds.	
Meerut Station	9	Not stated.	
Boolundshuhur, Khoorja	12	7,540 maunds.	By 9 presses only.
Allygurh District	21	9,787 ,,	By 5 do. 2 at Coeland 3 at Hattras.
Moradabad, Chundowsee	1	*Nil.*	
Muttra, { Juleysur, 1 / Koosee, 2 }	3	..	Not in use.
Agra Station...	30	16,875 ,,	By 10 presses.
Furruckabad ... { Futtehgurh / Ghuttea Ghat... / City... }	5	..	Not in use.
Etawah District...	3	4,000 maunds.	By 1 press ; 2 not in use.
Etah, Khasgunj...	5	...	Not in use.
Jaloun, Calpee...	2	..	Ditto.
Cawnpore Station, 10 or more...	...	9,693 bales.	By two or more presses.
Mirzapore District...	38	30,000	
Ghazeepore Station	2	1,000	

With reference to the progress of the Elgin Mills, the Collector of Cawnpore says :—"The Elgin Mills have been in "liquidation, or rather have never been out, for the last eighteen months. Some of the shareholders have now petitioned "the Court to wind up the concern. Recent operations have satisfied many people that the undertaking has great "elements of success, the chief defect being that the machinery is incapable of utilizing the indigenous cotton—at least, is "unable to make saleable twist out of it ; the consequence is that nearly all their cotton has to come from Hingunghat."

The reports from District Officers, with one or two exceptions, are silent on the subject of the demand for Native and English manufactures, and the range of prices ; but on these points all the information that could be given was embodied in the Board's report of February last.

A.—*Comparative Statement of the Area and Estimated and Actual Out-turn of the Cotton Crop in the Districts of the North-Western Provinces, for* 1869-70.

DISTRICTS.	Area and Outturn in Maund of 40 Seers or 80 lbs.				Remarks.
	1869-70.		1869-70.		
	Estimated Outturn.		*Actual Outturn in Cleaned Cotton.*		
	Acres.	Maunds.	Acres.	Maunds.	
MEERUT DIVISION.					
Dehra Doon,...	200	112	199	190	
Saharunpore,...	31,417	31,381	32,257	32,850	Condition of the crop is good.
Moozufferuuggur,	23,593	34,088	22,193	29,433	
Meerut,	43,229	54,541	43,229	27,551	No rains until the early part of September, and that almost entirely destroyed the first pickings. No sun to ripen the bolls which remained.
Boolundshuhur,	34,312	58,675	71,623	37,897	The rains of September, just when the plants were to bloom, did great injury to the buds.
Allygurh,	41,964	47,666	41,964	16,937	Late rains injured the blossoms, and reduced the bolls on the plants.
Total	174,715	226,463	211,465	144,858	
KUMAON DIVISION.					
Kumaon,	241	205	241	205	
Gurhwal,	...	.	..	...	
Total	241	205	241	205	
ROHILKHUND DIVISION.					
Bijnour,	33,766	29,143	33,766	25,814	The outturn has fallen about 12 per cent. short of the estimate, the cause being the heavy rain in September.
Moradabad,	53,744	45,627	52,465	26,690	The heavy rains considerably affected the crop.
Budaon,	38,152	25,120	38,152	1,568	Owing to heavy rains late in the season the cotton crop complete failure.
Bareilly,	28,574	32,250	27,390	18,268	The heavy rains late in the year considerably damaged the crop.
Shahjehanpore,	18,137	17,412	18,137	3,481	Three-fourths of the flowers lost by the abundant fall of rain in September and October.
Terrai,	2,308	3,259	2,848	2,830	The crop damaged by the late rains.
Total	171,681	146,811	172,758	78,651	
AGRA DIVISION.					
Muttra,	95,913	88,301	97,888	32,729	The falling-off is solely attributable to the heavy rains at the commencement of October.
Agra,	106,569	109,027	108,569	33,452	The heavy rain of October knocked off the flowers & pods.
Furruckabad,	13,967	10 568	13,967	32,138	The rain was late in falling; and, when the cotton pods were fully formed, fell so heavily that the crop has been almost destroyed.
Mynpoorie,	38,611	21,636	38,611	12,357	With little intermission rain continued to fall until the 9th October, it was only the later plants from which anything like a crop was gathered.
Etawah,	57,799	39,819	56,760	21,908	The actual outturn is 15,000 maunds less than what was estimated, owing to the heavy rains that fell in the end of August and beginning of September.
Etah,	39,243	35,000	39,243	17,717	The crop yellow and light, ruined by the heavy rain which fell as it was podding.
Total	352,132	307,351	355,068	124,201	
JHANSIE DIVISION.					
Jaloun,	48,813	28,435	17,971	6,079	The crop far short of the estimate owing to the serious injury in September by heavy rain.
Jhansie,	25,379	11,074	22,423	1,715	Crop destroyed by the late heavy rains.
Lullutpore,	1,607	1,058	1,478	244	
Total	75,829	40,567	71,872	8,068	
ALLAHABAD DIVISION.					
Cawnpore,	77,977	61,495	77,977	38,884	The rains in September, which lasted for 13 successive days, destroyed the flower and filled the young bolls with insects, so that the outturn is really the produce of the latter part of October, November, and December.
Futtehpore,	34,377	18,453	34,379	11,063	In the month of October very heavy rain fell, and the crop suffered greatly.
Banda,	132,635	106,153	131,575	25,120	Injury done to the crop by the winds and heavy rain in October.
Allahabad,	21,973	16,621	21,973	7,668	The extent of land under cotton corresponds with the estimate, but the actual outturn is less than half estimated. Causes, 1st, over-estimate, and, 2ndly unseasonable rains.
Humeerpore,	49,724	27,966	49,721	9,214	The discrepancy owing to the heavy rains of September, which ruined the crop.
Jounpore,	1,867	488	1,922	522	
Total	318,553	231,176	317,550	92,471	
BENARES DIVISION.					
Benares,	22,649	5,814	23,046	9,363	The crop abundant, but bad in quality.
Total	22,649	5,814	23,046	9,364	
AJMERE DIVISION.					
Ajmere,	8,898	15,053	8,898	5,981	The decrease in the actual outturn owing to locusts and the frosts of January. The crop very poor.
Total	8,898	15,053	8,898	5,981	

B.—*Statement showing the Quantity of Cotton Imported, the Quantity required for local Consumption, the Quality of the Crop, &c.*

Districts.	Quantity Imported.	Required for Local Consumption.	Quality of the Crop.	Number of Screws and work done by them.
		MEERUT DIVISION		
Dehra Doon	100 maunds	300 maunds	The cotton here is average good.	No machines for pressing, the native gin alone used to clean.
Saharunpore	No cotton is imported	15,000 maunds	The quality this year is good ...	Two screws have been erected in Saharunpore, quantity pressed up to date 5,000 maunds.
Moozuffergurh	1,500 maunds	About moiety of the produce.	Inferior, owing to untimely fall of rain.	None in use in this district.
Meerut	29,050 maunds	19,891 maunds	Cotton this year of very good quality.	At Meerut there are nine screws, Messrs. Middleton and Co.'s cotton is shipped without being re-pressed in Calcutta.
Boolundshuhur	3,000 maunds	20,000 maunds	Crops rather inferior	Twelve screws in the district, all at Khoorja. Screwed 7,540 mds.
Allygurh	14,500 maunds	15,525 maunds	The quality as good as that of former years.	Twenty-one screws in the district, five only, two at Coe and three at Hattras, at work.
		KUMAON DIVISION		
Kumaon	20 maunds	205 maunds	Average	*Nil.*
Gurhwal	.....	Not a cotton growing district.		,,
		ROHILKHUND		
Bijnour	.....	6,000 maunds	Usual quality; all grown from country seed.	No screws in this district.
Moradabad	20,000 maunds	24,000 maunds	The quality is usual	One screw at Chundowsee, but work nominal.
Budaon	200 maunds	6,000 maunds	The quality very bad	No cotton screws in this district.
Bareilly	3,600 maunds	10,374 maunds	The quality average	There are no screws at work here.
Shahjehanpore	15,000 maunds	8,000 maunds	Below average	Do.
Terrai	A small quantity imported.	.....	The crop damaged by the late rains.	Do.
		AGRA DIVISION.		
Muttra	12,000 maunds	18,000 maunds	Decidedly inferior to former years A red insect (*lalteha*) attacked the pod as it was forming.	Two screws at Kosee and one at Julleysur, but not used during the past twelve months.
Agra	60,000 maunds	2,000 maunds	The quality not good ..	Thirty screws in Agra, of which only ten are working. These screws turn out from 30 to 45 bales a day each screw, the bales weighing 300 lbs. of cotton and 11 lbs. of gunny covering, ropes, &c.
Furruckabad	3,500 maunds	The sudder tehseel imports 3,000 maunds, used in the cloth works, tent-making, &c.	.....	One screw in Futtehgurh and one at Ghuttea Ghat. In the city there are three lying unused.
Mynpoorie	No cotton imported	Two-thirds kept for local consumption.	Inferior by the unseasonable weather.	No screwing machines in this district.
Etawah	About 15,000 maunds	7,350 maunds	The quality of the crop is very inferior both as regards colour and staple.	Only one cotton screw in this district in use; confined to packing for the Calcutta market bales of 12 cubic feet containing 300 lbs. of cotton. Two powerful screws are unused.
Etah	9,000 maunds	7,500 maunds	The crop very inferior, yellowish, and very light, eaten by insects.	Five screws at Kashgunj, but not worked this or the previous year.
		JHANSIE DIVISION.		
Jaloun	11,000 maunds	10,000 maunds	The quality ordinary native, from indigenous seed.	Two screws at Calpee, but no work in the district.
Jhansie	Imports are practically *nil*	The yield about 12,000 mds. in an average year, of which 5,000 maunds required for local consumption.	The quality said to be average...	There are no screws at work in this district.
Lullutpore	70 maunds	Between 400 or 500 mds. required for local consumption.	.....	Cotton not screwed in this district
		ALLAHABAD DIVISION.		
Cawnpore	45,000 maunds	No accurate idea can be formed of local consumption.	The quality average	About ten native screw-owners have been working but only to the extent of 200 bales; the four European screw-owners screwed 9,193 bales.
Futtehpore	2,500 maunds	5,000 maunds	Suffered from the late rains.	No screws in this district.
Banda	3,000 maunds	One-fourth of the outturn	In colour and strength inferior.	No screws in this district.
Allahabad	8,300 maunds	2,540 maunds	Disappointed expectations, the pods injured by natural causes.	The cotton is packed in bales without pressing.
Humeerpore	2,000 maunds	7,800 maunds	The ordinary native but of a good description.	No screws in the district.
Jounpore	5,200 maunds	In addition to the produce of the district, 200 mds. required for local consumption	The quality good	No screws in the district.
		BENARES DIVISION.		
Goruckpore	Estimated that about 16,000 maunds are imported.	.....	The cotton medium quality, rather reddish in colour.	No screw in this district.
Bustee	12,500 maunds	12,500 are estimated to be imported from the west for local consumption.	.....	No screws in this district.
Azimgurh	10,000 maunds imported from Cawnpore & adjacent districts.	About 10,000 maunds.	.....	No cotton screws in this district.
Mirzapore	240,000 maunds	5,000 maunds.	On the whole good, but the cotton was yellowish.	Thirty-eight cotton screws working; 30,000 maunds screwed for exportation.
Benares	2,020 maunds	2,255 maunds	The crop promises well	No screws in the district.
Ghazeepore	90,000 maunds	One fifth used in the district.	.....	Two screws in Ghazeepore, 1,000 maunds per annum pressed.
		AJMERE DIVISION.		
Ajmere	Unknown	10,000 maunds	Very indifferent	No screws or presses in the district.
Estimated Total	664,060 maunds	290,390 maunds		

Abstract statement of the prices of Cotton in the principal marts of the North-West Provinces for the ten months closing with September, 1869 :—

Date.	Meerut.	Agra.	Furruckabad	Cawnpore.	Allahabad.	Mirzapore.	Ghazeepore.
	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.
December, 1868.....	18 13 2	19 8 0	18 8 0	26 0 0	21 0 0	21 4 0	22 13 6
January, 1869.....	18 2 3	18 0 0	18 12 0	25 0 0	20 0 0	21 4 0	22 13 6
February, „	20 0 0	20 0 0	19 0 0	20 9 10	22 0 0	21 4 0	17 6 0
March, „	19 6 3	17 0 0	19 5 2	20 9 10	22 0 0	20 0 0	21 5 5
April, „	20 0 0	22 0 0	21 1 0	20 5 10	22 0 0	21 14 0	20 0 0
May, „	18 13 2	22 0 0	22 0 0	20 0 0	22 0 0	21 4 0	29 0 0
June, „	20 0 0	22 0 0	21 12 0	20 0 0	23 0 0	21 4 0	21 5 4
July, „	22 1 0	22 0 0	22 0 0	23 11 3	21 0 0	25 0 0	28 3 6
August, „	22 1 0	21 0 0	23 0 0	22 0 0	23 0 0	25 0 0	26 10 9
September, „	20 0 0	21 0 0	22 0 0	25 0 0	23 0 0	22 8 0	28 7 0

The variation in prices at the same time in different localities is so remarkable, that without explanation the Board are not inclined to place much faith in the rates recorded

COTTON CULTIVATION IN THE PUNJAB IN 1869-70.

The area under cultivation in 1869 was 811,749 acres against 679,291 in 1868, and 687,321 in 1867. There has been a considerable increase in cultivation in the year under report. This increase has taken place in 21 Districts. In 6 Districts there was a decrease both in area and out turn, in one or two there was a decrease in area, but an increase in out turn, while in two Districts, Goorgaon and Hissar the crop was almost an entire failure. In these two Districts the area sown with cotton was 88,813 acres or about one tenth of the entire area of cotton cultivation in the Province.

The out turn is calculated at 618,900 maunds of cleaned cotton, or 30 seers, 8 chittacks (nearly 61 pounds) per acre. Had the area in Hissar and Goorgaon produced an out turn equal to the average of the Province, the total out-turn would have been about 679,322 maunds, or about 33 seers, 7 chittacks per acre.

From enquiries made, it was found that the original returns of 8 Districts had shown uncleaned cotton instead of cleaned. The necessary corrections have been made.

Taking the returns as they are, the Divisions in order of productiveness stand as follows :—

	Seers.	Chittacks
Jullundur ...	49	6 per acre.
Peshawur ...	48	5 „
Umballa... ...	46	9 „
Derajat	45	6 „
Umritsur ...	35	13 „
Mooltan... ...	28	8 „
Rawulpindee ...	21	12 „
Lahore ...	22	10 „
Delhi	22	0 „
Hirsar	20	9 „

Even at the best, the yield of cotton in the Punjab and in Upper India generally is very poor as compared with other countries, where the cultivation is more carefully carried on. In Egypt the yield is 500 lbs per acre.

With respect to the extent of area under cultivation, the order of Divisions is almost exactly the reverse of the above, which leads to the strange result that cotton is most extensively cultivated where it is least successful. There are, however, other reasons that influence the extent of the cultivation. The case of the Delhi Division is exceptional this year, owing to the failure of the crop in Goorgaon.

The most extensive cultivation is in the four Districts of the Rawulpindee Division, which have the advantage of an easy means of export down the Chenab and Jhelum rivers. The same may be said of the Districts of Mooltan and Mozuffergurh of the Mooltan Division, which export their surplus cotton down the Indus. In the Lahore Division, there is considerable cultivation in the Districts of Lahore and Goojranwalla. The cultivation in Ferozepore is small, but a large export trade down the river is carried on.

The average price of cotton was somewhat higher in 1869 than in the previous year. The average highest wholesale price was Rs. 19-13-8 per maund, and the lowest Rs. 17-3-0.

The price was particularly high in the following Districts, which are important export marts :—

Ferozepore	Rs. 23 per Maund.
Shahpore	„ 23 „
Mozuffergurh	„ 24-8 „
Dera Ghazi Khan...	„ 25-8 „

* The Maund is = ... 82 2/7ths lbs. avoirdupois. } 16 Chittacks = 1 Seer.
„ Seer is = ... 2 2/35ths „ „ } 40 Seers = 1 Maund.
„ Chittack is= ... ... 2 2/35ths oz. „

In Goorgaon the price was also high (Rs. 23-2), owing to the local scarcity of the article.

The lowest wholesale price in any District was Rs. 14 per maund.

The Trade Returns for the 3rd and 4th quarters of 1869-70, that is for the cold season, during which the cotton crop of the autumn of 1869 was brought into the market, show that 72,556 maunds of cotton were exported down the Indus to Kurrachee. The Town Returns show an export of 82,594 maunds—the difference represents the quantity exported in other directions.

The largest export shown in the town returns was from Mooltan—49,720 maunds.

From the remarks of the Deputy Commissioners it would appear that from 150,000 to 200,000 maunds of Cotton were expected to be available for export towards the sea-board. The river returns of boat traffic received from Sukkur, as above noted, show nothing like this quantity. A considerable quantity of Cotton was exported from Districts where it is produced, to other districts where native cloth is manufactured, such as Hoshiapore and Kangra. It is also to be remembered that the surplus Cotton of Districts is not all exported at once—some of it is held back for higher prices.

The Steamer and Railway returns do not show any very considerable quantity of Cotton exported this season. The Indus Flotilla Steamers carried only 1,300 maunds. In the Railway returns for the 3rd quarter, Cotton is not shown separately from cloth and wool. The returns for the 4th quarter have not been received. But the Cotton exported by Railway to Mooltan re-appears in the return of exports from Mooltan, and in the returns prepared at Sukker.

The total export of cotton from the Punjab to the sea-board, *via* the Indus, during the 6 months from October to March last, was not much above 80,000 maunds, which though more than last year, is considerably less than in previous years. Owing to the scarcity of food during the last two or three years, the cheap and durable native made Cotton cloth has been increasing in demand among the classes who are unable to purchase the dearer and lighter imported cloth, and the result has been to detain a considerable proportion of the stock of raw Cotton for local consumption.

It is very generally believed that the local manufacture will maintain its ground until Manchester sends to the east a cheaper and more durable fabric, and one better suited to the wants of the poorer classes.

From an interesting calculation made by a Native Deputy Collector in the North Western Provinces, and published in the *North Western Provinces Gazette* of 11th May 1870, it appears that the amount of Cotton required to clothe the population of an ordinary District is only from 3 to 4 pounds per head per annum. It is estimated that the better class of adult males use nearly 8 pounds, while the lower classes use less than 2 pounds each. A considerable quantity of raw Cotton is required for stuffing *ruzais*, which are used by all natives of the better, and most even of the lower classes in Upper India, except in and near the hills, where woollen blankets are often used. The amount of money which the mass of the people can afford to spend upon Cotton clothing is very limited, and unless a cheap and lasting material is imported from England, they will continue to manufacture cloth according to their own taste.

It is estimated that the Province contains 223,000 Cotton looms, giving employment to 700,000 people, and turning out 122 lacs of Rupees worth of Cotton cloth. This quantity divided over the whole population of 17½ millions, gives an average of a little over 11 annas per head; according to the calculation above given, the population requires only about two seers or less of Cotton per annum, which would be worth in a manufactured state, say 2 Rupees, but a considerable proportion of this is used in its unmanufactured state, so that the amount spent on imported Cotton cloth is very small. It is however very difficult to determine the exact proportion.

The external Trade Returns of 1868-69 show that 8,000 maunds of country cloth were imported, and 9,156 maunds were exported. The average value of it was about Rs. 40 a maund. The quantity of European Cotton cloth imported is stated at 31,991 maunds, and that exported at 29,002 maunds, which would leave very little for the consumption of the Province. This imported cloth is worth Rs. 100 to Rs. 130 per maund all round;—but the imports are probably under-stated.

Deducting the export of 80,000 maunds from the total out-turn of the crop, would leave some 530,000 maunds for internal consumption. This, at the average price of Rs. 18 per maund, would be worth a little over 95 lacs of Rupees. The looms of the Province turn out, as above stated, 122 lacs worth of cloth, but this represents only so much of the year's crop as is turned into cloth—there remains that portion of the crop used in its raw state. These figures are somewhat rough, but they are sufficient to show that the export of raw Cotton, and the consumption of English cloth, are very small, as compared with the internal consumption and manufacture.

Hingunghat Cotton seed was sown in a large number of plots in all parts of the Province during the season of 1869. From the reports received it appears that the experiment was for the most part a failure. The plant is apparently not so hardy as the indigenous Cotton, and exhibits a tendency to run to leaf and wood. Even under the most favorable circumstances, the yield was usually less than that of the common Cotton of the country.

Upon the whole, the prospects of the Cotton cultivation in the Punjab are encouraging. It is extending in some of the Districts best suited for it. Prices are steady, with a tendency to rise, so that the cultivation may be considered to be beyond the risk of loss, except from unfavorable seasons.

By order,

J. A. E. MILLER,

Secretary to Financial Commissioner,

Punjab.

Lahore, the 18th July 1870.

NOTE:

Traffic Returns received since this Report was written, show that nearly 30,000 maunds of Cotton were taken down the Indus to Kurrachee between the 1st April and 30th June 1870.

Comparative Statement showing the estimated extent of Cotton cultivated in the Punjab during the seasons of 1868 *and* 1869.

1	2	3	4	5		6		7		8		9		10	
Division and District.	Area under cultivation in 1869.	Out-turn.	Average out-turn per acre.	Highest wholesale prices of Cotton per maund.				Lowest wholesale prices of Cotton per maund.				Average wholesale prices of Cotton per maund.			
				1868		1869		1868		1869		1868		1869	
DELHI.	Acres.	Maunds.	M. S. C.	Rs. a. p.		Rs. a. p.		Rs. a. p.		Rs. a. p.		Rs. a. p		Rs. a. p.	
Delhi ...	32,070	19,612	0 21 8	19 8 0		21 1 0		16 0 0		17 13 0		17 12 0		19 7 0	
Goorgaon ...	48,728	2,577	0 2 2	19 6 5		23 2 0		17 0 7		19 1 7		18 4 0		21 1 9	
Kurnal ...	42,298	39,615	1 9 1	17 10 0		20 10 8		16 0 0		19 0 0		16 13 0		19 13 4	
Total...	1,13,096	61,804	0 22 0	18 13 6		21 9 10		16 5 10		18 10 2		17 9 8		20 2 0	
HISSAR.															
Hissar ...	40 115	3,633	0 3 10	17 8 0		20 6 5		11 6 8		18 6 5		15 15 4		19 6 5	
Rohtuk ...	32,517	33,600	1 1 0	17 1 3		18 8 3		18 15 0		21 2 6		18 0 1		19 13 4	
Sirsa ...	370	267	0 28 11	19 0 0		22 0 0		17 0 0		20 0 0		18 0 0		21 0 0	
Total. ..	73,002	37,500	0 20 9	17 13 9		20 4 10		16 12 6		19 13 8		17 5 1		20 1 3	
UMBALLA.															
Umballa ...	40,850	49,020	1 8 0	18 8 0		18 0 0		16 0 0		15 0 0		17 4 0		16 8 0	
Loodiana ...	11,331	10,880	0 31 0	17 8 0		17 8 0		14 2 8		14 2 8		15 13 4		15 13 4	
Simla ...	772	1,802	2 13 6	10 14 9		10 7 6		9 3 5		8 12 9		10 1 1		9 10 1	
Total...	52,953	61,702	1 6 9	15 10 3		15 5 2		13 2 0		12 10 6		11 6 1		13 15 10	
JULLUNDER.															
Jullunder ...	29,853	47,146	1 23 3	17 6 0		18 10 0		12 14 0		15 11 0		15 2 0		17 4 0	
Hooshiarpoor ...	19,460	22,101	1 5 7	16 8 8		18 5 4		14 6 4		15 5 4		15 7 6		16 13 4	
Kangra ...	8,928	2,636	0 11 13	19 10 8		20 8 4		16 0 0		18 1 5		17 13 4		19 4 10	
Total...	58,241	71,883	1 9 6	17 13 9		19 2 6		11 6 9		16 6 7		16 2 3		17 12 7	
UMRITSUR															
Umritsur ...	32 406	27,837	0 31 6	18 2 0		18 0 0		12 0 0		15 0 0		15 1 0		16 8 0	
Sealkote ...	42,078	41 845	1 2 10	18 2 0		16 12 0		15 0 0		14 5 4		16 9 0		15 8 0	
Goordaspoor ...	18,822	10,930	0 23 4	15 0 0		16 10 0		12 0 0		11 0 0		13 8 0		15 5 0	
Total...	93,306	83,612	0 35 13	17 1 4		17 2 0		13 0 0		14 7 1		15 9 8		15 12 6	
LAHORE.															
Lahore ...	50,270	27,061	0 21 5	16 0 2		17 11 0		14 4 3		17 12 8		15 2 3		17 11 10	
Ferozepoor ...	7,526	7,888	1 1 13	20 0 0		23 0 0		13 0 0		14 0 0		16 8 0		18 8 0	
Goojranwalla ...	39,385	20,027	0 20 5	11 0 0		17 0 0		11 8 0		15 5 .		12 12 0		16 2 8	
Total...	97,181	51,979	0 22 10	16 10 8		19 3 8		12 14 9		15 11 4		11 12 9		17 7 6	
RAWULPINDEE															
Rawulpindee ...	45,836	11,662	0 10 3	22 15 0		19 3 6		21 4 6		18 7 2		22 1 9		18 13 4	
Jhelum ...	32,113	11,868	0 14 12	18 6 6		18 9 9		14 7 6		16 13 9		16 7 0		17 11 9	
Goojrat ...	42,378	41.977	0 39 10	15 0 0		16 0 0		13 0 0		14 0 0		14 0 0		15 0 0	
Shahpoor ...	25,129	24,366	0 38 12	18 2 8		23 0 0		12 2 8		16 0 0		15 2 8		19 8 0	
Total...	145,456	89,873	0 24 12	18 10 0		19 3 4		15 3 8		16 5 3		16 14 10		17 12 3	
MOOLTAN.															
Mooltan ...	26,607	26,630	1 0 1	19 1 7		22 1 7		17 1 8		19 10 5		18 1 7		20 14 0	
Jhung ...	19,313	6,400	0 13 4	18 0 0		20 0 0		16 0 0		19 0 0		17 0 0		19 8 0	
Montgomery ...	34,837	16,669	0 19 8	17 4 0		17 8 0		15 8 0		16 8 0		16 6 0		17 0 0	
Muzuffergurh ...	30,934	29,820	0 38 8	19 10 8		24 8 0		17 5 4		22 0 0		18 8 0		23 4 0	
Total...	111,691	79,519	0 28 8	18 4 1		21 0 5		16 11 9		19 4 7		17 7 11		20 2 6	

SUPPLEMENT TO THE "INDIAN ECONOMIST."

THE

Statistical Reporter,

A MONTHLY JOURNAL OF STATISTICAL ENQUIRIES CONCERNING INDIA.

Vol. II.] CALCUTTA, THURSDAY, 15TH DECEMBER, 1870. [No. 5.

STANDARD OF LIVING—INDIA.

We are indebted for the following attempt to estimate the quantity of Cotton cloth annually consumed by the people of India to Mr. Luchmun Singh, Deputy Collector in the Boolundshuhur District of the North-West Provinces. According to this gentleman, the average consumption per head of population in the comparatively cold climate of Boolundshuhur, is but one seer and thirteen chittacks of cloth a year, about 3 lbs. 10 oz. The dress is nearly the same throughout the country and is of course adapted to the climate. It consists of various pieces of cloth wrapped round the body, requiring neither buttons, strings, nor pins, being kept in position simply by having the ends thrust under the folds.

CLOTHING.

LUCHMUN SINGH, *Deputy Collector, to Board of Revenue, Allahabad.*

Boolundshuhur, the 31st December 1869.

MY DEAR SIR,—WITH reference to your favour of the 24th instant, I beg to submit the statement showing the calculation for finding the average quantity of cotton cloth requisite for the annual use of each person in this district, hoping the Secretary will find the calculation reliable.

According to this calculation, which is meant for a year of fair prosperity, the total consumption of the district comes to about 36,231 maunds of cotton, and the population being 800,131 souls, the average per individual comes to one seer and thirteen chittacks nearly.

But in years of scarcity, like the present, or when cotton is too dear, as during the civil war in America and the last two years, the use of cloth is necessarily smaller.

The effects of the late famine will, I believe, last for two years more as regards the prosperity of the people; and I calculate accordingly that during these two years, as it has been for the past two, the consumption of cotton cloth in this district will not be more than 30,000 maunds per annum, or about one seer and thirteen chittacks per individual.

STATEMENT A.

Distribution of the Population of Zillah Boolundshuhur into Grades according to their circumstances in life.

	Caste.	1st Grade.	2nd Grade.	3rd Grade.	Total.	Remarks.
1	Europeans and Eurasians	156	...	...	156	
2	Brahmins	2,000	48,000	47,098	97,098	
3	Bhudrees	12	300	500	812	
4	Rajpoots	3,000	60,000	16,099	79,099	
5	Khuttrees	500	2,000	412	2,912	
6	Kaiths	2,000	5,000	1,691	8,691	
7	Jats	2,000	25,000	20,011	47,011	
8	Goojurs	112	20,000	24,000	44,112	
9	Sonars	322	2,000	2,000	4,322	
10	Lohars	61	2,700	7,000	9,761	
11	Budhyees	106	6,400	7,000	13,506	
12	Tumboolees	25	100	70	195	
13	Kulals	20	1,000	600	1,620	
14	Malees	29	3,000	7,700	10,729	
15	Aheers	198	5,000	10,100	15,298	
16	Lodhas	56	10,700	35,000	45,756	The total for each caste is taken from the Census Report of 1865, and the distribution into grades is made by guess founded on the opinion of several persons believed to be well informed with the circumstances of the people.
17	Kaeuees	...	421	2,000	2,421	
18	Kahars	26	5,000	15,000	20,026	
19	Gudrias	...	962	28,000	28,962	
20	Naees	...	6,114	10,000	16,114	
21	Dhobees	...	...	8,339	8,339	
22	Telees	...	255	7,000	7,255	
23	Barees	...	...	617	617	
24	Kolees	...	...	16,643	16,643	
25	Kombars	...	...	11,481	11,481	
26	Goshains and Byragees	71	7,000	7,000	14,071	
27	Chumars	...	1,487	118,000	119,487	
28	Bhungees	...	...	23,922	23,922	
29	Sheikhs	1,257	26,000	20,000	47,257	
30	Syuds	1,232	4,000	1,000	6,232	
31	Moguls	278	1,800	1,000	3,078	
32	Puthans	1,171	22,000	16,000	39,171	
33	Fukeers	25	500	5,400	5,925	
34	Dhoonas	...	57	4,700	4,757	
35	Jolahs	...	558	9,000	9,558	
36	Bunyas	977	30,000	3,000	33,977	
	Total	15,634	297,354	487,443	800,431	

LUCHMUN SINGH,
Deputy Collector.

STATEMENT B.

Result of Experiments to ascertain the Quantity of Cloth usually required for the use of a single person per annum in years of fair prosperity.

Grade in Life.	Age and Sex.	Number and Description of Apparel.	Average Weight. Seers	Chts.	Remarks.
1st, or well-to do.	Adult, Male.	2 Ungas of Khasa...	...	6	A few in this grade may require an extra suit or two of Unga and Pyjama, but others again do not use even so many as two suits given them in column 3.
		2 Koortas ditto	...	3	
		2 Pyjamas of Lutha	...	6	
		1 Pugree or Amama	...	3	
		2 Handkerchiefs	...	2	
		1 Doputta of Khasa	...	3	
		2 Chudras of Lutha	...	8	
		2 Dhotees (or 1 Pyjamas for Mussalmans) ...	...	11	
		4 Caps	...	1	
		1 Ruzaee to last 4 years (2¼ seers)	...	10	
		1 Toshuk (1¼ seers) to last 5 years	...	5	
		Total..... ...	3	13	
Ditto	Do. Female.	2 Lehungas or 1 Pyjamas	1	...	Only about half the women require a separate Ruzaee and Toshuk.
		3 Doputtas of Khasas	..	9	
		1 Breast cloths	...	1	
		1 Chudur (¼ seer to last 2 years...	...	1	
		1 Ruzaee (2¼ seers) to last 4 years	..	10	
		1 Toshuk for 5 years	..	5	
		Total.....	3	...	
Ditto	Boy.....	1 Ruzaee (1¼ seer) for 4 years	...	6	Children under 5 years of age require at the utmost two Koortas, which weigh about one chittak
		2 Ungas of Khasa...	...	4	
		2 Koortas ditto	...	2	
		2 Pyjamas of Lutha	...	3	
		1 Caps	...	1	
		2 Dhotees (or 1 Pyjamas)	...	1	Of the others, one-half use a separate Ruzaee, and the rest sleep with their parents.
		1 Doputta of Khasa	...	2	
		1 Warm suit	...	8	
		Total...	1	11	
Ditto	Girl.....	2 Gagrees		6	
		2 Doputtas of Khasa	...	1	
		1 Mirzaee and 1 Ruzaee	...	10	
		Total	1	4	
2nd or Middling.	Adult, Male.	1 Unga of Lutha or Gadha	...	4	About one-half of the men in this grade use Toshuks, the remainder use Dohurs of old cotton already used in Ruzaees.
		1 Mirzaee ditto	. .	2	
		2 Dhotees of Lutha or Gadha	1	.	
		1 Pugree (1 chittacks) for 2 years	...	2	
		1 Towel	...	1	
		1 Gulef (1 seer) for 2 years	...	8	
		1 Ruzaee (2¼ seers) for 5 years	...	8	
		1 Toshuk (1¼ seer) for 6 years...	...	4	
		1 Warm suit (1 seer) for 2 years	...	8	
		Total.....	3	5	
Ditto	Do. Female.	1¼ Lehungas of Gadha	1	6	About half the women want a separate Ruzaee, and very few a Toshuk.
		2 Doputtas of Lutha...	...	10	
		4 Breast cloths	...	4	
		1 Ruzaee (2¼ seers) for 6 years	...	6	
		Chudur (12 chittacks) for 3 years	...	4	
		Total	2	14	
Ditto	Boy.....	2 Dhotees of Gadha or Lutha	...	6	As a rule children under 5 years of age require no cloth except a Koorta about one chittack in weight; of the remainder, about one-half sleep with their parents, and, the others require a Ruzaee.
		1 Unga ditto	...	3	
		4 Caps ditto	...	1	
		1 Doputta ditto	...	4	
		1 Ruzaee (1¼ seer) for 4 years	...	6	
		Total.....	1	4	
Ditto	Girl.....	2 Ghagrees of Guzzee	...	8	
		2 Doputtas ditto	...	4	
		1 Ruzaee (1¼ seer) for 4 years	...	6	
		Total.....	1	2	

STATEMENT B.*

Result of Experiments to ascertain the Quantity of Cloth usually required for the use of a single person per annum in years of fair prosperity—(Concluded.)

Grade in Life.	Age and Sex.	Number and Description of Apparel.	Average Weight. Seers.	Chts.	Remarks.
3rd, or Poor.	Adult, Male.	2 Dhotees (or 4 Pyjamas)	1	...	About half the men in this grade use blankets in place of Ruzaees, and almost all use Dohurs in place of Toshuks.
		1 Ungocha	..	2	
		1 Pugree for 2 years	...	2	
		1 Mirzaee	...	3	
		1 Do warm for 2 years	...	4	
		1 Ruzaee (2½ seers) for 5 years	...	8	
		4 Caps	...	1	
		1 Chudra for 2 years	...	4	
		Total... ...	2	8	
Ditto.	Do. Female	1 Lehunga of Guzzee	1	1	Women in this grade rarely use a Ruzaee or Toshuk.
		2 Doputtás Do.	...	8	
		4 Breast-cloths	...	4	
		Chudur for 2 years		4	Kanthree made of old rags is their chief protection.
		Total... ..	2	4	
Ditto.	Boy .	2 Dhotees	..	6	Children under five years of age are naked.
		1 Mirzaee	...	2	
		4 Caps	..	1	
		1 Doputta	. .	4	
		Total... ..	...	13	
Ditto.	Girl ...	2 Ghagrees...	...	8	
		2 Doputtas...	...	4	
		Total... ...	...	12	

STATEMENT C.

Annual Consumption of Cotton Cloth in Zillah Boolundshuhur.

Grade.	Age and Sex.	Number of persons, declined by percentage.	Consumption Per Person vide Statement B. Seers.	Chittacks.	Total Consumption. Maunds.	Seers.	Chittacks.	Remarks
First.	Men	5,159	3	13	491	28	11	The Census Report of 1865 has:—
	Women	4,847	3	...	363	21	...	
	Boys	3,127	1	14	146	23	2	
	Girls	2,501	1	4	78	6	4	
	Total... ...	15,634	...	...	1,079	39	1	
Second.	Men	98,127	3	5	8,126	5	11	
	Women	92,180	2	14	6,625	17	8	
	Boys	59,471	1	4	1,858	18	12	
	Girls	47,576	1	2	1,338	3	...	
	Total... ...	297,354	...	...	17,948	4	15	
Third.	Men	160,856	2	8	10,053	29	..	
	Women	151,107	2	4	8,499	30	12	
	Boys	97,489	...	13	1,980	9	13	
	Girls	77,991	...	12	1,462	13	4	
	Total... ...	487,443	...	...	21,995	33	13	
	Grand Total... ...	800,431	...	...	41,023	37	13	

Men	262,062
Women ...	244,391
Boys ...	162,671
Girls ...	131,307
Total ...	800,431

Which gives the percentage on the total population as under:—

Men nearly 33 to each 100
Women „ 31 Do.
Boys „ 20 Do.
Girls „ 16 Do.

									Mds.	Srs.	Ch.
Total as above									**41,023**	**37**	**13**
Deduct:—											
For Infants under 5 years of age (about 40 per cent. of all children):—											
							Mds.	Srs.			
First Grade . .Boys, 1,250 ...at 1 sr. 13 chks. each ...							56	25			
Ditto ... . Girls, 1,000 . ... „ 1 „ 3 „ ...							29	28			
Second Grade ..... Boys, 23,788... .. . „ 1 „ 3 „ ...							706	8			
Ditto ... . Girls, 19,030 . . „ 1 „ 1 „ ...							505	19			
Third Grade . . Boys, 33 936 ... „ 0 „ 13 „ ...							792	4			
Ditto . . Girls, 31,196 ... . „ 0 „ 12 „ ...							584	37			
For Women requiring no Ruzaee or Toshuk :—											
First Grade ..... . 2,123 .. . at 15 chks. each							56	32			
Second ditto... . . 46,090 ... „ 6 „							432	4			
									4,792	32	0
For Men using no Toshuk :—											
Second Grade ... . 49,061... ..... at 4 chks. each...							306	26			
For Men using no Ruzaee :—											
Third Grade . . .... 80,123 . at 8 chks. each							1,005	14			
For Children above 5 years who use no Ruzaee :—											
First Grade Boys, 9,38, 30 per cent. ....at 6 chks each											
Ditto . .. .. Girls, 750, ditto ... ditto ...							316	35			
Second Grade ... Boys, 17,541, ditto . ditto											
Ditto . .Girls, 11 272, ditto ... ditto											
Balance...									36,231	5	13

Or nearly 1 sr 13 chks per person, which in a bad year may be reduced to 1 sr. 8 chks

LUCHMUN SINGH,
Deputy Collector

STANDARD OF LIVING.

Provision for Cooly Emigrants in Depôt.

Simla, the 15th October 1870.

No. 4762.—In supersession of previous orders on the subject, the following scale of diet for cooly emigrants during residence in the depots at Calcutta, has been sanctioned by the Governor General in Council, under the provisions of Section 63 of Act XIII. of 1864, and is published for general information :—

Scale of Diet for Rice and Flour eaters, respectively, showing daily allowance to each Adult, and its nutritive value

	Articles	In Ounces.							In Grains.		Remarks
		Quantity	Water	Albumen	Starch	Sugar	Fat	Salts	Nitrogen	Carbon	
		oz	oz	oz	oz	oz	oz	oz	grs	grs	
For Rice-eaters.	Rice	20	2 6	1 26	15 82	08	11	1	85	3,115	
	Dhal...	6	9	1 38	3 32	12	13	·15	93	1,012	
	Ghee	1·	15		.	.	83	02	..	403 5	
	Mustard Oil	5	·07	.			43	..	..	147	
	Vegetables	4	3 89	05	22	09	.	03	3 47	70·	
	Fresh fish or flesh	3·	1 8	46	..		12	12	29 5	297	
	Salt	5	..					·5	...	...	
	Curry-stuffs, &c	5		Variable, not estimated			..	...	...	...	
	Total.. ...	35·5	9 11	3 15	19 36	29	1 65	92	210·97	5,314 5	
For Flour-eaters.	Flour	16·	2 4	1 73	10 6	·67	·32	27	116.	2,700·	
	Dal...	4	6	92	2 22	·08	·08	1	62.	675	
	Ghee	1 5	23	..	...	...	1 25	·03	...	605·25	
	Mustard Oil	5·	07	...	...	...	·43	..	...	147·	
	Vegetables	4·	3 89	05	·22	·00	...	·03	3.47	70·	
	Fresh fish or meat	3	1·8	46	...	...	·12	·12	29.5	297·	
	Salt	·5	...	...	...	...	...	·5	...	...	
	Curry-stuffs, &c....	·5	...	Variable, not estimated			...	...	...	...	
	Total... ...	30·0	8·99	3·16	13·04	0·84	2·20	1·05	210·97	4,494·25	

N. B.—Half the quantities for children.

Scale of Provisions for Ships carrying Indian Emigrants to British and Foreign Colonies west of the Cape of Good Hope.

The length of voyage provided for (under Section 8 of Act XIII. of 1864) is twenty weeks. Water, salt, and tobacco are to be provided for the entire voyage. Ordinary provisions that require cooking, for eighteen weeks. Dry provisions for bad weather when cooking is impossible, for two weeks.

ORDINARY PROVISIONS.

Daily Allowance to each statute adult: children above two and under ten years of age to receive half rations.

Class.	Articles.	lbs.	oz.	dr.	Remarks.
Grain	Rice	0	20	0	
	Flour	0	16	0	
	Dhal — For rice-eaters	0	6	0	Urhur dal equal to one-half; Gram „ equal to one-fourth; Kulie „ equal to one-eighth; Moong „ equal to one-eighth — of the total quantity.
	Dhal — For flour-eaters	0	4	0	
Oils	Ghee — For rice-eaters	0	1	0	
	Ghee — For flour-eaters	0	1	8	Half an ounce extra allowance of ghee to each adult for every day that dried fish is supplied
	Mustard Oil	0	0	8	
Meats, &c.	Preserved Mutton	0	2	8	In lieu of preserved mutton ... To be supplied at scale rate—dried fish for two to three weeks, fresh mutton (sheep) one week.
Vegetables	1 oz. pumpkins or yams; 2 „ potatoes; 2 „ onions	0	5	0	In lieu of fresh potatoes, a sufficient quantity of preserved potatoes to allow two ounces twice a week to each adult, or about five weeks' supply at scale rate.
Curry Stuffs, &c.	Garlic	0	0	0½	
	Mustard seed	0	0	0½	
	Chillies	0	0	0½	
	Black pepper	0	0	1½	
	Coriander seed	0	0	2	
	Turmeric	0	0	4	
	Tamarind	0	0	8	
	Salt	0	0	8	
Narcotic	Prepared tobacco	0	0	7	
	Leaf „	0	0	3	
	Firewood	2	0	0	Or in lieu of firewood, its equivalent in coal for half the quantity
	Water	One gallon			

OF DRY PROVISIONS.

Total quantity to each statute Adult for remaining two weeks, to be issued at the discretion of the Surgeon, the quantity being really sufficient for about eighteen days.

Articles.	lbs	oz.	dr.	Remarks.
Best coarse biscuit	36	0	0	2 lbs per day for 18 days
Choorah	1	8	0	1 ounces „ „
Gram	3	8	0	Is usually eaten with Salt.
Sugar	2	8	0	Used with biscuit and choorah.

To every hundred Adults.

Sheep, averaging in weight 60 lbs. each	Five	As one sheep weighing 60 lbs. yields about 25 lbs. of available flesh, this number is equal to about one week's supply of fresh mutton at scale rate.

Scale of Medical Comforts, Medicines, Instruments, and Appliances for Hospital and Dispensary. For ships conveying emigrants to the West Indies.

Of Medical Comforts for one hundred Adults.

Articles.	Quantities in pounds (Avoird.)	Remarks.
Liebig's extract of meat	5	A teaspoonful (= 150 grs) dissolved in half a pint of warm water makes strong soup, which may be improved with flour, barley, finely-ground dhal, &c., well cooked
Mutton broth, 50 lbs.	100	In pound and half-pound tins.
Chicken broth, 50 lbs.		
Preserved milk	200	A pound tin of Anglo-Swiss milk, or one large (= 10 oz.) bottle of Grimwade's, with half a gallon of warm water, makes good milk
Sago	80	
Arrowroot	50	
Soojee	30	
Flour	30	
Barley (pearl)	10	
Sugar	500	For sago, &c., or limejuice, when desired with.
Tea	5	
Bail fruit (preserved)	30	A sufficient quantity of syrup or treacle should accompany *separately* to be added after inspection.
Lime juice	50 gallons.	Sufficient for eighty days, at 1 oz. a day to each adult.
Rum or Brandy	20 bottles.	
Port Wine	18 do.	

For numbers above one hundred, the quantities must be proportionally increased, according to above scale.

STANDARD OF LIVING—INDIA.

JAIL DIETARY,—BRITISH BURMAH.

ADMINISTRATION REPORT, 1869.

THERE were two uniform scales of diet in all the gaols of the Province, with the exception of Akyab, Sandoway, and Kyouk Phyoo, where the same obstinacy was shown in adhering to old usages in rationing convicts as was displayed on so many other points where the Burmah Gaol Manual prescribed anything looking like innovations.

One of these scales, believed to indicate the exact amount of food that is necessary to meet the waste of the tissues of a man employed daily on some form of severe labour, is known as the "Labouring Scale." The other is calculated as sufficient for the demands of a man's system who passes his days in idleness, and is called the "Non-labouring Scale." The first is that to which all prisoners sentenced to rigorous imprisonment and persons awaiting trial, are entitled to; the second is that supplied to all prisoners whose sentence is one of simple imprisonment, to all sick in hospital, and to all inmates who are unemployed for any reason.

The Labouring scale consists of the following articles, the weight being for uncooked food:—

	lbs.	oz	drs.
Rice	1	8	0
Vegetables	0	8	0
Meat or Fish	0	4	0
Gnapee	0	0	8
Salt	0	0	8
Oil	0	0	8
Condiments	0	0	8

The total weight is two pounds six ounces, or, in other words, 38 ounces; and there certainly can be no reason to charge the State with parsimony here. In Europe, where the body has to contend with an atmosphere many degrees below its own heat, and where consequently a large portion of food is consumed as simple fuel, physiologists tell us that thirty-two ounces of dry solid food is sufficient for an ordinary man pursuing an active out door life. If this be so there, is some reason for thinking that the Burmese labouring convicts are too highly fed. Nor can one be surprised that an error should be made in this direction. A few years ago the prisons of India attracted the attention of the civilised world to their high death rate, and to their generally discreditable condition. There can be little doubt that there was grounds for this attention, but I doubt that the mortality was due so much to an insufficient *scale* of diet as to a cruel system of peculation pursued by subordinate officials who found themselves unchecked by any proper supervision. However the Government of the day set itself to remedy the evil and escape from the odium involved. The system of supervision pursued previously in gaols was at once improved, and the quantity of food allowed to their inmates was increased. In these measures Burmah naturally shared. There is no reason to be dissatisfied with the results. The institutions so lately all but a disgrace to humanity have become an honor to British rule. So substantial and so permanent is their satisfactory condition regarded everywhere that the time appears to have arrived when their perfect sanitation may be pointed to as a proof of that want of administrative ability which has been assumed to characterize the service which brought it about. There is a bitter irony doubtless in this way of looking at what has been accomplished for our gaols by men trained to the peaceful pursuit of medicine, but it is not on that account devoid of truth;—and, indeed, it would be as reasonable for a physician to expect that his patient should return his services when restored to robust health, as to suppose that a public institution which he had been instrumental in raising from a den of vice, corruption, and starvation, to an abode of decency and order, or to a very palace of hygiene should never grow tired of his ministrations. History repeats itself is neither a very new or a very original—nor possibly a very true—saying, but I cannot avoid the suspicion that it will do so in this matter of gaols in India, and that after they have been for some time a quasi appanage of the police force or other public department and reaped the fruits of a dual administration, the doctors will again be called in to rehabilitate them;—for it is a fact which there is no gainsaying, that of all animals the most difficult to herd together without detriment to life and health are human beings, and that to prevent every inmate of a gaol from finding a term of imprisonment tantamount to a capital sentence is a task that would tax the knowledge of the most accomplished student of hygiene.

Burmah shared, as I have said, in the increased attention devoted to the feeding of convicts elsewhere, and the prison dietary of the Province was improved. But I am strongly inclined to think that there was no real necessity for this altering of it, and that the present labouring scale of Diet is in excess of what is requisite to keep a Burman in health whose sentence of imprisonment is not one of great length. The people of the country very rarely use meat, and I believe the animal food prescribed in the scale under consideration ought to mean fish and not flesh.—And "condiments" might with advantage be taken to mean a couple of chillies.

The Non-labouring scale of Diet is as follows:—

	lbs.	oz.	drs.
Rice	1	6	0
Vegetables	0	2	0
Fish or flesh	0	1	0
Gnapee...	0	0	8
Salt	0	0	8
Oil	0	0	8
Condiments	0	0	4

In all twenty-nine and three-quarter ounces. Here I think the vegetable is not sufficient in itself, and is not sufficient because the people are accustomed, as is well known, to consume large quantities of it at every meal. When they cannot obtain cultivated kinds they eat the wildest jungle productions, and though they suffer from dyspepsia occasionally, the result no doubt of this coarse aliment, they thrive wonderfully upon it. On the other hand, the animal food might be reduced to 3 oz, of fresh fish three days in the week, and one and half ounce of dried fish on the other days. This would make the scale resemble more the ordinary food of the people than it now does.

The average monthly cost of the two scales of diet, varied very much in the different gaols. In eleven, where each article was separately purchased, the first cost on an average Rupees 2-3-3, and the second Rupees 1-15-4. But in the three gaols where the false system of entering into a contract for the supply of the entire ration at a fixed rate daily, noticed elsewhere, was pursued, both cost much more.

At Thayetmyo the first cost Rupees 3-4-5 and the second Rupees 3-2-0, at Prome the cost was Rupees 3-2-0 and Rupees 2-13-7 respectively; and at Henzadah it was Rupees 2-13-0 for each scale,—the fact being that to still farther simplify here the rationing of the prisoners one uniform scale was adopted, the daily cost being Rupees 0-1-6 per head. The loss, as already pointed out, that resulted from the desire to avoid trouble—which alone dictated this system, has been very great during 1869, and I have no doubt in every year of its existence. I have succeeded in abolishing it at Thayetmyo but the love of old ways is too strong for me at Prome, and the authoritative opinion of the Chief Commissioner, will I fear be necessary for its complete suppression.

The gaol in which the lowest price was paid for each ration was Sandoway. Here the first scale cost Rupees 0-15-3 and the second Rupees 0-14-0, which contrasts well with Henzadah just referred to. On the other hand, the highest rate paid for a ration was at Mergui, viz: Rupees 2-14-4 for the first, and Rupees 2-11-3 for the second. The cause being in the first instance that Sandoway grows its own paddy and its vegetables, catches its own fish in great part, and supplies its own fuel; and in the second that oil, salt, and curry-stuff have been charged at the most exhorbitant rates, and the conversion of paddy into rice conducted in the most wasteful manner.

In addition to the foregoing scales there was in use a separate one, as follows, for such Natives of India as might object to the diet intended for the people of the province generally:—

	lbs.	ozs.	drs.
Rice	0	12	0
Attah	0	10	0
Vegetables	0	4	0
Dhal	0	2	0
Flesh or fish	0	4	0
Oil	0	0	8
Salt	0	0	8
Chillies	0	0	4

The prices paid for each article in the diet scales are very different in the various gaols. At Sandoway, Kyouk Phyoo and Myanoung, paddy was purchased at the rate of 96 pounds for one rupee, while at Bassein less than 56 lbs was obtainable for the same amount. But then, at the former stations the demand is small, while Bassein is a seaport town whose staple export is rice; and for the same reason the cost of paddy was very high at Rangoon where only a little more than 67 lbs. was obtainable per rupee. There is undoubtedly a wide field for economy still open to the various gaols in the purchase of their grain. If granaries were attached to each not fine masonry buildings, but sheds similar to those in use amongst the people—and the grain stored in those months when it is cheapest, the saving to Government would be considerable. The only difficulty in the way is that at this season of the year there is but little of the money allotted to meet the expenditure of each gaol remaining to its credit; but I am inclined to think that the advantageous results of making large annual purchases are so evident; that a loan or advance might be obtained from the Accountant General for the purpose. In no case need the loan be longer than for three months.

As with paddy so with fish. The rates at which it was obtainable varied much. At Mergui, where it is very abundant, somewhat more than 19 lbs. were purchased for a rupee. But at Tavoy, where it is also very plentiful, less than 6 lbs. were obtainable for the same money. No wonder the rations at the latter cost Rupees 2-11 8 per prisoner, or Rupees 31-2-11 per prisoner per annum. The price paid here was greater than that paid in any other part of Burmah except Mergui, and speaks I consider very badly for the Gaoler.

The average quantity of fish obtainable for one rupee was lbs. 10-0-0 for all gaols.

The average cost of meat likewise was lbs. 6 for a rupee—the highest price being paid for it at Bassein, where it was obtained at the rate of lbs. 4 oz. 11 drs. 11 for a rupee, and the lowest at Sandoway where lbs. 10, oz. 12, drs. 0 were purchased for the same money. It is easy to understand that the shipping in the port of Bassien is mainly the cause of this dearness, and the absence of any market at the remote station of Sandoway that of the cheapness there. To meet the difficulty at Bassien the Superintendent established a Butcher's shop in his gaol as a form of industry, and he succeeded so well in breeding pigs and fattening cattle that I quite believe that in the present year this gaol will have to pay little or nothing for meat. Too much credit cannot be given to Mr. Nisbet for this proof of his energy and his regard for the public interests, as well as his attention to the more immediate ones of his gaol.

Dhall was consumed in only some gaols, and in them to no great extent. It was purchased at Shwegyeen, Myanoung Tavoy, and Mergui, at the rate of 16 lbs. for a rupee, but Sandoway and Kyouk Phyoo paid just double this rate for it.

The prices paid for gnapee vary more than those paid for any other article. At Tavoy and at Mergui no less than 20 lbs. of this article were obtainable for a rupee, while at Toungoo only lbs. 4, oz. 9, drs. 2, could be purchased for the same sum. Lieut. Poole at Myanoung, however, with his usual success contrived to obtain lbs. 13, oz. 11, drs. 6, for a rupee. But at Shwegyeen, which is situated like Myanoung on a large river, the gaol had to pay a rupee for lbs. 6, oz. 6, drs. 6, that is as near as can be double the price. What is the cause of this? I say unhesitatingly that in one case attention is paid by the officer in charge of the gaol, and in the other the subject is considered one fit only for the gaoler to deal with. Rangoon and Bassein paid the same prices, namely a rupee for lbs. 12; and Maulmain and Sandoway a rupee for lbs. 10, oz. 10, drs. 10, while Kyouk Phyoo and Akyab only obtained about 8 lbs. for the same money.

Again, the price of vegetables varied to an extent quite inexplicable. While at Sandoway one rupee was sufficient to purchase lbs. 94, at Kyouk-Phyoo it obtained only lbs. 32, and at Shwegyeen lbs. 16 !! The attention of the officer in charge at the last gaol has been repeatedly drawn to this undoubted overcharge, and I hope that for the future vegetables will be obtainable at this station at a fair price.

Maulmain and Toungoo purchased vegetables at the rate of lbs. 48, Rangoon and Tavoy at that of lbs. 38, Kyouk Phyoo and Myanoung at 32 lbs., and Mergui at the rate of lbs. 44½ per rupee.

In the same way no uniform rate was paid for the oil consumed in the different gaols, though everywhere it was very high. There are difficulties in the way of successfully manufacturing this article in our prisons, but still I think that with perseverance and attention it might be done with great advantage. The greater part of the oil used in the Maulmain Gaol during 1868 was prepared from the Till seeds by convict labour and with the rude mills of the country, the cost of it being a little more than 10 annas a viss, or thirty per cent. less than the bazaar rates.

The average price paid for it in the eleven gaols which bought it separately was one rupee for lbs. 3-12-0. Shwegyeen, as might have been expected, paying the highest price, viz., a rupee for 2 lbs. 10 oz. 10 drs., and Akyab the lowest, or a rupee for lbs. 4-13-9.

The various gaols stand in the following order in regard to the cheapness with which they purchased this important item in their dietaries :—

	Quantity per Rupee. lbs. oz. drs.
1 Akyab	4 13 9
2 Myanoung	4 12 12
3 Maulmain	40 10 1
4 Bassein	3 14 3
5 Sandoway	3 1 11
6 Mergui	3 9 11
7 Rangoon	3 8 14
8 Tavoy	3 5 11
9 Kyouk-Phyoo	3 5 0
10 Toungoo	3 3 0
11 Shwegyeen	2 10 10

The price of salt, again, varied very much, Kyouk Phyoo paying a rupee for lbs. 80, and Mergui a rupee for lbs. 6. As I have often said, the difference in the market rates of various towns cannot possibly account for such dissimilar rates, and though it is I am aware encumbering this report with unnecessarily minute details, I think it right to give here the order in which gaols stand with regard to the prices paid for the commonest item in their ration scale in order that the officers in charge of them may have their attention directed to the subject. :—

	Per Rupee lbs oz. drs.
1 Kyouk-Phyoo	80 0 0
2 Maulmain	18 0 0
3 Akyab	45 0 0
4 Sandoway	33 0 0
5 Tavoy	32 0 0
6 Rangoon	27 0 0
7 Bassein	24 0 0
8 Myanoung	13 11 6
9 Toungoo	10 10 10
10 Shwegyeen	10 10 10
11 Mergui	6 0 0

A large sum of money has been spent upon condiments, and the rates paid for them have been as various as those paid for the articles already mentioned. Diversity is here however in some measure accounted for by the fact that many gaols supply simply chillies, while others issue to their inmates regular curry stuff and onions under this head. According to the prices paid the gaols stand as follows :—

	Per Rupee lbs. oz. drs
1 Rangoon	10 10 10
2 Tavoy	10 0 0
3 Mayanoung	9 2 4
1 Akyab	8 0 0
5 Toungoo	8 0 0
6 Maulmain	6 6 6
7 Mergui	6 0 0
8 Bassein	5 12 3
9 Shwegyeen	5 5 5
10 Kyouk Phyoo	4 0 0
11 Sandoway	3 10 1

The cost of firewood was only large at Rangoon, where it is always difficult to obtain; but at most other gaols the prisoners cut it in the neighbouring jungles paying nothing for it—This was the case at Maulmain, Bassein, Akyab, Kyouk-Phyoo, Sandoway, Toungoo, Shwegyeen, Tavoy, and Mergui, and of course led to a very great saving. I hope in the present year to see every goal in the Province, with the exception of Rangoon, following this economical plan.

The average cost of a labouring and a non-labouring ration per month was as follows in the different gaols :—

	Labouring.	Non-Labouring.
1 Thayetmyo	Rs... 3 4 6	Rs... 3 2 0
2 Prome	... 3 2 0	... 2 13 7
3. Henzadah	... 2 13 0	... 2 13 0
4. Mergui	... 2 12 0	... 2 11 0
5. Shwegyeen	... 2 12 2	... 2 8 0
6. Bassein	... 2 9 7	... 2 6 9
7 Tavoy	... 2 8 8	2 5 4
8. Maulmain	... 2 8 7	... 2 5 3
9 Rangoon	... 2 8 3	... 2 4 7
10. Myanoung	... 2 1 6	... 1 12 8
11. Akyab	... 2 0 6	... 1 12 5
12 Toungoo	... 1 9 4	... 1 6 6
13. Kyouk Phyoo	... 1 7 11	... 1 2 6
14. Sandoway	... 0 15 3	... 0 14 0

Further information upon this subject will be found in the appropriate statement, and it only remains for me, before quitting it, to say that I consider a scale of diet might be introduced into all our gaols for prisoners whose sentence is less than six months with very good results. It is undoubtedly a fact that prisoners who have to endure long sentences must be exceptionally well fed, or they will fall into a state of health known as atrophia, when a fatal result is only a matter of time. With short term prisoners no such necessity exists—they seldom suffer the despondency that plays so marked a part in destroying the health of men who feel that the best years of their lives must be passed within the walls of a prison, and a less ample dietary than that they now obtain in our gaols, without being physically detrimental, might prove to them morally beneficial.

STATEMENT.

Showing the Scales of Diet in force in the Gaols of British Burmah, and the Average Cost of the chief Articles composing, during the year 1869.

1	2	3	4	5	6																											7	
					AVERAGE RATE AT WHICH PROCURED DURING THE YEAR.																											Average monthly cost of diet of each Prisoner	
Number.	GAOLS.	Diet scales of labouring Prisoners.	Diet scales of non-labouring Prisoners.	Note of any change effected in either during the year	Paddy per rupee			Fish per rupee			Meat per rupee			Dhall per rupee			Gnapee per rupee.			Vegetable per rupee			Oil per rupee			Salt per rupee			Chillies condiments per rupee.			Fuel per rupee.			Attah per rupee			Labouring.			Non-labouring.		
		lb. oz	lb. oz.		lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	lb	oz	dr	R.	a.	p.	R.	a.	p.
1	Rangoon	Rice 1	Rice 1		67	2	1	8	5	9	7	1	12	0	0	0	12	0	0	38	6	6	3	8	14	27	6	13	1	10	10	2	0	0	8	0	0	2	8	3	2	4	7
2	Maulmain	Vegetables 0	Vegetables 0		80	11	8	9	1	0	5	5	5	10	10	0	10	10	10	48	0	0	4	10	14	48	0	0	6	6	6	Gl. supd.			8	0	0	2	8	3	2	5	3
3	Akyab	Fish or flesh 0	½ Fish or flesh		80	0	0	10	10	10	8	0	0	12	1	3	8	13	7	Gl. supd			4	13	9	45	11	6	8	0	0	Do			8	0	0	2	0	6	1	12	5
4	Bassein	Gnapee 0	½ Gnapee		55	11	4	8	11	10	4	11	11	0	0	0	12	0	0	Do			3	14	13	24	0	0	5	12	3	Do			8	0	0	2	9	7	2	6	9
5	Kyouk Phyoo	Salt 0	½ Salt 0		96	0	0	Gl. spd			6	0	0	8	0	0	10	0	0	Do			3	5	0	80	0	0	4	0	0	Do			8	0	0	1	7	11	1	2	6
6	Sandoway	Oil 0	½ Oil 0		Gl. spd.			12	8	0	10	12	0	8	0	0	10	10	10	94	0	0	3	11	1	33	0	0	3	10	1	Do			8	0	0	0	15	3	0	14	0
7	Prome	Condiments 0	½ Condiments 0		Fed at a contract rate of 1 8 each labouring and 1 6 each non-labouring prisoners per diem.																															3	2	0	2	13	7
8	Toungoo				83	6	14	6	1	6	5	5	5	10	10	0	4	1	20	Gl. supd			3	3	3	10	10	10	8	0	0	Gl. supd.			8	0	0	1	9	4	1	6	6
9	Shwegyeen			...	80	0	0	10	10	10	6	6	0	16	0	0	0	6	0	16	0	0	2	10	10	10	10	10	5	5	5	Do			8	0	0	2	12	0	2	8	0
10	Henzadah			...	Fed at a uniform rate of 1-6 per labouring and non-labouring prisoners per diem.																															2	13	0	2	13	0
11	Myanoung			...	96	0	0	12	10	10	7	0	0	16	0	0	13	11	6	32	0	0	4	12	12	13	11	6	9	2	4	400	0	0	8	0	0	2	1	6	1	12	8
12	Thayetmyoo			...	Fed at a contract rate of 1-9 per labouring and 1 8 per non-labouring prisoners per diem.																															3	4	6	3	2	0
13	Tavoy			...	91	0	0	5	5	5	7	0	0	16	0	0	20	0	0	38	6	6	3	5	11	32	0	0	10	0	0	Gl. supd.			8	0	0	2	8	8	2	5	4
14	Mergui			..	87	4	5	19	3	3	7	0	0	16	0	0	20	0	0	44	8	1	3	9	11	6	0	0	6	0	0	Do			8	0	0	2	12	0	2	11	0
	Total average	.....	.....	...	81	11	14	10	5	11	7	7	6	12	9	7	11	11	6	44	7	8	3	12	9	30	1	8	6	15	14	330	0	0	8	0	0	2	5	9	2	2	8

PUNJAUB JAILS.

THE following scale of dietary has been introduced from the 1st June 1864, in lieu of that existing previously :—

Old Scale Dietary.

Number of Class.	Denomination and class of Prisoners	Daily allowances. Flour. Chittacks	Dhall. Chittacks.	Salt. Grains	Pepper. Grains.	Wood. Chittacks.	Twice a week in lieu of dhall. Ghee. Chittacks.	Vegetable. Chittacks
1	Prisoners under sentence of labor... ...	10	2	67½	36	6	½	4
2	Prisoners under examination, or non-laboring women and boys under 15 years .	8	2	67½	36	6	45 grains	4
3	Hospital diet to consist of four rates ... 1st .	10	2	67½	36	6	45	4
	2nd .	8	2	...				
	3rd ..		2				...	
	4th ...	6	2		.		...	.

New Scale since 1864.

	Laboring Prisoners. Chittacks.	Non-laboring Prisoners, Boys under 16 years of age, and Women Chittacks.	REMARKS
Attah	10	8	Meat is to be given three times a week, the four chittacks are to be free of bone and fat In those jails where the people of the country live on dahi, milk, butter-milk, and *dahi in lieu of meat* may be given, vegetables, four chittacks, are to be issued three times a week with the meat, the whole, with the salt and condiments, to be cooked together The condiments to consist of dried garlic, turmeric, chillies, and coriander seed or dhunnia. When meat or dahi is given, dhall is not to be given Meat to be as free from bone and fat as can possibly be managed.
Dhall	3 (1 times a week)	2	
Ghee	(3 ditto) ½	½	
Salt	½	1	
Condiments...	½	½	
Meat...	4 (3 times a week)	3	
Dahi...	3 (ditto)	2	
Vegetable	4 (ditto)	4	
Firewood	6	6	

NORTH WEST PROVINCES, 1860.

Jail Dietary Scale.

	Labouring.	Non-Labouring.	
Attah ..... { Wheat ½ 2nd Quality ... ... Barley ½ ... ... }	10 Chittacks	8 Chittacks.	Sundays and Mondays
* ,, ... (Bajora)... ...	12 ,,	8 ,,	Tuesdays and Wednesdays
,, ... (Joar)	12 ,,	8 ,,	} Thursdays, Fridays, and Saturdays.
,, ... (Mukka) ...	12 ,,	8 ,,	
Dhall	2 ,,	2 ,,	Daily, except when vegetables are given
Gram	2 ,,	... ...	Daily.
† Vegetables	4 ,,	4 ,,	Sundays, Tuesdays, and Fridays, in lieu of Dhall
Oil (Mustard)	1 ,,	1 ,,	To every twenty men, when vegetables are given
Firewood	6 ,,	6 ,,	Good dry fuel, twigs not to be used
Chillies	No. 1	No. 1.	Or more.
Salt	100 grains.	100 grains	

* Where Bajera is not procurable and rice plentiful, 8 chittacks of the latter may be substituted, or bread composed of one-half wheat flour and one-half gram flour may take its place.

† The quantity of vegetables and chillies may be increased at the discretion of the Medical Officer in charge From the 1st May to the 30th September, the usual allowance of Dhall should be given on Tuesdays in excess of the above scale.

SINCE 1864.

Days of the week.	Morning Meal. Parched gram. Chk.	Evening Meal. Wheat flour Chk.	Barley flour. Chk.	Bajree flour. Chk.	Joaree flour. Chk.	Indian corn flour Chk.	Vegetables. Chk.	Oil. Chk.	Dhal. Chk.
Sunday	2	7½	2½	...	..	...	4	1-10th.	...
Monday	2	7½	2½	...	...	...	...	...	2
Tuesday	2	...	...	12	...	...	4	1-10th.	...
Wednesday	2	...	...	12	...	...	...	...	2
Thursday	2	...	...	...	12	...	..	...	2
Friday	2	..	...	...	...	12	4	1-10th.	...
Saturday	2	...	...	...	12	...	...	...	2

When bajera, joaree, or mukka are not procurable, wheat and barley flour, or pure wheat flour, or a mixture of wheat and gram flours, half-and-half, are substituted as in the Monday's dietary. Practically this is often the case, as the local markets do not afford a constant or sufficient supply of joaree, bajera, and Indian corn: when given, however, they afford a satisfactory variety in the diet, and are given in such proportion as to more than make up for any deficiency in their nutritious qualities. This will be seen clearly from the subjoined tabular valuation of the North-Western prison dietary:—

Days of week.	Albuminous Elements	Starchy, Oily, &c.	Water.
Sunday	2·17	·34	3·49
Monday	2 17	10 63	1·86
Tuesday	2 29	12 03	3 68
Wednesday	2 59	11 32	2·05
Thursday	2 59	12·32	2 05
Friday . .	2 29	12 03	3·68
Saturday ... ... * ..	2·59	11·32	2 05
Total	16·99	77 99	18 86

Of 113 chittacks of solid food which form the weekly amount of the diet of the prisoners in Bengal and the North-Western Provinces, in the former only 13·39 chittacks are albuminous and 75 63 starchy, while in the latter 16·99 chittacks are albuminous and 77·99 starchy, and this notwithstanding the allowance of 2 chittacks of fish or flesh four times a week in the Bengal dietary. This arises from the larger allowance of wheat and other highly albuminous cereals in the North-Western Provinces' diet scale to the exclusion of rice.

JAILS.—LOWER PROVINCES.

The following are the diet scales now sanctioned for the jails of the Lower Provinces. They are the minimum scales to be adopted, and within their limits the food is to be varied as much and as frequently as local circumstances will admit of:—

For Bengalees, Oorvas, and Assamese, 1866.

Convicted Non-labouring Prisoners.

	Morning Meal							Evening Meal.							Grand Total.
	Rice	Dhal.	Vegetables	Oil.	Salt	Condiments	Total	Rice.	Dhal.	Vegetables	Oil.	Salt.	Condiments	Total.	
	Cht	Cht	Cht.	Cht.	Cht	Cht	Cht.	Cht.	Cht	Cht	Cht.	Cht.	Cht.	Cht.	Cht.
Monday	5	2	1	1/6	1/8	1 8	85 12	4	1	1	1/6	1,8	1,8	65 12	145/6
Tuesday	5	1	2	1/6	1/8	1 8	85 12	4	0	2	1/6	1/8	1/8	65 12	145/6

Labouring and Under-trial Prisoners.

	Morning Meal								Evening Meal.							Grand Total.
	Rice.	Dhal.	Vegetables.	Animal Food	Oil	Salt.	Condiments.	Total	Rice	Dhal.	Vegetables.	Oil.	Salt.	Condiments.	Total	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday ...	6	0	2	2	1/6	1/8	1/8	10-5/12	4	2	0	1/6	1/8	1/8	6-5/12	$16\frac{5}{6}$
Tuesday ...	6	2	2	0	1/6	1/8	1/8	$10\frac{5}{12}$	4	0	2	1/6	1/8	1/8	$6\frac{5}{12}$	$16\frac{5}{6}$

For all Natives of Behar, the North-Western Provinces, and the Punjab.

Convicted Non-labouring Prisoners.

	Morning Meal.							Evening Meal.							Grand Total.
	Rice.	Dhal.	Vegetables.	Oil.	Salt.	Condiments.	Total.	Attah.	Dhal.	Vegetables.	Oil.	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday	5	2	1	1/6	1/8	1/8	$8\frac{5}{12}$	4	0	2	1/6	1/8	1/8	$6\frac{5}{12}$	$14\frac{5}{6}$
Tuesday	5	1	2	1/6	1/8	1/8	$8\frac{5}{12}$	4	2	0	1/6	1/8	1/8	$6\frac{5}{12}$	$14\frac{5}{6}$

Laboring and Under-trial Prisoners.

	Morning Meal.								Evening Meal.						Grand Total.
	Rice.	Dhall.	Vegetables.	Animal Food.	Oil.	Salt.	Condiments.	Total.	Attah.	Dhall.	Oil.	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday	6	0	2	2	1/6	1/8	1/8	10-5/12	5	1	1/6	1/6	1/8	6-5/12	16-5/6
Tuesday	6	2	2	0	1/6	1/8	1/8	10-5/12	5	1	1/6	1/6	1/8	6-5/12	16-5/6

For Coles, Sonthals, Garrows, all Tribes of Hill-men, and Jungly Prisoners generally.

Convicted Non-laboring Prisoners.

	Morning Meal.							Evening Meal.						Grand Total.
	Rice.	Vegetables.	Animal Food.	Oil.	Condiments.	Salt.	Total.	Rice.	Vegetables.	Oil.	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday	6	0	2	1/6	1/8	1/8	8-5/12	4	2	1/6	1/8	1/8	6-5/12	14-5/6
Tuesday	6	3	0	1/6	1/8	1/8	8-5/12	4	2	1/6	1/8	1/8	6-5/12	14-5/6

Laboring and Under-trial Prisoners.

	Morning Meal.							Evening Meal.						Grand Total.
	Rice.	Vegetables.	Animal Food.	Oil.	Condiments.	Salt.	Total	Rice.	Vegetables.	Oil.	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday.	6	2	2	1/6	1/8	1/8	10-5 12	4	2	1/6	1/8	1/8	6-5/12	16-5/6
Tuesday	6	3	1	1/6	1/8	1/8	10-5/12	4	2	1/6	1/8	1/8	6-5/12	16-5/6

As these classes invariably sicken if placed on full diet at once, their diet should be regulated at first by the Medical Officer until they have become accustomed to the regularity of the jail dietary.

For Mughs and Chinamen.

Convicted Non-laboring Prisoners.

	Morning Meal.						Evening Meal.						Grand Total
	Rice.	Animal Food	Gnapee.	Salt.	Condiments.	Total.	Rice.	Vegetables.	Gnapee.	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
For all days	6	2	1/4	1/8	1/8	8 1/2	5	1	1/4	1/6	1/8	6-13/24	15-1/24

Laboring and Under-trial Prisoners.

	Morning Meal.							Evening Meal.						Grand Total.
	Rice.	Vegetables.	Animal Food.	Gnapee.	Salt.	Condiments.	Total.	Rice.	Vegetables.	Gnapee	Salt.	Condiments.	Total.	
	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.	Cht.
Monday	7	1	2	1/4	1/8	1/8	10 1/2	5	1	1/4	1/8	1/8	6 1/2	17
Tuesday	7	2	1	1/4	1/8	1/8	10 1/2	5	1	1/4	1/8	1/8	6 1/2	17

DIET SCALE, No. V. For Europeans.

	Meat.	Bread	Vegetables and fruits.	Ghee.	Salt	Sugar	Tea	Milk.	Condiments.
	Cht	Cht.	Cht.	Cht	Cht.	Cht	Cht	Cht.	Cht
For European labouring prisoners	8	12	8	1	1/4	1/2	1/4	1	1/2
For European non-labouring prisoners	6	12	6	1/2	1/4	1/2	1/4	1	1/2

No rice less than six months' old is issued to prisoners. The dhals are carefully husked, and must never be mixed, when cooked. The use of khesaree dhal is prohibited. The allowance of fresh vegetables may be increased on the order of the Medical Officer, to any reasonable extent that can be supplied by the prison garden The weight of vegetables is calculated after the stalks, skins, and refuse have been separated. The allowance of meat is estimated without the bone.

General Statement showing the Scale of Diet and Cost of Dietary Prisoners in the Punjab, North-Western Provinces, and Bengal Jails in 1865.

PUNJAB

Laboring Prisoners

Scale of diet per diem per prisoner	Cost per annum per prisoner
	Rs. a. p
Atta ... . 10 Cks	21 15 2
Dall (four times a week) 3	
Ghee (three times a week) 1/4	
Salt 1/4	
Condiments ... 1/4	
Meat, (three times a week) 4	
Dahi Do. ... 3	
Vegetable Do ... 4	
Firewood 6	

Non-Laboring Prisoners

Scale of diet per diem per prisoner	Cost per annum per prisoner
	Rs a. p
Atta . . . . 8 Cks	Not known
Dhall, four times a week 2	
Ghee, three times a week 1/4	
Salt 1/4	
Condiments 1/4	
Meat, three times a week 3	
Dahi Do 2	
Vegetable Do .. 4	
Firewood . 6	

NORTH-WESTERN PROVINCES

Laboring Prisoners

Scale of diet per diem per prisoner	Cost per annum per prisoner
	Rs a. p
Atta, Sunday and Monday* 10 Cks	21 1 6
,, Bajra, Tuesday & Wednesday . 12	
,, Juar (Thursday, Friday & Saturday) 1	
,, Mucka (Thursday, Friday & Saturday) 1	
Dhall, daily except when vegetables are given 2	
Ghee, to every 25 men with dhall 4	
Vegetables, Sunday Tuesday, and Friday, in lieu of dhall 4	
Oil, Mustard, to every 25 men with vegetables 2	
Gram, daily 2	
Firewood . 6	
Chillies, 1 in number or more daily	
Salt ... . 100 grains.	

Non Laboring Prisoners.

Scale of diet per diem per prisoner	Cost per annum per prisoner
	Rs a. p.
Atta, Sunday and Monday* 8 Cks	Not known
,, Bajra, Tuesday & Wednesday 8	
,, Juar . . (Thursday, Friday & Saturday) 8	
,, Mucka (Thursday, Friday & Saturday) 8	
Dhall, daily except when vegetables are given . . 2	
Vegetable Sunday, Tuesday, and Friday in lieu of dhall 4	
Oil Mustard, to every 25 men with vegetables 2	
Firewood 6	
Chillies, 1 in number or more daily.	
Salt . . .. .. 100 grains	

BENGAL

Laboring Prisoners		Non-Laboring Prisoners	
Scale of diet per diem per prisoner.	Cost per annum per prisoner	Scale of diet per diem per prisoner.	Cost per annum per prisoner
	Rs a. p.		Rs. a. p.
See pages 33 to 36 of the Bengal Jail Rules.	27 1 4	See pages 33 to 36 of the Bengal Jail Rules.	23 2 10

Meat is to be given three times a week The four chittacks are to be free of bone and fat In those Jails where the people of the country live on dahi, milk, butter-milk, and dahi, in lieu of meat, may be given. Vegetables, four chittacks, are to be issued three times a week with the meat; the whole, with the salt and condiments, to be cooked together. The condiments to consist of dried garlic, turmeric, chillies, and salt, coriander seed or dhunnia. When meat or dahi is given, dhal is not to be given Meat to be as free from bone and fat as can possibly be managed

* Wheat three-fourths, 2nd quality; Barley one-fourth.

Statement showing the Cost of Feeding the Laboring and Non-Laboring Prisoners in the Jails of the Lower Provinces on the Diet Scales prescribed in the Bengal Jail Code, during the month of May 1866.

JAILS.	IN MAY 1866.																	
	On Laboring Diet Scales.						On Non-laboring Diet Scales.						Total.					
	Daily average number of prisoners.	Gross cost for food.			Average cost per prisoner.			Daily average number of prisoners	Gross cost for food			Average cost per prisoner.			Daily average number of prisoners.	Gross cost for food			Average cost per prisoner.		
		Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P	Rs.	A.	P.
Patna	558	1,826	15	6	3	1	8·3	119	358	6	2	3	0	2·2	677	2,185	5	8	3	6	0·8
Sarun	393	1,176	10	0	2	15	10·8	128	324	12	2	2	11	1·1	521	1,501	6	2	2	14	0·1
Behar	548	1,209	6	11	2	5	1·2	110	262	7	1	2	6	1·5	658	1,471	14	0	2	3	9·4
Shahabad	457	1,601	9	2	3	8	0·8	6	19	4	5	3	3	4·7	463	1,620	13	7	3	8	0·2
Deegah	555	1,872	7	1	3	5	11·2	44	132	15	9	3	0	4·3	599	2,005	6	10	3	5	6·8
Chumparun	205	635	13	3	3	2	0·1	95	251	2	5	2	10	3·6	300	886	15	8	2	15	3·6
Tirhoot	392	1,053	10	9	2	10	11·1	107	257	12	7	2	6	6·6	499	1,311	7	4	2	10	0·6
Bhaugulpore	249	638	0	9	2	8	11·9	42	100	4	4	2	6	2·3	291	538	5	1	1	13	7·2
Monghyr	489	1,239	6	11	2	8	6·6	90	271	10	0	3	0	3·4	579	1,511	0	11	2	9	9·1
Purneah	296	819	5	9	2	13	10·9	43	115	7	11	2	10	11·6	339	1,164	13	8	3	8	11·1
Rajshahye	326	816	13	10	2	8	1·1	135	335	15	3	2	10	2·8	461	1,152	13	1	2	8	0·1
Pubna	120	335	12	1	2	12	9·2	11	34	11	10	2	5	11·0	121½	339	7	11	2	12	10·7
Rungpore	332	851	9	6	2	9	0·4	27	60	10	10	2	3	11·1	359	912	4	4	2	8	7·9
Bograh	113	282	2	0	2	7	11·3	12	319	8	0	2	10	0	125	313	10	0	2	8	1·7
Dinagepore	372	855	3	7	2	4	6·1	22	41	10	2	2	0	5·5	394	899	13	9	2	4	6·5
Maldah	51	130	7	3	2	6	7·8	5	11	6	5	2	5	3·1	59	141	13	8	2	6	5·6
Moorshedabad	184	556	15	2½	3	0	5·1	48	131	13	2½	2	11	11·3	232	688	12	5	2	15	6·0
Dacca	349	1,153	7	3	3	4	9·4	98	297	0	0½	3	0	5·8	447½	1,450	7	3½	3	3	10·5
Furreedpore	394	1,185	2	3	3	0	0·8	32	79	11	6	2	7	10·3	426	1,264	13	9	2	15	8·8
Sylhet	366	1,146	2	10	3	15	2·6	30	98	3	5	3	4	4·5	396	1,544	6	3	3	11	3·9
Mymensing	378	1,010	1	10	2	10	9·1	20	45	1	2	2	4	0·7	398	1,055	6	0	2	10	5·1
Backergunge	338	953	5	0¼	2	13	1·5	43	124	3	11¼	2	14	2·8	381	1,077	9	0¼	2	13	3·0
Chittagong	250	652	11	5	2	9	9·2	16	19	12	4	1	3	9·3	266	672	7	9	2	8	6·8
Tipperah	346	829	9	6	2	6	7·8	16	32	4	9	2	0	3·5	362	861	14	3	2	6	1·2
Noakhally	169	389	9	2	2	4	10·6	14	26	15	6	1	14	9·8	183	416	8	8	..	..	..
Nuddea	301	963	12	6	3	3	2·8	73	191	9	9	2	10	7·9	374	1,158	6	3	3	1	6·7
Alipore	1,377	4,296	14	0	3	1	11·1	168	553	13	3	2	1	6·3	1,545	4,850	11	3	3	2	2·8
Baraset	146¼	429	9	1	2	15	0·8	80¼	20	5	1	2	8	7·6	227	449	14	2	1	15	8·5
Jessore	449	1,280	8	10½	2	13	7·6	87	192	4	8	2	3	4·4	536	1,472	13	6½	2	11	11·6
Burdwan	510	1,757	0	3	3	7	1·5	122	280	6	2	2	3	9·4	632	2,037	6	5	3	3	6·9
Hooghly	615	1,785	10	9	2	14	5·5	72	217	3	8	3	0	3·3	687	2,002	14	5	2	14	2·2
Howrah	181¼	562	14	0	3	1	9·1	30	77	2	0	2	9	1·6	211½	640	0	0	3	0	7·4
Bancoorah	689	2,241	14	0	3	4	0·7	104	360	15	6	3	7	6·4	793	2,602	13	6	3	4	6·2
Beerbhoom	329	1,059	6	7	3	3	6·2	30	90	1	1	3	0	0·1	359	1,149	7	8	2	11	10·7
Midnapore	741	1,846	3	7	2	7	10·3	83	225	15	6	2	10	5·7	824	2,072	3	1	2	8	2·8
Cuttack	417	1,486	12	2	3	9	0·5	183	646	5	11	3	6	11·8	600	2,133	2	1	3	8	10·0
Balasore	193	721	12	10	3	11	10·0	455	1,401	6	11	3	1	3·1	648	2,123	3	9	3	4	5·3
Pooree	269	560	15	9½	2	1	4·4	32	65	2	7½	2	0	6·0	301	626	2	5	2	1	3·0
Hazareebagh, European	11	150	4	10	13	10	7·4	6	48	14	3	8	2	4·5	17	199	3	1	11	11	5·6
,, Native	679	2,246	5	1	3	4	11·2	63	187	1	5	2	15	6·2	742	2,433	6	6	3	4	5·6
Lohardduggah	197	453	1	0½	2	4	9·8	88	300	1	2½	3	6	6·7	285	753	2	3	2	10	3·3
Maunbhoom	309	1,091	15	8	3	8	6·4	7	20	0	11	2	13	8·5	316½	1,112	0	7	3	8	3·6
Singbhoom	238	289	1	4	1	3	5·2	16½	23	2	5	1	7	1·8	254½	312	3	9	1	3	8·0
Gowalparah	108	186	8	0	1	11	7·5	32½	52	13	8	1	10	5·1	140½	239	5	8	1	11	2·5
Kamroop	181	471	2	1	2	9	7·7	39½	105	5	5	2	11	2·6	220	576	7	6	2	9	11·1
Nowgong	66	135	13	0	2	10	11·11	7	13	12	1	1	15	5·1	73	149	9	1	2	0	9·4
Seebsaugor	83	164	8	7	1	15	8·6	17½	33	6	0	1	15	4·9	100	197	14	7	1	15	8·0
Durrung	140	336	12	6	2	6	5·9	49	122	3	6	3	0	10·6	180	459	0	0	2	8	9·5
Debrooghur	87½	399	10	8	4	9	5·8	15½	45	5	4	3	0	4·2	103	445	0	0	4	5	1·5
Cossyah Hills	30	133	4	10	4	7	1·4	...	.....			.....			30	133	4	10	4	7	1·1
Cachar	155	687	7	9	4	6	11·6	32½	99	2	5	3	1	6·9	187½	786	10	2	4	3	3·6
Darjeeling	41	189	14	5	4	10	1·1	31	110	6	5	3	8	11·8	72	300	4	10	4	2	9·0
Rajmehal	103	295	10	3	2	13	11·7	31	33	4	9	2	8	11·1	116	328	15	0	2	13	3·3
Pakour	22	66	3	3	3	0	2·4	...	.....			.....			22½	66	3	3	3	0	3·8
Deoghur	23	58	2	9	2	8	5·6	27	72	13	0	2	11	1·7	50	130	15	9	2	9	11·7
Godda	37½	137	2	1	3	11	3·6	...	.....			.....			37½	137	2	1	3	6	11·6
Nya Doomka	24	65	2	4	2	11	10·0	5	11	7	3	2	4	7·4	29	76	9	7	2	10	3·2
Presidency, Native	552	1,708	12	0	3	1	8·5	8	23	6	1	2	14	9·1	560	1,732	2	2	3	1	5·9
,, European	96½	1,180	13	4	12	4	9·6	4	45	8	11	11	6	2·7	100	1,226	6	3	12	4	0·7
Total	176,350	52,993	12	0¾	3	0	0·9	3276	9,111	2	4¾	2	12	5·9	20,911	62,104	14	5½	2	15	6·2

Statement showing the Cost of Feeding the Laboring and Non-laboring Prisoners in the Jails of the Lower Provinces on the Diet Scales prescribed in the Bengal Jail Code, during the month of May 1865.

JAILS.	IN MAY 1865.																	
	On Laboring Diet Scales						On Non-laboring Diet Scales.						Total.					
	Daily average number of prisoners.	Gross cost for food.			Average cost per prisoner.			Daily average number of prisoners.	Gross cost for food.			Average cost per prisoner.			Daily average number of prisoners.	Gross cost for food.			Average cost per prisoner.		
		Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.		Rs.	A.	P.	Rs.	A.	P.
Patna	180	416	4	1	2	2	1·3	140	273	5	0	1	15	2·6	320	719	9	1	2	3	11·7
Sarun	295	711	2	6	2	6	8·8	201	391	2	5	1	14	1·1	496	1,105	4	11	2	3	8·1
Behar	361	562	6	0	1	8	8·6	194	329	13	10	1	11	2·5	558	892	3	10	1	9	7·0
Shahabad	370	974	12	11½	2	10	1·8	171/2	105	2	2½	2	3	9·5	416½	1,079	14	4	2	9	6·4
Deegah	484	1,190	9	7	2	7	4·3	103	200	10	3	1	15	3·1	587	1,391	3	10	2	5	11·1
Chumparun	161	318	6	9	1	15	7·7	106	138	15	11	1	4	11·1	267	457	6	8	1	11	6·2
Tirhoot	353	670	8	10	4	14	4·7	134	211	4	8	1	9	2·9	187	881	13	6	1	12	11·6
Bhaugulpore	279	414	2	6	1	9	5·7	76	112	13	9	1	7	9·0	355	557	0	3	1	9	0·9
Monghyr	290	613	5	6	2	1	10·1	90	180	1	3	2	1	9·5	380	793	6	9	2	1	1·9
Purneah	311	767	1	1	2	7	5·6	159	299	8	5	1	14	1·7	470	1,066	9	9	2	4	3·7
Rajshahye	372	564	10	11	1	9	10·3	98	143	1	3½	1	7	1·0	470	707	15	2½	1	8	1·2
Pubna	133	248	3	6½	1	13	10·8	48	102	7	1	2	2	1·8	181	350	15	7½	1	15	0·2
Rungpore	295	588	2	10½	1	15	10·8	61	118	14	10	1	15	1·8	356	707	1	8½	1	15	9·3
Bograh	106	202	13	0	1	11	7·3	33	51	13	6	1	9	1·6	139	254	10	6	1	13	3·7
Dinagepore	415	710	5	7	1	11	4·6	36	13	13	1	1	3	5·8	451	754	2	8	1	10	9·1
Maldah	40	86	15	0	2	2	9·3	...	.....						40	86	15	0	2	2	9·3
Moorshedabad	185	391	6	4	2	1	11·2	38	66	11	2	1	12	1·0	223	458	1	6	2	0	10·8
Dacca	368	781	7	9	2	1	11·7	139	233	6	3	1	10	9·6	507	1,014	14	0	2	0	0·3
Furreedpore	382	897	8	10½	2	5	7·2	67	113	5	9	2	2	3·1	449	1,010	14	7½	2	5	1·1
Sylhet	383	922	5	1½	2	6	3·9	15	28	2	5	1	14	0·3	400	950	7	9	2	6	0·2
Mymensing	397	867	13	4	2	7	0·1	76	171	9	7	2	3	11·8	473	1,039	0	11	2	3	1·9
Backergunge	338	719	5	10	2	2	0·6	59	112	5	10	1	14	5·6	397	831	11	8	2	1	6·2
Chittagong	220	680	1	2	2	1	6·6	79	178	2	7	2	4	2·2	308	858	6	9	2	12	7·7
Tipperah	358	592	13	9	1	10	5·9	33	52	2	6	1	9	3·6	391	645	0	3	1	10	1·7
Noakhally	157	274	3	6	1	11	8·4	32	31	1	0	1	0	0·3	188	305	4	6	1	9	11·7
Nuddea	288	578	9	10	2	0	1·7	65	118	10	8	1	13	0·8	353	697	4	6	1	15	7·3
Alipore	1,720	3,950	6	6	2	1	1·4	189	563	6	2	1	15	8·6	1,909	4,513	12	8	2	5	9·9
Baraset	57	138	2	1	2	6	9·2	14	27	12	2	1	15	8·6	71	165	14	3	2	5	4·6
Jessore	480	1,117	6	11½	2	5	2·9	52	81	13	2½	1	9	9·2	532	1,199	3	1	2	4	0·8
Burdwan	186	1,177	14	11½	2	6	9·3	14	15	2	5	1	15	1·5	530	1,263	1	4	2	5	10·2
Hooghly	603	1,613	11	1	2	10	9·4	79	197	1	11	2	3	11·9	682	1,810	13	0	2	10	8·6
Howrah	178	420	10	5	2	5	10·4	19	85	2	5	1	15	2·8	197	457	12	0	2	5	2·1
Bancoorah	380	838	9	9	2	3	4·0	138	197	1	11	1	12	6·2	158	1,084	10	1	2	1	6·0
Beerbhoom	231	498	10	0	2	2	1·2	65	37	1	7	1	13	10·8	296	618	4	5	2	1	5·0
Midnapore	465	776	3	5	1	10	0·8	246	246	0	4	1	7	11·8	711	1,138	12	2	1	9	7·5
Cuttack	327	556	9	6¾	1	11	2·8	74	119	10	5	1	7	10·1	401	667	11	7¾	1	10	8·5
Balasore	110	196	14	0	1	12	7·6	103	362	8	9	1	11	2·8	213	372	3	3	1	11	9·9
Pooree	29	48	14	2	1	10	11·3	23	111	2	1	1	8	7	52	84	5	0	1	9	11·3
Hazareebagh, European	21	171	2	2	8	2	4·6	...	175	5	3		...		21	171	2	2	8	2	4·7
„ Native	506	1,000	0	0	1	15	7·4	...	35	6	10		...		506	1,000	0	0	1	15	7·5
Lohardduggah	160	365	2	0	2	4	6·1	136		...		2	0	1·4	296	688	5	1	2	5	2·5
Maunbhoom	106	230	13	5	2	1	10·6	22		...		1	14	9·4	131	273	2	7	1	14	10·3
Singbhoom	125	114	2	0	0	14	7·3	7	323	3	1	0	8	8·6	132	117	15	0	0	14	2·5
Gowalparah	76	139	15	10	1	10	6·4	68	42	5	2	1	6	5·0	147	226	4	2	1	10	8·9
Kamroop	106	208	12	4	1	14	7·8	45	3	13	0	1	11	9·7	154	302	2	0	1	15	4·6
Nowgong	14	23	9	1	1	10	11·2	22	95	4	4	1	8	5·9	36	57	3	4	1	9	5·1
Seebsaugor	49	71	9	0	1	7	4·4	17	93	5	8	1	8	3·0	66	97	5	6	1	7	7·2
Durrung	181	418	6	9	2	5	11·4	50	33	10	3	2	5	0·2	231	533	7	11	2	4	11·4
Debrooghur	103	274	5	7	2	10	7·4	21	25	12	6	2	5	7·8	124	323	12	3	2	9	9·3
Cossyah Hills	18	46	7	11	2	9	3·9	17	115	1	2	2	7	0·2	35	87	15	2	2	8	2·5
Cachar	183	462	8	5	2	8	6·2	42	49	6	8	1	12	4·2	225	536	15	1	2	6	1·7
Darjeeling	37	117	13	1	3	2	11·0	36	41	7	3	2	2	1·9	73	194	10	10	2	10	10·7
Rajmehal	90	190	2	9	2	1	9·7	25	74	6	8	1	13	11·5	115	236	15	9	2	0	11·7
Pakour	11	16	11	0	1	8	3·2	...	76	13	9		...		11	16	11	0	1	8	3·3
Deoghur	23	42	4	0	1	13	4·6	8	46	13	0	1	8	7·4	31	56	10	3	1	13	2·8
Godda	17	29	15	0	1	12	2·1	...	14	6	3		...		17	29	15	0	1	12	2·1
Nya Doomka	16	25	15	2	1	9	11·3	...	.....				...		16	25	15	2	1	9	3·9
Presidency, Native.	336	923	1	9	2	11	11·5	83	176	3	11	2	1	11·6	419	1,099	5	8	2	9	11·8
„ European.	174	1,793	5	6	10	4	10·8	12	119	6	0	9	12	6·0	186	1,912	11	6	10	4	5·7
Total	14,962	33,800	4	6¼	3	4	1·7	3784½	7,312	10	0½	1	14	10·9	18746½	41,012	14	7¼	2	3	0·0

ALIPORE, the 10th October 1866.

J. FAWCUS,
Offg. Inspector Genl. of Jails, Lower Provinces.

MADRAS JAILS.

DIETARY SCALE.

After a careful consideration of this important subject, the Committee recommend that the several Jails should, as regards the prisoners' diet, be divided into three parts :—

1*st*.—Jails where rice is the principal staple of diet.
2*nd*.—Jails where "dry grains" are the principal staples of diet.
3*rd*.—Where mixed grains are used.

The diet to be used for each of these classes is detailed in the following table, which also exhibits the jails to be included in each of the several classes.

When a gang is working within any of the districts classified below, it will observe the diet of the Jail of the district in which it is located.

We recommend that the following Rules regarding diet should be strictly observed :—

1*st*.—When prisoners are employed on out door labor they shall have a warm meal before starting for their labor.

2*nd*.—They shall carry with them to their work a small quantity of raggee cake to be eaten at mid-day, and they shall have a third meal at 6 p.m, on returning from work.

3*rd*.—When the prisoners are employed on in door labor, a small meal shall be given at 6 a.m., before commencing work.

4*th*.—They shall have a meal at noon with an hour's rest, and they shall have their last meal at the close of their day's labor, or about 6 P. M.

5*th*.—A reduction of one-fifth shall be made in the scale of diet in the case of women and juvenile prisoners.

The proper recipe for curry powder is given in the Diet Table, and equivalents have been given in the marginal notes when, on account of local peculiarities, any change is made in articles of diet prescribed for any class.

These dietaries have been specially prepared, at our request, by Dr. Cornish, with the approval of the Principal Inspector General, Medical Department, after an examination of the recommendations made by the Medical Officers in charge of the jails throughout the Presidency. We believe that they are well suited to maintain the health and strength of the prisoners in jail.

Scale of Diet, Madras Jails, for Prisoners where Rice is the principal staple (No. 1).

		Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.	Sunday.	Note.
		oz	oz.	oz.	oz	oz.	oz	oz	
Rice	(*a*)	26	26	26	26	26	26	26	(*a*). 3 oz of rice to be made into hoppers and eaten in the mid-day.
Dhall		2	1	2	4	2	4	2	
Mutton or Fish	(*b*)	3	0	5	0	5	0	0	(*b*). When dried or salt fish is used, 2 half ounces to be considered equivalent to 5 oz of fresh fish.
Buttermilk or Tyre		0	10	0	10	0	10	10	
Ghee or Oil	(*c*)	half.	half.	half.	half.	half.	half.	half	(*c*) In districts where cocoanut is plentiful, 2 oz of coprah may be given in lieu of oil or ghee
Tamarind	(*d*)	half.	half.	half.	half.	half.	half.	half.	(*d*). Mango pickle may be substituted for tamarind, when procurable.
Salt		half.	half.	1	1	1	1	1	
Curry powder	(*e*)	half.	half.	half	half	half.	half	half	(*e*) Curry powder to be made according to formula in the Medical Code, (appended).
Vegetable		0	6	0	6	0	0	6	
Onions		half.	half.	half.	half.	0	half.	half.	
Garlic		30 grs	0	30 grs	0	30 grs	0	0	
Firewood		2 lbs	2 lbs	2 lbs	2 lbs.	2 lbs	2 lbs.	2 lbs	

No. 1 scale of diet will be applicable to the undermentioned jails —Chingleput, Trichinopoly, Cuddalore, Mangalore, Tanjore, Calicut, Tranquebar, Tellicherry.

Scale of Diet where "Dry Grains" are the staple (No. 2).

	Monday.	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday.	Note
	oz.	oz.	oz	oz	oz.	oz	oz.	
Verugoo, Raggee, Cholum, Cumboo } Without husks	22 / 24 / 21 / 25	22 / 21 / 21 / 25	22 / 21 / 21 / 25	22 / 21 / 21 / 25	22 / 24 / 21 / 25	22 / 21 / 21 / 25	22 / 21 / 24 / 25	Any of these quantities may be considered equivalent to 26 oz. of rice
Dhall	2	4	2	4	2	4	2	
Mutton or Fish	5	0	5	0	5	0	0	
Buttermilk or Tyre	0	10	0	10	0	10	10	
Ghee or Oil	half.	half.	half.	half.	half.	half.	half.	
Tamarind	half.	half.	half.	half.	half.	half.	half.	
Salt	1	1	1	1	1	1	1	
Curry-powder	half.	half.	half.	half.	half.	half.	half.	
Vegetable	0	6	0	6	0	0	6	
Onions	half.	half.	half.	half.	half.	half.	half.	
Garlic	30 grs.	0	30 grs.	0	30 grs.	0	0	
Firewood	2 lbs.	2 lbs.	2 lbs.	2 lbs.	2 lbs.	2 lbs.	2 lbs.	Raggee or cholum cakes (2 half ounces) in midday in lieu of hoppers.

No. 2 Scale of diet will be applicable to the undermentioned Jails :—
Guntoor, Nellore, Kurnool, Bellary, Cuddapah, Coimbatore, Salem.

and he eats his hot and half cold, making four meals a day: the herdsman or the owner of the field in charge, who takes the draught while he eats, so that no time may be lost. When there is no work to do in the field, the [illegible] his chief meal at noon, and has a light refection in the evening. A seer of rice or wheat flour, or one and a quarter seers of jowar, are reckoned the average food of a hard-working, able-bodied man.—*Hoshungabad Report*, p. 116.

THE RYOT,—MADRAS.

(By Mr. Bourdillon, 1853.)

"The ryots may be divided into two principal classes: those who are comparatively well off, the few, and those who are poor, the many. The former in general are either those whose villages or lands were from any cause favorably assessed at the first; or those who have enam or rent free land in addition to their rent paying land; or those who have more extensive holdings than common, all of whom have good land and have more or less enam. Individuals of the favored classes, as they are called, who hold their land on easier terms than usual, because belonging to certain castes, are also necessarily better off than others; and lastly, personal character has its own influence here as elsewhere; the careful and frugal will get rich, and so will the crafty and subtle, skilful to gain the favor of a tahsildar, or to supplant a rival.

"Even among this more wealthy class of agriculturists, the number of those who possess any considerable amount of property is very small. It is difficult to form or to convey an exact idea of their real means, but I will attempt it. I should say that if a man of this class is able to spend 15 or 20 Rs. a month, or rather if he can command a value equal to that, for he will rarely see so much money, such a man I say may be accounted to be very well off; and that a nett income from sources to the value of from 30 to 50 Rs. a month is very rare among the agricultural class. Such an income, indeed, is far more in this country than the money amount indicates to English ears. The actual purchasing power of money in this country is sometimes estimated at four times what it is in England, sometimes at six times. Assuming the intermediate proportion of five to one, an income of 20 Rs. a month will be equal to one of £120 a year in England; and 30 Rs. and 50 Rs. a month in this country, will be the respective equivalents of £180, and £300 a year in England. In point of fact, indeed, the difference is greater, both because from the nature of the climate, the range of absolute necessaries is here much abridged; and also because the general scale of incomes and style of living throughout all grades of society, are so much lower here than they are in our own country. But though the incomes above specified undoubtedly raise their possessors far above want; still they appear small in the extreme when regarded as the highest incomes from the possession of land in a very extensive country, and the largest of them certainly confined to an extremely limited number of instances.

"The dwellings of this class certainly do not indicate much wealth: tiled houses are rarely seen, and masonry walls are still much more rare. The almost universal habitation has mud walls and a thatched roof; the latter of a very flimsy order, and both often much dilapidated. And both walls and roof are the same within as without; the rooms have no ceiling, and their walls no sort of ornament or decoration, rarely even whitewash, and the floor is of simple earth beaten hard. The value of the residence of a ryot of the more wealthy class, of whom I am now speaking, probably rarely exceeds 200 Rupees, or £20. It may be urged that the habits of the people do not incline them to spend money on improving their dwellings, but that they rather invest savings in jewels or rich cloths for great occasions, or in cattle; or expend them on marriages and other family occasions. There is some truth in this; but though every family above actual poverty possesses some jewels, yet probably very few agricultural families possess to so large a value as 1,000 Rs. or £100 for both jewels and clothes; and even supposing an equal value in agricultural stock, and so much would very rarely be met with, the whole aggregate value, £220, equal to £1,100 in England, is extremely small to represent the whole property (exclusive of land) of one of the most wealthy members of the land-holding class; and it is the most wealthy only who possess as much as this.

"And if we look within their houses we still find few evidences of wealth, or even of what we should consider comfort. I have already described the interior of the house itself; and as to its contents there is nothing of what is commonly called furniture. There are no chairs, or tables, or couches, or beds; sometimes there is seen a single rude cot which would be dear at 2 Rs. The inmates for the most part sleep on the earthen floor, with nothing else below them but a mat or a small cotton carpet. They sit on the floor, and from it take their food, which is served in a few brass dishes, or perhaps by preference and not from poverty, on a simple plaintain leaf. Their usual clothes are simply of cotton, and cost little; and when going a distance, to the tahsildar's or collector's cutcherry for example, they generally travel on foot; or in exceptional cases, usually of age or infirmity, on a pony not worth above 7 or 8 Rs.

"It may perhaps be replied to all this that such are the simple habits of the country, and that the people are satisfied and require no more. This is no doubt true as a fact: to this extent at least, that in the absence of sufficient promise of success, these people abstain from active effort to better their circumstances. But if it be meant that they choose to be poor when they might be rich; that they are satisfied with the necessaries of life when they might command some of the comforts and luxuries; that they are content to have only their physical wants supplied when they might rise to the perception and enjoyment of intellectual pleasures; then I deny the truth of the assertion. And I must add that, if true in any degree, it would only prove the ignorance and debasement of the people to whom it relates.

"The foregoing description refers to the better class of ryots, men who are above the world and well off; but the condition of the great majority is much worse. From the official list of puttahs for the Revenue year 1848-49 it is seen that out of 1,071,588 the total number of puttahs (excluding joint puttahs) in the fourteen principal Ryotwar Districts, * no fewer than 589,932, being considerably more than half are under 10 Rupees each, and in fact average only a small fraction above 4 Rupees each; that 201,065 are for amounts ranging from 10 Rupees to 20, and in fact averaging less than 14¼ Rupees each; and that 97,891 are for amounts between 20 Rupees and 30, and in fact averaging only 24⅓ Rupees; and thus, that 888,888 puttahs, out of a total of 1,071,588, or considerably more than three-fourths, are for amounts under 30 Rupees, and in fact averaging less than 8¾ Rupees.

"Now it may certainly be said of almost the whole of the Ryots paying even the highest of these sums, and even of many holding to a much larger amount, that they are always in poverty and generally in debt. Perhaps one of this class obtains a small sum out of the Government advances for cultivation, but even if he does, the trouble that he has to take, and the time he loses in getting it, as well as the deduction to which it is liable, render this a questionable gain. For the rest of his wants he is dependent on the bazaarman. To him his crops are generally hypothecated before they are reaped, and it is he who redeems them from the possession of the village watcher, by pledging himself for the payment of the kist. These transactions pass without any written engagements or memoranda between the parties, and the only evidence is the chetty's own accounts. In general there is an adjustment of the accounts once a year, but sometimes not for several years. In all these accounts interest is charged on the advances made to the ryot on the balance against him. The rate of interest varies with the circumstances of the case, and the necessities of the borrower; it is probably seldom or never less than 12 per cent. per annum; and not often above 24 per cent.; of course, the poorest and most necessitous ryots have to pay the highest.

* Chinglepat, Salem, [illegible], [illegible], North Arcot, South Arcot, Tanjore, Trichinopoly, Tinnevelly, Bellary, Cuddapah, Coimbatore, Canara, Kurnool.

"A ryot of this class of course lives from hand to mouth; he rarely sees money except that obtained from the chetty to pay his kist; the exchanges in the out-villages are very few and they are usually conducted by barter. His ploughing cattle are wretched animals not worth more than from three and a half to six rupees each (seven to twelve shillings,) and those perhaps not his own, because not paid for. His rude and feeble plough costs when new no more than two or three shillings; and all the rest of his few agricultural implements are equally primitive and inefficient. His dwelling is a hut of mud walls and thatched roofs, far ruder, smaller, and more dilapidated than those of the better classes of ryots above spoken of, and still more destitute, if possible, of anything that can be called furniture. His food and that of his family is partly their porridge made of the meal of grain boiled in water, and partly boiled rice with a little condiment. And generally the only vessels for cooking and eating from, are of the coarsest earthenware, much inferior in grain to a good tile or brick in England, and unglazed; brass vessels, though not wholly unknown among this class, are rare.

"The scale of the ryots descends to those who possess a small patch of land, cultivated sometimes by the aid of borrowed cattle, but whose chief subsistence is derived from cooly labour, either cutting firewood and carrying it for sale to a neighbouring town, or in field labour. The purely labouring classes are below these again, worse off indeed, but with no very broad distinction in condition. The earnings of a man employed in agricultural labour cannot be quoted at more than 20 Rupees a year, including every thing; and this is not paid in money, but in commodities. As respects food, houses, and clothing, they are in a worse condition than the class of poor ryots above spoken of. But I will endeavour to describe their circumstances a little more particularly.

"The regular agricultural labourers are usually engaged at the commencement of the season, for the whole year. It is customary to advance them a small sum, about 5 or 10 Rs., as a sort of retainer, which, however, is to be repaid when the connection ceases. Frequently they remain without change for years; when a man desires to engage with another master, as he will rarely have been able to accumulate money to pay off the advance received, the sum advanced by the new master goes to pay the old one. These yearly labourers receive a certain allowance of grain every month, which is usually fixed by the custom of the locality; and at particular seasons, some regular, others occasional, the master makes the servant a small present, also fixed by the local custom. When the wife or children of the labourer work in the fields at weeding, &c., they receive daily hire in grain, and labourers not engaged for the whole year, but only at particular times, are paid in the same manner. The rates of hire are very low. The daily rate varies in different parts of the country, from eight pies (one penny) to one anna (three half pence); it is rarely or never above the latter sum for purely agricultural labour, and this is paid not in money but in grain. The occasional presents to the yearly labourers are partly in money, and partly in clothes; the entire earnings of a labourer engaged for a year do not exceed from 16 to 20 Rupees for that whole term.

"It appears from the foregoing detail that the condition of the agricultural labourer in this country is very poor. Taking his earnings at the highest rate, viz., 20 Rs. a year, this would be equivalent in real value, using the same standard of comparison as above, to £10 a year in England. The English field labourer earns on the average not less than £28 a year, including his extra gains in harvest time, and thus it appears that the real wages of a field labourer in regular employ, his command of the necessaries and conveniences of life, are in this country little more than a third of what they are in England. It is no doubt true that some things are necessaries there which are not so in so high a degree here; the labourer in this country does not need to spend so much on firing, clothing, or shelter from the weather as in England; in other words, an equal amount of physical comfort in those respects may be purchased here at a smaller outlay. But making full allowance for this difference, the labourer here will still be found to be much the worse off. In fact, almost the whole of his earnings must necessarily be consumed in a spare allowance of coarse and unvaried food, and a bare sufficiency of clothing. The wretched hut he lives in can hardly be valued at all. As to anything in the way of education or mental culture, he is utterly destitute of it."

MANNERS OF THE HINDOO.

(By Hon. Mr. Mountstuart Elphinstone.)

Difference of Indian Nations.

"It has been stated that Hindoostan and the Deccan are equal in extent to all Europe; except the Russian part of it and the countries north of the Baltic.

"Ten different civilised nations are found within the above space All these nations differ from each other in manners and language, nearly as much as those inhabiting the corresponding portion of Europe.

"They have also about the same degree of general resemblance which is observable among the nations of Christendom, and which is so great that a stranger from India cannot, at first, perceive any material difference between an Italian and an Englishman. In like manner Europeans do not at once distinguish between the most dissimilar of the nations of India.

"The greatest difference is between the inhabitants of Hindoostan proper and of the Deccan.

"The neighbouring parts of these two great divisions naturally resemble each other, but in the extremities of the north and south, the languages have no resemblance, except from a common mixture of Sanscrit; the religious sects are different; the architecture, as has been mentioned elsewhere, is of different characters; the dress differs in many respects, and the people differ in appearance; those of the north being tall and fair, and the other small and dark. The northern people live much on wheat, and those of the south, on ragi, a grain almost as unknown in Hindoostan as in England. Many of the points of difference arise from the unequal degrees in the two tracts which were conquered and occupied, first, by the people professing the Brahminical religion, and, afterwards, by the Mussulmans; but more must depend on peculiarities of place and climate, and, perhaps, on varieties of race. Bengal and Gangetic Hindoostan, for instance, are contiguous countries, and were both early subjected to the same governments; but Bengal is moist, liable to inundation, and has all the characteristics of an alluvial soil; while Hindoostan, though fertile, is comparatively dry, both in soil and climate. This difference may, by forming a diversity of habits, have led to a great dissimilitude between the people; the common origin of the language appears, in this case, to forbid all suspicion of a difference of race.

"From whatever causes it originates, the contrast is most striking. The Hindoostanees on the Ganges are the tallest, fairest, and most warlike and manly of the Indians, they wear the turban, and a dress resembling that of the Mahomedans; their houses are tiled, and built in compact villages in open tracts: their food is unleavened wheaten bread.

"The Bengallese, on the contrary, though good-looking, are small, black, and effeminate in appearance; remarkable for timidity and superstition, as well as for subtlety and arts. Their villages are composed of thatched cottages, scattered through woods of bamboos or of palms: their dress is the old Hindoo one, formed by one scarf round the middle and another thrown over the shoulders. They have the practice, unknown in Hindoostan, of rubbing their limbs with oil after bathing, which gives their skins a sleek and glossy appearance, and protects them from the effect of their damp climate. They live almost entirely on rice; and, although the two idioms are more nearly allied than English and German, their language is quite unintelligible to a native of Hindoostan.

MYSORE.

STATISTICS OF PHYSICAL, POLITICAL, AND FISCAL GEOGRAPHY.

A.—Physical Geography of the Territories under the Civil and Political Control of the Administration of Mysore.

I.

Mysore is situated between 11°36' and 15° 0' north latitude and 74°42' and 78°37' east longitude. Its extreme breadth from east to west is 230 miles, and its extreme length from north to south is 190 miles. Its area is 27,004 square miles. It is bounded on the north by the Bombay Collectorate of Dharwar, and the Madras Collectorate of Bellary. On the south by the districts of Salem and Coimbatore, both in the Madras Presidency. On the east by those of Cuddapah and North Arcot, also of Madras. On the west by Coorg and the Western Ghats, which shut off Mysore from Malabar and Canara on the west coast.

The Province was surveyed for revenue purposes during the administration of Purnaiya between 1800 and 1810, and a topographical survey was carried out by Colonel Mackenzie in the years 1800—1807. A revenue survey on the Bombay system, including the classification and assessment of the land, is now in progress.

Area.—Cultivated and Uncultivated, and Communications.

Districts.	Total Area in Square Miles.				Unappropriated Culturable Waste in Acres.			Communications—Mileage of.		
	Cultivated.	Waste		Total.	Remaining last year.	Sold or granted during the year.	Remaining at close of year.	Water distinguishing navigable Rivers and Canals.	Made Roads, 1st, 2nd and 3rd classes.	Rail Roads.
		Culturable.	Unculturable							
Bangalore	1,409	173	1,004	2,586	642,560	.....	642,560	...	457	17
Kolar	1,034	194½	1,053	2,281½	673,920	...	673,920	...	241	31½
Toomkoor	1,009	227½	1,530	2,766½	979,205	5	979,200	...	382½	...
Mysore	1,554	95	1,442	3,091	922,882	2	922,880	...	487½	...
Hassan	1,181	42½	474	1,697½	303,495	135	303,360	...	327½	...
Shimoga	567	511	3,572	4,650	2,286,172	92	226,080	..	...	...
Kudoor	417	162	6,444	7,023	4,124,173	13	4,124,160	...	210	...
Chituldroog	1,545	811½	1,849	4,205½	1,183,816	456	1,183,360	..	364½	...
Total... ...	8,716	2,217	17,368	28,301	11,116,223	703	11,115,520	...	2,470½	48½

II.

CIVIL DIVISION.

The Government of the Province is administered by the Chief Commissioner in the name of the Maharaja. This Officer was nominated in 1834 *as sole Commissioner in supersession of the Joint Commissioners originally appointed in* 1831-32. *In* 1843 *the duties of Resident were superadded, that office, as a separate post, being abolished.*

Names of Divisions.	Names of Executive Districts.	Number of Judicial and Revenue Sub-Divisions	Area in square miles	Population.	Chief Towns with Population	Number of Villages.	How many Civil Revenue Judges of all sort.	How many Magistrates of all sorts.	Maximum distance in miles of Villages from nearest Court	Average of do	Number of Police.	Total Cost of Officials and Police of all kinds.	Revenue.	
													Land	Gross.
Nandidroog.	Bangalore	13	2,586	659,403	Kasaba Town 52,895 Cantonment 79,301 Bangalore 1,32,196 Devanahalli 5,395 Dodda Ballapura... ... 9,016 Chennapatna 4,239	5,508	34	33	21	12	1,011	3,75,524 13 7	9,48,159 14 0	17,84,584 12 5
	Kolar	11	2,281½	479,248	Kolar ... 10,363 Chintamani in Ambajidurga 3,113 Chika Balapura 7,056	5,580	26	25	22	10	959	1,61,643 6 7	10,08,986 4 1	12,36,100 10 ½
	Toomkor	10	2,766½	491,599	Toomkoor... 10,680 Tipatur in Honnavalli 3,547 Sira ... 2407	4,996	23	22	24	4	868	2,14,085 3 4	9,02,865 1 5	11,76,521 3 1
Agragram.	Mysore	13	3,091	763,299	Mysore ... 73,067	4,740	21	36	43	22	1,424	4,72,210 0 7	9,62,411 3 8	15,08,924 9 1½
	Hassan.	10	1,697½	592,801	Hassan ... 52,009	5,155	13	23	34	17	866	2,18,646 0 2	9,93,489 10 11	12,57,161 3 6
Nagar.	Shimoga	9	4,650	430,220	Shimoga . . 29,743	4,016	13	20	273	19½	924	57,468 0 0	10,72,116 11 9	16,43,879 2 5
	Kudoor	8	7,023	261,822	including 7 towns ... 17,729	3,075	18	17	28	..	551	2,31,617 9 0	5,82,314 13 9	9,22,952 11 9
	Chitul-droog	10	4,205½	378,379	Do. 10 do. 28,395	2,150	13	22	22½	22½	767	1,84,318 13 0	6,79,821 3 1	9,46,023 12 9
Total..	.....		24,503	4,056,766	.....	35,220	161	198	...	...	.....	19,15,513 14 3	71,50,164 14 8	1,04,76,148 1 ½

III.

MYSORE.—*Character of the Soil.*

Nature of different Tracts.	Names, Area, and Physical Description of each Tract.	Where situated, in British or Native Territory.	Prevailing Soils, Minerals, and Products.
Mountains and elevated Tracts.	The Mysore country above the ghats is often called "The Table Land," a denomination very little descriptive of its appearance, as it is by no means plain or flat, but in some parts mountainous, and everywhere undulating. The Eastern Ghats form the frontier by which it is separated from the Carnatic. They constitute the exterior of the east ranges of hills, which run along the whole length of the Peninsula from Cape Comorin, stretching up to the continent of Asia. In many parts the ascent over them into Mysore is very high and difficult, while in others it is more sloping and protracted. The country rises gradually from these ghats towards Bangalore, which is situated in the most elevated portion of the Mysore plateau, and is 3,031 feet above the sea level.		The soils, in the order of their prevailing kinds, are as follows:— 1. Red soil mixed with loam and vegetable mould. 2. Inferior red sandy soil. 3. Black cotton, free from stones. 4. Stony and gravelly soil. 5. Rich garden soil. 6. White stiff loam. 7. Black cotton, but light and stony. 8. Soil impregnated with salt. The great rock, which may be said to constitute the basis of the whole country, is a kind of sienite, composed for the most part of four different ingredients, *viz.*, quartz, felspar, hornblende, and mica. The quartz as usually a dull greyish white color, and veins of it from 4 to 10 inches thick often traverse the rock in different directions. The felspar varies in color from a silver white to a deep brick red, and is the most copious constituent of the rock. The hornblende is black, very abundant, and very much given to decomposition. The mica is easily distinguished from the hornblende, even when the stone is nearly in a state of disintegration. The hornblende in that state has assumed a brown ochre color, and has lost all lustre, and cohesion, while the mica retains both its color, lustre and the progress of cohesion to the last, and becomes only more apparent by the progress of disintegration. This is particularly exemplified in the Mysore country, where the undulating high ground consists of sienite, decomposed into pipe clay, intermixed with micaceous shining particles and grains of quartz. From the structure of the country, which is entirely primitive, no coals could be expected.
Plains. ...	The descent from Bangalore on all sides is perceptible, though not rapid. On the north-west, after passing the Chitaldroog range of hills, there is a gradual fall through the broad valley which leads to the river Tungabhadra, near which is the station of Harihara, probably the lowest point in Mysore, its altitude above the sea being only 1,800 feet. To the south-west and west, by Seringapatam and Hassan, there is perhaps a more marked descent, until it is abruptly terminated by the western range of ghats, comprising in this direction the Nilgiri and Coorg hills, and further north, the Manjarabad and Nagar ranges. A marked feature of the country is the number of isolated hills called Durgs, on the most inaccessible of which the former palegars or petty chiefs built forts, afterwards in many instances strengthened and improved by Hyder and Tippu, and still in good preservation, but now without guns.		
Forests. ...	The principal forests are found clothing the sides of the Western Mountains. They abound in teak, blackwood, and other valuable kinds of timber. There are no forests in the Eastern Ghats. Sandalwood grows in the country bordering the hills.		Chlorite slate is found near Sira, and drawing slate in the neighbourhood of Chitaldroog. Other minerals are the following:— Clay iron stone. Schorl in quartz. Mica slate. Magnetic iron stone. Pot stone. Actinolite. Ligniform asbestos. Brown spar. Common salt. Carbonate of soda. Gold is occasionally found near Betmangala by washing the alluvial soil, but in too small quantities to repay labor.
Rivers. ...	The Tunga and Bhadra rise in the north-west of Mysore, and uniting, form the Tungabhadra, which flows northwards and eastwards till it joins the Kristna below Kurnool. The banks of the Tungabhadra are too high for irrigation purposes. The Kaveri rises in Coorg and passes through and out of Mysore in a south-easterly direction, after receiving the Hemavati, the Lokani, the Shimsha, and the Arkavati from the north, and the Lakshmantirth and the Kabani from the south. The Kaveri and its tributaries supply numerous irrigation channels and tanks. The Pennair, the Palar, and Penar, rise in the eastern [illegible] of Mysore, in their short course through which the waters are detained and converted into chains of tanks. They become large rivers before they reach the sea. None of these rivers are suitable for navigation.		The chief products are:— Paddy. Ragi—the principal food of the people. Ballar—a kind of small bean. Gram. Wheat. Millet. Oil-seeds. Sugar-cane. Cotton. Hemp. Tobacco. Mulberry. Coffee. Cocoanuts. Betel nuts. Potatoes for export.
Lakes. ...	There are no natural lakes in Mysore; but there are nearly 20,000 artificial reservoirs, some of which are of considerable magnitude.		
Marshes	None of any consequence.		

Climate.

Places at which observations taken, and year for which taken.	Rainfall in Inches.				Average Temperature in the shade.									Prevailing Winds.			Remarks.
					May.			July.			December.						
	Jan. to May.	June to Sept.	Oct. to Dec.	Total.	Sunrise.	2 P.M.	Sunset.	Sunrise.	2 P.M.	Sunset.	Sunrise.	2 P.M.	Sunset.	Jan. to May.	June to Sept.	Oct. to Dec.	
Bangalore District	3·97½	24·11½	12·32½	40·41½	77	90	...	73	81	...	70	76	...				
Kolar do.	4·0	22·0	6·0	32·0	...	...	...	...	...	...	...	...	...				
Toomkoor do.	0·69	21·69	3·73	26·11	81	89	87	78	82	81	77	79	78				
Mysore do.	7·36	17·80	6·21	31·37	75	...	87	69	...	79	81	...	...				
Hassan do.	8·88	16·52	5·0	32·40	78	...	82	72	...	73	71	...	74				
Shimoga do.	3·81½	17·33½	5·12	26·27	...	93	...	...	39	...	..	85	...				
Kudoor do.	2·31½	23·14	5·86	31·31½	76	...	81	70	...	72	70	...	74				
Chitaldroog do.	2·56	10·83	9·50½	22·89½	76	87	88	76	76	78	...	...	...				

IV.

MYSORE.—POPULATION.

Districts.	Inhabited Houses.			Population.						Classification of Population.									Occupation.		Prevailing languages.	Emigration or Immigration during the year.	Remarks.
	No. of masonry dwellings.	Do. of all other kinds.	Total.	Men.	Women.	Children under 12 years. Male.	Children under 12 years. Female.	Total.	No. per square mile.	Christians. European.	Christians. East Indian & other mixed classes.	Christians. Native.	Hindus.	Mahomedans.	Parsis.	Budhists & Jains.	Aborigines.	Agriculturists.	Non-Agriculturists.			
Bangalore	1,231	131,923	133,154	253,164	216,212	103,077	86,950	659,403	255	3,877	2,477	2.702	597,802	51,996		549	.	80,743	578,660	Kanarese, and in some parts Telugu, also Hindustani.	224	
Kolar	91	145,635	145,726	170,704	146,541	90,693	71,305	479,243	210	5	40	486	453,715	24,852	.	145	...	74,669	404,574		1,983	
Toomkoor	15	126,171	126,186	164,693	147,999	95,467	83,440	491,599	177	29	33	300	471.835	18,074	.	1,328		76,536	415,063		...	
Mysore	263	153,031	153,294	253,723	235,779	146,714	127,083	763,299	247	85	172	1,809	722.023	36,947		2,263	...	114,169	649,130		...	
Hassan	95	124,726	124,821	205,857	171,824	114,516	100,604	592,801	349	53	56	2.080	573.351	14,251		3,010		88.705	504,096		163	
Shimoga	...	102,981	102,981	140,183	124,819	93,984	71,234	430.220	92	39	64	544	404,179	22,011		3,383		71,792	358,428		...	
Kudoor	...	64,306	64,306	83,833	81,434	53,760	42,795	261,822	37	48	13	135	250,989	9.493	.	1,144		47,768	214,054		...	
Chituldroog	4	102,257	102,261	122,739	108,302	80,749	66.589	378,379	90	15		130	365,785	11.648		801	.	52,638	325,741		698	
Total	1,699	951,030	952,729	1,394,896	1,232,910	778,960	650,000	4,056,766		4,151	2,855	8,186	3,839,679	189,272		12,623	...	607,020	3,449,746		...	

V.

MYSORE.—LAND TENURES HELD DIRECT FROM GOVERNMENT.

Nature of Tenure.		Number of Estates.	Number of Villages.	Number of Holders.	Gross Area in Acres.	Average Area of each Estate.	Average Assessment of each Estate.	Revenue Rate per Acre.	Supposed Net Profit per Acre.
Great Zamindaris paying more than Rs. 50,000 revenue	Held by individuals under law of primogeniture	.....	.....	.....	.....	.....	.....	.....	.....
	Held by individuals and families under ordinary law								
Large Zamindaris paying more than Rs. 5,000 revenue	Under law of primogeniture	.....	.....	.....	.....	.....	.....	.....	.....
	Under ordinary law								
Small Zamindaris other than those of cultivating communities		.....	2,438¼	.....	845,502	.....	.....	0—6—11	.....
Proprietary cultivating communities paying in common		.....	.....	.....	.....	.....	.....	.....	.....
Proprietary cultivators paying separately, including all small estates paying less than Rs. 100		.....	31,945½	607,020	3,436,544	5—2—0	10—15—0	1—15—0	.....
Holders of revenue-free tenures	In perpetuity	.....							
	For life	.....	836½	.....	663,487	.....	.....	.....	.....
Land-holders who have redeemed the revenue		.....	.....	.....	.....	.....	.....	.....	.....
Purchasers of waste lands		.....	.....	.....	703	.....	.....	4—12—0	.....
Total		.....	35,220	607,020	4,946,236	.....	.....	.....	.....

MYSORE.—STATISTICS.

VI.

STATISTICAL TABLES SHOWING THE AREA, CULTIVATION, POPULATION, AND PRODUCE OF THE VARIOUS DISTRICTS IN THE PROVINCE OF MYSORE.

Classification of Lands and Crops.

Classification of Lands.		Bangalore.	Kolar.	Toomkoor.	Hassan.
		Acres.	Acres.	Acres.	Acres.
Total area		1,857,280	1,828,480	2,147,200	1,025,828
Barren		854,400	1,120,640	682,880	484,160
Residue cultivable		1,002,880	707,840	1,464,320	541,668
Jagheer, or not paying revenue		150,988¼	87,642½	85,070	42,885
Cultivable not cultivated		437,103	164,845½	839,620	29,978
Fallows of one year		4,633	66,194¾	34,460	14,390
Crops of one year	Vysakee	1,124	2,731	10,161	452,660
	Kartekee	409,031¾	386,426¼	495,009	1,755
	Total	410,155¾	389,157¾	505,170	454,415
Baranee, or dry land	Vysakee	.....	.....	.....	308,580
	Kartekee	351,026¾	315,730¾	424,821	.....
	Total	351,026¾	315,730¾	424,821	308,580
Canal irrigated by lift	Vysakee	101	40	169	5,950
	Kartekee	344	207¾	5,710	.....
	Total	145	247¼	5,879	5,950
Canal irrigated by flow	Vysakee	.....	120	55	.....
	Kartekee	37	820	1,116	.....
	Total	37	940	1,171	.....
Total canal irrigated	Vysakee	101	160	224	5,950
	Kartekee	381	1,027¾	6,826	.....
	Total	482	1,187¼	7,050	5,950
Irrigated from other sources	Vysakee	1,023	2,503½	5,558	138,130
	Kartekee	57,624	69,735¾	67,741	1,755
	Total	58,647	72,239½	73,299	139,885
Total irrigated	Vysakee	1,124	2,663½	5,782	144,080
	Kartekee	58,005	70,763½	74,567	1,755
	Total	59,129	73,427	80,349	145,835
		No.	No.	No.	No.
Population	Town	186,684	41,229	40,984	5,209
	Rural	472,719	438,014	450,615	587,592
	Total	659,403	479,243	491,599	592,801

Abstracts of Areas in Acres.

	Vysakee.	Kartekee.	Total.
	Acres.	Acres.	Acres.
Baranee, or dry land	2,000,625½	2,076,098¾	4,076,724¼
Canal	231,622	40,543¾	272,165¾
Other irrigation	481,141	259,438¼	740,579¼
Total crop	2,682,035	2,404,602	5,086,637
Fallow	.....	.....	282,335¾
Total cultivated			5,368,972¾

MYSORE.—AGRICULTURE.

I.—Crops cultivated, in Acres, Actual or Approximate.

Districts.	Rice.	Wheat.	Other food grains.	Oil-seeds.	Sugar-cane.	Cotton.	Opium.	Indigo.	Fibres.	Tobacco.	Tea.	Coffee.	Vegetables.	Mulberry.	Cocoanut and Areca-nut.
Bangalore ...	47,102½	199	46,810½	27,048	1,766	.. ..	73	...	...	945	...	...	4,883	5,954	7,553
Kolar ...	52,277	127	118,366	10,440	9,496½	67½	1,066	...	84	724¼	...	99	3,723½	1,198¾	688¼
Toomkoor ...	51,557	254	17,996	7,807	450	21	...	...	120	2,123	...	...	2,191	3,171	12,574
Mysore	59,060	295	598,725	40,460	221	3,165	...	...	...	...	...	528	1,218	1,465	
Hassan	66,151	119	207,696	18,471	3,762	99	...	...	162	13,644	...	51,745	151	63	
Shimoga ...	977,400	40	105,000	4,800	2,500	1,100	...	...	3,500	150	...	5,500	3,300	...	30,000
Kudoor	40,654	2,100	64,040	2,350	494	687	12	...	1,020	4,642	...	53,059	11	...	8,718
Chituldroog ...	39,480	5,543	731,966	6,654	3,322	46,435	...	...	424	1,292	...	...	4,183	...	25,029
Total...	13,33,681½	8,677	1,890,599½	118,030	22,011½	51,574½	1,151	...	5,3 0	23,520¼	...	110,931	19,660½	11,854¾	84,562¼

MYSORE.—STOCK.

Districts.	Cows and Bullocks.	Horses.	Ponies.	Donkeys.	Sheep and Goats.	Pigs.	Carts.	Ploughs.	Boats.
Bangalore ...	391,121	1,456	2,701	11,302	257,027	1,426	16,554	73,678	1
Kolar ...	243,198	816	2,777	11,207	364,743	2,016	21,716	69,057	...
Toomkoor ...	312,380	711	3,277	6,898	341,324	1,740	3,390	86,564	
Mysore	488,366	1,554	2,592	8,620	430,732	834	4,378	93,955	47
Hassan	342,183	180	3,109	4,536	272,395	12,340	2,430	92,280	28
Shimoga ...	362,841	828	1,851	1,590	45,569	2,896	10,162	67,224	65
Kudoor	236,946	479	495		106,460	54,018	769	47,159	5
Chituldroog ...	257,781	48	2,181	4,557	435,935	5,607	5,001	21,505	3
Total...	2,634,816	6,072	19,483	48,710	2,254,185	80,877	64,400	551,422	149

MYSORE.—RATES OF RENT AND PRODUCE.

Average Rent per acre for land suited for

Districts.	Rice.	Wheat.	Inferior grains.	Indigo.	Cotton.	Opium.	Oil-seeds.	Fibres.	Sugar.	Tobacco.
Bangalore ...	5 9 10	5 9 0	1 7 4			7 1 0	1 7 4	0 14 1	14 13 5	6 8 10
Kolar ...	6 0 0	6 0 0	1 8 0		1 8 0	10 0 0	1 8 0	..	12 0 0	6 0 0
Toomkoor ...	6 15 10	7 1 6	1 10 0		1 7 0		0 14 7	1 10 0	13 6 8	2 5 2
Mysore	0 4 0	2 10 9	2 10 9		2 10 9		2 10 9	2 10 9	4 10 0	2 10 9
Hassan	6 0 8	4 10 7	4 2 7		3 13 3		3 15 10	3 9 5	5 6 5	3 14 5
Shimoga	13 0 0	3 0 0	5 10 0		3 0 0		3 0 0	2 8 0	13 0 0	3 0 0
Kudoor	6 8 4	3 9 9	2 7 9		2 7 9	8 0 0	1 10 8	1 7 4	10 9 0	3 4 0
Chituldroog ...	1 13 0	1 8 0	1 8 0		0 15 0		0 12 0	4 0 0	6 0 0	1 10 0
Total... ...	50 8 8	34 2 5	21 2 5		15 13 9	25 1 0	15 15 2	17 11 7	78 13 6	29 5 2
General Average ...	6 5 1	4 4 3½	2 10 3½		2 4 3	8 5 8	2 0 0	2 8 6	9 13 8	3 10 8

Average Produce of land per acre in lbs.

Districts.	Rice.	Wheat.	Inferior grains.	Indigo.	Cotton.	Opium.	Oil seeds.	Fibres.	Sugar.	Tobacco.	Tea.	Coffee.	Silk.
Bangalore ...	2,261	1,464	784			5	394	139	138	200	...	...	79
Kolar ...	2,080	972	680		72	3	680	...	1,640	445	...	42	...
Toomkoor ...	1,133	1,125	405		144	..	504	179	360	180	...	...	...
Mysore	2,524	319	521		2,688	...	336	2,524	576	276	...	3,600	...
Hassan	1,592	804	627		400	..	648	194	1,250	264	...	267	...
Shimoga	1,000	40	1,000	..	350	..	240	900	360	400	...	280	...
Kudoor	813	213	470	...	400	20	215	400	1,440	428	...	292	...
Chituldroog ...	518	284	408	...	60	...	186	148	1,940	294	...	...	...
Total... ...	11,921	5,221	4,895	..	4,114	28	3,203	4,484	7,704	2,487	...	4,481	79
General Average ...	1,490	652 0/16	611 4/16	..	58 13/16	9 5/16	400 6/16	640 9/16	963	310 14/16	...	896 3/16	79

X.

DISTRIBUTION OF PRODUCE IN MAUNDS OF 82 POUNDS

Exports	Rice.	Cotton.	Jolah or Millet	Oil-seeds	Wheat and Barley.	Pulse	Jowar, Ragi, and Bajra	Coffee.	Sugar.	Others	Tobacco.	Total.
Bangalore	91,006		80	38,439	336	84,097				655,998		869,956
Kolar	331,512			28,859		75,592				501,367		937,330
Toomkoor	95,400		5,000	1,525		20,350	70			241,515		363,860
Mysore	48,761			23,306		20,037	195,781	14		72,330		360,229
Hassan	280,000			36,000		56,000	493,000	45,822		62,000		972,822
Shemoga	712,000	1,800		6,800	130	25,500	5,500			107,000		859,630
Kudoor	207,000	1,000	3,000	3,000	16,000	9,000	150,000	16,600	4,200	91,600	2,600	494,000
Chituldroog	67,700	19,622		75,818	15,638	100,628	826,443			551,302		1,657,161
Total	1,834,289	22,422	8,080	213,747	32,104	391,204	1,670,794	62,436	4,200	2,273,112	2,600	6,514,988

Kept for Consumption	Rice	Cotton.	Jolah or Millet.	Oil-seeds	Wheat and Barley	Pulse	Jowar, Ragi, Bajra, and Grams	Coffee.	Sugar	Others.	Tobacco.	Total.
Bangalore.	1,380,894		120	195,851	614	380,903				5,128,552	.	7,086,934
Kolar	994,538	594		57,717	1,505	226,776				1,002,734		2,283,329½
Toomkoor	196,073	125	159,306	30,412	996	139,969	15,400			1,119,436		1,661,717
Mysore	955,259	18,996		340,834	2,212	466,371	4,464,344	514		1,314,430		7,562,960
Hassan	1,000,000	230		110,000	1,000	185,200	1,198,000			229,800		2,724,230
Shemoga	506,500	200		8,200		109,500	16,500			1,098,000	. ...	1,738,900
Kudoor	560,016	200	6,892	6,170	8,585	20,409	150,374	400	3,029	72,371	1,014	829,460
Chituldroog	53,074	14,171		59,063	26,744	58,270	339,359	..	..	486,430	.....	1,037,111
Total ..	5,646,354	33,981¼	166,318	808,247	41,656	1,587,398	6,183,977	914	3,029	10,451,753	1,014	24,924,641¼

THE

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ZANZIBAR,—1870.

(By Dr. John Kirk, Acting Political Agent.)

THE Administration Report of the British officer resident at Zanzibar, an independent State, outside and distant from the Indian Empire, which holds equal relations with various civilized countries, must necessarily be little more than a report of the trade and chief political events, with more detailed information regarding that part of the community placed under his care, whose rights it is his duty to watch over, and among whom he has to administer justice.

The British community in Zanzibar consists of Natives of India and born subjects of Great Britain, together with the Goanese, who, in the absence of an accredited Portuguese officer, are here treated in all respects as English subjects.

The three classes above named consist as follows :

1.—Natives of India	No. 3,667
2. „ England	„ 22
3.—Goanese	„ 31
Total	No 3,710

making a total population under this Agency of 3,710, exclusive of engineers, Indian sepoys, and Goanese bandsmen in the service of the Sultan.

The Political Agent at Zanzibar is also *ex-officio* His Majesty's Consul and Judge in the Vice-Admiralty Court for the trial of slave captures made by Her Majesty's cruisers, on which subjects he is under the immediate orders of the Secretary of State for Foreign Affairs.

During the past year (1869-70) no change has taken place in the relations of Zanzibar with any of the European or American Powers, with the exception of the recognition of the Consulate of the late Hanseatic Republic as that of the North German Confederation

The different Governments represented here are :—

1, Great Britain—John Kirk, Esq, Acting Political Agent and Her Britannic Majesty's Consul, 2, France— Ch. de Vienne, Consul ; 3, United States—F R Webb, Consul ; and 4, North German Confederation—F O'Swald, Acting Consul.

CUSTOMS AND REVENUE

In Zanzibar, where there is no public treasury distinct from the private income of the Sultan, it is impossible to obtain an accurate account of the expenditure.

The following is, however, a sufficiently exact statement of the receipts :—

	Dollars.
1.—Paid by Jairam Sewji as farmer of the revenue	310,000
2.—Capitation Tax paid by the Wahadimu of Zanzibar	10,000
3.—Produce of the Sultan's estates	25,000
Total income in 1869	345,000
Being equal to £	72,812

No subsidy having been paid last year to Muscat, and the question of the continuance of this annual charge being still under consideration, the above sum has been at His Highness' sole disposal. On the other hand this year there will be a considerable loss, exceeding the amount of the subsidy, being as follows :—

	Dollars.
1.—Clove Tax of 5 per cent., formerly levied on Indians, and now abolished	10,000
2.—Loss in consequence of the reduction of the Coast Duties on produce	30,000
3.—Loss from deaths among the Wahadimu from cholera and diminution of capitation tax	2,000
Estimated loss in 1870 Dollars	42,000

Thus leaving an available balance of dollars 303,000, or £63,789.

But it is extremely probable that the greater part of this loss will be taken by the farmers of the revenue, whose profits are considered to be very great. Ludda Damji, manager of the customs and agent for Jairam Sewji, who for upwards of forty years has been a confidential servant of that house, has given the following information relative to the sums paid at different times for the good-will of the Zanzibar revenue. In the time of Syud Sultan the coast of Zanzibar yielded dollars fifty thousand per annum, derived chiefly from the slave trade. The Banian house of Wat Bima first rented the customs at seventy thousand dollars, two years afterwards it was raised to eighty-four thousand and passed into the hands of Sewji, then to his son Jairam, at one hundred and ten thousand; it has since advanced at the expiry of five yearly terms to one hundred and forty thousand, one hundred and eighty thousand, and two hundred and forty thousand, reaching the present amount three hundred and ten thousand. This includes every sort of custom or duty, such as that on imports or coast produce, ivory, copal, and slaves, but not special contributions, such as that of the *Wahadimu* (or aborigines of Zanzibar). The tax paid by the aborigines of Pemba has for several years ceased, the population having disappeared and been replaced by slaves.

ZANZIBAR CUSTOM TARIFF, 1870.

1.	Duty on all foreign goods	5 per cent.
2.	„ Coast produce (except slaves, ivory, and copal)	do.
3.	*Slaves.*	
	A.—Shipped to Zanzibar	2 dollars each
	B.—Shipped from Zanzibar	do.
	C.—Shipped direct from Quiloa, &c., to Lamo	4 do.
4.	*Copal* (Animi)	dlrs.
	A.—From Delgado, &c	½ per frasilah.
	B.—From Quiloa, &c	20 per cent.
	C.—From Bagamoyo, &c	½ per frasilah.
5.	*Ivory, Hippopotamus*	3 „
	Ivory, Elephants'	
	A.—Nyassa ivory brought to Delgado and Quiloa by Arab caravans	9 „
	Do. do Native caravans	15 „
	B.—Unyanmezi ivory, &c., brought to Bagamoyo, &c., by Arab caravans and taken to Zanzibar	9 „
	Do do. sold at the Coast	12 „
	Do do. by Native caravans	15 „
	C.—Masai ivory brought to Mombas	3 „
	Do. if taken to Zanzibar, additional to the above	1 „
	D.—Somali ivory, from the Benadir (Brava, Merka, Modeesha)	2 „

The above is the authorised tariff, which came in force this year under the circumstances already reported fully to the Government.

N. B.—It is extremely doubtful how far Syud Majid will succeed in enforcing even the reduced coast produce tax should the French and Germans go largely into the coast trade with their own ships.

TRADE OF ZANZIBAR.

It is impossible to obtain accurate and reliable statistics of the trade of Zanzibar, every one being interested in representing thei mports and exports as less than they actually are. The customs master by showing the true imports from abroad and from the African coast would disclose the amount of his profits, and thus draw competition into the field, while the forcing merchants have alike no desire to induce others to think of establishing rival houses. The statement of imports is, however, of all others relating to Zanzibar commerce, the most easily obtained, and the following may in general be relied on as an approximate to the truth. If we exclude from former reports the coast produce, we find that there has been a steady increase up to the present time :—

IMPORTS AT ZANZIBAR CUSTOM HOUSE EXCLUSIVE OF COAST PRODUCE.

Year.	Value Imported.
1861-62	£245,981
1862-63	332,092
1863-64	294,613
1866-67	380,051
1867-68	433,693
Tota	1,686,430

The following table shows in dollars the imports of the year 1866-67 from 23rd August to 23rd August :—

IMPORTS IN 1866-67.

From what Country.	Amount in Dollars.
United Kingdom	311,020
British India	408,769
Kutch	266,052
Arabia	71,169
France	66,900
United States	297,160
Hamburg	384,175
Total	1,805,245

The first three items representing the whole British interest, or dollars (985,841) nine hundred and eighty-five thousand eight hundred and forty-one, being nearly three times greater than that of any other nation, exclusive of the indirect British imports brought in Hamburg and French vessels. The accompanying table (Table No. 1) exhibits in detail the value of the chief articles of imports during the year 1867-68, from this an increase of (dlrs. 254,779) two hundred and fifty-four thousand seven hundred and seventy-nine dollars worth of imports over the preceding year is apparent, but, on the other hand, the British interest has fallen (dlrs 257,642) two hundred and fifty-seven thousand six hundred and forty-two, this being chiefly due to an interruption in the direct trade with Great Britain and the closing of the mercantile house of H. A. Fraser & Co., which from this time limited its attention to the manufacture of cocoanut oil and sugar. Of late it has been clearly seen that the cotton manufacture of Kutch and Bombay cannot compete with the cheap cloth of Europe, and the Natives ascribe the yearly increasing number of Kutch emigrants to the ruin of the native cotton trade. However this may be, the fact of an absolute diminution in the exports from India to East Africa, at the same time that the total trade of this region has increased, is plainly evident. A more accurate estimate of the exports from Zanzibar to other countries may be made from a statement of the produce of the coast and island than from any return given by the local traders; those from the coast for the year 1867-68 are shown in the table annexed (Table No 2), to which must be added cloves, cocoanut oil, dried cocoanuts, and coir fibre, the produce of the island itself (Table No. 3).

THE SLAVE TRADE.

(ANNEXURES IV & V.)

I regret to have to report that as yet there is no appearance of a diminution in the yearly export of slaves to Arabia, the Red Sea, and Persian Gulf; nor do our efforts under concessions hitherto made with Zanzibar seem to have had much effect.

The transport of slaves, like all other branches of trade carried on in native vessels between this and the north, is limited to the two seasons of *Mossim* and *Damani*, the former extending in the case of native vessels engaged in legitimate trade with Kutch from the 30th of March to the 19th of May, and the latter from the 23rd August to the 26th September.

In the case of dhows sailing either later than the 19th of May or before the 23rd August there is danger from the strength of the wind, which in the case of a slave cargo is less than that caused by want of water and delays from calms and baffling winds, and therefore the restriction as to time of sailing under the concession of 1st January 1864 has proved to be of little practical value.

Between the above extremes the time chosen for running slave cargoes is guided by what is known of the disposition and movements of the squadron, thus it is always a matter of great importance for our cruisers to meet the stream of vessels going north, so that on one prize being made, others that follow may not be able to get information of the fact. Hitherto it has commonly been the practice for vessels first to come to Zanzibar from Seychelles or Madagascar, and follow up the slavers northwards, a system otherwise inadvisable, since Zanzibar has been made the port of adjudication of all Zanzibar dhows taken off the Zanzibar dominions, and to which the crew and passengers must be brought and presented at the time of trial

The following statistics, taken from official Arab sources, and therefore beyond all suspicion of exaggeration, will show what is now the declared slave trade of Zanzibar, as carried on within the limits of present treaties and concessions, exclusive, therefore, of the large contraband traffic.

In the year ending 23rd August 1869, (11,944) eleven thousand nine hundred and forty-four slaves were imported at the Zanzibar Custom House, being brought from the coast in eighty-one dhows. During a similar and nearly parallel period of one year, the number of slaves for whom permits were made out for removal to Lamo was (8,215) eight thousand two hundred and fifteen, leaving an apparent balance of (3,729) three thousand seven hundred and twenty-nine for use in the island and town of Zanzibar. From this balance must be deducted those kidnapped and carried off by northern Arabs, and those shipped as contraband from the north by Natives of the island, amounting, it is estimated, to (2,000) two thousand. Thus the true requirements of the island of Zanzibar would be about (1,800) one thousand eight hundred, or not more than (2,000) two thousand.

In such a season as the present, however, when there has been an excessive death-rate, owing to the presence of epidemic cholera, this number must be increased.

To the above number of (11,944) eleven thousand nine hundred and forty-four slaves imported at Zanzibar we must add (3,000) three thousand shipped direct to Lamo from Quiloa, making the total number of slaves taken yearly from Quiloa and the southern ports (14,944) fourteen thousand nine hundred and forty-four.

Referring to the Custom House tariff previously given, the above shipment of slaves will yield the following revenue to the State :—

		Dollars.
1.	Slaves entered at the Zanzibar Custom House, at dlrs. 2 each	23,888
2.	Slaves shipped direct to Lamo, at dlrs 4 each	12,000
3.	Slaves shipped from Zanzibar to Lamo, at dlrs 2 each.....	16,430
	Total.....	52,318

or one-seventh part of the State revenue.

VICE-ADMIRALTY COURT.

During the year 1869 proceedings have been instituted in this Vice-Admiralty Court against seventeen vessels captured by Her Majesty's cruisers as engaged in the illicit slave trade. In fifteen instances proof having been given to the satisfaction of the Court that these had really been equipped for slave traffic, or no difference having been made, decree was given for the captors, while in two cases full compensation was awarded to the sufferers, in one amounting to dollars (709½) seven hundred and nine and a half, in the other to dollars (4,779) four thousand seven hundred and seventy-nine.

Owing to cases of great hardship having been brought to the notice of Government, orders have now been issued for the guidance of Her Majesty's cruisers, and a broad distinction drawn between slave trade and the accidental fact of domestic slaves being found in a vessel, the latter not rendering the ship subject to condemnation unless the slaves are shown to have been carried for sale.

Instructions have also been issued to the officers of Her Majesty's Navy, ordering them in all cases when possible to take the dhow, her crew, passengers, and papers, but at all events t[illegible] to the place of the Court, thus ensuring a fair hearing of both sides, a thing seldom possible, when, as formerly, the crew and passengers were forced on shore, the dhow burned, and the case decided at a distant Court on the *ex parte* statements of the captors.—

Zanzibar being now the proper Court for the trial of all vessels taken within or near these dominions, there can be no longer any ground for the complaints so often made, and most justly, by His Highness Syud Majid, but it will be found quite impossible for the ships of war to bring to this place the dhows themselves when the monsoon is contrary, and therefore they must either be destroyed at the risk of the captors, or deposited pending the trial at some of the coast ports as has been suggested.

The Zanzibar Slave Trade Act of 1862 being, in one of its provisions, retrospective, captures condemned in this Vice-Admiralty Court, the legality of which was doubtful under the original constitution of the Court by Her Majesty's order in Council of August 1866, are now rendered valid, and the jurisdiction in future extended to such cases.

MOZAMBIQUE.

(ANNEXURE NO. VII.)

The Indian agency at Zanzibar being the only station in east tropical Africa, where a British officer is resident, I add a few notes showing the present state of the Portuguese dominions in the Mozambique.

Notwithstanding the obstructive policy of Portugal, the commerce of Mozambique has of late years considerably increased, owing to the encouragement given to the growth of coast produce by two rival French houses that now hold in their hands the business of that part of the coast

With Great Britain Mozambique has no direct trade, but, as at Zanzibar, much of the goods imported by foreign nations are of English origin and manufacture.

At present there are ten Indian houses doing trade in the city of Mozambique to the extent of about (£60,000) sixty thousand pounds yearly, but they complain that of late years the most lucrative part of their trade has passed to the French, who now import direct from Europe goods which they formerly supplied through Bombay and Zanzibar.

The Bonga rebellion which for two years has cut off the ivory trade of Tete and the Upper Zambezi from the coast still continues, having gained strength and importance through the successive defeats of three expeditions organised for its suppression.

During last year an order has been published abolishing the status of slavery within the Portuguese possessions abroad, thus anticipating the term fixed by former legislature.

The new tariff published for the regulation and reduction of the Custom Dues will, if properly carried out, act as an inducement to foreign vessels to visit those parts.

Cholera, which first appeared in the island of Mozambique, is reported still to continue.

RESOLUTION OF GOVERNMENT, dated 4th Feb. 1871.—Dr. Kirk should be thanked for this interesting report, copy of which should be transmitted to the Government of India and Her Majesty's Secretary of State, and copy placed on the editors' table

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COTTON SEASON,—BOMBAY, 1870-71.

SUMMARISING the recent aggregate returns issued by the Cotton Department, we find the area under cotton cultivation this season in the Bombay Presidency is said to show a decrease of nearly 12 per cent., while the yield is, notwithstanding, anticipated to exceed that of the preceding season by over 10 per cent., as set out here-under :—

I.—*Area under cotton cultivation in acres.*

		1868-69.	1869-70.	1870-71.
1.	Broach, (Surat for '68-69) and Rewa Kanta (for '69-71)	199,651	231,106	223,476
2.	Ahmedabad, Kaira, Mahee Kanta (for 68-69), and Pahlunpore (for 69-71)...	155,178	272,890	352,775
3.	Kutch	141,867	213,333	186,667
4.	Dharwar, Belgaum, Kulladghee, Kolapore and S. M. Country	1,219,795	1,723,956	1,299,992
5.	Ahmednuggur, Poona, Sattara, Sholapore and Akulkote	146,016	282,510	200,916
6.	Khandeish	426,640	540,808	611,031
	Total acres	2,289,147	3,264,603	2,874,857

II.—*Crop in bales of 3½ cwts.*

		1868-69.	1869-70.	1870-71.
1.	Broach, Surat and Rewa Kanta	37,158	45,468	45,848
2.	Ahmedabad, Kaira, (Mahee Kanta for '68-69) and Pahlunpore	13,187	25,476	34,493
3.	Kutch	7,214	13,235	14,570
4.	Dharwar, Belgaum, Kulladghee, Kolapore and S. M. Country.	138,486	75,383	88,515
5.	Ahmednuggur, Poona, Sattara, Sholapore and Akulkote	18,157	22,760	13,084
6.	Khandeish (and Nassick)	37,325	113,611	129,637
	Total bales	251,527	295,933	326,147

Including Kattiawar, Baroda, Mahee Kanta, and Sind, we are told that, in accordance with the return received, "the total contribution to the cotton trade from the produce of the Bombay Presidency in 1870-71 may be taken as 503,705 bales of 3½ cwts.," say from—

	Bales.
The Northern Division, comprising the British Collectorates of Guzerat, Khandeish and Nassick	201,929
The Southern Division, comprising do. of the S. M. Country, Sholapore, &c.	66,213
Sind (which we remove from the Commissioner's list of "Native States")	24,772
The Northern Native States of Cutch, Pahlunpore, Rewa and Mahee Kanta, Baroda, and Kattiawar	175,404
The Southern do. of Kolapore, Akulkote, &c.	35,387
Total bales of 3½ cwts.	503,705

"This," the Commissioner remarks, in rather redundant and not particularly clear phraseology, "exhibits an increase over the *estimates* of the *anticipated amount of produce* for the year 1869-70 which was *expected* from the Collectorates of the Presidency and the adjoining Native States, as published, &c., and which *amounted* to 416,514 (? 412,315) bales, not including however Kattiawar and Baroda" Now of what practical use, we would ask, is such a comparison as this? A statement that Kattiawar, Baroda, Mahee Kanta, and Sind being excluded, so as to admit of a comparison of the remainder, the present estimate amounts to 326,147 bales against 415,602 (or 411,103 ?) for the preceding year would be intelligible; though, even so, there is room for criticism—why take last year's *estimate* of the *anticipated amount* &c., for comparison when "the amount of crop realized" is available?

The Commissioner closes his report with the statement that "the estimate now presented does not of course include the cotton brought to the Bombay market from the Punjab, the Berars, and other places, the contributions from which serve to swell the exports from the port of Bombay." As we are reminded in the following weekly report, he offers "no opinion of his own regarding the probable amount of the entire crop," nor of the amount likely to be available for export. His reticence on these points shows, we think, an undue amount of diffidence, which is much to be regretted, for the information at command of the department must be very great. The Cotton Commissioner for the Central Provinces and the Berars, in his report of the 24th December last, estimates that the area under cotton cultivation in those territories was this season "18,550 acres, or rather less than one per cent" above that of 1869-70, and expresses a hope that the exports thence "will not fall short of a quarter of million bales," adding, however, the caution that "if prices are very low, it generally happens that the local manufactures revive," and this naturally causes a corresponding decrease of exports. Last month unseasonable weather was again experienced throughout the whole of the central cotton-fields, and we think Dr. Forbes might have procured a later estimate for us from those provinces, as also some advice as to the probable supply from the Nizamate and from Madras Collectorates adjoining Dharwar. These might suitably have been supplemented with a detailed statement of the estimated balance of last crop still remaining in the several districts within reach of this port, particularly in those from which our Dhollera and Dharwar cottons are drawn. Also, the probable supplies from the N. W. Provinces—which up to the end of last month had already furnished about 1,000 bales since our railway communication therewith was completed—might have been named; and the extent to which local consumption for manufactures and domestic use is likely to keep back produce, which higher prices would have brought forward for export, should have been alluded to. Information on such points as these, with such comments as Dr. Forbes's long experience and mature judgment might dictate, would be interesting and highly valued.

Early in February last, at the close of our review of the Commissioner's Report for 1869-70, we expressed the opinion that the exports from the port of Bombay for the civil year 1870 were, unless the season became extremely favourable, not likely to exceed 1¼ millions of bales. Later, the crop of Broach, Dharwar, Barsee, and, in a less degree, Oomrawuttee, suffered severely, and at the end of the following month it became apparent that notwithstanding the unprecedently large though rather late, crop of Dhollera, Veravul, &c., still expected, there was little chance of the year's exports exceeding those of 1869. They actually fell short of the latter by 56,651 bales, the respective totals, according to the account we are at present following, being 1,081,824 for 1870 and 1,138,475 for 1869.

Any estimate at this early period of the year must be open to criticism and to subsequent correction; but we think the Commissioner would not have greatly erred if, amending his last year's basis of calculation, he had made some such statement as the following:—

	Bales.
Total exports from Bombay in 1870	1,081,824
Estimated portion derived from the Berars and Central Provinces	241,824
Exports derived from Bombay Presidency and adjoining territories (except the above)	840,000

Then, supposing that there should be the same proportion between the reported amount of the last crop of the Bombay Presidency, 295,933 bales, according to the figures given above (see Table II), and the estimate of the present crop, 326,147, and between the exports derived from the Presidency and adjoining territories last year, 840,000 bales, and those likely to be obtained in the present, we find this last quantity would

	Bales.
Amount to	925,762
And adding thereto the quantity likely to be drawn from the Berars and C. P., say	244,238
We should have as the total estimated export from Bombay during the present year 1871	1,170,000

Some deduction, however, must be made on account of the cotton-fields of Kattiawar and Baroda which, instead of showing an increase of 40 per cent., are expected to have a shorter crop than last year, although, on the other hand, the considerable residue of the latter will be a partial set off. So far as we can gather, the following represents the comparative official returns for these districts and Mahee Kanta:—

Cotton area in acres.				Crop in bales of 3½ cwts.		
1868-69	1869-70	1870-71		1868-69	1869-70	1870-71
170,221	183,641	175,201	Baroda	no returns		40,370
2,334	2,500		M. Kanta	694	112	1,855
880,617	1,038,329	1,175,205	Kattiawar.	942,733	148,702	134,908

Notwithstanding the Commissioner's diffidence, we venture to express the opinion that the exports from Bombay this year, 1871, are not likely to fall short of a million bales, and that they may amount to 1⅛ millions, or say, 1,100,000 bales. —*Times of India.*

NORTH WEST PROVINCES—AGRICULTURAL STATISTICS

A RECENT *Government Gazette* gives us the following series of elaborate statements concerning the agriculture of the North-West Provinces in 1868-69. The tables seems to have been prepared under the orders of the Board of Revenue at Allahabad; according to these statements, the harvest of the North-West in 1868-69, was as follows:—

GROSS PRODUCE N. W. PROVINCES.—1868-69.

	Acres.	*Maunds 82 lbs.*
Rice	2,479,874	16,681,568
Cotton	971,885	1,160,408
Joaree and bajree	4,302,890	12,855,273
Oil Seeds	475,331	1,923,006
Wheat and barley	7,257,873	46,345,722
Pulse, gram, &c.	1,653,238	6,657,516
Other crops	4,836,423	28,756,941
Kurbee (or joaree stalk)	1,956,911	24,498,448
Acres	23,934,425	138,878,882
Add		
Ghazeepore district (particulars not received)	842,000	
Acres	24,776,425	

Although the year was marked by a very scanty rain-fall, it is impossible to regard these figures, as even approximately true. It is impossible to believe that the average produce of the land throughout the North-West in the year in question is rightly stated at such rates as these—

Rice	7	Maunds or 574 lbs. per acre.
Joaree	1⅛	„ or 246 „ „
Oil seed	4	„ or 328 „ „
Wheat and barley	6⅓	„ or 520 „ „
Pulse	4	„ or 328 „ „

Whatever damage may have been done to the khureef crops of rice, joaree and til there was no drought we believe to affect materially the rubbee (or wheat) crop either in 1868 or 1869; and yet, according to these tables, the total harvest of the year amounted but to 113,000,000 maunds of food, of which the tables shew 29,000,000 maunds to have been exported, leaving for home consumption 84,000,000 maunds or about 3,000,000 tons. But the people themselves who are about 30,000,000 in number, must at a moderate estimate require 8,000,000 tons of food a year. We find it difficult to suppose that there is not some vast error in particular in the estimate of the yield of wheat. It may seem ungracious to criticize the first efforts of the Board to supply us with the statistics we have so long desiderated. But to be of any worth statistics must be real and not the semblances of things. It is a feature in these returns that they include a mention of fodder, as part of the harvest of the land,—

	Acres	*Produce*
Kurbee or joar stalk	1,956,911	24,498,448 Maunds.

Was this a pure fodder crop, and *was the grain* cut down for the cattle? It would seem so from the shape in which the fact is recorded. No mention, however, is made either of grass, or *bhoosa* (wheat straw). To complete the returns we require an estimate of both.

N. W. PROVINCES.—AGRICULTURAL STATISTICS.

TABLES SHOWING THE AREA, CULTIVATION, POPULATION, AND PRODUCE OF THE SEVERAL DISTRICTS.

Classification of Lands and Crops for 1868-69.

Districts.	A.	A.	C				G			H.		
		B.	C	D.	E	F	Crops of one year			Baranee or not irrigated.		
	Total Area.	Barren.	Residue cultivable.	Jagheer or not paying revenue.	Culturable not cultivated	Fallows of one year	Rubbee.	Khurreef.	Total	Rubbee.	Khurreef.	Total.
Dehra Doon*	643,042	461,146	181,896	20,133	93,163	48,115	21,584	38,901	60,485	5,704	15,956	21,660
Saharunpore	1,425,280	221,440	1,203,840	219 520	152,680	100,391	390,011	341,238	731,249	221,660	281,371	503,031
Moozuffurnuggur	1,054.065	155,752	898,313	52,736	157,296	187,146	236,192	264,943	501,135	48,260	139,249	187,509
Meerut	1,515,520	207,098	1,308,422	[illegible]682	292,328	128,615	424,094	364,697	788,791	93,346	250,516	343,862
Boolundshuhur	1,222,204	130,545	1,091.659	45[illegible]608	303,238	13,971	339,729	389,113	728,842	61,714	274,204	335,918
Allyghur	1,189,527	176,926	1,012,601	27[illegible]324	82,125	65,374	401.887	435,591	837,478	84,699	219,191	303,890
Kumaon	3,840,000	3,196,800	643,200	12,800	377,600	...	137,600	252,800	390,400	91,600	168,800	260,400
Burhwal	3,520,000	3,370,645	149,355	8,27[illegible]	24,950	56,585	59,549	116,134	175,683	56,584	113,169	169,753
Bijnour	1,207,606	284,314	923,292	112,254	236,408	.	.	.	.	...	...	541,850
Moradabad	1,563,450	215,959	1,347,491	120,260	293,722	142,694	318.122	479,827	797,949	313,971	470,884	784,855
Budaon	1,228,639	131,378	1,097,261	17,667	233,457	93,205	327.72[illegible]	425,204	752,932	33,478	263,221	296,699
Bareilly	1,872,000	273,929	1,598,071	51,902	426,229	40,765	370,504	708,671	1,079,175	180,235	571,989	752,224
Shahjehanpore	1,096,320	179,649	916,671	28,212	193,668	13,149	342.134	339,508	681,642	106,381	241,864	348,245
Terai Pergunnahs	469,760	253,440	216,320	2,560	113,899	8,948	23,225	67,668	90,913	15,541	47,035	62,576
Muttra	1,031,280	134,326	896,954	73,059	86,233	79,673	237,459	420,530	6 7,989	60,560	338,890	399,450
Agra...	1,204,480	253,288	951,192	59,394	80,596	97,012	256,714	457.452	714,196	77,374	337,334	414,708
Furruckabad	1,090,581	263,828	826,753	11,168	152,233	8,188	308,057	375,607	684,164	85,332	181,064	266,396
Mynpoory	1 066,240	385,730	680.510	5,677	94,986	52.607	275 721	251,519	527.240	55,949	110,486	166,435
Etawah	1,044,123	391,924	652,199	24,611	128,384	453	296.761	201,990	498,751	97,457	127,420	224,877
Etah...	896,000	158,704	737,296	30.496	78,130	61,636	258,393	308,641	567,034	95,988	264,605	360,593
Jaloun	988,418	241,643	746,775	46,751	85,070	11.504	446,357	157,093	603,450	430,176	154,535	584,710
Jhansie	1,030,590	292,523	738,067	93,672	224,048	.	163,623	256.725	420 348	163,521	256,709	420,230
Lullutpore	1,212,681	288,694	923,987	154,156	458,363	164,879	82,968	63,621	146,589	58,257	63,159	121,416
Cawnpore	1,506,460	513,829	992,631	19 875	130,333	.	487,845	354.578	842,423	193,939	214,076	408,015
Futtehpore...	1,011,050	348,443	662,607	10,439	113,359	.	269,785	269,024	538,809	101,061	203,508	304,569
Banda	1,939,200	437,120	1,502,080	69,760	390.048	42,497	514.714	485,061	999,775	512,789	483,517	996,306
Allahabad	1,769,600	489,452	1,280 148	90,132	193,410	29,732	556,626	410,248	966,874	333 216	298,682	631,898
Humeerpore	1,464,641	353,641	1,111,000	19,935	314,403	72,573	372,525	331,564	704,089	360,314	328,935	689,249
Jounpore	995,635	91,543	904,092	22,004	213.958	7.739	440.9[illegible]	219,488	660,391	66,109	49,814	115,923
Goruckpore...	2,933,038	503,429	2,429,609	61,440	777,149	64,690	757,775	859,454	1,617,232	325,730	372,190	697,920
Bustee	1,740,247	285,706	1,544,541	63,360	342,833	82,615	598,022	457,711	1,055,733	113,205	211,614	324,819
Azimgurh	1,628,849	562,064	1,066,785	362,064	218,800	104.031	425,525	318,429	743,954	42,692	125,426	168,118
Mirzapore	3,328,148	2,041,692	1,286,456	116,927	190,693	147,023	427,898	403,915	831,813	...	...	...
Benares	637,199	137,734	499,465	27,999	25,088	2,212	297,239	146,927	444,166	137,745	59,998	197,743
Ghazeepore...	1,357,898	258,904	1,098,994	47,360	175,770	33,555	.	.	...	...	...	...
Ajmere	1,710,164	422,010	1,288,154	991,572	63,538	85,238	64,138	93,285	157,423	19,748	59,046	78,794
Grand Total...	53,483,935	18,075,248	35,408,687	2,804,069	7,518,182	2,006,815	10,931,940	11,667,177	21,999,117*	4,644,334	7,298,457	12,484,541

NOTE.—In some districts the figures against C *Residue* culturable do not correspond with those against D, E, F, and G taken together, because the same lands growing both rubbee and kurreef crops are shown under G.

* Jounsar and Bawur included.

N. W. PROVINCES.—AGRICULTURAL STATISTICS.

TABLES SHOWING THE AREA, CULTIVATION, POPULATION, AND PRODUCE OF THE SEVERAL DISTRICTS.

Classification of Lands and Crops for 1868-69.

Districts.	G. I. Canal irrigated by Lift. Rubbee.	Khurreef.	Total.	Canal irrigated by Flow. Rubbee.	Khurreef.	Total	Total Canal irrigated. Rubbee.	Khurreef	Total	G. J. Irrigated from other sources. Rubbee	Khurreef	Total.	I. AND J. Total irrigated. Rubbee.	Khurreef.	WTotal.	Population. Town.	Rural.	Total.
Dehra Dhoon* ...	.	...	...	9,810	4,144	13,954	9,810	4,144	13,954	6,812	18,059	24,871	16,732	22,093	38,825	11,782	91,049	102,831
Seharunpore	7,275	1,392	8,667	62,666	37,334	100,000	99,672	48,620	148,292	65,734	14,192	79,926	165,406	62,812	228,218	124,109	742,374	866,483
Moozuffurnuggur ...	...	...			...	...	99,494	68,842	168,336	88,438	56,852	145,290	187,932	125,694	313,626	535,664	146,525	682,189
Meerut ...	48,173	23,716	71,889	153,084	83,188	236,272	201 257	106,904	308,161	129,491	97,283	228,774	330,748	204,187	534,935	174,529	1,025,064	1,199,593
Boolundshuhur .	...	.	.	...	..	..	110,037	45,583	155,620	169,978	69,326	239,304	278,015	114,909	392,924	110,763	669,718	800,481
Allyghur	20,483	18,903	39,386	55,009	34,530	89,539	75,492	53,433	128,925	241,696	162,962	404,658	317,188	216,395	533,583	99,571	825,967	925,538
Kumaon	...								..	46,000	84,000	130,000	46,000	84,000	130,000	6,151	379,639	385,790
Gurhwal	...	...	..	..		...	...	..	..	2,965	2,965	5,930	2,965	2,965	5,930	1,927	246,815	248,742
Bijnour	...			.		...	..	.	3,052	.	..	29,728	.	...	32,780	126,940	564,035	690,975
Moradabad ...	...	...	.	..		...	..	..	.	4,151	1,809	5,960	4,151	1,809	5,960	100,189	1,090,815	1,191,004
Budaon	...	...	...		..	...	.		..	294,250	161,983	456,233	294,250	161,983	456,233	83,321	806,489	889,810
Bareilly	...	...	..			...	29,398	29,319	58,717	160,871	107,363	268,234	190,269	136,682	326,951	152,508	1,311,691	1,464,199
Shahjehanpore ..	...	...		..		..			..	235,753	97,644	333,397	236,703	96,694	333,397	106,735	812,115	918,850
Terai Pergunnahs...	202	12	214	3,183	3,673	6,856	3,315	3,685	7,070	10,635	10,634	21,269	14,020	14,319	28,339	*Nil.*	91,797	91,797
Muttra	6,780	3,783	10,563	7,759	4,989	12,748	14,519	8,772	23,311	161,588	73,640	235,228	176,127	82,412	258,539	129,413	670,908	800,321
Agra	...	...		.		.	1,029	812	1,841	178,341	119,306	297,647	179,370	120,118	299,488	142,667	887,093	1,029,760
Furruckabad ...	...	...	...			...	29,905	14,296	44,201	235 295	137,398	372,693	...	...	416,894	150,189	768,036	918,225
Mynpoory... ...	32,969	12,536	45,505	28,735	24,274	53,009	61,705	36,810	98,515	158,066	104,223	262,289	219,771	141,033	360,804	75,582	624,638	700,220
Etawah	40,384	17,108	57,492	28,846	15,656	44,499	69,227	32,764	101,991	130,077	41,806	171,883	199,304	74,570	273,874	27,228	599,216	626,444
Etah	...	..				.	22,768	12 985	35,753	122.417	48,271	170,688	145,185	61,256	206,441	242,214	372,137	614,351
Jaloun	...	...			..	...	..	..	.	16,182	2,558	18,740	16,182	2,558	18,740	54,058	351,214	405,272
Jhansie	...	...					.		..	102	16	117	102	16	118	49,070	308,704	357,774
Lullutpore ...	..	...	..			.	..	..	..	24,711	562	25,173	24,711	462	25,173	9,258	238,888	248,146
Cawnpore ...	..		...			..	73,301	32,911	106,212	198,193	135,076	333,269	271,494	167,987	439,481	113,601	1,072,261	1,185,862
Futtehpore ...	..	..				..				168,724	65.436	234,160	168,724	65,436	234,160	37,548	643,238	680,786
Banda	..	.	.	.		...				1,925	1,544	3,469	1,925	1,544	3,469	1,002	16,477	17,479
Allahabad	..	.	.	...	.	..	.	.	.	221,876	113,100	334,976	221,876	113,100	334,976	105,926	1,294,400	1,396,326
Humeerpore. ...	16	10	26	875	321	1,196	891	331	1,222	11,320	2,298	13,618	12,211	2,629	14,840	45,831	475,110	520,941
Jounpore .	.	.			.	.	.	..	..	374,794	169,674	544,468	374,794	169,674	544,468	33,306	982,121	1,015,427
Goruckpore ...	.	.				...	...			432,048	487,264	919,312	432,048	487,264	919,312	50,853	1,932,963	1,983,816
Bustee	..	.	.	.	.	..	..	..		484,817	246,097	730,914	484,817	246,097	730,914	34,899	1,420,798	1,455,697
Azimgurh ...	.	.	.		.			..		448,337	91,445	539,782	448,337	91,445	539,782	15,208	1,370,664	1,385,872
Mirzapore...	...					...	..	..	..	161,406	94,152	255,558	161,406	94.152	255,558	81,974	972,439	1,054,413
Benares	..					...	..	.	.	159,494	86,929	246,423	159,494	86,929	246,423	173,352	619,925	793,277
Ghazeepore ...	.								.	.	.		...	...	...	140,492	1,191,911	1,332,403
Ajmere	..	..	.		.	...	.	..		44,390	34,239	78,629	44,390	34,239	78,629	73,342	352,926	426,268
Grand Total...	156,282	77,460	233,742	349,964	208 109	558,073	901,910	500,211	1,402,121	5,190,877	2,939,006	8,160,611	5,826,647	3,287,463	9,563,784	3,421,202	25,986,160	29,407,362

NOTE.—In some districts the figures against *C Residue* culturable do not correspond with those against D, E, F, and G taken together, because the same lands growing both rubbee and kurreef crops are shown under G.

* Jounsar and Bawur included.

N. W. PROVINCES.-

DISTRIBUTION OF CHIEF CROPS IN ACRES (BOT

Districts.	Crops i							
	Khurreef.							
	Rice.	Cotton.	Jowar and Bajra.	Til (Oil seed.)	Others.	Total.	Wheat and Barley.	Pulse.
Dehra Doon*	18,732	200	577	574	3,212	23,295	13,852	729
Saharunpore	68,813	28,310	91,374	4,144	128,632	321,273	265,017	21,885
Moozuffurnuggur	33,541	19,257	29,402	2,412	125,233	209,845	223,539	10,426
Meerut	12,821	43,963	11,466	3,764	257,960	329,974	336,808	56,064
Boolundshuhur	826	60,071	155,912	1,072	165,286	383,167	213,938	9,127
Allygurh	910	51,304	280,419	...	83,101	415,734	311,900	19,755
Kumaon	96,000	200	...	6,400	150,195	252,795	121,600	12,800
Gurhwal	34,840	..	...	2,903	78,391	116,134	50,617	2,977
Bijnour...		...	..	..	...	...	.	..
Moradabad	94,284	25,321	195,486	10,49)	112,546	438,127	254,075	31,211
Budaon...	24,947	56,479	260,397	5,409	49,280	396,512	265,732	30,623
Bareilly..	288,447	27,396	156,421	2,029	149,125	623,418	265,984	3,514
Shahjehanpore...	56,154	12,199	180,941	6,846	47,202	303,342	250,726	43,745
Terai Pergunnahs	56,955	1,282	2,950	786	5,197	67,170	17,417	4,240
Muttra	682	63,773	314,673	.	37,671	416,799	166,367	58,793
Agra ...	1	84,856	309,498	465	52,760	447,580	195,155	35,241
Furruckabad	14,260	27,542	177,942	6,314	44,622	270,680	287,065	38,820
Mynpoory	6,256	28,647	180,331	1,574	20,532	246,340	229,840	7,380
Etawah	3,958	42,788	130,979	201	12,101	190,027	228,998	..
Etah	7,623	45,632	182,791	1,210	34,640	271,896	197,817	16,736
Jaloun	22	27,236	126,212	1,316	1,448	156,234	357,479	82,420
Jhansie...	3,446	35,107	161,021	17,034	39,456	256,064	106,811	51,941
Lullutpore	412	1,164	22,038	5,049	33,836	63,159	30,699	11,767
Cawnpore	9,957	7,212	213,868	...	48,197	339,234	374,137	...
Futtehpore	38,772	34,377	142,532	9,443	31,584	256,708	161,985	70,756
Banda	12,250	100,573	276,803	11,119	84,316	485,061	148,266	41,595
Allahabad	102,194	20,948	215,233	5,195	66,678	41),248	372,602	86,199
Humeerpore	1,011	43,444	216,773	12,877	55,895	330,000	155,682	170,194
Jounpore	92,550	1,075	14,919	315	40,991	179,850	239,358	170,851
Goruckpore	601,744	5,895	10,000	2,149	204,002	823,790	433,855	221,363
Bustee	319,624	1,392	42,481	3,218	72,966	439,681	330,874	43,720
Azimgurh	167,834	312	13,839	23,131	29,782	234,898	242,512	126,073
Mirzapore	220,928	4,558	80,058	6,408	89,075	401,027	184,511	61,627
Benares..	88,771	389	30,458	1,035	26,274	146,927	166,890	95,880
Ghazeepore	...	...	...	..	..	...	...	...
Ajmere...	309	8,983	44,436	5,940	25,487	85,155	55,765	14,866
Total... ...	2,479,874	971,885	4,302,890	160,822	2,416,673	10,332,144	7,257,873	1,653,238

* Jounsar and Bawu

AGRICULTURAL STATISTICS.

IRRIGATED AND UNIRRIGATED) FOR 1868-69.

ACRES.								
Rubbee.			Two-fusl Crops.				Grand Total.	Remarks.
Oil Seed.	Others.	Total.	Sugar.	Vegetables.	Fruit Trees	Total.		
...	...	14,581	541	375	90	1,006	38,882	
15,515	46,827	349,214	50,116	3,504	7,142	60,762	731,249	
976	22,600	257,541	31,721	2,012	16	33,749	501,135	
...	904	393,776	60,927	3,475	639	65,041	788,791	
9,834	102,411	335,310	5,506	4,859	..	10,365	728,842	
26,950	53,784	412,389	1,355	6,600	1,400	9,355	837,478	
3,000	195	137,595	...	5	5	10	390,400	
5,955	...	59,549	...	...	...	...	175,683	
..	...	...	...	...	...			Details not furnished by Collector.
6,545	22,661	314,492	33,683	4,513	7,134	45,330	797,949	
1,000	30,373	327,728	18,353	7,368	2,971	28,692	752,932	
4,831	86,414	360,743	69,177	6,316	19,521	95,014	1,079,175	
11,025	27,184	332,680	23,125	6,285	16,210	45,620	681,642	
590	818	23,065	306	172	200	678	90,913	
...	10,559	235,719	797	972	3,702	5,471	657,989	
1,328	24,566	256,290	5,983	2,772	1,571	10,326	714,196	
32,226	16,861	374,972	18,693	16,485	3,334	38,512	684,164	
7,054	23,058	267,282	9,209	2,074	2,335	13,618	527,240	
5,658	61,963	296,619	11,226	879	...	12,105	498,751	
5,525	31,061	251,139	14,432	4,375	25,192	43,999	567,034	
3,656	1,530	445,085	872	859	400	2,131	603,150	
4,613	129	163,494	267	523	..	790	420,348	
...	40,502	82,968	462			462	146,589	
...	105,894	480,031	17,864	5,036	258	23,158	812,423	
12,089	12,639	257,469	18,635	4,410	1,587	24,632	538,809	
4,891	319,962	514,714	...	...	...	...	999,775	
22,416	75,402	556,626	..		...	...	966,674	
13,753	31,791	371,420	1,979	632	58	2,669	704,089	
1,091	4,313	415,613	25,290	5,315	34,323	64,928	660,391	
70,857	24,291	756,366	35,664	7,412	.	43,076	1,617,232	
12,117	164,714	551,425	28,565	4,255	31,807	64,627	1,055,733	
10,179	46,761	425,525	74,217	1,469	7,845	83,531	743,954	
17,838	151,805	415,781	12,980	1,315	710	15,005	831,813	
2,550	3,364	268,684	27,046	793	716	28,555	444,166	
...	...	...	...	..	...	...	...	Details not furnished by Collector
447	471	71,549	324	360	35	719	157,423	
314,509	1,545,814	10,771,434	599,315	105,420	169,201	873,936	21,977,514	

not included.

N. W. PROVINCES.—

WEIGHT OF PRODUCE IN MAUNDS

Districts.	Rice		Cotton.		Jowar and Bajra		Oil Seeds.		Wheat and
	Area	Weight	Area	Weight	Area	Weight	Area	Weight.	Area.
Dehra Doon*	18,732	98,343	200	112	577	6,026	574	1,509	13,852
Saharunpore	68,813	615,753	28,310	51,679	91,374	304,066	19,659	46,733	265,017
Moozuffurnuggur	33,541	384,840	19,257	49,050	29,402	124,986	3,388	13,460	223,539
Meerut	12,821	117,290	43,963	105,553	11,466	452,315	3,764	14,507	336,808
Boolundshuhur	826	2,243	60,071	237,505	155,912	277,082	10,906	98,248	213,938
Allygurh	910	6,147	51,304	84,466	280,419	466,700	26,950	105,500	311,900
Kumaon	96,000	960,000	200	200			9,400	94,000	121,600
Gurhwal	34,840	340,690					8,858	46,456	50,617
Bijnour		65,478		38,991		15,694			
Moradabad	94,284	55,663	25,321	19,324	195,486	508,236	17,035	20,131	254,075
Budaon	24,947	113,750	56,479	33,980	260,397	788,166	6,409	8,532	265,932
Bareilly	288,447	3,114,118	27,396	24,329	156,421	681,326	6,860	30,997	265,984
Shahjehanpore	56,154	188,795	12,199	7,367	180,941	586,585	17,871	104,538	250,726
Terai Pergunnahs	56,955	255,690	1,282	2,330	2,950	21,434	1,376	3,902	17,417
Muttra	682	2,825	63,773	46,025	314,673	214,811		24,758	166,367
Agra	1	1	84,856	59,384	309,498	542,781	1,793	6,753	195,155
Furruckabad	14,260	149,730	27,542	27,542	177,942	1,218,403	38,540	19,270	287,065
Mynpoory	6,256	23,355	28,647	41,276	180,331	634,018	8,628	73,904	229,840
Etawah	3,958	11,611	42,788	53,708	130,979	251,501	5,859	83,671	228,998
Etah	7,623	13,403	45,632	50,784	182,791	219,657	6,735	36,279	197,817
Jaloun	22	9	27,236	4,895	126,212	61,277	4,972	3,527	357,479
Jhansie	3,446	24,975	35,107	78,073	161,021	697,699	21,647	33,661	106,811
Lullutpore	412	136	1,164	1,152	22,698	30,618	5,049	2,077	30,699
Cawnpore	9,957	24,458	67,212	21,409	213,868	552,582		252,524	374,137
Futtehpore	38,772	206,784	34,377	12,302	142,532	760,171	21,532	114,771	161,985
Banda	12,250	10,722	100,573	40,059	276,803	1,082,570	16,010	37,628	148,266
Allahabad	102,194	402,643	20,948	15,760	215,293	886,312	27,611	77,863	372,602
Humeerpore	1,011	1,877	43,444	25,054	216,773	463,866	26,63)	25,843	155,682
Jounpore	92,550	297,011	1,075	308	44,919	148,482	1,406	7,416	239,358
Goruckpore	601,744	6,017,440	5,895	10,919	10,000	60,000	73,006	438,036	433,585
Bustee	319,624	1,543,150	1,392	354	42,481	232,923	15,335	36,827	330,874
Azimgurh	167,834	1,055,794	312	185	13,839	104,737	33,310	29,390	242,512
Mirzapore	220,928	166,589	4,558	2,520	80,056	321,612	24,246	22,013	184,511
Benares	88,771	409,811	389	367	30,458	120,967	3,585	4,759	166,890
Ghazeepore									...
Ajmere...	309	449	8,983	13,446	44,436	17,670	6,387	3,523	55,765
Total.....	2,479,874	16,681,568	971,885	1,160,408	4,302,890	12,855,273	475,331	1,923,006	7,257,873

* Jounsar and Bawur not

AGRICULTURAL STATISTICS.

OF 28 POUNDS 1868-69.

Barley.	Pulse.		Others.		Total.		Kurbee or Jowar Straw.		Remarks
Weight.	Area.	Weight.	Area.	Weight.	Area	Weight	Area	Weight.	
							Acres.	Maunds.	
54,084	729	29,555	4,218	20,231	38,882	209,860	570	14,965	
3,047,077	21,855	56,456	236,221	1,113,883	731,249	5,235,647	50,110	599,701	
2,968,445	10,426	57,389	181,582	2,589,773	501,135	6,187,943		3,040,000	
2,484,513	56,064	330,972	323,905	2,387,850	788,791	5,893,000	90,006	1,923,677	
1,917,842	9,127	109,847	278,062	2,213,622	728,842	4,856,389	40,628	306,848	
2,700,825	19,755	127,184	146,240	1,899,151	837,478	5,389,973		3,696,200	
1,216,000	12,800	64,000	150,400	1,500,000	390,400	3,834,200			
289,668	2,977	29,770	78,391	820,489	175,683	1,527,073	*Nil.*	*Nil*	
274,182	...	52,506		68,456		515,307			
1,415,806	31,211	154,061	180,537	149,537	797,949	2,322,758			
1,039,532	30,623	113,466	108,345	1,105,312	752,932	3,202,738			
2,208,266	3,514	19,432	330,553	2,306,707	1,079,175	8,385,175	16,022		
1,299,961	43,745	335,956	120,006	1,518,491	681,642	4,041,693	25,189	1,707,010	
122,032	4,240	20,531	6,693	27,269	90,913	453,188		14,100	
1,800,946	58,793	70,174	53,701	141,001	657,989	2,300,540		518,861	
2,193,194	35,241	163,398	87,652	208,651	714,196	3,174,162	560		
2,334,817	38,328	232,920	99,995	628,296	684,164	4,610,978	1,132,413		
1,344,330	7,330	70,954	66,208	325,732	527,240	2,513,569		2,100,207	
1,060,865			86,169	812,563	498,751	2,273,919	65,913		
862,710	16,736	47,380	109,700	432,651	567,034	1,662,864		381,046	
450,405	82,420	74,986	5,109	7,019	603,450	602,118	101,200	300,000	
371,934	51,941	143,066	40,375	126,303	420,348	1,475,711			
126,257	11,767	23,809	74,800	22,950	146,589	206,999		.	
2,296,114		15,183	177,249	986,545	842,423	4,148,810	. .	2,866,971	
864,320	70,756	377,366	68,855	294,820	538,809	2,630,534	. .	2,175,648	
339,772	41,595	100,045	404,278	1,581,074	999,775	3,191,870	.	.	
1,752,869	86,199	329,503	142,087	531,318	966,874	3,996,268	. .	2,181,729	
489,835	170,194	390,150	90,355	163,069	704,089	1,559,694	216,773	1,957,000	
1,051,037	170,851	514,252	110,232	192,983	660,391	2,211,489	137,469	145,500	
3,331,787	221,363	1,399,412	271,369	1,947,555	1,617,232	13,205,149	. .		
1,244,718	43,720	104,463	302,307	1,005,082	1,055,733	4,167,517		. .	
1,520,608	126,073	595,471	160,074	913,321	743,954	4,219,506		10,000	
656,308	61,627	59,330	255,885	541,991	831,813	1,770,363	80,058	450,990	
875,366	95,880	419,975	58,193	95,789	444,166	1,927,034	. .	. .	
..								.	Details not furnished by Collector.
339,297	14,866	24,554	26,677	77,457	157,423	476,396		107,995	
46,345,722	1,653,238	6,657,516	4,836,423	28,756,941	21,977,514	114,380,434	1,966,911	24,498,448	

Included in Dehra Doon.

N. W. PROVINCES.—

DISTRIBUTION OF PRODUCE IN MAUNDS

Districts.	Exports.							Total.
	Rice.	Cotton.	Oil Seeds.	Jowar and Bajra Grains.	Wheat and Barley.	Pulse.	Other Crops.	
Dehra Doon*	60,000	...	...	...	...	5,000	3,000	68,000
Saharunpore	10,252	12,750	..	5,100	339,825	1,860	8,850	378,637
Moozuffurnuggur	143,263	34,735	1,500	15,672	1,499,340	34,000	523,288	2,251,798
Meerut	33,306	59,920	10,040	59,300	852,044	75,241	899,091	1,988,942
Boolundshuhur	1,343	190,005	58,948	207,812	1,437,932	65,908	1,106,811	3,068,759
Allygurh	1,847	61,066	49,750	41,750	493,044	9,034	807,162	1,463,653
Kumaon	..		..		..	...	...	...
Gurhwal	113,563	...	23,228		72,417	3,721	205,122	418,051
Bijnour	...	..	...	..	...	...	..	..
Moradabad	...	...	...	...	...	...	...	..
Budaon	21,500	16,000	2,500	225,000	335,000	...	275,000	875,000
Bareilly	1,668,155	6,758	6,167	139,247	202,901	7,906	464,899	2,496,033
Shahjehanpore	41,000	..	47,250	129,000	328,000	153,750	553,500	1,252,500
Terai Pergunnahs	100,836	1,256	478	3,219	39,332	6,413	6,610	158,144
Muttra	2,008	36,881	17,470	102,011	1,078,676	31,466	86,981	1,355,493
Agra	...	21,235	2,569	31,250	381,207	10,455	36,876	486,592
Furruckabad	..		.	...	...	..	..	...
Mynpoory	250	19,061	2,668	38,055	230,590	4,032	29,233	323,889
Etawah	8,522	33,375	42,360	90,589	325,128	.	243,339	743,313
Etah	1,985	41,713	10,000	...	64,900	2,250	20,767	141,615
Jaloun	...	1,000	1,100	20,000	140,000	25,000	3,000	190,100
Jhansie	4,975	70,573	..	16,512	56,897	51,587	..	200,544
Lullutpore	...	..	...	...	...	..	...	..
Cawnpore	2,201	9,782	9,678	100,539	422,911	2,000	284,696	831,807
Futtehpore	68,928	8,202	38,257	253,390	288,108	125,788	98,273	880,946
Banda	3,150	31,240	11,762	124,700	99,000	19,083	471,569	760,504
Allahabad	53,088	10,479	32,120	236,085	331,023	34,314	210,219	907,328
Humeerpore	..	19,633	6,857	138,189	147,003	104,695	47,991	464,368
Jounpore	..	...	...	...	...	...	45,000	45,000
Goruckpore	1,553,854	..	146,012	...	1,099,994	283,516	687,618	3,770,994
Bustee	573,875	...	24,500	50,775	491,075	34,672	353,897	1,528,794
Azimgurh	313,032	...	15,885	1,156	410,890	101,459	418,454	1,260,876
Mirzapore	32,824	...	4,917	85,373	65,911	9,513	214,873	413,511
Benares	84,478	...	768	16,215	67,765	59,231	10,657	239,114
Ghazeepore	.	...	...	...	...	...	...	...
Ajmere	15	8,100	219	3,650	63,250	6,000	9,182	90,416
Total	4,898,250	693,764	567,003	2,137,589	11,364,163	1,267,894	8,125,958	29,054,621

*Jounsar and Bawur not

AGRICULTURAL STATISTICS.

OF 82 POUNDS FOR 1868-69.

Kept for Consumption.							Total.	Remarks.
Rice.	Cotton.	Oil Seeds.	Jowar and Bajra Grains.	Wheat and Barley.	Pulse.	Other Crops.		
38,343	112	1,509	6,026	54,084	24,555	17,231	141,860	
605,501	38,929	46,733	298,966	2,707,252	54,596	1,105,033	4,857,010	
241,577	14,315	11,960	109,314	1,469,105	23,389	2,066,485	3,936,145	
83,984	45,633	4,467	393,015	1,632,469	255,731	1,488,759	3,904,058	
900	47,500	39,300	69,270	479,910	43,939	1,106,811	1,787,630	
4,300	23,400	55,750	424,950	2,207,781	118,150	1,091,989	3,926,320	
960,000	200	94,000	.	1,216,000	64,000	1,500,000	3,834,200	
227,127	. .	23,228	...	217,251	26,049	615,367	1,109,022	
...	...	. .		.	. .	.	...	Details not furnished by the Collector.
...	...	. .	...	. .	...	.	..	Ditto ditto.
92,250	17,980	6,032	563,166	704,532	113,466	830,312	2,327,738	
1,445,963	17,571	24,830	542,079	2,005,365	11,526	1,841,808	5,889,142	
147,795	7,367	57,288	457,585	971,961	182,206	964,991	2,789,193	
154,854	1,074	3,424	18,215	82,700	11,118	20,659	295,044	
817	9,144	7,288	112,800	722,270	38,708	54,020	945,047	
1	38,149	4,184	508,531	1,811,987	152,943	171,775	2,687,570	
...	...	...	.	...	. .	...	...	Ditto ditto.
23,105	22,215	71,236	595,963	1,113,740	66,922	296,499	2,189,680	
3,089	20,333	41,311	160,912	735,737	...	569,224	1,530,606	
11,418	9,071	26,279	219,657	797,810	45,130	411,884	1,521,249	
9	3,895	2,427	41,277	310,405	49,986	4,019	112,018	
20,000	7,500	33,661	681,187	315,037	91,479	126,303	1,275,167	
. .	...	...	. .	. .	.	...	. .	Ditto ditto.
22,252	11,627	242,846	452,043	1,873,203	13,183	701,849	3,317,003	
137,856	4,100	76,514	506,781	576,212	251,578	196,547	1,749,588	
7,572	8,819	25,866	957,870	240,772	80,962	1,109,505	2,431,366	
349,555	5,281	45,743	650,227	1,421,846	295,189	321,099	3,088,940	
1,877	5,421	18,986	325,677	342,832	285,455	115,078	1,095,326	
297,011	308	7,416	148,482	1,051,037	514,252	147,983	2,166,489	
4,463,586	10,919	292,024	60,000	2,231,793	1,115,896	1,259,937	9,434,155	
969,275	354	12,327	182,148	753,643	69,791	651,185	2,638,723	
742,762	185	13,505	103,581	1,109,718	494,012	494,867	2,958,630	
133,765	2,520	17,096	236,239	590,397	49,817	327,118	1,356,952	
325,333	367	3,991	104,752	807,601	360,744	85,132	1,687,920	
...	...	...	...	...		...	..	Ditto ditto.
434	5,346	3,304	14,020	276,047	18,554	68,275	385,980	
11,512,311	379,635	1,314,525	8,944,733	30,830,497	4,926,826	19,761,744	77,669,771	

included in Dehra Doon.

TABLE V.

Area and Population of Districts on the Line of Railway in the North-Western Provinces (Main and Jubbulpore Line).

Districts.	Total Area.	Cultivated Area.	Population.	
			Town.	Rural.
Ghazeepore	1,357,898	932,551*	140,492	1,191,911
Benares	637,199	444,166	173,352	619,925
Mirzapore	3,328,148	831,813	81,974	972,439
Allahabad	1,769,600	966,874	105,926	1,290,400
Futtehpore	1,011,050	538,809	37,548	643,238
Banda	1,939,200	999,775	1,002	16,477
Cawnpore	1,506,460	842,423	113,601	1,072,261
Etawah	1,044,123	498,751	27,228	599,216
Mynpoory	1,066,240	527,240	75,582	624,638
Agra	1,204,480	714,196	142,667	887,093
Muttra	1,031,280	657,989	129,413	670,908
Allygurh	1,189,527	837,478	825,967	925,538
Boolundshuhur	122,204	728,842	110,763	689,718
Meerut	1,515,520	788,791	174,529	1,025,064
Moozuffurnuggur	1,054,065	501,135	535,664	146,525
Saharunpore...	1,425,280	731,249	124,109	742,374
Total...	21,211,274	11,542,082	2,799,817	12,117,725
* Taken from Census.	Square miles 33,143	Acres per square mile 348	Per square mile. 84	Per square mile. 366

THE POST OFFICE OF INDIA—1870-71

(Abridged Report by the Director General)

THE most important relations which India has with places abroad are those with the United Kingdom; and I shall therefore allude first to the changes which have taken place in the postage rates and conditions affecting correspondence with that country The scale of postage chargeable on packets of books and patterns exchanged with England was, during the year under report, altered by the adoption of lower rates for lower weights Formerly such packets were chargeable at the rate of 2 annas 8 pie per 4 ozs. when sent *via* Southampton, and at 4 annas per 4 ozs. when sent *via* Marseilles; but, under arrangements made during 1869-70, the rates marginally noted were substituted for the above. A one ounce packet posted in India for England was thus chargeable with a postage rate actually less than is charged on a packet of like weight intended for delivery in India, this somewhat anomalous result being due to the high minimum chargeable weight (10 tolas, or about 4 ozs.) prescribed for inland packets.

	Not exceeding 1 oz.	1 oz to 2 ozs.	2 ozs. to 4 ozs. and for every additional 4 ozs.
	A. P.	A P	A P.
Via Southampton. .	0 8	1 4	2 8
Via Marseilles . .	1 4	2 8	4 0

The special privileged rates formerly allowed to officers of the army in India in respect of their correspondence with England were withdrawn, on the 1st January 1870, the correspondence of military officers becoming thenceforward chargeable with the same postage rates as those applicable to the correspondence of the public generally.

The route *via* Brindisi was made available experimentally during the year 1870, the rates noted in the margin being charged in addition to those prescribed for the Marseilles route. The results show, with few exceptions, a gain of about two days in transit *via* Brindisi.

Letters 2 annas per ½ oz. extra
Newspapers 8 pie each extra.

The postage rates now chargeable on correspondence forwarded "*via* Brindisi," to the United Kingdom or places served through the United Kingdom are as follows —

			A.	P.
For the United Kingdom ..	Each letter, per ½ oz. ...		8	0
	Each newspaper, per 4 ozs .		2	8
	Each book or pattern packet	not exceeding 1 oz	2	0
		not exceeding 2 ozs.....	3	4
		not exceeding 4 ozs.....	4	8
		every additional 4 ozs	4	8
For places served through the United Kingdom	Each letter 8 pie per ½ oz. less than the published rate for a letter sent *via* Marseilles.			
	Each newspaper 8 pie per 4 ozs more than the published rate for a newspaper sent *via* Marseilles.			
	Each packet of books or patterns	8 pie per 4 ozs. more than the published rate for a packet sent *via* Marseilles.		

The full pre-payment of correspondence forwarded *via* Brindisi is compulsory, and all covers not fully prepaid unless specially marked by the senders for transmission by any other route and conforming to its conditions, are forwarded *via* Southamptom

LOCAL STEAM SERVICES.

The local steam services performed under contract with the British India Steam Navigation Company are :—

(1.)—Calcutta and British Burmah, *weekly*, with a continuation to the Straits *once every four weeks*, the subsidy being Rs. 21,333 per mensem, of which Rs. 1,083 are paid by the Straits' Government.

(2.)—Bombay and Kurrachee, *weekly*, with a continuation to the Persian Gulf *once a fortnight*, the subsidy being Rs. 23,111 per mensem.

(3.)—Calcutta, Bombay, and intermediate ports on the east and west coast, *fortnightly*, the subsidy being Rs. 10,000 per mensem.

(4.)—Madras, Rangoon, and intermediate ports on the east coast, *once every four weeks*, the subsidy being Rs. 6,000 per mensem.

(5.)—Calcutta, Port Blair, and Camorta, *fortnightly*, without any subsidy, but under contract arrangements in respect of the transmission of Government stores, &c.

The line last mentioned was organised during 1870 and is still only experimental. At first starting the steamers of this line proceeded on to the Straits, but this extension was discontinued. There are steam services with other Companies as follows :—

(1.)—With the Irrawaddy Steam Flotilla Company for communications about three times a month between Rangoon and Mandalay.

(2.)—With the same Company for a monthly communication between Moulmein, Tavoy, and Mergui.

(3.)—With Jardine, Matheson and Company (of Hong-Kong) and Apcar and Company (of Calcutta) for the conveyance of mails monthly between Calcutta, the Straits, and Hong-Kong, the dates of the starting of the steamers being regulated primarily with reference to the Calcutta opium sales.

(4.)—With the Euphrates and Tigris River Steam Navigation Company for fortnightly communication between Busreh and Bagdad.

The last-mentioned contract is made by Her Majesty's Government, although the subsidy (Rs. 4,000 a month) is believed to be charged against the Indian revenue.

MODIFICATION OF INLAND POSTAL RATES AND CONDITIONS.

Rates of Postage.	Limits of Weight.	
	Former limits	New limits
½ anna	½ Tola	½ Tola.
1 anna	½ Tola	1 Tola
2 annas. ...	1 Tola	2 Tolas
and so on		

On the 1st April 1869, the limits of weight allowed for the several rates of inland letter postage were doubled as per margin This alteration has proved to be a less expensive measure than was anticipated.

PATTERN POST.

On the 1st September 1869 the postage rates chargeable on pattern packets which had till then been the same as those chargeable on book packets, *viz*, one anna per ten tolas, were doubled. On the same date a change was made in the scale of postage chargeable upon banghy parcels The former scale of postage varied not merely with weight, but with distance, and the distance limits were so numerous that it was almost impossible for the public to ascertain the rate chargeable upon a parcel without reference to the Post Office, and the constant change of routes, as well as the large increase in the number of post offices, rendered it extremely difficult for the department to keep its own offices informed of the charges properly leviable The change made in September 1869 involved a reduction of the distance rates to two, *viz.*, a single and double distance rate, and Government has since taken a further step in the same direction by making the postage charge on banghy parcels independent altogether of distance.

SORTING OF LETTERS.

In consequence of the junction of the Great Indian Peninsula and East India Railways, as well as of the upper and lower sections of the Punjab and Delhi Railway, arrangements were made last year for a radical change in the system of railway sorting. The previous existence of breaks in railway transit gave time for a large amount of sorting in stationary offices, but the final junction of the railway systems of Bengal, the Punjab, and Bombay involved the supersession of all arrangements for the sorting of through mails otherwise than during transit The system of railway sorting previously in force originated at a time when the lengths of railway were small and was not adapted to the requirements arising from lines of such enormous extent as now traverse the continent of India In view of this alteration it was deemed advisable to organize a system of what has been called "frontier railway sorting" distinct from the previously existing local railway sorting. Under this system all through mails passing between different provinces through Allahabad are disposed of by a separate sorting establishment working on sections of the railway converging at Allahabad.

POSTAL LINES.

The total extent in miles of each class of postal lines at the close of 1870 as compared with the returns of the previous year is given in the margin The increase in railway line mileage is composed mainly of extensions of the Punjab and Delhi Railways from Umballa to Loodiana, and from the Beeas to Jullundur, of the Great Indian Peninsula Railway from Sholapore to Goolburgah, and of the Madras Railway from Tadputry to Gooty. The decrease under the head of mail cart, &c, is the net result of a very large number of reductions and extensions. Among the extensions may be mentioned the substitution of mail carts under contract between Calcutta and Midnapore and between Gya and Patna in Bengal; between Allahabad and Fyzabad (since abolished) in the North-Western Provinces, between Wuzeerabad and Sealkote and Ferozepore and Lahore in the Punjab; and between Munmar and Dhoolia (tonga dak) and Deesa and Anadra (camel dak) in Bombay. Among the reductions may be mentioned the abolition of the line between Cawnpore and Jhansie in the North-Western Provinces, and between the Beeas and Jullundur, Umballa and Loodiana and Rawul Pindee and Kohat in the Punjab.

Year.	Railway.	Mail Cart Horse Dak and Camel Dak.	Runners and Beats.	Sea	Total.
1868-69	4,234½	5,460½	34,973	5,613	50,281½
1869-70	4,433½	5,333	35,498	5,613	50,877½
Increase	199	.....	525	.....	596½
Decrease.....	...	127½	.....	.....	.....

CORRESPONDENCE.

Year.	Letters.	Newspapers.	Parcels.	Books and Patterns.	Total.
1868-69 ...	68,891,232	5,773,585	699,206	623,594	75,987,617
1869-70 ...	76,867,918	6,165,039	764,911	736,710	84,534,578
Increase.	7,976,686	391,454	65,705	113,116	8,546,961
Increase percentage	11·57	6·78	9·39	18·13	11·24

The returns of the year 1870 show an increase of (11½ per cent.) and although this may be due to many different causes, it is probable that it is in no small measure due to the increased limit of weight allowed for the several rates of postage. The increase of the limits of weight was a measure which without doubt conferred a great boon upon those who use the Post Office. The very high rate of increase under the head of "books and patterns" is noticeable. It was in 1867-68 that this class of article first showed expansion, being for that year no less than 19·39 per cent.; and since then the rate of increase has been substantially maintained.

Year.	Paid.	Unpaid.	Service.	Registered.	Total.
1868-69	38,904,155	24,612,666	4,017,709	1,356,702	68,891,232
1869-70	44,668,194	26,594,484	4,117,424	1,487,816	76,867,918
Increase. ...	5,764,039	1,981,818	99,715	131,114	7,976,686
Increase.... percentage.	14·81	8·01	2·48	9·66	11·57

DEAD LETTER OFFICE.

The letter returns may be analysed as per margin.

As a rule, letters that cannot be delivered are sent for disposal to the Dead Letter Office of the postal circle in which they originated, that being the locality where the language and character are most likely to be understood. Dead Letter Office work in India is beset with special difficulties, owing to the great variety of character, language, and dialect; but after making all allowances, results are not as good as they might be.

DISTRICT POST.

The district post consists of lines of communication connecting the head quarters of each district with the interior police and revenue stations, and is maintained primarily for the purpose of conveying official correspondence, the expense being met, in some parts of the country, from the proceeds of a special cess levied for the purpose, and in other places forming a charge on the general revenues. The management of the district post in Bombay and the North-Western Provinces has for some years been confided to the officers of the department under the orders of the local Governments. Under an arrangement with the Punjab Government, the control of the district posts in that province is to be made over to the Imperial Postal Department as the revenue settlement of each district is completed; and there is now an early prospect of the measure being carried out in three districts of the Umritsur division. As regards Bengal, the first step taken was to obtain the management of the district post in a single experimental district. The result being satisfactory, a like transfer of control has been effected in 17 districts (increased since the close of the year 1869-70 to 22 districts). The change, so far as it has gone, has resulted in improvement. In the Madras Presidency the measure is still under experiment in a single district. The district post delivery arrangements in Oude urgently demand attention. The fact, that of the covers made over by the Imperial Postal Department to the Oude district post for delivery no less than 30·72 per cent are returned as undeliverable, shows how great is the necessity for reform.

The result of the district post operations in so far as concerns correspondence passing between it and the imperial post in abstract form is as follows:—

	Number.	Percentage.
Sent to district post for delivery	4,754,233	Being 5·62 per cent. of the total number of covers received for delivery.
Portion of the above received back undelivered	505,900	Being 10·64 per cent. on the number sent to the district post.
Received from district post	12,81,762	Being 3·32 per cent. on the total number of covers received by General Post Office for delivery.

Names of Postal Circles.	1868-69.			1869-70.		
	British Territory.	Foreign Territory.	Total.	British Territory.	Foreign Territory.	Total.
Bengal	1	0	1	3	0	3
Madras	5	1	6	2	6	8
Bombay	2	8	10	0	2	2
N. W. Provinces	9	6	15	4	11	15
Punjab	0	0	0	1	1	2
British Burmah	0	0	0	0	0	0
Central Provinces	0	1	1	1	0	1
Sind	0	0	0	0	0	0
Total ...	17	16	33	11	20	31

MAIL ROBBERIES.

The total number of highway robberies of mails was less in 1869-70 than the preceding year, in which they numbered 33. As shown in the marginal abstract the number for 1869-70 is 31. The great bulk of the highway robberies occurred in Rajpootana and Central India, and probably resulted in some degree from the famine in those parts of the country.

(To be Continued.)

Statistical Reporter.

A MONTHLY JOURNAL OF STATISTICAL ENQUIRIES CONCERNING INDIA.

Vol. II] CALCUTTA, SATURDAY, 15TH APRIL 1871. [No. 2.

THE POST OFFICE OF INDIA—1870-71.

(Continued from our last.)

ROBBERIES.

The localities in which the robberies occurred are given below :—

	British Territory.			Foreign Territory.		
Bengal Circle...	Midnapore ... 2 Dinagepore ... 1	Besides one attack in Chumparun				
Madras Circle...	Nellore .. 1 Bellary ... 1	... ...		Hyderabad 5 Mysore 1	Besides	
Bombay Circle...	... .			Guzerat 1 Kattiawar 1	2 attacks. „ 1 „	
N. W. P Circle	Etawah 1 Meerut 1 Ajmere 1 Mozuffurnuggur 1	Besides two attacks in the Agra district.		Jeypore .. 4 Bhurtpore 1 Dholepore 1 Gwalior .. 3 Tonk ... 1 Indore 1	„ 3 „ „ 1 „ „ 1 „ „ 2 „ „ 1 „	
Punjab Circle ..	Kurnal .. 1 ..			Rampore Meywar Dewas Marwar	One attack in each.	
Central Provinces Circle ...	Seonee 1 . .			Puttiala 1		
	Total 11	Besides three attacks		Total 20	Besides fifteen attacks.	
	Grand Total... 31, besides 18 attacks.					

ESTABLISHMENT.

The persons employed permanently in the Post Office Department number 24,819, as below.

	1868-69.	1869-70.
Inspecting Post Masters... ...	99	101
Post Masters and Deputy Post Masters	1,903	2,172
Clerks	1,684	1,761
Peons, &c	4,512	5,248
Road Establishment	15,059	15,537
Total	23,257	24,819

FINANCIAL RESULTS.

The general financial results are shown in the following abstract :—

	1868-69.	1869-70
PURELY POSTAL SERVICE		
Receipts, including official postage and sale of service postage stamps ...	Rs a. p. 68,60,720 12 3	Rs a. p. 68,16,010 9 4
Receipts, excluding official postage and sale of service postage stamps	41,05,704 4 3	39,28,388 5 10
Disbursements...	53,70,201 15 8	55 96,779 11 4
Net revenue, including official postage and sale of service postage stamps	14,90,518 12 7	12,19,230 14 0
Net deficit, if official postage and service postage stamps be excluded	12,64,497 11 5	16,68,396 5 6
NON-POSTAL BRANCHES		
Bullock Train.		
Receipts	10,13,570 7 3	10,48,249 8 1
Disbursements.	8,88,939 12 2	10,16,618 13 11
	Excess of receipts.	Excess of receipts
	1,24,630 11 1	31,630 10 2
Punjab Military Van Dák		
Receipts	1,66,426 9 7	2,56,505 10 3
Disbursements	1,68,533 4 3	2,52,847 13 11
	Excess of disbursements.	Excess of receipts.
	2,106 10 8	3,657 12 4
Passenger Services on Mail Cart Lines		
Receipts	1,34,105 12 5	1,57,196 12 6
Disbursements	1,34,105 12 5	1,57,196 12 6
Military Transport Train.		
Disbursements	1,84,611 10 9	1,57,550 0 6
Contract Subsidies to Local Steamers engaged primarily for non-Postal Services.		
Disbursements	*Nil.*	5,05,574 7 8

Briefly stated, these results show—

	Rs.	
(1).—A net revenue in the purely Postal Department of.....	12,19,230	if official postage be included.
(2).—A net deficit ditto ditto of.....	16,68,396	if official postage be excluded.
(3).—A net revenue in the Bullock Train of.....	31,630	
(4).—A net revenue in the Punjab Military Van Dák.....	3,657	

THE POST OFFICE OF INDIA.—STATISTICS.

STATEMENT SHOWING THE NUMBER OF UNCLAIMED AND REFUSED LETTERS RECEIVED AT, AND DISPOSED OF BY, THE DEAD LETTER OFFICES AT CALCUTTA, MADRAS, BOMBAY, AGRA, AND LAHORE, DURING THE YEARS 1868-69 AND 1869-70.

Class of Letters.	Calcutta.				Madras				Bombay.				Agra.				Lahore.			
	Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.		Number of chargeable letters unclaimed or refused in		Proportion.	
	1868-69.	1869-70	1868-69	1869-70.	1868-69	1869-70.	1868-69	1869-70	1868-69.	1869-70	1868-69.	1869-70	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.
The number of unclaimed paid letters returned to senders	40,916	44,106	59 55	57·73	12,287	14,291	39·27	37 87	32,148	40,198	59 93	73·83	11,330	28,261	69·37	66·92	20,499	23,578	88·49	89·77
Ditto that cannot be disposed of ...	27,788	32,285	40·44	42 26	18,998	23,440	60 72	62·12	21,492	1,244	40·06	26·16	5,002	13,965	30·62	33·07	2,659	2,684	11·50	10·22
Total...	68,704	76,391	99·99	99 99	31,285	37,731	99 99	99 99	53,640	54,442	99·99	99·99	16,332	42,226	99·99	99·99	23,158	26,262	99·99	99·99
The number of unclaimed bearing letters returned to senders ...	121,676	149,137	35 46	41·84	25,018	38,457	26 91	30·24	171.756	155,692	58 57	58 95	70,375	72,417	25·96	23·10	82,334	80,867	56·19	60·88
Ditto that cannot be disposed of ...	221,388	207,501	64·53	58 15	67,948	65,606	73 08	69·75	121,488	108,408	41·42	41·04	200,641	240,969	74·03	76·89	64,185	51,972	43·80	39·11
Total...	343,064	356,638	99 99	99·99	92,966	104,063	99 99	99 99	293,244	264,100	99 99	99·99	271,016	313,386	99·99	99·99	146,519	132,839	99·99	99·99
The number of refused paid letters returned to senders	965	787	70 90	72·06	167	127	12 62	9 34	2,688	4,313	85 17	91·55	1,140	1,026	74·21	75·77	373	253	85·15	75·29
Ditto that cannot be disposed of ...	396	305	29 09	27 93	1,156	1,231	87 37	90 65	468	398	14·82	8·44	396	328	25·78	24·22	65	83	14·84	24·70
Total...	1,361	1,092	99 99	99·99	1,323	1,358	99 99	99 99	3,156	4,711	99·99	99·99	1,536	1,354	99 99	99·99	438	336	99·99	99·99
The number of refused bearing letters returned to senders	65,956	82,179	34·09	39 54	14,296	19,218	21 49	28 56	94,392	93,549	55·61	55 11	64,513	72,061	30·84	31·21	48,104	50,888	61·23	60·07
Ditto that cannot be disposed of ...	127,504	125,643	65·90	60 45	52,222	48.041	78·50	71 43	75,336	76,174	44 38	44·88	144,619	158,813	69·15	68 78	30,450	33,830	38·76	39·93
Total...	193,460	207,822	99·99	99·99	66,518	67,259	99·99	99 99	169,728	169,723	99·99	99·99	209,132	230,874	99·99	99·99	78,554	84,718	99·99	99·99

ABSTRACT.

	1868-69.	1869-70.
The total number of all classes of letters returned to senders ... ...

STATEMENT SHOWING THE NUMBER OF ORDINARY POSTAGE LABELS OF EACH DENOMINATION SOLD IN EACH OF THE PRESIDENCIES AND PROVINCES, WITH GROSS VALUE AND DISCOUNT THEREOF, DURING THE YEARS 1868-69 AND 1869-70.

Names of Presidencies and Provinces.	8 Pie Labels.	½ Anna Envelopes.	½ Anna Note Paper.	1 Anna Envelopes.	½ Anna Labels.	1 Anna Labels.	2 Anna Labels.	4 Anna Labels.	6 Anna Labels.	6 Anna and 8 Pie Labels.	8 Anna Labels.	Gross Value.	Discount.
	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.	Rs. A. P.	Rs. A. P.
Bengal...	294,911	16,926	95,038	9,882	5,690,202	2,067,433	618,246	623,340	51	48,710	366,438	7,60,226 4 5	31,967 3 0½
Madras...	181,594	14,464	200,754	3,459	7,046,786	1,062,994	297,223	370,588	...	17,259	104,248	4,90,388 5 8	26,295 10 2
Bombay	309,206	3,512	123,431	3,184	7,744,421	1,402,409	502,767	385,017	...	35,282	352,256	6,97,063 1 9	30,122 4 8
North-Western Provinces	155,018	62,379	126,847	7,761	5,044,877	1,245,728	198,114	332,687	5	20,770	99,583	4,15,246 15 1	23,389 7 7
Punjab...	108,677	17,443	153,300	6,391	3,146,351	500,744	121,018	209,175	...	17,621	78,159	2,53,869 3 9	14,472 5 2
British Burmah...	54,154	624	1,666	1,200	236,653	180,184	94,288	60,004	32	16,573	51,997	80,768 0 10	4,647 4 11
Central Provinces	29,142	5,380	32,059	1,529	695,825	146,515	45,739	64,282	...	2,783	15,236	63,990 0 1	3,487 5 10½
Sind	29,562	2,192	23,616	1,408	991,040	119,438	44,882	38,410	...	3,394	20,458	67,434 10 8	4,147 8 9
Total of 1869-70 ...	1,162,264	132,920	756,711	†34,814	30,596,155	6,725,445	1,922,277	2,083,503	88	162,392	1,088,375	28,28,986 10 3	1,38,429 2 2
Total of 1868-69 ...	1,128,362	170,412	*1,356,082	76,602	27,137,889	8,068,222	2,302,171	2,174,464	845	204,949	973,680	28,59,801 13 10	1,38,628 11 4

* 307,594 Half anna Note Paper sold at the rate of 10 annas per packet of 16.

† 7,506 One Anna Envelopes sold at 1 Rupee 1 Anna per packet.

APRIL 15, 1871. THE STATISTICAL REPORTER.

THE POST OFFICE OF INDIA.—STATISTICS.

STATEMENT SHOWING THE NUMBER OF COMPLAINTS OF VARIOUS DESCRIPTIONS MADE BY THE PUBLIC IN THE YEARS 1868-69 AND 1869-70.

Names of Postal Circles.	Ascertained to be well Founded.		Ascertained to be Groundless.		Enquiry unsuccessful.		Under Enquiry.		Total.	
	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.
Bengal	250	263	240	312	330	258	18	6	838	839
Madras	266	292	194	275	179	169	22	13	661	749
Bombay	*.....	282	.....	176	.....	201	.....	30	*.....	689
North-Western Provinces	89	68	24	81	66	43	6	14	185	206
Punjab	48	86	48	43	18	15	1	0	115	144
British Burmah	18	21	13	17	9	12	2	1	42	51
Central Provinces	7	12	8	1	8	6	1	1	24	20
Sind	.....	16	.....	22	.....	7	.....	1	.....	46
Total...	678	1,040	527	927	610	711	50	66	1,865	2,744

* Information not available owing to the destruction by fire of the B P. Office in March, 1869.

STATEMENT SHOWING THE DISTANCE OVER WHICH MAILS WERE CONVEYED THROUGHOUT INDIA BY RAILWAY, MAIL CART, HORSES, RUNNERS AND BOATS, DURING THE YEARS 1868-69 AND 1869-70.

Names of Postal Circles.	Railway.		Mail Cart, Horse or Camel Dak, &c		Runners or Boat Lines		Sea.		Total.	
	1868-69	1869-70	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.	1868-69.	1869-70.
Bengal	787	787	308	440	7,909	8,203	2,837	2,837	11,841	12,267
Madras	862¾	892¾	492⅝	371	6,549	6,655	.....	.....	7,904⅜	7,918¾
Bombay	1,101	1,231	1,000	987	7,085	6,723	2,445	567	11,691	9,508
North-Western Provinces	578	548	1,494	1,452	6,286	6,400	.....	.....	8,358	8,400
Punjab	529	553	2,002	1,023	3,629	2,978	7	.....	6,167	4,554
British Burmah	.....	.....	.....	.....	1,038	1,338	324	324	1,362	1,662
Central Provinces	317	317	164	164	2,477	2,477	.....	.....	2,958	2,958
Sind	.....	105	.....	896	.....	724	.....	1,885	.....	3,610
Total...	4,234¾	4,433¾	5,460⅝	5,333	35,973	35,498	5,613	5,613	50,281⅜	50,877¾

THE POST OFFICE OF INDIA—STATISTICS.

STATEMENT EXHIBITING THE NUMBER OF SERVICE POSTAGE LABELS OF EACH DENOMINATION SOLD IN EACH PRESIDENCY AND PROVINCE, AND THE GROSS VALUE THEREOF, DURING THE YEARS 1868-69 AND 1869-70.

Names of Presidencies and Provinces.	½ anna Labels.	1 anna Labels.	2 anna Labels.	4 anna Labels.	8 anna Labels.	Gross Value.
	Number.	Number.	Number.	Number.	Number.	Rs. A. P.
Bengal	126,194	211,272	78,976	22,686	4,734	35,058 9 0
Madras	143,729	98,707	32,404	11,671	2,914	19,085 15 6
Bombay	172,210	174,458	67,974	27,425	9,525	36,400 11 0
North-Western Provinces	272,104	274,753	93,935	40,645	9,375	52,265 15 0
Punjab	118,437	182,301	83,744	30,891	6,745	36,658 3 6
British Burmah	10,222	15,200	4,274	1,728	738	2,604 11 0
Central Provinces	42,895	53,917	23,196	10,089	1,504	10,884 0 6
Sind	35,248	24,073	8,844	3,086	680	4,823 1 0
Total of 1869-70	921,039	1,034,681	393,347	148,221	36,215	1,97,781 2 6
Total of 1868-69	579,792	1,207,301	676,025	265,906	82,181	2,85,644 15 0

STATEMENT SHOWING THE CORRESPONDENCE SENT TO, AND RECEIVED FROM, THE DISTRICT POST BY THE GENERAL POST IN EACH POSTAL CIRCLE DURING THE YEARS 1869-70.

Names of Presidencies and Provinces.	Total Number sent to District Post.			Number received back from District Post.			Received for despatch from District Post.		
	Letters.	Newspapers.	Parcels.	Letters.	Newspapers.	Parcels.	Letters.	Newspapers.	Parcels.
Bengal	846,767	35,732	5,246	99,156	572	52	562,338	2,621	980
Madras	977,186	126,224	19,176	71,111	1,432	1,176	698,441	18,603	7,635
Bombay	990,202	30,310	3,404	80,468	671	85	322,751	1,960	466
North-Western Provinces	967,963	34,643	3,526	171,004	933	114	719,076	2,918	888
Punjab	381,563	9,193	2,107	59,692	974	286	177,099	3,754	605
Central Provinces	128,186	2,755	527	6,389	16	6	140,056	213	201
Sind	176,287	10,242	2,994	11,624	104	35	150,034	474	649
Total...	4,468,154	249,099	36,980	499,444	4,702	1,754	2,769,795	30,543	11,424

THE POST OFFICE OF INDIA—STATISTICS.

COMPARATIVE ABSTRACT RECEIPTS AND CHARGES DURING THE YEAR 1868-69 AND 1869-70.

Head of Receipts.	1868-69.	1869-70.
	Rs. A. P.	Rs. A. P.
I.—POSTAL SERVICE.		
Cash Receipts	16,25,976 3 10	16,13,383 13 9
Sale of Ordinary Postage Stamps	28,59,801 13 10	*26,90,557 8 1
Sale of Service Postage Stamps	2,85,644 15 0	1,97,781 2 6
Official Postage	24,69,371 9 0	26,89,846 1 0
Due by the London Post Office	2,14,583 8 10	2,39,170 14 2
Miscellaneous, *i. e.*, Sale of Waste Paper, Fines, Savings, &c.	44,224 4 3	67,550 0 4
Total	74,99,602 6 9	74,98,289 7 10
Deduct amount due to the London Post Office	6,38,881 10 6	6,82,278 14 6
Net Amount	68,60,720 12 3	68,16,010 9 4
II.—NON-POSTAL BRANCHES.		
Bullock Train	10,13,570 7 3	10,48,249 8 1
Military Van Dâk, Punjab	1,66,426 9 7	2,56,505 10 3
Mail Cart and Parcel Van Passenger Service	1,34,105 12 5	1,57,196 12 6
Total	13,14,102 13 3	14,61,951 14 10

Head of Charges.	1868-69.	1869-70
	Rs. A. P.	Rs. A. P.
I.—POSTAL SERVICE.		
Salaries and Establishments	31,62,021 2 5	35,50,017 4 7
Miscellaneous and Contingent Charges	7,86,351 9 11	6,89,510 14 2
Mail Cart (after deducting Charges for Passenger Service)	13,89,971 7 10	13,25,372 9 10
Bounty Money due to ship Captains for the conveyance of Mails	3,413 12 0	3,284 7 0
Construction and Repairs of Buildings	28,443 15 6	28,594 7 9
Total	53,70,201 15 8	55,96,779 11 4
II.—NON-POSTAL BRANCHES.		
Bullock Train	8,88,939 12 2	10,16,618 13 11
Military Transport Train	1,84,611 10 9	1,57,550 0 6
Military Van Dâk, Punjab	1,68,533 4 3	2,52,847 13 11
Mail Cart and Parcel Van Passenger Service	1,34,105 12 5	1,57,196 12 6
Subsidiary Payments to B. I. S. N. Co.	... ...	5,05,574 7 8
Total	13,76,190 7 7	20,89,788 0 6

* From the sale proceeds of ordinary postage stamps for 1869-70 has been deducted for the first time the discount allowed to purchasers, *viz.*, Rs. 1,38,628-11-4.

STATEMENT SHOWING THE ESTIMATED NUMBER OF LETTERS AND NEWSPAPERS RECEIVED FOR DELIVERY IN THE POST OFFICE OF INDIA DURING THE YEARS 1854-55 TO 1869-70.

Name of Presidencies and Provinces.	1854-55.	1855-56.	1856-57.	1857-58	1858-59.	1859-60.	1860-61	1861-62	1862 63	1863-64	1864-65	1865-66.	1866-67.	1866-67, exclusive of Eastern Settlement.	1867-68.	1868-69,	1869-70.
Bengal	5,890,380	6,816,144	7,538,496	8,423,448	9,300,504	9,177,492	9,054,810	9,357,518	9,729,618	9,734,709	11,167,741	12,614,453	13,036,977	12,920,607	13,822,252	15,236,422	17,388,632
Madras.....	5,466,372	5,707,464	7,129,044	7,773,720	8,108,191	8,264,857	8,937,428	8,732,297	8,680,578	8,836,562	9,172,172	9,732,145	10,471,156	10,471,156	10,829,753	11,917,657	12,890,229
Bombay	6,304,260	7,101,768	8,709,828	11,607,168	15,145,272	12,978,684	12,275,431	10,645,100	11,442,461	12,982,291	14,138,763	14,395,039	13,654,313	13,654,313	15,165,672	17,123,690	19,045,682
N. W. Provinces...	11,136,288	12,676,584	13,883,052	14,503,644	18,424,068	17,367,072	16,709,741	12,094,231	12,390,673	13,065,577	14,148,361	15,333,524	15,520,837	15,520,837	15,652,848	16,986,561	18,276,503
Punjab	...	...	.	..	..	. .	...	5,348,387	6,126,964	6,456,594	6,882,907	7,368,105	9,268,617	9,268,617	10,001,172	10,631,585	10,237,434
British Burmah ...	...	..	...	...	..	...	...	388,355	434,360	480,771	476,702	488,638	502,711	502,711	515,593	626,796	690,646
Central Provinces.	...	..	..	..		...	...	...	.	..	.	....	1,780,746	1,780,746	1,991,075	2,142,106	2,410,531
Sind.....	..	...	...	..	..	...			...	. .	.	..	...	...		...	2,093,300
Total... ..	28,797,600	32,301,960	37,260,420	42,307,980	50,978.035	47,788,105	46,977,410	46,565,888	48,804,654	51,556,504	55,986,646	59,931,904	64,235,357	64,118,987	67,978,365	74,664,817	83,032,957

THE POST OFFICE OF INDIA—STATISTICS.—*Financial and Revenue Accounts* 1869.

ACCOUNT SHOWING THE GROSS REVENUE, COST OF MANAGEMENT AND NET REVENUE OF THE POST OFFICE DEPARTMENT IN INDIA FROM 1853-54 TO 1869-70.

Years.	Receipts, exclusive of fares from Passengers by Mail Cart & Parcel Vans.	Official Postage.	Total.	Disbursements, exclusive of Bullock Train, Military Transport Train, & charges connected with the conveyance of passengers.	Excess of Receipts.	Deficit if Official Postage be not taken into account.
1853-54...	20,48,454 4 9	24,71,168 15 1	45,19,623 3 10	24,37,209 15 4	20,82,413 4 6	3,88,755 10 7
1854-55	19,86,912 1 1	13,00,000 0 0	32,86,912 1 1	27,39,376 0 4	5,47,536 0 9	7,52,463 15 3
1855-56...	15,90,524 5 5	16,20,662 6 9	32,11,186 12 2	29,44,501 1 10	2,66,685 10 4	13,53,976 12 5
1856-57	18,50,844 3 9	18,62,006 13 6	37,12,851 1 3	29,03,289 5 2	8,09,561 12 1	10,52,445 1 5
1857-58	17,49,814 1 9	18,53,210 15 5	36,03,025 1 2	35,92,848 8 0	10,176 9 2	18,43,034 6 3
1858-59	24,14,952 9 7	25,25,189 2 0	49,40,141 11 7	35,20,092 4 9	14,20,049 6 10	11,05,139 11 2
1859-60	25,92,233 5 10	27,47,012 11 0	53,39,246 0 10	37,37,911 15 3	16,01,334 1 7	11,45,678 9 5
1860-61	27,34,279 7 6	23,84,734 8 8	51,19,014 0 2	38,60,798 12 7	12,58,215 3 7	11,26,519 5 1
1861-62	28,04,846 11 10	28,68,833 3 2	56,73,679 15 0	37,99,755 10 8	18,73,924 4 4	9,94,908 14 10
1862-63	30,20,682 14 8	31,92,983 12 8	62,13,666 11 4	37,37,535 12 7	24,76,130 14 9	7,16,852 13 11
1863-64	32,07,045 2 2	35,58,546 13 0	67,65,591 15 2	38,76,162 15 6	28,89,428 15 8	6,69,117 13 4
1864-65	34,16,579 6 6	40,20,822 10 9	74,37,402 1 3	39,30,579 4 2	35,06,822 13 1	5,13,999 13 8
1865-66	35,59,268 9 3	50,08,003 7 3	85,67,272 0 6	41,88,625 11 7	43,78,646 4 11	6,29,357 2 4
1866-67 (11 months),	33,65,613 9 4	*26,56,260 6 11	60,21,874 0 3	40,29,481 9 7	†19,92,392 6 8	6,63,868 0 3
1866-67 (12 months), calculated on the average of 11 months, including Eastern Settlements	36,71,578 7 4	*28,97,738 10 5	65,69,317 1 9	43,95,798 1 7	†21,73,519 0 2	7,24,219 10 3
1866-67 (12 months), calculated on the average of 11 months, excluding Eastern Settlements	36,11,245 5 10	*28,89,758 0 7	65,01,003 6 5	43,75,067 11 10	†21,25,935 10 7	7,63,822 6 0
1867-68	37,74,607 4 6	*23,09,839 12 0	60,84,447 0 6	47,54,940 6 5	†13,29,506 10 1	9,80,333 1 11
1868-69	41,05,704 4 3	*27,55,016 8 0	68,60,720 12 3	53,70,201 15 8	‡14,90,518 12 7	12,64,497 11 5
1869-70	‡39,28,383 5 10	*28,87,627 3 6	‡68,16,010 9 4	55,96,779 11 4	†12,19,230 14 0‡	16,68,396 5 6

* Including sale of Service Postage Stamps.

† The apparent reduction is to a large extent nominal, owing to the introduction of a new system of accounting for Official Postage, under which a portion of the official correspondence between Government Officers in the same District is not brought to account.

‡ These amounts are less by Rs. 1,38,429-2-2 than they would have been under the former mode of calculation, owing to the deduction for the first time in 1869-70 of the discount on sale of stamps.

THE POST OFFICE OF INDIA.—STATISTICS.—*Financial and Revenue Accounts*, 1869.

GROSS REVENUE, COST OF MANAGEMENT, AND NET REVENUE OF THE POST OFFICE IN EACH YEAR FROM 1853-54 TO 1868-69.

Years.	Receipts, exclusive of those from separate Departments.	Official Postage.	Total.	Disbursements, exclusive of charges for the separate Departments.	Excess of Receipts.	Deficit if official postage be not taken into account.	Separate Departments.	
							Total Receipts.	Total Payments.
	£	£	£	£	£	£	£	£
1853-54	204,846	247,117	451,963	243,721	208,242	38,875	65,028	53,246
1854-55 (estimated)	198,691	130,000	328,691	273,938	54,753	75,247	14,644	51,991
1855-56	159,052	162,066	321,118	294,450	26,668	135,398	81,200	56,531
1856-57	185,085	186,199	371,284	290,328	80,956	105,243	80,413	73,689
1857-58	174,982	185,321	360,303	359,285	1,018	184,303	33,799	58,795
1858-59	241,495	252,518	494,013	352,009	142,004	110,514	94,850	74,149
1859-60	259,223	274,701	533,924	373,791	160,133	114,568	146,882	93,961
1860-61	273,428	238,473	511,901	386,080	125,821	112,652	149,598	130,309
1861-62	280,482	286,884	567,366	379,976	187,390	99,494	148,708	108,803
1862-63	302,070	319,297	621,367	373,753	247,614	71,683	150,262	116,950
1863-64	320,705	355,853	676,558	387,616	288,942	66,911	151,611	111,736
1864-65	341,659	402,082	743,741	393,057	350,684	51,398	11,763	22,032
1865-66	355,926	500,801	856,727	418,863	437,864	62,937	7,562	7,346
1866-67 (11 months)	336,560*	265,626	602,186	402,948	199,238	66,388	21,531	23,081
1867-68	377,462*	230,983	608,445	475,494	132,951	98,032	31,258	29,046
1868-69	410,570*	275,502	686,072	537,020	149,052	126,450	131,411	137,619

* Including sale of service postage stamps

TOTAL REVENUES AND CHARGES FOR THE POST OFFICE IN EACH PRESIDENCY AND PROVINCE IN EACH YEAR FROM 1853-54 TO 1868-69.

Years.	Receipts.								
	Bengal	North-West Provinces	Punjab.	Central Provinces.	Bombay.	Madras	British Burmah	Eastern Settlements	Total.
	£	£	£	£	£	£	£	£	£
1853-54	60,272	88,593	..		38,176	41,372	266	6,818	451,963*
1855-56	66,600	117,190			67,662	57,221	5,045	7,400	321,118
1856-57	74,977	134,655		..	78,596	67,105	7,713	8,238	371,284
1857-58	84,599	71,773		...	106,831	79,214	8,564	9,322	360,303
1858-59	100,397	163,015	.		125,810	88,656	10,647	5,488	494,013
1859-60	98,504	178,214			141,443	96,422	10,005	9,336	533,924
1860-61	97,948	168,691	.	.	137,534	90,564	6,747	10,417	511,901
1861-62	105,223	129,692	83,800	...	131,869	97,933	6,389	12,460	567,366
1862-63	113,191	148,547	78,760		155,921	102,491	8,677	13,780	621,367
1863-64	132,307	150,885	89,749	...	169,412	109,417	9,669	15,119	676,558
1864-65	130,829	167,032	102,850	...	20,419	116,069	9,953	15,589	743,741
1865-66	148,661	197,951	116,385	...	236,308	129,322	11,833	16,267	856,727
1866-67 (11 months)	123,889	125,644	98,266	20,222	120,470	89,657	9,939	14,099	602,186
1867-68	139,298	118,302	101,848	21,658	124,258	92,995	10,086	.	608,445
1868-69	153,339	131,901	109,459	23,932	149,377	105,211	12,853	..	686,072

N.B.—Accounts in detail for 1854-55 are not available in the Post Office records.

* Includes £216,466, being the amount of difference between official postage and steam postage due by the London Post Office for which no details for each Presidency and Province are available.

THE POST OFFICE OF INDIA.—STATISTICS.—*Financial and Revenue Accounts*, 1869.

DETAIL OF THE GROSS REVENUE AND CHARGE OF THE POSTAL DEPARTMENT RECEIVED AND EXPENDED IN BOMBAY IN EACH YEAR, FROM-1853-54 TO 1868-69.

Years.	Revenue.											
	Cash Postage.	Sale of Ordinary Postage Stamps.	Miscellaneous.	Total.	Less Net Amount due to London Post Office.	Net Revenue from Public.	Official Postage and Service Postage Stamps.	Grand Total	Detail of Cash Postage		Detail of Steam Postage.	
									On Letters.	On Banghy Parcels.	Due by the London Post Office.	Due to the London Post Office.
	£	£	£	£	£	£	£	£	£	£	£	£
1853-54 ..	31,649	. .	1,319	32,968	5,208*	38,176	...	38,176	28,406	3,243	5,208	...
1855-56 ...	11,735	18,501	1,261	31,497	2,459	29,038	38,624	67,662	8,328	3,407	2,341	4,800
1856-57 ...	13,014	19,548	5,106	37,668	6,703	30,965	47,631	78,596	9,441	3,573	2,126	8,829
1857-58 .	14,413	24,054	8,018	46,485	404*	46,889	59,942	106,831	12,206	2,207	4,495	4,091
1858-59 .	21,117	30,751	7,545	59,413	9,094	50,319	75,491	125,810	15,995	5,122	9,531	18,625
1859-60 ..	23,248	35,467	1,804	60,519	5,095	55,424	86,019	141,443	17,538	5,710	6,770	11,865
1860-61 ..	23,991	40,925	1,801	66,717	4,814	61,903	75,631	137,534	18,083	5,908	7,878	12,692
1861-62 ..	22,930	41,024	1,392	65,346	12,362	52,984	78,885	131,869	16,541	6,389	12,421	24,783
1862-63	25,875	45,523	1,160	72,558	7,377	65,181	90,740	155,921	19,239	6,636	8,381	15,758
1863-64 ...	30,389	51,669	1,837	83,895	17,131	66,464	102,948	169,412	22,089	8,300	9,835	27,266
1864-65 ...	30,701	56,571	2,154	89,426	19,224	70,202	131,217	201,419	23,860	6,841	10,165	29,389
1865-66 ..	32,111	60,366	1,882	94,359	26,621	67,738	168,570	236,308	26,193	5,918	10,766	37,387
1866-67 (11 months)	25,928	50,655	1,970	78,553	18,025	60,528	59,942	120,470	22,784	3,144	9,835	27,860
1867-68 .	29,768	61,072	2,057	92,897	18,784	74,113	50,145	124,258	26,076	3,692	13,610	32,394
1868-69 .	32,566	72,174	1,725	106,465	18,933	87,532	61,845	149,377	28,906	3,660	20,460	39,393

* Plus amount due by London Post Office.

Years.	Expenditure.					
	Salaries and Establishments.	Miscellaneous and Contingencies	Mail Cart, after deducting Charges for Passenger Service.	Bounty Money.	Construction and Repairs of Buildings.	Total.
	£	£	£	£	£	£
1853-54	37,697	18,181	9,360	...	...	65,238
1854-55	35,893	20,868	15,453	99	...	72,313
1855-56	15,721	63,563	2,115	10	...	81,409
1856-57	58,580	9,065	8,429	29	102	76,205
1857-58	87,539	6,785	11,145	24	300	105,793
1858-59	75,675	14,301	29,204	56	123	119,359
1859-60	63,608	26,061	31,438	17	32	121,156
1860-61	67,681	10,512	43,394	20	120	121,727
1861-62	46,920	9,631	43,555	39	348	100,493
1862-63	44,755	13,094	43,502	1	136	101,488
1863-64	47,546	16,799	48,870	31	692	113,938
1864-65	53,797	17,972	41,814	47	67	113,697
1865-66	58,783	16,997	38,773	146	225	114,924
1866-67 (11 months)	49,743	14,959	17,350	71	288	82,411
1867-68	59,719	19,822	24,108	48	51	103,748
1868-69	69,166	30,314	28,580	48	70	128,178

THE POST OFFICE OF INDIA.—STATISTICS.—*Financial and Revenue Accounts*, 1869.

TOTAL NUMBER OF LETTERS, NEWSPAPERS AND PARCELS RECEIVED FOR DELIVERY IN THE POST OFFICE IN INDIA IN EACH YEAR FROM 1853-54 TO 1868-69.

Years.	Letters.					Newspapers.			
	Paid.	Unpaid.	Service.	Registered.	Total.	Paid.	Unpaid.	Service.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Estimated. 1853-54 ...	4,547,868	7,625,004	5,084,904	2,484	17,260,260	158,232	1,358,412	308,256	1,824,900
1854-55 ...	16,901,076	4,270,860	4,996,272	224,052	26,392,260	601,944	1,795,668	231,780	2,629,392
1855-56 ...	15,948,888	7,580,400	5,639,520	334,908	29,503,716	813,396	2,108,028	211,728	3,133,152
1856-57 ...	16,873,620	10,042,452	6,571,656	376,248	33,863,976	1,134,156	2,321,652	316,884	3,772,692
1857-58 ...	18,322,992	11,217,180	7,495,764	422,904	37,458,840	2,387,256	2,531,424	353,364	5,272,044
1858-59 ...	21,804,672	14,632,044	8,813,532	493,224	45,743,472	3,303,768	2,720,208	302,880	6,326,856
1859-60 ...	19,788,708	14,099,916	8,182,932	566,424	42,637,980	4,784,028		478,740	5,262,768
1860-61 ...	19,589,424	14,065,848	8,769,876	556,560	42,981,708	4,242,684		409,584	4,652,268
1861-62 ...	18,434,934	14,328,376	8,989,469	594,391	42,347,170	3,325,364	456,253	447,660	4,229,277
1862-63 ...	19,270,039	15,378,296	8,950,575	647,163	44,246,073	3,606,312	447,949	504,320	4,558,581
1863-64 ...	20,564,883	16,642,233	8,938,121	762,417	46,907,654	3,758,881	409,504	480,465	4,648,850
1864-65 ...	21,970,586	18,459,573	9,722,684	916,474	51,069,317	3,992,127	402,048	523,154	4,917,329
1865-66 ...	22,435,572	19,904,301	11,381,467	1,072,964	54,797,304	4,157,879	425,787	550,934	5,134,600
1866-67 (11 months) ...	25,903,285	19,788,769	7,267,713	1,097,253	54,057,020	4,117,524	382,179	325,693	4,825,396
1867-68 ...	34,997,281	22,321,703	3,983,830	1,266,441	62,567,255	1,916,296	377,740	117,074	5,411,110
1868-69 ...	38,904,155	24,612,666	1,017,709	1,356,702	68,891,232	5,280,970	393,862	98,753	5,773,585

Years.	Parcels.				Total.			
	Paid	Unpaid.	Service	Total	Paid and Registered.	Unpaid	Service.	Total.
	No.	No.	No.	No.	No.	No.	No.	No.
1853-54 ...	42,300	159,792	94,248	296,340	4,750,884	9,143,208	5,487,108	19,381,500
1854-55 ...	157,488	137,424	168,648	463,560	17,884,560	6,203,952	5,396,700	29,485,212
1855-56 ...	159,504	139,572	178,272	477,348	17,256,696	9,828,000	6,029,520	33,114,216
1856-57 ...	144,516	152,016	195,792	492,324	18,528,540	12,516,120	7,084,332	38,128,992
1857-58 ...	141,672	164,940	226,644	533,256	21,274,824	13,913,544	8,075,772	43,264,140
1858-59 ...	189,444	206,628	229,200	625,272	25,791,108	17,558,880	9,345,612	52,695,600
1859-60 ...	333,780		230,292	564,072	20,355,132	14,099,916	8,891,964	48,464,820
					5,117,808			
1860-61 ...	317,172		246,504	563,676	20,145,984	14,065,848	9,425,964	48,197,652
					4,559,856			
1861-62 ...	146,342	172,913	242,304	561,559	22,501,031	14,957,542	9,679,433	47,138,006
1862-63 ...	150,770	178,504	227,002	556,276	23,674,284	16,004,749	9,681,897	49,360,930
1863-64 ...	149,346	176,930	229,978	556,254	25,235,527	17,228,667	9,648,564	52,112,758
1864-65 ...	162,777	168,786	259,531	591,094	27,041,964	19,030,407	10,505,369	56,577,740
1865-66 ...	154,181	157,250	267,642	579,073	27,820,596	20,487,338	12,203,043	60,510,977
1866-67 (11 months) ...	187,528	151,157	224,140	562,825	31,305,590	20,322,105	7,817,546	59,445,241
1867-68 ...	239,528	167,499	244,399	651,426	41,417,546	22,866,942	4,345,303	68,629,791
1868-69 ...	266,131	165,480	277,595	699,206	45,797,958	25,172,008	4,394,057	75,364,023

THE POST OFFICE OF INDIA.—

TOTAL RECEIPTS AND PAYMENTS OF THE SEVERAL SEPARATE DEPARTMENTS MANAGED BY THE POST

Years.	Bengal.					North-Western Provinces.				
	Bullock Train	Dak Bearers	Passengers Service	Staging Bungalow Fund	Total.	Bullock Train	Dak Bearers	Passenger Service.	Staging Bungalow Fund.	Total.
	£	£	£	£	£	£	£	£	£	£
1853-54 ...	4,393	...	...		4,393	39,510	...	6,437	14,688	60,635
1854-55 ...	.	...	...	.	...	...	...	7,675	5,969	13,644
1855-56 ...	13,670	...	.	1,349	15,019	50,174		8,554	6,406	65,134
1856-57 ...	16,666	...	119	1,475	18,260	46,981	...	9,122	5,952	62,055
1857-58	3,127		1,214	1,270	5,611	14,210	...	10,111	3,763	28,084
1858-59 ...	3,450		561	2,173	6,184	71,978	..	10,884	5,638	88,500
1859-60 ...	14,941	7,582	1,185	2,210	25,918	94,479	5,479	13,220	7,245	120,423
1860-61 ...	24,982	5,611	1,013	2,276	33,882	90,716	5,210	12,331	6,897	115,154
1861-62 ...	25,605	5,224	922	2,185	33,936	46,592	4,726	6,168	3,797	61,283
1862-63 ...	13,916	7,386	782	1,946	24,030	62,166	4,392	4,819	3,856	75,233
1863-64 ...	13,677	2,692	..	1,479	17,848	65,887	3,637	4,319	4,553	78,396
1864-65 ...	716	4	..		720	1,655	1,799	2,755	..	6,209
1865-66 ...	1,047		53	..	1,100	38	168	3,574		3,780
1866-67 (11 months).	4,881	...	511	..	5,392	8	181	2,222	...	2,411
1867-68 ...	8,896	...	1,413	...	10,309		81	2,290	.	2,371
1868-69 ...	29,031	.	2,456	...	31,487	27,178	...	2,334	...	29,512

PAY

1853-54 ...	7,965	..	.	.	7,965	26,326	.	6,437	12,518	45,281
1854-55 ...	14,762		..	..	14,762	23,508		7,675	5,046	36,229
1855-56 ...	15,172	..		998	16,170	25,536		8,554	5,224	39,314
1856-57 ...	28,616	..	.	1,483	30,099	28,998	..	9,122	5,372	43,492
1857-58 ...	10,866	..		934	11,800	33,941		10,111	2,839	46,891
1858-59 ...	424	..	...	1,264	1,688	57,075	..	10,884	4,336	72,295
1859-60 ...	13,014	6,982	1,185	1,767	22,948	47,525	4,400	13,220	5,327	70,472
1860-61 ...	33,458	5,130	1,013	1,904	41,505	65,839	4,164	12,331	5,908	88,242
1861-62 ...	30,606	4,851	922	1,176	37,555	31,873	3,782	6,168	2,542	44,365
1862-63 ..	26,165	7,364	782	1,286	35,597	47,334	4,368	4,819	1,882	58,403
1863-64	18,606	2,717	...	882	22,205	54,054	3,583	4,319	1,818	63,774
1864-65 ...	4,581	53	.	37	4,671	6,492	1,906	2,755	10	11,163
1865-66 ...	825	...	53	..	878	...	168	3,574	..	3,742
1866-67 (11 months).	5,614	6	511	... .	6,131	...	181	2,222	...	2,403
1867-68 ...	6,517		1,413	...	7,930	275	81	2,290	...	2,646
1868-69 ...	36,682	...	2,456	...	39,138	27,921	...	2,334	...	30,255

{ £3,685
£18,461

STATISTICS.—*Financial and Revenue Accounts* 1869.

OFFICE IN DETAIL FOR EACH PRESIDENCY AND PROVINCE IN EACH YEAR FROM 1853-54 TO 1868-69.

CEIPTS

Punjaub.						Central Provinces.	Bombay.	Madras.	Grand Total.	Years.
Bullock Train.	Dak Bearers.	Passenger Service	Staging Bungalow Fund	Military Van Dak	Total	Passenger Service				
£	£	£	£	£	£	£	£	£	£	
...	...	...	...	...	...	...	...	...	65,028	1853-54
...	...	...	...	...	...	...	1,000	...	14,644	1854-55
...	...	...	...	...	...	...	1,047	...	81,200	1855-56
...	...	...	...	...	...	...	...	98	80,413	1856-57
...	...	...	...	...	...	...	...	104	33,799	1857-58
...	...	...	...	...	...	...	...	166	94,850	1858-59
...	...	...	...	...	...	...	207	334	146,882	1859-60
...	...	...	...	...	...	...	130	432	149,598	1860-61
42,428	117	7,689	2,519	...	52,753	...	510	226	148,708	1861-62
40,397	74	6,610	2,515	..	49,596	...	1,039	364	150,262	1862-63
45,879	20	4,854	2,780	..	53,533	...	1,336	498	151,611	1863-64
1,802	10	2,042	...	...	3,854	...	690	290	11,763	1864-65
...	...	1,474	...	...	1,474	...	910	298	7,562	1865-66
...	...	1,656	...	10,667	12,323	989	262	154	21,531	1866-67 (11 months)
...	...	2,516	...	13,938	16,454	1,252	736	136	31,258	1867-68
45,148	...	3,644	..	16,643	65,435	3,685	1,135	157	131,411	1868-69

MENTS,

...	...	...	...	..	...	...	...	...	53,246	1853-54
...	...	...	...	...	...	...	1,000	...	51,991	1854-55
...	...	. .	...	...	...	...	1,047	..	56,531	1855-56
...	...	...	..	...	...	...	...	98	73,689	1856-57
...	...	...	...	...	...	...	...	104	58,795	1857-58
...	...	...	...	...	...	...	...	166	74,149	1858-59
...	...	..	...	...	...	...	207	334	93,961	1859-60
...	...	...	...	...	...	...	130	432	130,309	1860-61
17,043	99	7,689	1,317	...	26,148	...	510	225	108,803	1861-62
13,775	74	6,610	1,088	...	21,547	..	1,039	364	116,950	1862-63
18,002	21	4,854	1,046	...	23,923	..	1,336	498	111,736	1863-64
3,166	10	2,042	...	...	5,218	...	690	290	22,032	1864-65
44	...	1,474	...	...	1,518	...	910	298	7,346	1865-66
...	...	1,656	...	11,486	13,142	989	262	154	23,081	1866-67 (11 months)
30	...	2,516	...	13,800	16,346	1,252	736	136	29,046	1867-68
24,291	...	3,644	...	16,853	44,788	*22,146	1,135	157	137,619	1868-69

Passenger Service.
Military Transport Train.

THE POST OFFICE OF INDIA.—STATISTICS.—*Financial and Revenue Accounts*, 1869.

DETAIL OF CHARGES FOR THE CENTRAL CONTROL OF THE POST OFFICE, AND TOTAL RECEIPTS AND PAYMENTS OF THE SEVERAL SEPARATE OR SPECIAL DEPARTMENTS MANAGED BY THE POST OFFICE IN EACH YEAR FROM 1854-55 TO 1868-69.

Years.	Charges for the Central Control.						
	Director General of the Post Office.			Compiler of the Post Office Accounts.			Grand Total.
	Salaries and Establishment	Miscellaneous and Contingencies	Total.	Salaries and Establishment	Contingencies.	Total.	
	£	£	£	£	£	£	£
1854-55	3,809	517	4,326	...	...	...	4,326
1855-56	3,848	1,033	4,881	.	...	...	4,881
1856-57	1,158	154	1,312	...	..	..	1,312
1857-58	5,370	125	5,495	...	. .	...	5,495
1858-59	1,433	754	2,187	...	...	..	2,187
1859-60	2,517	344	2,861	...	...	...	2,861
1860-61	3,972	272	4,251	...	...	...	4,251
1861-62	3,719	96	3,815	1,971	74	2,045	5,860
1862-63	3,380	110	3,490	2,522	60	2,582	6,072
1863-64	2,104	198	2,302	2,574	65	2,639	4,941
1864-65	2,297	284	2,581	2,574	82	2,656	5,237
1865-66	4,310	423	4,733	2,566	986	3,552	8,285
1866-67 (11 months)... ...	4,042	383	4,425	2,362	1,196	3,558	7,983
1867-68	4,622	643	5,265	3,746	818	4,564	9,829
1868-69	5,302	613	5,915	5,498	409	5,907	11,822

Years.	Separate Departments.											
	Receipts.						Payments					
	Bullock Train.	Military Van Dak	Dak Bearers	Passenger Service	Staging Bungalow Fund.	Total.	Bullock Train.	Military Van Dak, Punjab.	Dak Bearers	Passenger Service.	Staging Bungalow Fund.	Total.
	£	£	£	£	£	£	£	£	£	£	£	£
1853-54 ...	43,903	...	...	6,437	14,688	65,028	34,291	...	...	6,437	12,518	53,246
1854-55 .	...	...	...	8,675	5,969	14,644	38,270	.	...	8,675	5,046	51,991
1855-56	63,844	...		9,601	7,755	81,200	40,708	...		9,601	6,222	56,531
1856-57	63,647	...	..	9,339	7,427	80,413	57,614	...		9,220	6,855	73,689
1857-58 ...	17,337	...	.	11,429	5,033	33,799	44,807	.	...	10,215	3,773	58,795
1858-59 ..	75,428	...	.	11,611	7,811	94,850	57,499	..	...	11,050	5,600	74,149
1859-60 ...	109,420	...	13,061	14,946	9,455	146,882	60,539	...	11,382	14,946	7,094	93,961
1860-61 ...	115,698	...	10,821	13,906	9,173	149,598	99,297	..	9,294	13,906	7,812	130,309
1861-62 ...	114,625	...	10,068	15,514	8,501	148,708	79,522	...	8,732	15,514	5,035	108,803
1862-63 ...	116,479	...	11,852	13,614	8,317	150,262	87,274	...	11,806	13,614	4,256	116,950
1863-64 ...	125,443	...	6,349	11,007	8,812	151,611	90,662	...	6,321	11,007	3,746	111,736
1864-65 ...	4,173	...	1,813	5,777	...	11,763	14,239	...	1,969	5,777	47	22,032
1865-66 ...	1,085	...	168	6,309	...	7,562	869	...	168	6,309	...	7,346
1866-67 (11 months)	4,889	10,667	181	5,794	...	21,531	5,614	11,486	187	5,794	...	23,081
1867-68 ...	8,896	13,938	81	8,343	...	31,258	6,822	13,800	81	8,343	...	29,046
1868-69 ...	101,357	16,643	...	13,411	...	131,411	88,894	35,314*	...	13,411	...	137,619

* £16,853 Military Van Dak, Punjab.
£18,461 Military Transport Train, Central Provinces.

THE POST OFFICE OF INDIA.—STATISTICS.—*Financial and Revenue Accounts, 1869.*

NUMBER OF PAID, UNPAID, SERVICE, AND REGISTERED LETTERS RECEIVED FOR DELIVERY IN THE POST OFFICES IN EACH PRESIDENCY AND PROVINCE IN EACH YEAR FROM 1853-54 TO 1868-69.

		Bengal.	Madras.	Bombay.	North Western Provinces.	Punjab.	British Burmah.	Central Provinces.	Total
		Number.	Number.	Number.	Number.	Number.	Number.	Number.	Number.
Estimated.	1853-54 ...	4,072,188	3,664,044	3,055,320	6,468,708	...	...	...	17,260,260
	1854-55 ...	5,300,628	4,978,224	5,807,952	10,305,456	...	...	...	26,392,260
	1855-56 ...	6,055,392	5,172,372	6,562,716	11,713,236		...	...	29,503,716
	1856-57 ...	6,663,696	6,452,256	7,888,992	12,859,032	...	...		33,863,976
	1857-58 ...	7,253,544	6,881,208	10,466,484	12,857,604	..		...	37,458,840
	1858-59	8,092,032	7,799,748	13,172,940	16,678,752		...	..	45,743,472
	1859-60	7,896,180	7,267,224	11,625,144	15,849,432	...	...		42,637,980
	1860-61 ...	8,187,528	8,067,684	11,289,624	15,436,872				42,981,708
1861-62 ...		8,380,096	7,762,409	9,898,651	11,193,020	4,814,079	298,915		42,347,170
1862-63 ...		8,676,250	7,739,507	10,487,690	11,464,510	5,548,515	329,601		44,246,073
1863-64 ...		8,791,061	7,812,675	11,951,477	12,149,613	5,838,842	363,986	...	46,907,654
1864-65 ...		10,075,457	8,135,068	13,094,357	13,150,228	6,255,316	358,891		51,069,317
1865-66 .		11,386,491	8,722,036	13,299,827	14,305,071	6,710,654	373,225		54,797,304
1866-67 (11 months)		10,901,583	8,643,915	11,559,757	13,299,957	7,828,838	354,345	1,468,625	54,057,020
1867-68 ...		12,644,174	9,766,251	14,042,686	14,674,003	9,244,093	395,734	1,800,314	62,567,255
1868-69 ...		14,021,203	10,734,799	15,834,942	15,954,773	9,887,641	477,995	1,979,879	68,891,232

NUMBER OF PAID, UNPAID AND SERVICE NEWSPAPERS RECEIVED FOR DELIVERY IN THE POST OFFICES IN EACH PRESIDENCY AND PROVINCE IN EACH YEAR FROM 1853-54 TO 1868-69.

Estimated.	1853-54 ...	536,784	290,520	456 564	541,032			...	1,824,900
	1854-55 ...	667,812	536,376	520,932	904,272	.	...	...	2,629,392
	1855-56	884,004	600,732	575,700	1,072,716	. .	...		3,133,152
	1856-57 ...	1,019,496	747,960	871,092	1,134,144	...			3,772,692
	1857-58	1,314,564	987,924	1,213,572	1,755,984	...		..	5,272,044
	1858-59	1,376,196	1,018,692	2,060,628	1,871,340	.	...	.	6,326,856
	1859-60 ...	1,132,392	1,083,684	1,414,116	1,632,576	...	...		5,262,768
	1860-61 ...	1,112,592	980,028	1,196,136	1,363,512	...	...	.	4,652,268
1861-62 ...		977,422	880,447	846,449	901,211	534,308	89,440		4,229,277
1862-63 ...		1,053,368	941,071	954,771	926,163	578,449	104,759	...	4,558,581
1863-64		943,648	1,023,887	1,030,814	915,964	617,752	116,785	.	4,648,850
1864-65		1,092,284	1,037,104	1,044,406	998,133	627,591	117,811	.	4,917,329
1865-66		1,227,962	1,010,109	1,095,212	1,028,453	657,451	115,413		5,134,600
1866-67 (11 months).		1,048,979	954,644	956,697	927,478	667,397	106,474	163,727	4,825,396
1867-68 ...		1,178,078	1,063,502	1,122,986	978,845	757,079	119,859	190,761	5,411,110
1868-69 ...		1,215,219	1,182,858	1,288,748	1,031,788	743,944	148,801	162,227	5,773,585

POST OFFICE OF INDIA.—STATISTICS.—GROSS REVENUE PROPER.—*Financial and Revenue Accounts*, 1869.

Years.	Cash Postage.	Sales of Ordinary Postage Stamps.	Miscellaneous	Total.	Less Net Amount due to London Post Office.	Net Revenue from Public.	Official Postage and Service Postage Stamps.	Grand Total.	Detail of Cash Postage.		Detail of Steam Postage.	
									On Letters.	On Bunghy Parcels.	Due by the London Post Office.	Due to the London Post Office.
	£	£	£	£	£	£	£	£	£	£	£	£
1853-54	199,287	...	5,559	204,846	...	204,846	247,117	451,963	173,774	25,513	30,651	30,651
1854-55 (estimated)	...	...	...	227,291	28,600	198,691	130,000	328,691	...	...	...	28,600
1855-56	77,274	85,275	6,030	168,579	9,527	159,052	162,066	321,118	57,081	20,193	12,973	22,500
1856-57	99,494	87,061	16,971	203,526	18,441	185,085	186,199	371,284	76,508	22,986	5,540	23,981
1857-58	82,529	85,350	17,547	185,426	10,444	174,982	185,321	360,303	69,065	13,464	10,183	20,627
1858-59	122,600	119,887	19,323	261,810	20,315	241,495	252,518	494,013	88,914	33,686	17,758	38,073
1859-60	123,568	144,904	9,226	277,698	18,475	259,223	274,701	533,924	90,870	32,698	13,444	31,919
1860-61	122,386	159,935	8,386	290,707	17,279	273,428	238,473	511,901	91,642	30,744	15,014	32,293
1861-62	125,480	175,992	6,276	307,748	27,266	280,482	286,884	567,366	92,190	33,290	19,330	46,596
1862-63	133,090	189,308	5,655	328,053	25,983	302,070	319,297	621,367	99,270	33,820	14,883	40,866
1863-64	144,341	210,010	3,559	357,910	37,205	320,705	355,853	676,558	109,222	35,119	17,005	54,310
1864-65	146,775	228,010	5,397	380,182	38,523	341,659	402,082	743,741	116,721	30,054	17,425	55,948
1865-66	149,170	244,611	4,759	398,540	42,614	355,926	500,801	856,727	122,298	26,872	19,528	62,142
1866-67 (11 months)	139,646	231,893	4,934	376,473	39,913	336,560	265,626	602,186	114,608	25,038	16,761	56,674
1867-68	153,296	254,224	6,315	413,835	36,373	377,462	230,983	608,445	126,497	26,799	18,578	54,951
1868-69	162,598	285,980	4,422	453,000	42,430	410,570	275,502	686,072	137,578	25,020	21,458	63,888

N.B.—Accounts in detail for 1854-55 are not available in the Post Office records.

NUMBER OF POST OFFICES OPEN AT THE CLOSE OF EACH YEAR, AND THE DISTANCE OVER WHICH MAILS WERE CONVEYED BY MEANS OF RAILWAY, MAIL CART OR HORSE DAK, RUNNERS OR BOAT LINES, AND SEA, FROM 1854-55 TO 1868-69.

Years.	Number of Post Offices open at the close of each year.	Distance over which Mails were conveyed by				
		Railway.	Mail Cart and Horse Dak, &c.	Runners or Boat Lines.	Sea.	Total
		Miles.	Miles.	Miles.	Miles.	Miles
1854-55	645	...	6,127	24,467½	..	30,594½
1855-56	753	146	5,697¼	30,470	...	36,313¼
1856-57	779	No information available for this year.				
1857-58	810	273¼	5,508¼	31,152	..	36,933¼
1858-59	835	532¼	5,766	33,232	...	39,530¼
1859-60	852	711½	5,861½	32,765	...	39,338
1860-61	889	1,046½	5,740	36,784½	..	43,570½
1861-62	942	1,798½	4,722	39,034	...	45,554½
1862-63	1,011	2,382	5,247	34,318	5,137	47,084
1863-64	1,091	2,473	5,156	33,853	5,137	46,619
1864-65	1,191	2,904	5,319	33,320	5,332	46,875
1865-66	1,538	3,275½	4,967	33,311	5,444	46,997½
1866-67 (11 months)	1,738	3,658	4,851	33,976	5,444	47,929
1867-68	2,205	3,988	5,146⅜	34,930	5,613	49,671⅜
1868-69	2,589	4,235	5,460⅜	34,973	5,613	50,281⅜

	Details for the Latest year 1868-69.					
	Number of Post Offices opened.	Distance over which Mails were conveyed by.				
		Railway	Mail Cart, &c.	Runners &c.	Sea.	Total.
		Miles.	Miles.	Miles.	Miles	Miles.
Bengal ...	106	787	308	7,909	2,837	11,841
Madras ..	39	863	492⅜	6,549	...	7,904⅜
Bombay ...	113	1,161	1,000	7,085	2,445	11,691
North-Western Provinces ...	54	578	1,494	6,286	...	8,358
Punjab ...	62	529	2,002	3,629	7	6,167
British Burmah	1	...	...	1,038	324	1,362
Central Provinces... ...	9	317	164	2,477	...	2,958
Total ...	384	4,235	5,460⅜	34,973	5,613	50,281⅜

GROSS CHARGES PROPER.

Years.	Salaries and Establishments.	Miscellaneous and Contingencies.	Mail Cart, after deducting charges for Passenger Service.	Bounty Money.	Construction and repairs of Buildings.	Total.
	£	£	£	£	£	£
1853-54 .	164,316	37,134	42,214	57	..	243,721
1854-55 .	169,485	52,299	51,743	411	...	273,938
1855-56...	146,842	107,442	39,752	414	...	294,450
1856-57...	203,298	40,423	45,965	452	190	290,328
1857-58 .	217,768	97,559	42,851	571	536	359,285
1858-59...	228,763	52,166	70,188	399	493	352,009
1859-60 ..	222,374	61,659	88,502	281	675	373,791
1860-61...	216,333	43,061	125,754	201	731	386,080
1861-62...	206,035	35,190	137,214	401	1,136	379,976
1862-63...	207,851	35,485	129,178	280	659	373,753
1863-64...	210,428	48,951	126,017	405	1,815	387,616
1864-65...	221,874	39,908	128,792	518	1,965	393,057
1865-66...	238,458	47,683	130,758	777	1,187	418,863
1866-67 11 months .	235,181	46,481	118,770	664	1,652	402,948
1867-68...	280,760	58,839	133,495	458	1,942	475,494
1868-69...	316,202	78,635	138,997	341	2,845	537,020

Memorandum of the monthly subsidies paid under the last and the present contracts for the conveyance of Mails by the several lines of steam communication.

Old Lines.	Calcutta to Bombay	£	750
	Do. to Singapore		700
	Do. to Moulmein		350
	Do. do.		346
	Do. to Akyab		100
	Bombay, Kurrachee, and Persian Gulf		2,311
New Lines,	Calcutta to Bombay	£	1,000
	Calcutta, British Burmah and Straits' Settlements		2,133
	Madras and Rangoon		600
	Bussorah and Baghdad		4,800

THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Statistical Reporter.

A MONTHLY JOURNAL OF STATISTICAL ENQUIRIES CONCERNING INDIA.

Vol. II.] CALCUTTA, THURSDAY, 15TH JUNE, 1871. [No. 11.

MILITARY EXPENDITURE OF INDIA.

(MAJOR-GENERAL NORMAN'S STATEMENT IN COUNCIL, 1871)

(Continued from our last Number)

"THERE remain the marine charges which were specially referred to by my Hon'ble friend Mr. Chapman. These charges are not in their nature so susceptible of reduction or of check by the Supreme Government as the military charges, and must, practically, to some extent, be dependent on the supervision of the local Governments. Those Governments have been enjoined to exercise strict economy in their marine estimates, and various reductions have been effected. In fact, as I stated in this week, the difference between the expenditure of the Marine Department in India as estimated for 1870-71, and the sum now shown in the regular estimate for that year, is more than £5,000. At the same time it must be recollected that the purchase of a single vessel in any one year largely deranges the marine estimates, and vitiates comparisons As before 1868-69, the Marine Department was not connected with the Military Department, I do not propose to say more with reference to past years, than that in 1870-71 the estimated marine expenditure was £784,100, of which £307,924 was to be incurred in England and £476,176 in India. The regular estimate has increased the former to £311,700, an increase of nearly £4,000, while it has decreased the latter Indian expenditure to £422,000, a reduction of £54,000, but as the receipts in India are estimated at £272,100, the net expenditure in India was only £150,000.

For 1871-72 the marine expenditure is estimated at £777,800, or £6,700 less than the budget estimate of the current year. Of this £290,700 is for expenditure at home This provides for £70,000 for the cost of six ships of Her Majesty's Navy serving in the Indian seas; £168,000 for stores for India, £50,000 for pensions—I presume mainly for members of the old Indian Navy—and £2,500 for furlough pay. There is a considerable increase for stores, but a decrease of £66,000, paid in the previous year, towards the cost of iron-clad monitors for Bombay

The estimated expenditure in India is for £487,100, but the receipts are estimated at £237,900, leaving a probable expenditure of £249,800.

The transition state of the marine service on the other side of India renders comparison between this year and last impossible, for the Indian vessels have not yet been reduced, while the Royal Naval vessels are already out here, and though the payment for these vessels are made in the Home estimates, cost of coal and repairs will be an Indian charge, and for a time swell expenditure.

The Bombay Government has been requested to carry out all possible reductions consequent upon the arrival of the Royal Naval vessels, and to submit a carefully considered report of the permanent wants of that Presidency under the new arrangements, by which all military naval duties in these seas devolve on the Royal Navy

This will no doubt actually reduce the expenditure in Bombay, and in Bengal a considerable reduction has been effected, but I am not prepared to say that we are incurring a very large marine expenditure in India, considering that it provides for the following items —

All the charges connected with the Master Attendant's Department, the Dockyard, the pilot vessels and pilot service steamers, yachts, river surveys for this port and for rivers in Bengal, various charges for the Mutlah which, however, are greatly reduced this year; cost of all marine establishments including that of light-ships and light-houses in British Burmah, cost of river steamers in the Punjab, the Master Attendant's Department at Madras, and heavy expenses for the marine establishment at Bombay, in the Persian Gulf, at Aden, and Kurrachee, besides one lakh of rupees for vessels employed on the telegraph service, and also a charge of Rs 27,000 for marine pensioners at Bombay, as well as provision for the new monitors for the defence of the Bombay harbour.

Of these, as already observed, we hope to effect a considerable reduction in the Persian Gulf as soon as the entire relief of Indian vessels is effected by the ships of Her Majesty's Navy for which we now pay, and I entertain a strong conviction that the marine expenditure for 1871-72, if no unforeseen circumstances arise, will bear a very favorable comparison with that of previous years.

I have now gone through the expenditure of the three branches of the public service of which I have more immediate charge, and I fear I have greatly wearied the Council I can only plead the magnitude of my subject, and I promise that if I again have the honor to submit statements of this kind, they shall be more brief than those I have to-day offered"

INDIAN ARMY—1871-72

STRENGTH OF THE HOME DEPOTS—1861 TO 1867-68

RETURN for the seven years 1861-62 to 1867-68 of the estimated establishment of the Indian depôts, for cavalry and infantry, of the actual strength of those depôts, and of the actual number of recruits and drafts sent out thence to India.

Depôts.	1861-62.	1862-63	1863-64.	1864-65	1865-66	1866-67.	1867-68.	Total.	Average
Estimated Establishment	6,688	6,224	7,467	7,465	7,222	7,099	7,894	50,059	7,351
Actual strength on monthly averages	9,638	6,190	7,543	7,811	8,826	8,881	10,572	59,461	8,494
Number of men embarked in drafts	1,646	787	2,839	1,656	3,001	1,801	3,646	15,376	2,196
Approximate amount of home charges for depôts, including recruiting expenses and pay on passage out and home	£ 365,700	£ 296,650	£ 379,650	£ 277,650	£ 378,650	£ 398,150	£ 469,650	£ 2,666,100	£ 380,871
Average cost of each recruit embarked	221	376	134	223	126	221	129	...	205

MILITARY EXPENDITURE OF INDIA—1828-51.

ACCOUNT OF THE NUMBER OF OFFICERS AND MEN COMPOSING THE MILITARY FORCE OF THE THREE PRESIDENCIES OF INDIA IN EACH YEAR, FROM 1828 TO 1851 INCLUSIVE, AND THE AMOUNT OF THE MILITARY CHARGES DEFRAYED IN EACH OF THOSE YEARS *in India itself.*

Year.	QUEEN'S TROOPS.			EAST INDIA COMPANY'S TROOPS.				Grand Total.	Military Charges, including Military Buildings.	Remarks.
	Cavalry.	Infantry.	Total.	Artillery and Engineers.	Cavalry.	Infantry.	Total.			
									£.	
1828	2,291	17,337	19,628	17,758	21,811	*199,831	239,400	259,028	8,973,803	—In 1826 the army of India had numbered 291,145 men at the close of the war with Burmah, and the siege of Bhurtpoor. In 1828 the army was in progress of reduction to a peace establishment, and was actually reducted the next year to a lower standard than in 1822-23, the year before the war with Burmah commenced, and eventually, viz. in 1834-35, to a number less by 107,385 than in the year 1826.
1829	2,432	17,716	20,148	17,658	20,182	185,460	222,300	243,448	8,195,796	
1830	2,577	17,731	20,398	18,046	19,962	168,160	203,168*	223,476	7,911,882	
1831	2,684	16,922	19,606	18,124	16,174	143,094	177,392	196,998	7,490,452	
1832	2,680	16,779	19,459	18,178	15,907	139,424	173,509	192,968	7,292,660	
1833	2,788	16,328	19,116	17,597	15,658	137,745	171,000	190,116	7,323,969	
1834	2,631	15,410	18,041	17,312	15,582	136,931	169,825	187,866	7,240,041	
1835	2,720	14,959	17,679	17,505	15,324	133,252	166,081	183,760	7,041,162	
1836	2,724	15,936	18,660	17,423	15,389	134,567	167,379	186,039	6,847,096	
1837	2,618	15,906	18,524	17,213	15,491	135,303	168,007	186,531	6,865,851	
1838	2,530	15,025	17,555	16,941	15,446	135,364	167,751	185,306	7,141,439	—On two occasions in the year 1838, ten men per company were added to the Bengal Native Infantry, and in 1839 one company to each regiment, the whole occasioning an increase of about 19,000 men. The movements on Affghanistan occasioned a large increase of military establishment and war charge. A further amount of expense, partly consisting of the pay of troops, was charged in the Political Department, as connected with the restoration of Shah Shoojah, from 1839 to 1842.
1839	2,574	14,771	17,345	16,432	15,850	157,513	189,795	207,140	7,607,514	
1840	2,793	17,424	20,217	16,819	19,111	179,296	215,226	235,443	8,454,208	
1841	2,981	18,924	21,905	16,580	21,178	191,359	229,117	251,022	9,006,433	—At the close of the year 1841 the disaster befel the force at Cabool, and the army
1842	2,939	21,214	24,153	16,490	21,819	192,275	230,584	254,737	9,193,745	was augmented in consequence. Six Queen's regiments were sent to India in 1842,
1843	3,538	25,090	28,628	16,556	22,701	199,788	239,045	267,673	9,562,524	and the strength of those in India was increased. One company was added to each native regiment, occasioning an increase of 7,400 natives.
1844	3,578	24,782	28,360	17,493	22,795	194,172	234,460	262,820	9,558,306	—In this year the military charges were increased by the formation of an army of observation on the north-west frontier, the rupture with the State of Gwalior, and the operations in Scinde. The irruption of the Sikhs in the first war with that power, occurred in this year.
1845	3,536	24,749	28,285	17,868	23,217	217,051	258,136	286,421	9,634,985	
1846	3,142	23,319	26,461	18,166	23,953	216,090	258,209	284,670	10,384,249	—Peace with the Lahore State was signed on 11 March 1846. During that year
a 1847	3,518	23,436	26,954	18,560	30,627	215,655	264,842	291,796	10,598,016	eight regiments of irregular cavalry were added to the Bengal army, and one more in 1847.
1848	3,623	21,283	24,906	18,944	28,248	193,063	240,235	265,161	29,932,209	—The reduction of number here shown was occasioned by the partial return to a peace establishment.
1849	3,464	23,770	27,234	19,089	28,157	202,543	249,789	277,023	10,739,647	—The Queen's troops and the Bengal Army which had been reduced after the peace
b 1850	3,553	25,828	29,381	19,101	27,891	201,355	248,347	277,728	10,098,926	with Lahore were again augmented towards the close of 1848 to meet the rebellion in Mooltan and the hostile movements of the Sikhs. The military buildings required in the Punjab also increased the amount of military charge in the later years.
1851	3,664	25,816	29,480	19,009	31,320	209,720	260,049	289,529	10,180,615	—Four corps of Sikh local infantry, and a corps of Guides, raised in 1847, are first brought upon the Returns of the Bengal army in April 1851, and five regiments of Punjab cavalry, and five regiments of Punjab infantry, raised in 1849. are first entered in those Returns at the same date, and together occasion the increase here shown.

* *Note.*—The Medical Establishment and Warrant Officers are included under this head.

AVERAGE STRENGTH OF THE EUROPEAN ARMY IN INDIA THROUGHOUT 1861.

From a Return furnished by Major-General Pearse, Military Secretary, India Office.

	Total.	Bengal.	Madras.	Bombay
Royal Troops	61,641	41,876	11,333	8,982
Officers	2,719	1,906	465	348
Men	58,922	39,470	10,868	8,584
European Troops of the Indian Army, as under:—	23,367	10,512	7,121	5,734
Officers	5,606	2,163	2,085	1,407
Men	17,762	8,349	5,036	4,327
ENGINEERS AND SAPPERS	586	251	204	131
Officers	286	132	78	76
Men	300	119	126	55
ARTILLERY	8,595	3,800	2,616	2,119
Officers	677	320	203	154
Men	7,858	3,480	2,413	1,965
Horse — Officers	196	113	48	35
Horse — Men	2,396	1,395	467	534
Foot — Officers	427	207	129	91
Foot — Men	5,452	2,085	1,944	1,423
Native Foot — Officers	54	...	26	28
Native Foot — Men	10	...	2	8
CAVALRY	1,852	1,705	88	59
Officers	498	365	80	53
Men	1,354	1,340	8	6
European — Officers	220	220		
European — Men	1,340	1,340		
NATIVE:				
Regular — Officers	220	117	80	23
Regular — Non-Commissioned Officers	14	..	8	6
Irregular — Officers	58	28	...	30
Irregular — Non-Commissioned Officers				
INFANTRY	9,360	3,339	3,099	2,922
Officers	3,125	877	1,358	890
Men	6,235	2,462	1,741	2,032
European — Officers	539	256	132	151
European — Men	6,046	2,402	1,646	1,998
NATIVE.				
Regular — Officers	2,471	555	1,214	702
Regular — Men	167	48	93	26
Irregular — Officers	115	66	12	37
Irregular — Men	22	12	2	8
VETERANS	639	218	380	41
Officers	169	55	73	41
Men	470	163	307	
MEDICAL ESTABLISHMENT	1,775	912	541	322
Officers	850	414	243	193
Apothecaries and Stewards	925	498	298	129
EUROPEAN WARRANT OFFICERS	620	287	193	140
Total including European Troops of the Indian Army	85,008	51,888	18,454	14,666

THE TRANSPORT SERVICE.—THE HYDRAULIC LIFT.—BOMBAY

ABOUT three years since, it was resolved by somebody that as H. M.'s Steam Transports would require frequent repairs and periodical scraping, appliances for these purposes should be created for them six or seven miles away from the present Dockyard We have used the term appliances; but so far as can be gathered, the Westminster or other projectors thought nothing but docks would be needed at Hog Island. The necessity for a fixed establishment being maintained, the absence of any water supply, the cost of habitations for labourers and engineers, and all the expensive arrangements required for workshops are considerations that do not seem to have entered into the calculations of the Hog Island dock projectors. Some authorities, name and designation yet unknown, being fascinated, we suppose, with Mr. Clark's very ingenious patent, entered into a contract for the erection of a Hydraulic Lift and Pontoons for the moderate sum of 25 lakhs. That is a quarter of a million in Europe; but as it is only the Government of India's money, no one at Westminster counts the cost. Now it appears that, as usual, the original estimate is likely to be exceeded; and it would probably be a very good bargain if the Indian Treasury could compound this Hog Island business for half a million sterling.

In this outlined history, several objections are implied; but there remains the chief one, namely, that the site in question is one of the last in the world where a Hydraulic Lift Dock should be erected. The contrivance is one admirably adapted for harbours with a wide expanse of shallow shore, or other situations where it is difficult to make a capacious graving dock near to deep water. This is the case at the Victoria Docks on the Thames, where also the cost of land for approaches rendered it the more expedient to adopt the Hydraulic Lift, and where we believe it is highly successful; but until this Bombay experiment, we believe that was the only one in existence. At Hog Island the reverse obtains of all the physical and financial conditions which render the use of Clark's patent desirable. Then, again, as this elaborate scientific contrivance is one intended to compensate for deficiencies in natural advantages, it is necessarily costly anywhere, and, being of iron, excessively expensive in India. Brought to a site where it was not needed, it may be said to have cost three times the sum that would have been spent on a dock adapted to the site. Or, let us test the project by the results attained. The pontoon and lift, as now planned, will accommodate one troop-ship or other large vessel at a time; but for the sum of the original contract, *three* masonry docks might have been constructed. This statement we have made before on good professional authority, and it has not been called in question.

The public ought to know what man or system is responsible for waste of our resources in this fashion. The Public Works Secretary to the Bombay Government ought to disavow his share in it if he can; but if this Government had resisted the scheme, we do not see how it could have been pushed through at Westminster.—*Times of India.*

EXPENSE OF RECRUITS FOR THE INDIAN ARMY.

A RETURN of the proceedings of Mr. Seccombe's Committee on the expense of recruits for the Indian Army has just been published by order of the House of Commons. The first report of the Committee dealt with a plan for the settlement of the charges against India on a principle of a schedule of prices per man for regiments, batteries, drafts, &c., the War Office making a similar payment to the Indian Government for every effective man returned to England. They also minutely considered the cost of the old depôt of the East India Company at Warley, and compared it with Indian depôts kept up by the Imperial Government. The following is the astounding result of the comparison. The average cost of each soldier sent out from the Warley depôt from 1850 to 1859 was £19-15. The average cost of each soldier sent out from the depôts of the War Office was £205, subject to some slight alteration after the average was struck. At the Imperial depôts a large staff is kept up; at the Warley depôt the staff was small, which accounts for a great deal, but not anything like the entire difference between £200 and £20. In the second report the Committee say :—

"The Committee, in that report, requested the attention of Her Majesty's Government to the very heavy charge imposed on India, and to the very large difference between the expenditure under the existing system, and that which was formerly incurred by the East India Company, in recruiting their European artillery and infantry. The recommendation of the Committee having been adopted, another Committee, consisting of three officers representing the India Office, War Office, and Horse Guards, respectively, was appointed to consider to what extent the depôt establishments maintained for regiments serving in India would admit of reduction."

The following is the alteration which is important enough to be quoted entire :—

"The Committee are therefore of opinion, that, from the 1st April 1870, the claims of the Imperial Government should be adjusted by repayment of the actual charges on the general principles which governed the settlement of the accounts for recruiting depôts and other Home services, from the year 1824 to the date of the introduction of a capitation rate. There are, however, certain charges, formerly included in that adjustment which it would be expedient henceforth to exclude; the payments under the several heads to be in future made direct by the India Office, viz. :—Pay of officers on furlough from India, with the exception of the pay of colonels of regiments, and colonels commandants of artillery, which should continue to be issued by the agents and charged to India, through their accounts with the War Office. Advances in this country to regiments proceeding to India, which should be accounted for by the paymasters to the local Government in India, the paymasters rendering to the War Office a pay list to the day preceding embarkation. Advances in India to regiments returning to England to be accounted for by the paymasters to the India Office, a pay list being rendered to the day preceding disembarkation. Advances to drafts proceeding to, and detachments returning from, India should be adjusted in the mode adopted previous to the introduction of the Capitation Rate. The Committee would also recommend that the remittances from India by officers and soldiers should be paid direct by the India Office, and that the present charge for agency be revised. Excluding the foregoing items, the charges which will have to be adjusted on the principle of actual accounts, are detailed in the appendix and may be classified as follows:—Class 1, direct charges; Class 2, indirect, or assessed charges. There are certain charges shown under Class 3, to which reference will be made separately. The items in Class 1 do not require explanation. In regard to Class 2, comprising the indirect or assessed charges, in respect of which India is liable for a proportion only, the expenditure for these services should be charged rateably on the net disbursements occurring in *each* of the several recruiting districts and depôt battalions, in which there may be recruits for India, with the exception of the charges for barrack accommodation, and for difference of numbers of men on passage to and from India. The charge for barrack accommodation should be calculated on the average number of officers and men belonging to regiments on the Indian establishment, accommodated in barracks on the 1st of each month. With reference to the charge hitherto made for the difference of numbers of men on passage to and from India, and to a recent communication from the Horse Guards, copy of which is annexed, respecting the minimum time required for training recruits of the several arms of the service, the Committee are of opinion that the following sums, details of which are given in Appendices B. and C. should, for the present, be charged for every non-commissioned officer or soldier embarked, as reliefs for India, with regiments of the line, viz:—

	£	s.	d.
Cavalry	45	16	10
Infantry	27	7	11

and the Government of India will be entitled to credit, at the same rates, for every non-commissioned officer or soldier disembarked with regiments, who, at the date of disembarkation, shall not be within two years of completion of his term of service. This adjustment will not apply to drafts sent from this country to India, as India will have paid for them, nor to detachments of invalids or time-expired men returning from India. Assuming that the expenses of the Indian depôts of Royal Artillery will, in future, be defrayed by the Government of India in the same manner as those for depôts of cavalry and infantry, the Committee consider that the amount chargeable for every non-commissioned officer or soldier of artillery embarked for India should be as follows, viz. :—

	£	s.	d.
Horse Artillery	47	10	7
Garrison and Field Artillery	40	11	5

Details showing how these charges are arrived at, are given in the appendix. The rates will be chargeable on the numbers embarked with troops or batteries of artillery as reliefs, and also on such non-commissioned officers or men, if any, as may be sent from troops and batteries not belonging to the Indian depôts, India being re-imbursed at the same rates for every effective non-commissioned officer or soldier disembarked with troops or batteries who shall not be within two years of the completion of his term of service. As in the case of regiments of the line, drafts of artillery embarked for India will not be chargeable, nor will India be entitled to credit for invalids or time-expired men returning. The practice at present adopted, of not sending out men who have less than two years to serve, should be continued; and in calculating the number on which the prescribed sums are to be paid for effective men going out or returning with their corps, the number of men left with the depôts who may not be within two years of the termination of their period of service should be added to the numbers embarking; and, in like manner, the number of soldiers and recruits of three months' service and upwards, serving with the depôt at the date on which the order was issued for the recall of the regiment from India, should be added to the number of men disembarking in this country with the corps. The rates at present chargeable for non-commissioned officers of Royal Engineers required for special service in India, as fixed in the report of the Committee which considered the subject in March 1867, should remain in force. The Committee recommend that the above rates, as well as the charges under Class 2, should be subject to revision every three years. On the subject of these charges a separate minute is recorded by the members representing the India Office on this Committee. In regard to the mode of payments, the Committee recommend that monthly advances, based on the estimated expenditure, should be made by the India Office. The accounts should be kept distinct for each year, and the balance of each year's account should, if practicable, be declared within nine months of the expiration of the financial year. The final adjustment of each year's accounts would be materially facilitated by the establishment of a system of concurrent audit, on behalf of India, of the direct charges as recorded in the books of the War Office, many of which charges are so well defined, that they will hardly admit of objection; and in recommending the adoption of that course, the Committee consider that the necessary detailed arrangements, to carry it into effect, might, with advantage, be left in the hands of the responsible officers of each department, charged with the duty of rendering and auditing the accounts. With the view of facilitating the settlement of any questions which may arise in the course of the adjustment of the accounts, the Committee recommend that a standing committee should be formed, composed of members representing both the Indian Office and the War Office. The charges (cost for kits) specified in appendix having relation to the army generally, have not hitherto been a matter of account between the Imperial Government and the Government of India. The question as to the liability of India to bear a proportion of these charges was discussed by the committee, which arranged the existing Capitation Rate in 1861, and it resulted in the exclusion of those charges therefrom. The Committee again refer to the heavy expense of the Indian depôts as at present constituted. They are unanimously of opinion that the present rate of expenditure is

too large when compared with that incurred prior to the Mutiny in India; and, as shown in their former report, excessive when compared with the charge incurred by the East India Company in the maintenance of their depôt at Warley. The Committee are therefore of opinion that, without any sacrifice of efficiency, it is practicable to effect a very large reduction in these charges."

In the third report, the Committee recognize the extensive alterations made in the constitution of the army in India involving:—

"The breaking up of the cavalry depôt and infantry depôt battalions, attaching, in lieu of the former, a home troop of each regiment on service to a regiment of similar equipment at home; and, of the latter, two companies of each battalion abroad to a battalion at home, eight companies to be on foreign service and 12 companies on home service. A battalion of infantry in India would then consist of eight companies, each company having one captain and two subalterns; and there would be in respect of every battalion two companies at home, each with one captain and one subaltern, these two companies forming the depôt, and being attached to a home battalion of 10 companies. The recruits annually required for each regiment of cavalry in India are estimated at 32, and for each battalion of infantry at 60. As under the proposed arrangement there would be nine regiments of cavalry and 60 battalions of infantry in India, the annual drafts required would be 288 cavalry and 3,000 infantry recruits.

"The propositions placed before the Committee are, that ten months is to be regarded as the average period of training of each cavalry, and seven months of each infantry, recruit; and that payment should be made from Indian revenues for recruits, at rates per man to be calculated with reference to those periods. It is proposed by the members appointed by the Secretary of State for War that a proportion of the staff charges of each regiment or battalion should be included in the calculation; but this is objected to by the members appointed by the Secretary of State for India, on the ground that the staff charges in question would not be increased in consequence of one troop or two companies being attached to each regiment or battalion, and that the object to be kept in view is the repayment to Imperial revenues of expenditure incurred for the purposes of the Indian Government, and not the relief of the Imperial Exchequer from charges which it would incur independently of any Indian requirements. The Committee have, therefore, submitted two statements, one exclusive, the other inclusive, of the regimental or battalion staff."

The Committee thus reduces the cost to £136-13-11 for each cavalry recruit, and £63-8-5 for each infantry recruit; or £144-9-5 and £66-19 respectively if the regimental staff charges are to be paid by India. Finally the Committee says:—

"We feel it to be our duty again to refer to the fact, stated in the first report of the Committee, that the East India Company were able to send efficient artillery and infantry recruits to India at a cost of 26*l.* 7*s.* 5*d.* per man, instead of 136*l* 13*s.* 11*d.* for cavalry and 63*l.* 8*s.* 5*d.* for infantry recruits, as now proposed. We are fully aware that the changes made in the terms of enlistment, pay, clothing, &c., would have increased the charge as incurred by the East India Company, but the proposed establishments for, and the periods of training, which have formed the bases of this third report of the Committee, appear to us to be enormously in excess of what can be possibly required for the purpose of properly recruiting the British Army in India."

This report ought to be of immense importance to India. In close concise language it pictures some huge blots, and if the Government can deal with them, the blots may be removed, if not the work will fall to other hands.—*Friend of India.*

IMPERIAL CHARGE FOR EACH RECRUIT PROPOSED BY MR. SECCOMBE'S COMMITTEE.

Cavalry.

	£.	s.	d.
Pay for nine months, at 1s. 5d. per diem	19	7	9
Beer money for nine months, at 1d. per diem	1	2	9
Marching money, cost of conveyance of recruits, &c., (16 per cent. on pay)...	3	2	0
Recruiting and depôt battalion staff charges, 22 per cent. on foregoing charges and on levy money	5	15	2
Barrack accommodation for nine months, at 6*l.* 2*s.* 11*d.* per man per annum	4	12	2
Excess cost of bread and meat for nine months ...	1	2	0
Charge for accoutrements for nine months	0	1	2
Clothing for nine months, at 4*l.* 8*s.* 9d. per annum ...	3	6	7
Hospital expenses for ditto, at 17*s.* 7d. per annum ...	0	13	2
	39	2	9
Levy Money	2	11	0
Cost of free kit	4	3	1
	45	16	10

Infantry.

	£	s.	d.
Pay for six months, at 1s. 2d. per diem	10	12	11
Beer money for six months, at 1d. per diem	0	15	2
Marching money, cost of conveyance of recruits, &c., (16 per cent. on pay)...	1	14	1
Recruiting and depôt battalion staff charges, 22 per cent. on above charges and on levy money	3	9	0
Barrack accommodation for six months, at 6*l.* 2*s.* 11*d.* per annum	3	1	5
Excess cost of bread and meat for six months... ...	0	14	8
Accoutrements for six months	0	0	10
Clothing for six months, at 3*l.* 1*s.* 8d. per annum ...	1	10	10
Hospital expenses for ditto, at 17*s.* 7d. per annum ...	0	8	9
	22	7	8
Cost of free kit (exclusive of extra articles formerly in the kit, but now issued as clothing)	2	9	3
Levy money	2	11	0
	27	7	11

Royal Horse Artillery.

	£	s.	.
Pay for nine months, at 1s. 7¼d. per diem	21	19	1
Beer money for nine months, at 1d per diem	1	2	9
Marching money, and cost of conveyance of recruits, &c., (16 per cent. on pay)	3	10	3
Barrack accommodation for nine months, at 6*l.* 2*s.* 11*d.* per annum	4	12	2
Excess cost of bread and meat for nine months... ...	1	2	0
Accoutrements for nine months	0	1	2
Charge for staff expenses	5	0	0
Clothing for nine months, at 3*l.* 17*s.* 2d. per annum ...	2	17	10
Hospital expenses for ditto, at 17*s.* 7d. per annum ...	0	13	2
	40	18	5
Levy money	2	11	0
Cost of free kit (exclusive of extra articles formerly in the kit, but now issued as clothing)...	4	1	2
	47	10	7

Royal Artillery.

	£	s.	d.
Pay for eight months, at 1s. 5¼d. per diem ...	17	9	9
Beer money for eight months, at 1d. per diem... ...	1	0	8
Marching money, cost of conveyance of recruits, &c., (16 per cent. on pay)	2	16	0
Barrack accommodation for eight months, at 6*l.* 2*s* 11*d.* per man per annum	4	2	0
Excess cost of bread and meat for eight months. ...	0	19	8
Accoutrements for eight months	0	1	1
Charges for staff expenses	5	0	0
Clothing for eight months, at 3*l.* 18*s.* 6d. per annum ...	2	12	4
Hospital expenses for ditto, at 17*s.* 7d. per annum ...	0	11	8
	34	12	9
Levy money	2	11	0
Cost of free kit (exclusive of extra articles formerly in the kit, but now issued as clothing)...	3	7	8
	40	11	5

Royal Engineers.

	£
For each Quartermaster-Sergeant	190
„ Colour Sergeant...	150
„ Sergeant	140
„ Corporal	125
„ Second Corporal	110
„ Lance Corporal and Sapper ...	90

ENHANCED CHARGES FOR RECRUITS PROPOSED BY THE HORSE GUARDS.

CAVALRY	£.	s.	d.
Pay for 10 months, at 1s. 5d. per diem	21	10	10
Beer money for 10 months, at 1d. per diem	1	5	4
Marching money and cost of conveyance of recruits, &c., (16 per cent. on pay)	3	8	11
Recruiting staff charges	2	19	1
Barrack accommodation for 10 months, at 6l. 2s. 11d. per annum	5	2	5
Excess cost of bread and meat for 10 months	1	4	5
Charge for accoutrements for 10 months	0	1	4
Charge for practice ammunition	0	8	1
Clothing for 10 months, at 4l. 8s. 9d. per annum	3	14	0
Hospital expenses, at 17s. 7d. per annum	0	14	7
Forage for 10 months, providing one horse for three recruits	11	2	8
Levy money	2	11	0
Cost of free kit	4	3	1
	58	5	9

INFANTRY.	£.	s.	d.
Pay for seven months, at 1s. 2d. per diem	12	8	5
Beer money for seven months, at 1d. per diem	0	17	9
Marching money, cost of conveyance of recruits, &c. (16 per cent. on pay)	1	19	9
Recruiting staff charges	2	19	1
Barrack accommodation for seven months, at 6l. 2s. 11d. per annum	3	11	8
Excess cost of bread and meat for seven months	0	17	1
Accoutrements for seven months	0	1	0
Practice Ammunition	0	8	1
Clothing for seven months, at 3l. 1s. 8d. per annum	1	16	0
Hospital expenses for seven months, at 17s. 7d. per annum	0	10	3
Cost of free kit (exclusive of extra articles formerly in the kit, but now issued as clothing)	2	9	3
Levy money and bounty	2	11	0
	30	9	0

The charge of the Troop Depôt :—

	£.	s.	d.		
1 Captain	266	2	11		
1 Lieutenant	164	5	0		
2 Troop Sergeant-Majors	121	13	4		
3 Sergeants	136	17	6		
1 Trumpeter	28	17	11		
1 Artificer	38	0	5		
10 Rank and File	258	10	10		
Beer money	25	17	1		
Agency ... Allowance ... £16 14 7 / Poundage ... 2 13 9	19	8	4		
Contingent Allowance	41	0	0		
Postage, &c	7	0	0		
Mess Allowance.	25	0	0		
Forage for 17 Horses, at 1s 10d.	568	15	10		
Cost of Remount Horses	98	0	0		
Forage for five Officers' Horses, at 1s 1½d. a day each	102	13	1		
For 48 Recruits	1,902	2	3		
				44	4 8
At per Recruit				102	10 5

The charge of the two Depôt Companies :—

	£.	s.	d.		
Pay of 2 Captains	422	15	10		
„ 2 Subalterns	237	5	0		
„ 2 Colour Sergeants	97	6	8		
„ 6 Sergeants	237	5	0		
„ 4 Drummers	91	5	0		
„ 6 Privates	127	15	0		
Beer money	27	7	6		
Contingent Allowance	36	10	0		
Postage and Stationery	14	0	0		
Mess Allowance.	50	0	0		
Agency	18	5	0		
Ditto. Poundage	8	7	9		
For 80 Recruits	1,368	2	9		
				17	2 0
Or, per Recruit				£ 47	11 4

If the proportion of the pay of the Regimental Staff in England be added, viz :—

	£.	s.	d.		
1 Lieutenant Colonel	419	15	0		
1 Major	351	6	3		
1 Paymaster	228	2	6		
1 Adjutant (allowance)	45	12	6		
1 Quartermaster	155	2	6		
1 Surgeon	273	15	0		
1 Assistant Surgeon	182	10	0		
1 Veterinary Surgeon	182	10	0		
Command Allowance	54	15	0		
Non-effective Allowance	40	0	0		
Special Allowance to Quartermaster	30	0	0		
Agency (1½d. per £ on 1,963l. 8s. 9d.)	12	5	5		
Forage for 21 Officers' Horses, at 1s. 1½d. a day each	421	3	0		
	2,406	17	3		
For one troop (one eighth)	300	17	2		
				5	16 3
For each recruit for 10 months				108	7 1
The rate per recruit would be					

If a proportion of the pay of the Regimental Staff in England be added, viz :—

	£.	s.	d.		
1 Lieutenant Colonel	310	5	0		
2 Majors	584	0	0		
1 Paymaster	228	2	6		
1 Adjutant (allowances)	63	17	6		
1 Instructor of Musketry (allowances)	45	12	6		
1 Quartermaster	118	12	6		
1 Surgeon	273	15	0		
1 Assistant Surgeon	182	10	0		
Command Allowance	54	15	0		
Non-effective allowance	40	0	0		
Special allowance to Quartermaster	30	0	0		
Forage for seven horses	234	4	2		
Agency	13	10	7		
	2,179	4	9		
For two companies (one-sixth)	363	4	1		
For each recruit for seven months				2	12 11
The rate per recruit would be				50	4 3

STRENGTH OF THE EUROPEAN ARMY IN 1865.

Non-commissioned Officers and Men	68,336
NATIVE TROOPS OF EACH ARM.	
All Ranks :—Cavalry	17,490
Artillery	2,052
Infantry	95,291
Total	114,833
NATIVE POLICE.	
Total strength	154,435
OTHER NATIVE ORGANISED LEVIES.	
All Ranks :—Cavalry	1,469
Infantry	3,976
Total	5,445
CONTINGENTS OF NATIVE PRINCES.	
All Ranks :—Artillery	506
Cavalry	4,693
Infantry	9,148
Total	14,347

THE DECENTRALIZATION SCHEME.

ASSIGNMENTS TO BE MADE FOR "PROVINCIAL SERVICES" IN ACCORDANCE WITH THE RESOLUTION OF THE GOVERNMENT OF INDIA, IN THE FINANCIAL DEPARTMENT,

No. 3334, DATED 14TH DECEMBER 1870.

	Grants, 1870-71.											Estimated Receipts, 1870-71.						Total Net Assignment, 1870-71.	Proportion of £350,000	Permanent Assignment now made.
	Jails.	Registration.	Police.	Education.	Medical Services (except Medical Establishment.)	Printing.	Roads and miscellaneous Public Improvements	Civil Buildings	Proportion of "Public Works Establishments"	Proportion of "Tools & Plant."	Total.	Jails.	Registration.	Police.	Education.	Printing.	Total.			
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Oudh	26,922	.....	103,269	26,056	5,499	7,609	32,900	20,090	13,777	1,060	237,182	1,575	..	10,586	1,482	1,080	14,723	222,459	15,511	206,948
Central Provinces.....	27,881	3,509	130,607	27,864	11,770	3,640	63,403	14,406	20,230	1,556	304,866	6,000	5,500	12,520	....	... .	24,020	280,846	19,583	261,263
British Burmah.....	32,777	.. ...	139,253	10,998	6,460	3,000	63,100	23,959	22,635	1,741	303,923	9,420	. ....	18,671	500	.....	28,591	275,332	19,199	275,332
Bengal.....	218,210	36,609	555,757	234,385	89,713	41,732	157,800	111,370	69,984	5,583	1,520,943	110,385	40,000	70,363	42,012	2,000	264,760	1,256,183	87,591	1,168,592
N. W. Provinces	88,394	20,129	348,135	103,528	27.607	25,302	82,636	63,341	37,954	2,920	799,946	11,154	35,030	51,730	11,050	2,160	111,124	688,822	48,030	640,792
Punjab	58,204	11,623	289,950	64,909	24,935	14.106	84,200	39,710	32,217	2,478	622,332	. ...	20,694	41,724	5,000	...	67,418	554,914	38,693	516,221
Madras	91,983	22,970	350,730	90,052	61,696	25,840	123,880	58,506	47,421	3,648	876,726	7,300	34,000	32,350	6,900	1,260	81,810	794,916	55,428	739,488
Bombay	73,440	25,372	388,708	118,271	74,852	27,050	121,900	107,500	59,644	4,588	1,001,325	664	30,141	14,000	10,480	. .	55,285	946,040	65,965	880,075
Total ..	617,811	120,212	2,306,409	676,063	302,532	148,279	729,819	438,882	303,862	23,374	5,667,243	146,498	165,365	251,944	77,424	6,500	647,731	5,019,512	350,000	4,668,711

HOME CHARGES.

STATEMENT OF THE AMOUNT OF CHARGES AT HOME IN EACH YEAR FROM

	1834-35.	1835-36.	1836-37.	1837-38	1838-39.
PERMANENT AND FIXED CHARGES.	£	£	£	£	£
Dividends to Proprietors of East India Stock 630,000*l.* per annum	636,826	626,098	637,086	626,570	632,559
Payments under Act 4 Geo. 4. c. 71. on account Retiring Pay, Pensions, &c. of the Royal Troops serving or having served in India, 60,000*l.* per annum, payable by quarterly instalments	60,000	60,000	60,000	60,000	60,000
Her Majesty's Paymaster General for Claims accrued against the Company in respect of the Royal Troops serving in India, the advances on account of which are now fixed at 200,000*l.* annually, payable in quarterly instalments, the balances necessarily varying in amount being subsequently adjusted	120,000	120,000	120,000	120,000	120,000
Her Majesty's Mission to the Court of Persia, portion of the charge borne by the Company, now fixed at 12,000*l.* per annum, payable by quarterly instalments	6,000	6,000	15,000	12,000	12,000
Her Majesty's Government on account of the proportion agreed to be borne by the Company of the amount payable under Contract between Her Majesty's Government and the Peninsular and Oriental Steam Navigation Company, for an extended communication with India and China, 70,000*l.* per annum, payable by quarterly instalments	.....	.....	.....	.....	.....
Donation to the Bengal Civil Fund, payable annually	2,500	2,500	2,500	2,500	2,500
Salaries of the Court of Directors, 7,600*l.* per annum	7,900 (Including an Arrear.)	7,587	7,584	7,589	7,589
	833,226	822,185	842,170	828,659	834,648
PERMANENT CHARGES, BUT VARYING IN AMOUNT.					
Interest on the Home Bond Debt	92,858	83,556	115,132	139,341	84,396
Military and other Public Stores, exported and to be exported.	202,855	186,484	277,339	226,751	236,121
Purchase and equipment of steam vessels, and various expenses connected with steam communication with India	.....	.....	.....	37,813	136,549
Transport of Troops and Stores	44,412	23,710	26,222	19,537	30,012
Furlough and Retired Pay to Military and Marine Officers of the Indian Establishments, including off-reckonings	521,317	475,577	489,200	488,571	520,907
Civil Establishments of India, Absentee Allowances, and Passage Money under Regulations	38,633	39,792	32,483	33,170	43,345
Her Majesty's Establishment in China, portion paid by the Company of the actual charge in each year	7,633	7,633	....	11,286	.....
Board of Commissioners for the Affairs of India, comprising salaries of the President and Officers of the Board, and Superannuation Allowances granted by Warrant of the Crown, under the Act 53 G. 3. c. 55. s. 91	31,310	31,378	29,802	29,444	29,455
Recruiting Charges, Pay of Officers, Non-commissioned Officers of Recruiting Establishments, and of Recruits previous to Embarkation, bounty, clothing, arms, accoutrements, &c.	20,901	23,161	23,420	24,418	23,641
Salaries and Allowances of the Secretaries and Officers of the Court of Directors, deducting amount applied from the Fee Fund in part payment thereof	74,960	75,214	67,433	69,572	75,255
Annuitants and pensioners, exclusive of Compensation Annuities under Act 3 & 4 W. 4. c. 85.	120,143	128,643	120,066	120,266	109,567
Lord Clive's Fund, net Payments, for Pensions, &c.	47,792	43,109	46,410	47,348	49,348
Donations under Deed to Widows' Funds for the Home Service.	2,600	2,600	1,900	1,100	1,738
Paymaster General of the Forces, for claims accrued against the Company in respect of the Royal Troops serving in India, in excess of the annual advances, stated under the Head of Permanent and Fixed Charges.	.....	.....	.....	.....	2,86,201
	1,205,414	1,120,857	1,229,347	1,248,617	1,626,535
MISCELLANEOUS CONTINGENT CHARGES, VARYING IN AMOUNT.					
Contingent expenses of the Courts of Directors and Proprietors, consisting of repairs to the East India House, Taxes, Rates, Tithes, Coals, Candles, Printing, Stationery, House Dinners, Entertainments, Books, Maps and Charts, Bookbinding, Stamps on Bills of Exchange and other instruments, and various petty charges	28,622	25,748	21,729	29,158	24,717
Charges of the Store Department, articles for use in inspection of Stores, Labour, &c.	3,609	4,836	4,534	5,392	5,330
Law Charges	7,214	2,054	2,890	1,551	6,463
Haileybury College, net charge after deducting receipts from Students	9,914	9,535	8,327	10,883	10,332
Military Seminary at Addiscombe, net charge after deducting receipts from Cadets	13,530	11,308	9,546	6,888	1,565
Maintenance of Lunatics	4,992	4,946	4,923	4,875	5,247
Cultivation and Manufacture of Cotton, &c., in India (expenses incurred in view to the improvement of)	.....	.....	....	.....	.....
Expense of overland and Ships Packets, Maintenance of Natives of India, Donations to Soldiers, Seamen, and others for Services and Relief, and various miscellaneous expenses, deducting miscellaneous receipts	4,104	2,448	6,651	5,667	4,199

SUMMARIZED—1834-51.

1834, DISTINGUISHING PERMANENT AND FIXED CHARGES FROM THOSE VARYING IN AMOUNT.

1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	1846-47.	1847-48.	1848-49.	1849-50.	1850-51.
£	£	£	£	£	£	£	£	£	£	£	£
626,477	631,645	632,545	625,885	631-591	629,009	623,163	632,544	627,393	631,497	629,435	636,495
60,000	60,000	60,000	45,000	60,000	60,000	75,000	60,000	60,000	45,000	75,000	45,000
120,000	150,000	150,000	150,000	150,000	187,500	200,000	200,000	200,000	200,000	200,000	200,000
4,570	11,000	17,557 Including an arrear	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
...	...	...	...	...	12,578	63,707	70,000	70,000	70,000	70,000	70,000
2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
7,581	7,558	7,560	7,598	7,579	7,582	7,576	7,600	7,581	7,600	7,600	7,559
821,128	862,703	870,162	842,983	863,670	911,169	983,946	984,644	979,474	968,597	996,535	973,554
51,828	51,383	61,373	62,257	59,303	64,339	69,271	70,010	102,984	150,509	173,723	144,970
286,122	329,395	409,471	394,431	364,987	424,952	476,506	655,165	598,540	452,582	350,830	315,864
182,580	83,142	143,625	100,669	78,131	62,894	118,535	97,970	86,923	53,657	50,544	44,273
61,269	73,213	55,731	71,598	55,497	40,296	52,085	62,338	64,557	60,297	45,788	31,061
488,701	502,053	535,608	532,799	541,686	577,636	597,099	597,150	604,373	625,819	614,394	641,513
45,644	44,437	44,240	40,686	46,571	46,100	40,342	39,216	37,919	32,437	32,383	29,895
5,142	4,117	4,783	4,450	...	...	...	16,058	10,093	9,486	...	8,781
29,581	28,290	28,051	28,383	28,565	29,641	30,554	29,909	29,867	30,123	30,523	28,610
49,923	50,414	36,096	35,586	44,777	34,302	33,526	41,421	61,889	41,264	43,438	41,854
80,905	81,483	84,849	86,519	89,091	89,904	88,388	91,844	89,856	94,163	93,794	95,573
109,722	107,534	104,124	102,852	93,341	100,935	94,542	102,243	98,117	99,309	91,788	89,074
51,628	53,246	54,163	56,274	59,162	61,377	65,264	67,819	70,978	70,733	36,519	106,326
1,738	1,738	1,738	1,738	1,738	1,738	1,738	1,738	1,738	1,738	1,738	1,738
100,000	150,000	250,000	...	450,000	...	250,000	100,000	...	150,000	...	...
1,494,788	1,560,445	1,813,852	1,518,242	1,912,849	1,534,114	1,917,750	1,972,881	1,857,834	1,872,117	1,565,462	1,579,532
26,459	25,302	28,868	26,905	31,210	26,506	25,311	29,387	28,257	27,496	28,829	28,978
5,832	6,364	6,481	5,750	6,591	6,841	7,185	8,001	8,555	7,602	6,201	5,615
16,720	...	11,655	3,710	3,353	5,896	15,893	10,598	22,105	2,691	12,215	17,800
9,673	10,214	10,736	8,650	7,957	7,963	10,129	9,800	11,323	9,802	9,074	9,769
3,864	3,904	4,031	3,729	2,435	3,362	3,816	3,138	5,201	4,856	4,057	5,080
5,353	5,523	5,876	5,476	5,992	5,891	5,660	5,862	5,922	6,001	6,466	6,183
2,300	9,324	2,418	284	...	...	182	125	728	163	547	29
5,455	9,749	9,269	*2,051	6,631	3,784	15,523	11,670	10,251	8,854	3,419	7,173

* Excess Receipts.

HOME CHARGES.

STATEMENT OF THE AMOUNT OF CHARGES AT HOME IN EACH YEAR FROM

MISCELLANEOUS CONTINGENT CHARGES—*(Continued)*.	1834-35.	1835-36.	1836-37.	1837-38.	1838-39.
	£	£	£	£	£
Expenses on account convicts transported from India to Van Dieman's Land, paid to Her Majesty's Paymaster General...	.....	. ..	.....	.....	.....
Passage and outfit of Governors, Church Dignitaries, Commanders-in-Chief, Judges, Officers in Her Majesty's and Company's Service proceeding to join their Regiments, Veterinary Surgeons, Chaplains, Aides-de-Camp, Volunteers for the Pilot Service, &c.	23,473	18,993	20,519	16,279	18,484
Disbursements under orders of the Secret Committee ...	.....	.....	.....	.....	* 53,050
Board of Ordnance for Arms and Accoutrements supplied to Her Majesty's Troops embarked for India ...	..	.....	.....	.....	.....
Discount on anticipated receipts of Remittances, and interest allowed on balances of Funds in the Company's Treasury, in excess of interest realized from investment of Cash Balances	.....	.....	.....	.....	.....
	95,458	79,863	79,119	80,693	129,287
TEMPORARY CHARGES, AND CHARGES WHICH HAVE NOW CEASED.					
Expenses of the Tanjore Commission in England	7,927	7,922	7,884	7,908	7,499
Canton Agency Charges	.....	1,200	3,810	13,673	3,961
Commission to Agents at the outports on Realization of Remittances	.....	....	.. ..	1,089	335
Experimental Navigation of the Euphrates	.....	....	....	8,000	173
Grant to the Marquess Wellesley	.....	. ....	.....	20,000	..
Grant to the Estate of the late Mr. W. Fraser, late Commissioner and Agent at Delhi, who was assassinated in that Territory	.....	.....	.. ...	...	5,000
Interest paid to Indian Railway Companies on sums provisionally deposited by them in the Home Treasury; viz. to the 17th August 1849, the date of their respective Deeds of Contract with the East India Company .. .	...	.....	.....	.....	.....
Compensation Annuities under Act 3 & 4 W. 4. c. 85. ...	25,315	121,960	131,109	139,740	144,186
Annuities of the Madras Civil Fund of 1818, borne by the Company	...	... .	...	. ...	....
Retired Pay and Pensions of Persons formerly belonging to the St. Helena Establishment, not chargeable to the Crown.	..	.....	.....	.....	10,260
Mission to the Court of Persia, Company's Mission.. ..	500	17,733	.....	.....	.....
Peninsular and Oriental Steam Navigation Company in aid of the extension of steam communication with India ...	.....	....	..	.....	.. ...
PAYMENTS UNDER THE ACT 3 & 4. W. 4. C. 85 CHARGEABLE AGAINST THE PROCEEDS OF THE COMMERCIAL ASSETS.					
To Owners of Ships with unexpired Contracts	89,500	45,000	...	.....	.. ..
Compensations by way of Gratuity and Commutation of compensation Annuities	56,998	244,282	63,882	10,272	28,193
Bills of Exchange and Certificates from China	29,955	..	....	.....	.....
Miscellaneous Payments on account of the late Commercial Department in excess of receipts.	.....	.....	.....	.....	... ..
£	210,198	438,097	206,685	200,682	199,610
TOTAL AMOUNT OF HOME CHARGES ... ... £	2,344,296	2,461,002	2,357,321	2,358,651	2,790,080

* These sums include an expenditure of 111,300*l.* 2*s.* 9*d* incurred in placing at the disposal of the Government of India steam vessels constructed or adopted by the Secret Committee in relation to what were com-

THE HOME CHARGES, AND ANNUAL DRAIN UPON INDIA.

FEW persons have any very clear notion of what the Home Charges really mean. The Home Charges are the liabilities of the Government of India which annually accrue in England, and have to be paid for by a remittance from the Indian taxes.

In ordinary years the Secretary of State draws bills for the amount upon the Government Treasuries in India at sixty days' sight. As these bills form the most eligible way of transmitting money to India, the East India merchants and Exchange Banks in London compete for them by tender, and the Secretary of State sells them to the highest bidder. It is in this way, in ordinary times, that the Treasury of the India Office in Downing Street is provided with funds to meet these charges. In other words, the Secretary of State issues drafts upon the Indian taxes for the amount he requires in London, and the banks and East India houses cash the drafts for him at a greater or less discount according to the demand for them. The buyers of these drafts send them out to India, and with their proceeds purchase the produce of the country and ship it to Europe. It thus comes to pass that the exports from India must always be in excess of her imports, by the amount of these drawings. Unfortunately, this drain upon the produce of the country is not the only one. All the chief executive officers of Government in India, all the officers of the English Army, all the European planters of the country, in fine, every European in India, whether he derives his income from the State (the taxes) or from his own private enterprise, sends a very large proportion of it, year by year, and at last, upon retiring, his whole fortune to Europe. Our rule is thus a giant system of absenteeism. The salaries paid out of the taxes, and the fortunes saved therefrom, or made in private enterprise by merchants or planters, are never spent upon the soil where they are earned, but are transported to another country as fast as they are realised. Now as all the chief civil and military appointments throughout the country are held by Englishmen who have families or family connexions to be maintained in Europe, and whose customs and habits necessitate the expenditure of a large proportion of their incomes upon articles imported from Europe, we have here another very heavy drain upon the taxes of the country. There is thus not only the plain and palpable drain of the Home Charges to sustain, but a ceaseless, unseen stream of private remittances of savings and fortunes to aggravate its extent. The probability is that these remittances do not fall short at the present moment of five millions sterling a year. Of late years, moreover, sixteen millions sterling of the debt subscribed in India has been purchased from the native holders thereof by European capitalists, so that in addition to the two millions of dividends paid through the Home Charges another million of interest upon Indian securities, which was formerly spent annually within the country itself, is now spent in England.

Lastly, India, from the double misfortune of being at once a poor country, and a country governed by strangers, whose administration is not only very costly, but marked by the evils of *absenteeism*, has been unable to construct her railway system out of indigenous capital, but has had to borrow three-fourths of it (70,000,000*l.*) at five per cent. interest.

SUMMARIZED—1834-51.

1834, DISTINGUISHING PERMANENT AND FIXED CHARGES FROM THOSE VARYING IN AMOUNT—*(Continued.)*

1839-40.	1840-41.	1841-42.	1842-43.	1843-44.	1844-45.	1845-46.	1846-47.	1847-48.	1848-49.	1849-50	1850-51.
£	£	£	£	£	£	£	£	£	£	£	£
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
25,727	25,704	34,543	39,362	16,995	21,023	21,335	33,778	25,825	25,968	22,655	19,496
*62,700	3,498	.....	.....	500	.....	.....	.....	.....	.....	.....	.....
4,619	.....	.....	26,397	.....	.....	2,463	.....	14,928	6,097	14,581	.....
.....	.....	.....	.....	4,801	.....	.....	.....	.....	22,201	6,377	.....
170,702	99,581	113,877	118,212	86,465	81,266	107,397	113,295	133,095	121,131	114,421	105,166
4,702	1,831	269	.....	.....	.....	.....	.....	.....	.....	.....	.....
4,623	6,250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
597	442	1,188	206	196	.....	14	818	2,288	1,285	260	333
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,705	.....
146,184	143,140	143,713	140,373	141,139	128,906	125,648	121,087	115,403	109,755	106,411	104,181
.....	.....	.....	.....	.....	.....	.....	.....	16,755	15,612	15,388	14,690
19,166	11,678	10,733	9,540	8,928	9,863	7,125	6,473	5,046	7,445	5,795	3,533
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	20,000	20,000	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11,166	3,680	2,509	4,097	2,019	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	192	123	1,613	1,481	.....	.....	1,638	.....	.....
186,441	167,021	158,412	154,408	172,405	160,382	134,268	128,378	139,492	135,735	132,559	122,737
2,673,054	2,689,750	2,956,303	2,633,845	3,035,389	2,686,931	3,143,361	3,199,195	3,109,895	3,097,580	2,808,977	2,780,989

purchased in England for service on the Euphrates and Tigris Rivers and on the Indus, and partly available for service in the Bay of Bengal, the measures municated to the Court of Directors on the 16th September 1840

The result is that she has now to remit 3,500,000*l.* of produce every year to England as interest to her railway creditors. No one will suppose us to be complaining of this for a moment. We are simply explaining our economic position. We may see at a glance how greatly better our position would have been if we had capital enough to build our railways out of our own resources; and we should have had it but for the Home Charges. The general result of all this is—that whereas the total *annual drain* upon our resources thirty years ago was estimated at 5,000,000*l.* sterling a year,* it is now not less than three times that amount, or 16,000,000*l.* a year, thus :—

Home Charges	£6,500,000
Private remittances, &c	5,000,000
Interest upon debt in India held in Europe	1,000,000
Interest to railway creditors	3,500,000
	£16,000,000

That is to say, before India can now import an ounce of silver, or ton of iron, or yard of piece goods, or pound of copper—all vital necessities to her—she must ship, year by year, 16,000,000*l.* of her produce to England, to meet our present standing claim upon her. Until this annually recurring claim has been met, she cannot import a sixpenny worth of anything, let her necessities be what they may.

Now these necessities are very urgent. Partly by the superiority of English machinery, and partly by a calculated and selfish policy in the past, we have utterly destroyed the manufactures of India, which were once so famous. She who once supplied the world with the wonderful produce of her looms, is now dependent upon Europe for her own clothing. Our rule has effected a complete revolution—no doubt an unavoidable one—in her economic position. She has all but ceased to manufacture anything, and has become simply a grower of raw produce. But the more urgent does this make our case. Having no silver mines of our own, and yet with a silver currency (ever contracting under wear and tear, and loss, and hoarding, and conversion into ornaments), *it is vital to our well-being that we should be able to import silver largely every year*, to maintain our currency intact, and to increase it according to the needs of our growing commerce. But, vital as silver is to India's welfare, she must supply herself first with clothing (piece goods), and with the coarser metals, iron, &c. Look, then, at the full significance of the case. Before India can get an ounce of silver she must pay our annual claim of 16,000,000*l.* a year, and then provide her two hundred millions of people with clothing however scanty, and then with coarser metals to enable them to cultivate the fields at all. If, after these heavy drains upon her exports, there is yet a margin that she may invest in silver to replenish her wasting currency—happy is she!

Now it is the considerations we have just stated that make an examination of the Home Charges of so much importance. If we can show that any of those charges are unjust and ought not to be borne by India at all, we are *pro tanto* putting it in her power to import just so much silver.

* *Trevelyan's evidence before the Lord's Committee*, 1840.

HOME CHARGES—1851-57.

	1851-52.	1852-53.	1853-54.	1854-55.	1855-56.	1856-57.
PERMANENT AND FIXED CHARGES.	£	£	£	£	£	£
Dividends to Proprietors of East India Stock, 6,30,000*l.* per annum.	625,059	634,070	632,970	628,335	632,689	627,898
Payments under the Act 4 Geo. 4, c. 71, on account of Retiring, Pay, Pensions, &c. of the Royal Troops serving or having served in India, 60,000*l.* per annum, payable by quarterly instalments...	60,000	including an arrear 75,000	60,000	60,000	60,000	3 quarters 45,000
Her Majesty's Paymaster General for Claims accrued against the Company in respect of the Royal Troops serving in India, the advances on account of which are now fixed at 250,000*l.* annually payable in quarterly instalments; the balances necessarily varying in amount are subsequently adjusted.....	200,000	200,000	200,000	250,000	250,000	250,000
Her Majesty's Mission to the Court of Persia; portion of the charge borne by the Company, 12,000*l.* per annum, payable by quarterly instalments	12,000	12,000	12,000	12,000	12,000	12,000
Donation to the Bengal Civil Fund payable annually	2,500	2,500	2,500	2,500	2,500	2,500
Salaries of the Court of Directors, now fixed at 10,000*l.* per annum Act 16, & 17 Vict. c. 95 s. 24	7,530	7,600	7,569	10,000	10,000	9,969
£	907,089	931,170	915,039	962,835	967,189	947,362
PERMANENT CHARGES, BUT VARYING IN AMOUNT.						
Interest on the Home Bond Debt	121,022	117,509	112,012	153,518	152,017	155,494
Military and other Public Stores exported, and to be exported.....	269,710	374,909	442,947	430,484	684,779	941,753
Purchase and equipment of steam vessels, and various expenses connected with the steam communication with India..	71,451	53,424	60,611	86,191	79,939	61,889
Transport of Troops and Stores	20,445	31,822	80,904	89,747	74,367	51,838
Furlough and Retired Pay to Military and Marine Officers of the Indian Establishments, including off-reckonings	658,253	665,783	683,112	732,093	832,486	819,873
Civil Establishments of India, Absentee Allowances and passage money, under Regulations	27,567	26,121	27,440	32,944	53,877	61,237
Her Majesty's Establishments in China, portion paid by the Company of the actual charge in each year	.....	15,557	9,056	.....	20,682	.....
Board of Commissioners for the Affairs of India, comprising salaries of the President and Officers of the Board, and Superannuation Allowances granted by Warrant of the Crown under Act 53 Geo. 3, c. 55, s. 91	28,386	29,141	29,421	29,177	29,580	28,977
Recruiting Charges: Pay of Officers and Non-commissioned Officers of Recruiting Establishments, and of recruits previous to embarkation, bounty, clothing, arms, accoutrements, &c	32,172	38,366	48,292	81,641	67,307	65,420
Salaries and allowances of the Secretaries and Officers of the Court of Directors, deducting amount applied from the Fee Fund in part payment thereof.....	94,413	94,930	94,387	92,594	95,043	95,555
Annuitants and pensioners, exclusive of Compensation Annuities under Act 3 & 4 Will. 4. c. 85	98,743	96,095	95,122	95,118	94,378	103,078
Lord Clive's Fund: net payment for pensions, &c., ...	70,290	86,149	78,555	81,018	77,607	81,535
Donations under deed to Widows' Funds for the Home Service...	1,738	1,738	1,738	1,738	1,738	1,738
Paymaster General of the Forces, for claims accrued against the Company in respect of the Royal Troops serving in India, in excess of the annual advances stated under the head of "Permanent and Fixed Charges"	.....	3,797	453,693	.....	.....	.....
Her Majesty's Government: Payments under the new Postal Arrangements with the Lords of Her Majesty's Treasury	.....	.....	.....	.....	55,378	49,887
£	1,494,190	1,635,341	2,217,290	1,906,263	2,319,178	2,518,274
MISCELLANEOUS AND CONTINGENT CHARGES, VARYING IN AMOUNT.						
Contingent Expenses of the Courts of Directors and Proprietors, consisting of repairs to the East India House, Taxes, Rates, Tithes, Coals, Candles, Printing, Stationery, House Dinners, Entertainments, Books, Maps, Charts, Bookbinding, Stamps on Bills of Exchange and other instruments, and various petty charges...	26,775	30,573	32,062	33,680	26,837	27,819
Postage of the Company's Despatches to and from India	.....	.....	.....	4,234	8,874	4,139
Charges of the Store Department: articles for use in Inspection of Stores and Miscellaneous.....	5,089	5,874	5,999	6,262	7,036	9,361
Law Charges	5,472	4,111	10,468	12,990	16,560	19,517
Military College at Addiscombe: net charge after deducting receipts from Cadets	4,779	8,786	5,904	9,228	8,507	7,104
Maintenance of Lunatics	6,311	6,563	6,351	6,440	6,337	6,759
Cultivation and Manufacture of Cotton, &c., in India (expenses incurred in view to the improvement of)	874	.....	250	9	10	247
Expense of Overland and Ships Packets, Maintenance of Natives of India, Donations to Soldiers, Seamen, and others for Services and Relief, Absentee Allowances granted to Professors at Colleges, Law Officers, Master Attendant, &c., in India, and various Miscellaneous Expenses, deducting Miscellaneous Receipts	4,458	4,218	7,339	12,107	10,592	20,199
Expenses on account of Convicts transported from India to Van Diemen's Land, paid to Her Majesty's Paymaster General.....	.....	5,401	4,606	.....	9,483	2,824
Passage and Outfit: of Governors, Church Dignitaries, Commanders-in-Chief, Judges, Officers in Her Majesty's and Company's Services proceeding to join their Regiments, Veterinary Surgeons, Chaplains, Aides-de-Camp, Volunteers for the Pilot Service, &c.	14,564	15,679	26,183	20,248	25,325	27,980
Value of Arms and Accoutrements taken to India by Her Majesty's Troops.....	.....	.. ...	.....	6,240	10,387	2,725
Cost of War Medals for Troops	.....	.....	.....	6,527	4,500	4,797
£	68,322	81,205	99,112	117,966	134,448	132,291

HOME CHARGES 1851-57.—(*Continued*).

	1852-53.	1853-54	1854-55	1855-56	1856-57	1857-58
TEMPORARY CHARGES, AND CHARGES WHICH HAVE NOW CEASED :	£	£	£	£	£	£
Compensation Annuities under Act 3 & 4 Will. 4, c. 85	101,688	97,930	95,692	91,565	87,259	83,326
Annuities of the Madras Civil Fund of 1818, borne by the Company	13,725	13,901	11,400	10,800	10,062	8,886
Retired Pay and Pensions of persons formerly belonging to the St. Helena Establishment, not chargeable to the Crown	5,033	5,880	4,568	4,525	3,125	4,642
Haileybury College, net charge, after deducting receipts from Students	11,990	12,573	9,613	14,841	10,803	14,570
Proportion agreed to be borne by the Company of the Amount payable under contract between Her Majesty's Government and the Peninsular and Oriental Steam Navigation Company, for an extended communication with India and China	70,000	70,000	70,000	35,000	14,384	.....
Expenses attending the Exhibitions of the Industry of all Nations, deducting proceeds of articles sold	3,885	Excess receipts 7,903	968	1,143	3,700	Excess receipts 3,476
In lieu of an Annuity of 1,000*l.* per annum, assigned by the Company on 23rd July 1851, to the daughter of General Ventura, in commutation of the proceeds of 3 Jaghires granted to her by Maharajah Runjeet Sing	.....	24,000	.....	.....	.....	.....
Indian Law Commission Act, 16 & 17 Vict. c. 95, s. 28	....	.....	1,425	4,450	6,325	618
Rungo Bapojee, Vakeel to the ex-Rajah of Sattara, for payment of his debts and expense of his return to India	.. ..	... ..	2,869	.....	.....	.....
Miscellaneous payments on account of the late Commercial Department	264	.....	.....	.....	.....	.....
Burmah Donation Batta	... ..	.....	... ..	8,746	336	6,638
Grant to Prince Gholam Mahomed, as a mark of the Court's approbation, and to enable him to return to India in a manner suitable to his rank	.....	.. ...	.....	.....	3,000	.....
Meer Jaffoer Ali Khan, the proportion paid in England of the sum of 20,000*l.* which the Court consented to pay in "Free Gift," in consideration of the expenses incurred by his residence in England, and with a view to assist in making a further provision for his daughters	.....	.....	.....	.....	.....	5,000
£	206,585	216,381	196,535	171,070	138,994	120,204
Total Amount of Charges at Home £	2,676,186	2,864,097	3,427,976	3,158,133	3,559,809	3,719,131

HOME CHARGES—1834-57

EXTRAORDINARY CHARGES INCURRED IN EACH YEAR, UNDER THE SEVERAL HEADS OF SUBSCRIPTION, PRESENTS, GRATUITIES, HOUSE DINNERS, ENTERTAINMENTS AND MISCELLANEOUS.

	Subscriptions to Charities, Societies, Hospitals, and Schools.	Presents and Gratuities.		House Dinners and Refreshments, including Entertainments to Governors General, Governors, Commanders-in-Chief, and other Functionaries, and Persons of Distinction connected with India.	Miscellaneous :—Compensation Charges incurred in view to the improvement of Cotton Cultivation; Expenses on Account of the experimental Navigation of the Euphrates, Expenses incurred on account of Electric Telegraphs for India; Expenses relating to the Trigonometrical Survey of India; Books, Maps and Charts relating to India Remuneration to Officers for Expenses incurred and Losses sustained on Service in England and abroad, Expenses on account of the Paris Exhibition Examination of candidates for the Civil and Medical Services Money issued by Order of the Secret Committee; Papers printed by Order of the Court of Proprietors; and various other extraordinary and Miscellaneous Charges.
		To Servants of the Civil, Military, and Marine, &c Establishments of India, and to their Families, also to Servants of the Home Establishment, including Donations for Relief granted to Soldiers and Seamen.	Special Grants and other Presents and Gratuities		
	£	£	£	£	£
1834-35	668	3,239	...	3,606	5,657
1835-36	619	1,775	1,905	2,149	2,523
1836-37	1,041	2,667	...	2,640	3,602
1837-38	865	2,884	20,735 (*a*)	2,067	12,724
1838-39	1,006	2,378	5,697 (*b*)	2,728	4,600
1839-40	1,413	2,183	1,650	2,907	9,103
1840-41	1,027	2,212	2,165	3,514	19,530
1841-42	1,171	1,078	200	2,808	8,405
1842-43	1,043	884	755	3,042	5,310
1843-44	1,209	1,993	612	3,076	10,216
1844-45	1,207	2,390	3,000 (*c*)	3,082	4,046
1845-46	1,138	2,113	5,017 (*d*)	3,008	10,308
1846-47	2,271	1,351	215	3,129	8,995
1847-48	1,071	1,174	4,075	4,760	7,620
1848-49	1,014	953	1,650	3,448	5,065
1849-50	1,959	1,330	50	3,475	7,912
1850-51	1,008	1,497	344	4,039	5,298
1851-52	1,183	492	150	3,424	7,711
1852-53	1,420	1,548	150	3,380	7,436
1853-54	1,110	1,457	4,989 (*e*)	3,960	11,700
1854-55	1,440	1,324	2,520	3,672	10,060
1855-56	1,065	1,378	4,400 (*f*)	3,462	11,567
1856-57	1,580	1,390	8,560 (*g*)	2,952	17,330

(*a*) Includes 20,000*l.* Grant to the Marquis Wellesley.
(*b*) Includes 5,000*l.* Grant to the Family of the late Mr. W. Fraser (Commissioner at Delhi, and Agent to the Governor General,) who was assassinated at Delhi on the 22nd March 1835.
(*c*) and (*d*) Includes 7,111*l.* Testimonial presented to Mehemet Ali, Pacha of Egypt.
(*e*) Includes 2,869*l.* Grant to Rungo Bapojee, Vakeel to the late ex-Rajah of Sattara.
(*f*) Includes 3,000*l.* Grant to Prince Gholam Mahomed.
(*g*) Includes 5,000*l.* Free Gift to Meer Jaffur Alee Khan.

HOME CHARGES—1869-70.

	Original Estimate.	Real Amount.	Increase.	Decrease.
	£	£	£	£
PART I.—*Debt Discharged.*				
East India Bonds paid off	1,200	1,300	100	...
Loan on Security of East India Bond repaid	500,000	500,000	...	...
	501,200	501,300		
Remittance account between England and India.				
Advances on account of the several Civil and other Provident Funds ...	618,000	186,332	...	431,668
Indian Civil Service Annuity Funds : Annuities payable in England ..	240,000	209,411	...	30,589
Her Majesty's Postmaster General, on account of postage collected in India.	38,000	44,407	6,407	...
Family Remittances, Remittances by Administrators General, &c.	517,000	671,239	154,239	...
Prize Money	108,000	13,032	...	94,968
Compensation awarded to Officers by Bonus Committees...	...	3,478	3,478	...
	1,521,000	1,127,899		
Abyssinian Expedition.				
Disbursements in England on account of the above Expedition		46,442	46,442	...
Expenses of Witnesses attending the Parliamentary Committee on the above Expedition		301	301	...
	...	46,743		
PART II.—*Charges connected with the Collection of the Revenue, and direct claims thereon.*				
STAMPS : Stores for India	23,925	12,562	...	11,363
MINT : Stores for India	12,084	13,015	931	...
POST OFFICE :				
Amount payable under the Postal Arrangement with the Lords of Her Majesty's Treasury	55,000	29,300	...	25,700
Subsidy to the Euphrates and Tigris Steam Navigation Company on account of the Mail Service between Bussorah and Bagdad... ...	4,800	4,800	...	...
Stores for India	5,154	4,449	...	705
TELEGRAPH :—Indo-European Telegraph	8,000	73,161	65,161	...
Telegraph Lines in India : Stores for India...	108,184	5,038	...	103,146
ALLOWANCES AND ASSIGNMENTS UNDER TREATIES AND ENGAGEMENTS :				
His Highness Maharajah Duleep Sing	19,336	19,336	...	...
	236,483	161,661		
Charges on the Revenue of India.				
ADMINISTRATION AND PUBLIC DEPARTMENTS : Home Establishments, &c. ...	191,000	202,179	11,179	...
MARINE CHARGES :				
Pensions and Retired Allowances. . ..	50,000	52,240	2,240	...
Furlough and Absentee Allowances	2,000	2,753	753	...
Commutation of Pensions of Officers of the late Indian Navy... ..	...	5,925	5,925	...
On account of Contracts for construction of two Ironclad Monitors for Bombay	180,000	136,691	...	43,309
Contribution towards the Expenses of Her Majesty's Ships employed in the Indian Seas	...	51,521	51,521	...
Stores for India	177,837	109,980	...	67,857
STATIONERY AND PRINTING :—Stores for India	49,348	113,627	64,279	...
Other Payments	4,200	8,214	4,014	...
POLITICAL AGENCIES AND OTHER FOREIGN SERVICES: ..				
Mission to the Court of Persia	12,000	21,000	9,000	...
Her Majesty's Establishments in China	23,000	...	..	23,000
MISCELLANEOUS :—Civil Stores for India	7,420	40,555	33,135	...
Other Payments	108,027	121,286	13,259	..
SUPERANNUATION, RETIRED AND COMPASSIONATE ALLOWANCES	234,000	739,763	505,763	...
CIVIL FURLOUGH AND ABSENTEE ALLOWANCES...	99,000	157,918	58,918	...
ARMY :—*Effective* :				
The Imperial Government, for Troops serving in India (including Clothing for Depôts of British Regiments serving in India)	720,000	725,232	5,232	...
Furlough Allowances	738,000	402,885	164,885	...
Passage of Officers and Troops	74,000	63,465	...	20,535
India Overland Troop Transport Service	230,900	224,740	...	6,170
Purchase of Horses	3,000	3,265	265	...
Miscellaneous	32,000	23,024	...	8,976
Stores for India...	820,161	878,491	58,330	...
Non-Effective :				
The Imperial Government, on account of Retired Pay, &c., of Troops serving or having served in India (Act 25 & 26 Vict., cap. 27) ...	217,000	217,000	...	...
Retired Pay, including Colonels' Allowances	744,000	759,867	15,867	...
Lord Clive's Fund—Pensions	123,108	204,389	81,281	...
Lord Clive's Fund—Payments to Representatives of Lord Clive ..	1,892	1,892	...	...
Gratuities, equal to the value of their Commissions, granted to Officers of the late Indian Regiments on their retirement from the service .		6,750	6,750	...
PUBLIC WORKS ORDINARY :—Stores for India	162,160	236,399	74,239	...
Other Payments	8,000	619	...	7,381
INTEREST ON DEBT :—Interest on Loans contracted in England	1,469,250	1,516,378	47,128	...
Dividends on the Indian Transfer Loan	63,000	62,658	...	342
DIVIDENDS TO PROPRIETORS OF EAST INDIA STOCK	629,970	629,970	...	...
	6,674,273	7,710,668		
GUARANTEED INTEREST ON THE CAPITAL OF RAILWAY AND OTHER COMPANIES.	4,140,000	4,138,150	...	1,850
PUBLIC WORKS EXTRAORDINARY :				
E. I. Irrigation and Canal Co., for surrender of the Orissa Undertaking	1,055,000	1,043,698	...	11,302
Punjab Northern (State) Railway	257,000	77,068	...	179,932
Soane Canal Works	...	48,711	48,711	...
Survey for Railway from Carwar	...	1,645	1,645	...
Calcutta and South-Eastern Railway Company	...	500	500	...
	1,312,000	1,171,62[illegible]		
Total...	£14,884,956	14,858,041		

HOME CHARGES—1870-71.

	Estimate of January 1870.	Estimate of December 1870.	Increase.	Decrease.
	£	£	£	£
PART I.—*Remittance Account between England and India.*				
Advances on account of the several Civil and other Provident Funds.	664,000	140,275	...	523,725
Indian Civil Service Annuity Funds: Annuities payable in England ...	201,000	195,060	...	6,006
Her Majesty's Postmaster General, on account of postage collected in India	44,000	44,000	...	...
Family Remittances, Remittances by Administrators General, &c.	572,000	656,000	84,000	...
Stores chargeable to Local, Port, and Foreign Funds, &c.	...	46,940	46,940	..
Prize Money	12,000	3,600	...	8,400
	1,493,000	1,085,815		
Abyssinian Expedition.				
Disbursements in England on account of the above Expedition	...	129	129	...
Expenses of Witnesses attending the Parliamentary Committee on the above Expedition	...	630	630	..
		759		
PART II.—*Charges connected with the Collection of the Revenue, and direct claims thereon.*				
STAMPS: Stores for India...	20,351	25,463	5,112	...
MINT: Stores for India	9,409	9,409	...	...
POST OFFICE:				
Amount payable under the Postal Arrangement with the Lords of Her Majesty's Treasury	55,000	132,000	77,000	...
Subsidy to the Euphrates and Tigris Steam Navigation Company on account of the Mail Service between Bussorah and Bagdad	4,800	4,800	...	..
Stores for India	4,897	4,897	...	...
TELEGRAPH:—Indo-European Telegraph	31,300	51,000	19,700	...
Telegraph Lines in India: Stores for India	183,600	111,500	...	72,100
ALLOWANCES AND ASSIGNMENTS UNDER TREATIES AND ENGAGEMENTS:				
His Highness Maharajah Duleep Sing	19,336	19,336	...	...
	328,693	358,405		
Charges on the Revenue of India.				
ADMINISTRATION AND PUBLIC DEPARTMENTS: Home Establishments, &c....	202,400	207,400	5,000	...
MARINE CHARGES:—Pensions and Retired Allowances	51,000	51,000	...	...
Furlough and Absentee Allowances	3,000	2,500	...	500
Commutation of Pensions of Officers of the late Indian Navy	...	2,406	2,406	...
On account of Contracts for construction of two Ironclad Monitors for Bombay	66,000	84,000	18,000	..
Contribution towards the Expenses of Her Majesty's Ships employed in the India Seas	70,000	70,000	..	...
Stores for India	117,924	101,814	...	16,110
STATIONERY AND PRINTING:—Stores for India	75,625	75,625	...	...
Other Payments	8,000	8,000	..	...
POLITICAL AGENCIES AND OTHER FOREIGN SERVICES:				
Mission to the Court of Persia	12,000	12,000	..	...
Her Majesty's Establishments in China	23,000	45,000	22,000	...
Special Mission of Major General Goldsmid, C.B., to Persia	...	3,000	3,000	..
MISCELLANEOUS:—Civil Stores for India	20,125	25,127	5,002	..
Other Payments	123,027	207,000	83,973	..
SUPERANNUATION, RETIRED AND COMPASSIONATE ALLOWANCES	236,000	780,000	544,000	...
CIVIL FURLOUGH AND ABSENTEE ALLOWANCES	165,000	165,000	..	...
ARMY:—*Effective.*				
Home Charges of Her Majesty's Regiments serving in India	660,000	660,000	..	...
Furlough Allowances of Officers of the Indian Service	384,000	458,000	74,000	...
Passage of Officers and Troops	77,000	90,000	13,000	...
India Overland Troop Transport Service	220,000	272,000	52,000	...
Purchase of Horses	800	800	...	...
Miscellaneous	29,000	25,000	..	4,000
Stores for India	785,041	981,319	196,278	...
Non-Effective:				
The Imperial Government on account of Retired Pay, &c., of Troops serving or having served in India	213,500	213,500		...
Retired Pay of Officers of the Indian Service, including Colonels' Allowances	750,000	754,000	4,000	...
Lord Clive's Fund—Pensions	128,156	129,000	844	...
Lord Clive's Fund—Payments to representatives of Lord Clive ...	1,844	1,844	...	..
Charge to India for cost of absorption of Supernumerary Ensigncies in British Regiments	...	47,400	47,400	...
Gratuities, equal to the value of their Commissions, granted to Officers of the late Indian Regiments on their retirement from the Service ...	6,000	16,600	10,600	...
PUBLIC WORKS ORDINARY:—Stores for India..	294,400	139,200	...	155,200
Other Payments	650	650	...	...
INTEREST ON DEBT:—Interest on Loans contracted in England	1,613,868	1,659,868	46,000	...
Dividends on the Indian Transfer Loan	63,000	59,686	...	3,314
DIVIDENDS TO PROPRIETORS OF EAST INDIA STOCK	629,970	629,970	..	...
	7,030,330	7,978,709		
GUARANTEED INTEREST ON THE CAPITAL OF RAILWAY AND OTHER COMPANIES.	4,363,000	4,370,000	7,000	...
PUBLIC WORKS EXTRAORDINARY:				
Punjab Northern (State) Railway	264,000	62,500	...	201,500
Soane Canal Works	...	1,268	1,268	...
Calcutta and South-Eastern Railway Company.—Expenses incurred by the Liquidators...	...	517	517	...
Calcutta and South-Eastern Railway Debentures, falling due 1st January 1871	10,550	10,550	...	...
	274,550	74,835		
Total ... £	13,489,573	13,868,523		

ESTIMATED HOME CHARGES—1871-72.

	1870-71. Estimate of January 1870.	1871-72. Estimate of December 1870.
PART I.—*Debt Discharged.*	£	£
India 5 per cent. Debentures, due 16th August 1871	.....	5,000
REMITTANCE ACCOUNT BETWEEN ENGLAND AND INDIA.		
Advances on account of the several Civil and other Provident Funds	664,000	120,000
Indian Civil Service Annuity Funds : Annuities payable in England	201,000	192,000
Her Majesty's Postmaster General, on account of postage collected in India	44,000	45,000
Family Remittances, Remittances by Administrators General, &c.	584,000	640,000
Stores for Hyderabad B[illegible]ay	.....	123,850
Stores chargeable to P[illegible]rust Funds, Bombay ; and against income derived from Roorkee Workshops	.....	45,000
PART II.—*Charges connected with the Collection of the revenue, and Direct claims thereon.*	1,493,000	1,165,350
STAMPS : Stores for India	20,351	19,640
MINT : Stores for India	9,409	12,360
POST OFFICE :—Amount payable under the Postal Arrangement with the Lords of Her Majesty's Treasury	55,000	100,000
Subsidy to the Euphrates and Tigris Steam Navigation Company on account of the Mail Service between Bussorah and Bagdad	4,800	4,800
Stores for India	4,897	3,680
TELEGRAPH .—Indo-European Telegraph	31,300	38,000
Telegraph Lines in India · Stores for India	183,600	126,000
ALLOWANCES AND ASSIGNMENTS UNDER TREATIES AND ENGAGEMENTS —		
His Highness Maharajah Duleep Sing	19,336	19,336
	328,693	323,816
Charges on the Revenue of India.		
ADMINISTRATION AND PUBLIC DEPARTMENTS : Home Establishments, &c.	202,400	207,400
MARINE CHARGES :		
Pensions and Retired Allowances	51,000	50,000
Furlough and Absentee Allowances	3,000	2,500
On account of Contracts for construction of two Iron-clad Monitors for Bombay	66,000	.....
Contribution towards the expenses of Her Majesty's Ships employed in the Indian Seas	70,000	70,000
Stores for India	117,924	168,190
STATIONERY AND PRINTING —Stores for India	75,625	86,670
Other Payments	8,000	8,000
POLITICAL AGENCIES AND OTHER FOREIGN SERVICES :		
Mission to the Court of Persia	12,000	12,000
Her Majesty's Establishments in China	23,000	23,000
Special Mission of Major-General Goldsmid, C. B., to Persia	.....	2,000
MISCELLANEOUS :—Civil Stores for India	20,125	21,290
Other Payments	123,027	140,000
SUPERANNUATION, RETIRED AND COMPASSIONATE ALLOWANCES	236,000	797,000
CIVIL, FURLOUGH, AND ABSENTEE ALLOWANCES	165,000	165,000
ARMY—*Effective* :		
Home Charges of Her Majesty's Regiments serving in India	660,000	698,000
Furlough Allowances of Officers of the Indian Service	384,000	450,000
Passage of Officers and Troops	77,000	93,500
India Overland Troop Transport Service	220,000	320,000
Purchase of Horses	800	.....
Miscellaneous	29,000	19,000
Stores for India	785,041	824,720
Non-Effective :		
The Imperial Government on account of Retired Pay, &c., of Troops serving or having served in India.	213,500	224,000
Retired Pay of Officers of the Indian Service, including Colonels' Allowances	750,000	750,000
Lord Clive's Fund—Pensions, &c.	130,000	129,800
Charge to India for cost of absorption of Supernumerary Ensigncies in British Regiments	.....	48,000
Gratuities, equal to the value of their Commissions, granted to Officers of the late Indian Regiments on their retirement from the Service	6,000	17,000
PUBLIC WORKS ORDINARY :—Stores for India	294,400	72,980
Other Payments	650	550
INTEREST ON DEBT :—Interest on Loans contracted in England	1,613,868	1,739,743
Dividends on the Indian Transfer Loan	63,000	60,000
DIVIDENDS TO PROPRIETORS OF EAST INDIA STOCK	629,970	629,970
	7,030,330	7,830,313
GUARANTEED INTEREST ON THE CAPITAL OF RAILWAY AND OTHER COMPANIES	4,363,000	4,600,000
PUBLIC WORKS EXTRAORDINARY :		
Punjab Northern (State) Railway	264,000	157,500
State Railway in the North-Western Provinces	.....	232,000
Calcutta and South-Eastern Railway Debentures falling due 1st January 1871	10,650	.....
	274,650	389,500
Total	£12,439,573	14,313,979

THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

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MUNICIPAL FINANCE.—CALCUTTA.—*Continued.*

INCOME AND EXPENDITURE OF THE YEAR 1869.

The following statement exhibits the total amount of revenue available for Municipal purposes in Calcutta in 1869, and the aggregate expenditure during the same period. The unappropriated balance at the end of the year 1869 amounted to Rs. 1,70,276-12-4, and in addition to this there was at the close of that year, a further sum of Rs. 3,67,694-15-3 refunded in the water-supply account.

RECEIPTS.

	Rs.	A.	P.	Rs.	A.	P.
Ordinary.						
House-rate	9,53,247	10	9			
Lighting-rate	1,94,821	15	6			
Police-rate	2,92,238	9	6			
Fees for licenses on professions and trades	2,43,190	7	3			
Fees for licenses for carriages and horses	1,03,762	0	0			
Fees for registration of carts and hackeries	47,270	12	0			
Miscellaneous	1,60,024	7	8			
				10,94,545	14	3
Extraordinary.						
Sale proceeds of surplus lands	9,846	14	9			
Sale proceeds of Government paper	2,877	0	5			
Received for house drainage	51,983	2	11			
Received for 2 lakhs of rupees of Municipal debenture	2,10,000	0	0			
				2,74,707	2	1
Add cash balance on 31st December 1868				1,70,276	12	4
Add refund from water-supply				3,67,694	15	3
Grand Total				18,07,224	11	11

EXPENDITURE.

Interest of loans	2,55,325	0	0
Cost of general establishment and contingencies	2,89,580	0	0
Expenses of the Conservancy Department	1,97,539	0	0
Expenses of the Drainage Department	3,73,556	0	0
Expenses of the Road Department	3,71,675	0	0
Road materials in stock	1,06,354	0	0
Charges on account of water-supply and street watering	93,074	0	0
Charges on account of purchase of water-cart and aqueduct repairs	9,102	0	0
Charges on account of lighting, including lamps and posts	2,39,923	0	0
Police charges	2,67,893	0	0
Charges on account of city improvements	83,390	0	0
Construction of public necessaries	70,508	0	0
Charges on account of Pauper and Lock Hospitals	58,636	0	0
Charges on account of the Town Hall and cremation of dead paupers	14,284	0	0
Working Municipal railway	35,764	9	0
Fire engines	6,883	0	0
Drainage material in stock	44,508	0	0
Private house drainage	24,246	0	0
Total	25,22,130	0	0

The number of licenses taken out during the year for the different trades and professions followed in Calcutta is shewn in the annexed return :—

Joint stock companies	76
Merchants, agents, bankers, and wholesale traders	1,362
Practising barristers, attornies, pleaders, and law agents	133
Medical-practitioners, licentiates of medicine, and apothecaries	109
Owners of markets and bazaars	25
Hotel and boarding-house-keepers	45
Owners of cargo boats	85
Shop-keepers paying rent more than Rs. 25 and less than Rs. 100	1,516
Shops for intoxicating drinks and drugs	136
Brokers and petty dulolls	532
Shop-keepers in brick-rooms, and permanent stall-keepers	5,336
Native doctors and kobeerajes	35
Shop-keepers in tiled huts	6,345
Miscellaneous pedlars	2,000
Itinerant vendors of food and drink	9,367

The number of carriages and horses for which licenses were taken out is also noted below :—

Carriages drawn by 2 horses	503
Ditto ditto 1 horse	2,201
Buggies	272
Horses	3,513
Ponies	1,748

WATER-SUPPLY WORKS.

At the close of 1869 the water-works were so far advanced to completion, as to admit of a regular supply of water to the town, and this supply has been maintained up to the present time. The value of the work done by the contractors up to the end of November, amounted to Rs. 21,16,289, which will bring the total expenditure on all sanctioned works under this head, when complete, to Rs. 53,53,960.

MUNICIPAL FINANCE.—BENGAL.

RECEIPTS AND EXPENDITURE OF THE MOFUSSIL MUNICIPALITIES OF BENGAL.

The table below shows the income and expenditure of the Bengal Municipalities under various heads during 1869-70.

Table showing the Receipts and Expenditure of the Mofussil Municipalities during the year 1869-70.

Towns.	Balance of previous year's account.	Income during the year.	Expenditure during the year on account of police.	Amount expended for establishments, conservancy, roads, general improvements, &c.	Balance of account in hand at close of the year.
Presidency Division.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Suburbs of Calcutta	20,519 13 10	3,61,241 14 2	93,503 6 0	2,16,676 15 11	71,581 6 1
Kishnagur	6,185 5 10	22,473 15 7	5,748 1 2	9,497 13 1	13,413 7 2
Santipore	6,284 7 0	14,391 4 11	6,364 14 3	9,806 5 6	4,502 8 2
Jessore	7,105 8 7	13,480 8 8	3,615 0 11	10,986 9 1	5,984 9 3
Ranaghat	1,867 9 8	6,782 1 6	2,752 4 3	4,311 12 0	1,585 10 11
Burdwan Division.					
Serampore	5,531 0 6	37,413 13 4½	9,438 7 1	31,609 15 3	1,896 7 6½
Midnapore	5,101 0 2	12,365 5 0	5,128 0 2	7,339 9 0	4,498 12 0
Hooghly	17,197 5 11	32,790 1 5	11,437 15 8	26,517 9 11	12,031 13 9
Ooterparah	452 13 11	3,783 11 10½	984 6 0½	2,812 11 8½	439 8 0½
Burdwan	7,561 9 7	48,982 12 9	12,560 9 10	38,407 4 10	5,576 7 8
Bhagulpore Division.					
Bhagulpore	8,952 6 2	29 527 2 0	8,576 7 7	22,418 14 3	7,304 2 4
Monghyr	8,302 12 4	85,109 1 2	9,350 0 10	24,485 3 7	9,576 9 1
Purneah ... ... :.	2,627 8 6	21,745 3 6	6,556 0 0	15,731 7 9	2,085 4 3
Patna Division.					
Patna City	7,960 0 0	1,25,815 5 5	23,667 3 1	50,042 5 11	60,065 12 5
Gya	9,743 7 11	25,659 8 2	15,266 11 3	8,546 2 6	11,590 2 4
Tirhoot (Mozufferpore)	19,583 14 8	21,485 12 6	6,387 0 0	27,339 0 7	7,343 10 7
Chupra	5,552 4 1	25,688 5 5	7,956 3 8	23,021 0 2	263 5 8
Arrah	4,094 4 9	12,669 8 9	5,406 15 0	9,497 5 4	1,859 9 2
Durbhanga	88 4 7	14,398 0 9	10,007 12 0	4,299 14 9	178 10 7
Dacca Division.					
Dacca...	666 9 10	48,854 4 6	16,347 15 0	32,357 6 3	216 9 1
Chittagong Division.					
Chittagong	8,242 15 8	17,659 3 4	6,605 1 8	14,288 9 8	5,008 7 8
Commillah	791 8 10	8,638 15 2	2,370 4 9	6,820 6 0	239 13 3
Assam Division.					
Gowhatty	6,624 9 9	21,622 6 5	2,749 12 11	24,512 12 2	984 7 1

MUNICIPALITY OF DACCA.

From D. R. Lyall, Esq., Chairman of the Municipal Commissioners of Dacca, to the Commissioner of the Dacca Division,—(No. 27, *dated Dacca, the* 20*th May* 1870.)

Sir,—I have the honour herewith to submit an Administration Report and a statement of actual receipts and expenditure of the Dacca Municipality for the year 1869 70, with reference to your No. 117 of 14th instant.

The income of this Municipality is derived from the following sources hereafter reported on in detail :—

Ferries.

House tax.—The total collections under this head for the year 1869 70 amount to Rs. 36,132. This sum is considerably less than the collections of the previous year, and the shortcoming may be accounted for in that : the current year's dakhillahs were withheld from tahsildars, in a measure, in order that they might bring up arrears of previous years. Arrears have now been brought within closer limits, and the collections for 1870-71 will proceed without interruption.

The items of expenditure are as follows :—

(1*st.*) *Cost of collection.*—Under this head a sum of Rs. 4,477 has been expended, and the cost is less than was estimated. The present staff of tax collectors is efficient, and their collections are paid into the bank account bi-weekly.

(2*nd.*) *General charges.*—A charge of Rs. 5,415 has been incurred under this head, and this sum somewhat exceeds the estimate, partly owing to a heavy item of Rs. 246, incurred in law expenses, a portion of which is however recovered and credited to petty receipts account. This item includes the pay of the office establishment. The duties of the office have been carried out with diligence, and the accounts and registers have all been properly kept.

(3*rd.*) *Roads.*—A sum of Rs. 5,147 has been expended on this account during 1869-70, and this amount is within the estimate. The roads have been well kept, and the staff of coolies maintained under this charge is found very necessary, not for the roads only, but to keep clear the many kutcha drains throughout the city.

(4*th.*) *Watering.*—This item of expenditure has been debited with Rs. 1,316 for the year 1869-70, which is the actual cost of water-cart, coolies, and bheesties employed. A sum of Rs. 2,848 had been estimated for ; but it was found that proposed reservoirs, &c., included therein, could not be constructed for want of funds.

(5*th.*) *Police.*—Proportion of pay due by the Municipality for maintenance of police force was estimated for according to revised budget returned by the District Superintendent of Police, Dacca ; the old charge however was maintained throughout the year amounting to Rs. 16,347 for the twelve months, against Rs. 15,709 estimated.

(6*th.*) *Local improvements.*—It is a matter of regret that the past year is not marked by any progress under this head, but the funds falling short of the estimate, no opportunity was afforded for carrying out the projected works. A sum of Rs. 162 only has been expended in the renovation of an old public privy taken over from a mether, and in the filling up of one or two unwholesome hollows.

From this report it would appear that there are not funds to meet the interest of the proposed loan, but the decrease is merely nominal, and by the efforts made this year to collect old-standing balances, the funds are put in a more healthy state, and the collection in future will be easier.

STATEMENT OF THE ACTUAL RECEIPTS AND EXPENDITURE OF THE DACCA MUNICIPALITY FOR THE YEAR 1869-70.

Receipts.

	Rs.	a.	p.
Balance of last year	669	9	10
Amount collected on account of the rate of 7½ per cent, upon the annual value of houses, buildings, and lands	36,132	14	9
Amount collected on account of tax on carriages, horses, and elephants	2,585	8	0
Amount collected on account of fines, &c., under Act III. of 1864	492	6	9
Amount collected on account of rent of Committeegunj bazaar	1,263	5	0
Amount collected on account of Company's garden	161	0	0
Amount collected on account of rent of the upper story of the Municipal Office	543	0	0
Amount collected on account of license fees	397	2	6
Amount collected on account of miscellaneous receipts	631	2	3
Amount collected on account of fees	27	5	0
Amount collected on account of ferries	4,178	5	6
Amount collected on account of pounds	1,300	2	9
Total ..	48,921	14	4

Expenditure.

	Rs.	a.	p.
Charges incurred in the collection of tax on carriages and horses, &c., and of the rate at 7½ per cent. upon the annual value of houses, buildings, and lands	4,477	3	8
Conservancy charges	7,068	3	6
Amount paid for the maintenance of the city police	16,347	15	0
Amount paid for repair of Committee's tiled huts	116	11	9
Amount paid for filling up tanks and hollows	107	2	0
Amount paid for repair of the privy at Beygum bazaar, including its dry-earth shed	55	12	3
Amount paid for repair of Bungram road with good rubbish	209	14	6
Amount expended for new metalling the following roads :—No. II. Road leading from Saint Thomas's Church to the Pogose School	986	2	6
II. Road from the iron suspension bridge to the end of the Baboo bazaar, including band-stand road	4,223	15	3
III. Road from the north-west corner of Lallbaug to Gungaram's bazaar	952	9	9
Amount expended for repair of Gowalnuggur embankment	48	0	6
Amount expended as vaccination charges	421	9	9
Amount expended for repair of the existing roads	415	3	3
Amount expended for repair to bridges and culverts	329	12	3
Amount expended as boat hire for bhowal kunkur or iron slag; for top dressing of roads; material given free of cost by Kally Narain Roy	692	1	0
Amount [illegible] out for petty miscellaneous works	314	7	6
Amount laid out for watering the streets	1,316	1	3
Establishment of the office of the Municipal Commissioners, constituted under Act III. of 1864	4,591	15	0

Contingencies of ditto, viz.—

	Rs.	a.	p.			
Printing charges	224	9	9			
Law charges	246	5	9			
Miscellaneous	353	8	0			
				824	7	6
Establishment entertained for the repairs of roads				5,147	1	3
Balance on the 31st of March 1870				216	9	1
Total ..				48,921	14	4

MUNICIPALITY OF BHAGULPORE.

From V. Taylor, Esq., Chairman of the Municipality, Bhagulpore; to the Commissioner of the Bhagulpore Division,—(No. 26, dated Bhagulpore, the 11th May 1870.)

The total income of the present year has been shown as Rs. 38,479, against Rs. 39,755 as shown for the year 1868-69, or a decrease of Rs. 1,276. The balance outstanding at the close of the year (all of which is reported recoverable) amounts to Rs. 8,342, as against Rs. 8,952 outstanding at the close of the previous year. The chief items of decrease are in the items of—*first*, ferry collections, which show a decrease of Rs. 8,099; pound collections a decrease of Rs. 403; fines under the Act and bye-laws, a decrease of Rs. 738. The chief items of increase are license fees on hackeries, which were not imposed last year, amounting to Rs. 3,769, and licenses for wood-godowns, showing an increase of Rs. 95. Cause of decrease in ferry collections appears to be that in 1868-69; arrears of 1867-68 were collected to the amount of over Rs. 2,000.

My predecessor, in forwarding his last annual report, remarked that the charges of establishment have been out of all proportion to its income, and arrangements were effected by him, which reduced the total cost of the establishment by Rs. 2,500.

The conservancy establishment for the year under report cost Rs. 3,480, as against Rs. 3,268.

The road establishment cost Rs. 3,396, as against Rs. 4,183. The general charges have been slightly decreased. The metalling of roads cost Rs. 5,381, as against Rs. 5,866; and the maintenance of the police has cost Rs. 8,576, against Rs. 9,032.

My predecessor last year remarked :—"The system of manuring land with latrine poudrette has been introduced this year. Ten beegahs of land have been taken up for this purpose. The cultivation of the land has not yet commenced, but it is expected that a fair profit will accrue from this system. The land has not as yet been cultivated; the ground is very hard, and great difficulty has been experienced in getting the mehters to dig it deep enough to ensure proper disposal of the night-soil. Complaints have arisen, but the Commissioners have insisted on the work being properly done."

In conclusion, I must express my opinion that from various circumstances, the Bhagulpore Municipality is a very difficult one to manage. Reports as previously made can be recorded again in support of this assertion. The great straggling length of the town, the number of branch roads, the deficient water-supply, the crumbling nature of material used (kunkur) in repairs, extensive traffic of carts, and the poverty of the Municipality, are all causes for the bad roads.

There are great evils in the station itself. "To improve Bhagulpore would cost probably ten times as much as the fee simple of the whole place is worth." Any idea of drainage is almost hopeless in consequence, and each village would require drainage of its own. Here is little or no money that can be spared for such a purpose. Dr. Wright, in his sanitary report for 1868, has put on record :—"The general condition of the place is not so satisfactory as might be desired, but on the other hand it is very much better than that of many other places." Bhagulpore is not a compact city; has no crowded and regularly built bazaars; but is, on the other hand, a conglomeration of many villages within a certain boundary. It is spread over an enormous area, and the population, as compared with the area, is scanty; while the people are almost uniformly poor, and the rateable property in the possession of each is exceedingly small. From these circumstances it follows that there must be a great extent of road kept up, and also that a large number of Municipal police is required; and in practice it is found that when these two expenses have been met, the balance available for the general improvement of the town is extremely scanty.

Taking then all these difficulties into consideration, I venture to say that much has really been done during the past year in the right direction, and during the coming year much more will be done as regards sanitary and conservancy arrangements, and a foundation laid for the more easy, lasting, and profitable repairs of many of the roads after the next cold weather.

MUNICIPAL IMPROVEMENT FUND UNDER ACT III. OF 1864 (B.C.) FOR THE YEAR 1869-70, COMMENCING FROM 1ST APRIL 1869 TO 31ST MARCH 1870.

Income.

	Rs.	a.	p.	Rs.	a.	p.
Balance from last account	.....			8,952	6	2
Amount collected on account of the rate of 5 per cent. upon the annual value of houses	12,359	1	6			
Ditto ditto remitted, being irrecoverable	1,476	4	3			
Ditto ditto refunded to the parties on account of old chowkeydary tax collected in advance	73	4	6			
				13,907	10	3
Amount of ferry collections	9,381	4	0			
Ditto pound collections	1,067	6	9			
				10,448	10	9
Ditto fines under Act III. of 1864 and under bye-laws	933	6	6			
Ditto fees under ditto	79	8	0			
Ditto fees on account of registration of hackeries	3,769	4	0			
				4,772	2	6
Ditto license on account of wood golas	111	12	0			
Ditto ditto on bricks	43	6	6			
				155	2	6
Ditto earnest-money deposited by Contractor of Municipal roads	100	0	0			
Ditto printed forms refunded	136	0	0			
Ditto old chowkeydary tax	7	8	0			
				243	8	0
Grand Total..	.....			38,479	0	2

Disbursements.

		Rs. a. p.	Rs. a. p.
Charges incurred in the collection of the rate of 5 per cent. upon the annual value of houses		1,463 4 6	
Ditto conservancy establishment		2,479 9 8	
Ditto road establishment		3,206 7 9	
Ditto Municipal Commissioner's establishment		252 0 0	
Ditto general charges		400 2 6	
			8,901
Ditto on account of re-metalling roads		5,360 11 9	
			5,360 11 9
Ditto for maintenance of police		8,576 7 7	
			8,576 7
Ditto for construction of latrines		4,000 0 0	
			7
			4,000 0 0
Ditto for repairing cutcha roads		70 6 0	
Ditto for purchase of bullocks and carts		40 0 0	
Ditto for re-tiling sheds		94 14 0	
Ditto for construction of bridges and culverts		501 1 0	
			706 5 0
Ditto for office buildings		1,350 0 0	
			1,350 0 0
Amount refunded on account of old Chowkey tax, collected in advance		73 4 6	
Ditto remitted, being irrecoverable		1,476 4 3	
Contingencies		620 12 10	
			2,170 5 7
Balance on 31st March 1870.		....	7,304 2 4
	Grand Total	....	38,479 8 3

MUNICIPAL FINANCE.—MADRAS.

REVENUE OF THE TOWN OF MADRAS 1870.

THE taxes, tolls, and rates levied during the past year were sanctioned by the Commissioners at their adjourned General Meeting held on the 9th of December 1868, and approved of by Government by their Proceedings in the Public Department, dated the 15th idem, No. 1538, in pursuance of Section 33 of the Act, as follows, viz. :—

1*st*.—A Tax on Carriages, Horses, and other Animals, as provided in Sections 36 to 43 of and Schedule A to the Act.
2*nd*.—A Tax on Carts and other wheeled Vehicles without springs, as provided in Sections 45 to 47.
3*rd*.—Tolls on Carriages and Animals entering the Municipal limits, as provided in Sections 49 to 55 of and Schedule B to the Act.
4*th*.—A Tax on Arts, Professions, Trades, or Callings, and Liquor Licenses, as provided in Sections 57 to 62 of and Schedule C and C 2 respectively to the Act.
5*th*.—A rate of 7½ per cent. on the annual value of all Houses, Buildings, and Lands, as provided in Sections 69 to 82 of the Act.

Tax on Carriages, Horses, and other Animals.

The amount collected during the year under this head is Rs. 44,115-0-0 (netting Rupees 44,074-8-0 after deducting refunds) against an estimate of Rupees 45,500 as shown by the Comparative Statement below; the actual firstly above noted is short of that of 1866 by Rs. 11,114-0-0; is in excess of that of 1867 by Rs. 587-0-0; and is short of that of 1868 by Rs. 951-0-0; and is short even of the average of these three years by Rs. 3,826-0-0.

Statement.

—	Collected in 1866.	Collected in 1867.	Collected in 1868.	Total of the 3 years.	Average of the 3 years.
	Rs. 55,229	Rs. 43 528	Rs. 45,066	Rs. 1,43,823	Rs. 47,941
Collected in 1869	44,115	44,115	44,115	...	44,115
Decrease.....	11,114	...	951	...	3,826
Increase	...	587	...	...	...

Being dissatisfied with the working of this tax during the past three years as compared with that of 1866, I brought the matter to the special attention of the Commissioners, whereupon the Department for the collection of this tax was re-organized by the removal of the three Inspectors who were engaged on high salaries, and the substitution for them of eight men on low salaries, with the allowance of a fee for each carriage or animal newly brought into the Register. This system has been in operation from the commencement of the current year, and the result of it remains to be seen.

Tax on Carts and other wheeled Vehicles without springs.

The sum collected during the year under review for fees on registration of Vehicles of this description is Rs. 13,008, against the budgetted amount of Rs. 11,300, and exceeds the collections of the previous three years, and the average of those years respectively by the respective amounts shown in the Statement below :—

Statement.

—	Collected in 1866.	Collected in 1867.	Collected in 1868.	Total of the 3 years.	Average of the 3 years.
	Rs. 10,284	Rs. 10,439	Rs. 11,322	Rs. 32,545	Rs. 10,848
Collected in 1869.....	13,008	13,008	13,008	...	13,008
Increase.....	2,724	2,569	1,186	...	2,160

It will be observed that the revenue under this head has been steadily increasing every year; and as an inducement for its better working, a fee in addition to salary has been offered to the men employed in its collection for every new cart brought into account. This system is brought into force this year.

Tolls on Carriages and Animals entering the Town.

The tolls were collected departmentally during the first year of their existence; but since the year 1867, inclusive, they were farmed out under the power in that behalf conferred on the Commissioners by the Act. The following Statement will exhibit the annual revenue under this head during the past four years :—

Statement.

	1866.	1867.	1868.	Total of the 3 years.	Average of the 3 years.
	Rs.	Rs.	Rs.	Rs.	Rs.
	46,135	36,000	48,000	1,30,135	43,378
1869...	42,000	42,000	42,000	...	42,000
Increase	...	6,000	...	...	...
Decrease	4,135	...	6,000	...	1,378

from which it will be seen that the revenue of 1869 is less than the revenues of 1866 and 1868, and the average of the revenues of 1866, 1867, and 1868, respectively, by the respective sums of Rs. 4,135, Rs. 6,000, and Rs. 1,378, and that it is in excess of that of 1867 by Rupees 6,000. I am glad to say that I have been able to secure an offer of Rs. 48,600 for the farm of the tolls for the current year. So far as the tolls are concerned, this is an unprecedented amount in the records of this Municipality.

Taxes on Arts, Professions, Trades, and Callings.

The realization of this tax during the year under review, viz., Rupees 69,523-8-0 (netting Rs. 69,133-8-0 after setting off refunds) is very far from the Budget, which was Rs. 1,29,000, and is most unsatisfactory, especially as it has fallen short of the collection of the previous year, (which was the first year of the working of the present Municipal Act) by Rs. 14,383-8-0, or nearly one-fifth. The tax on Arts, &c., levied under Act IX. of 1865, which was in force during the years 1866 and 1867, brought in on an average a sum of about Rs. 90,000 a year. The last year therefore is worse than the average of the previous three years, and the worst of the past four years, as will be seen from the Statement below :—

Statement.

	Under Act IX. of 1865.		Collected in 1868.	Total of the 3 years.	Average of the 3 years.
	Average for 1866.	Average for 1867.			
	Rs.	Rs.	Rs.	Rs.	Rs.
	90,000	90,000	83,907	2,63,907	87,902
Collected in 1869.	69,523	69,523	69,523	...	69,523
Increase.....	...	...	...	...	...
Decrease.....	20,477	20,477	14,384	...	18,379

It is evident that many persons have evaded or been allowed to evade payment of the tax. This state of things has however had my serious attention and that of my Honorary Colleagues, at whose recommendation the salaries of the Inspectors working this tax have been reduced, and an arrangement adopted from the beginning of this year for allowing them a commission on their collection at a rate commensurate with the loss they sustain by the reduction. This course, combined with the reformation in working introduced at the recommendation of the Finance Committee, and the close supervision exercised by myself and Assistant, will, I hope, make amends for the past, as it has shown symptoms of improvement during the first quarter of the current year.

Tax on Liquor License.

The amount collected on account of this tax, viz., Rs. 11,407 is also below the Budget Estimate by Rupees 1,993, though in excess of the collection of the previous year (which was the first year of the tax coming into force) by Rs. 350. The arrangement for allowance of commission on collection of tax on Arts, &c., above alluded to, applies to this tax also, and I hope that it may be the means of improving the income under this head for current year.

Rates on Houses, Buildings, and Lands.

This tax, the largest in amount of all the revenues derivable under the Municipal Act, realized Rs. 2,26,577-12-9 (netting Rupees 2,26,535-13-8 after deducting refunds) during the year under review, against an estimate of Rupees 2,60,000.

TAXES ON CARRIAGES, HORSES, AND OTHER ANIMALS.

NOTICE is hereby given that every person keeping or having charge, within the Town of Madras, of any of the carriages or animals mentioned in the Schedule hereto annexed, for more than sixty days, during the half-year ending on the 30th day of April 1870, without having duly paid into the Office of the Municipal Commissioners for the said Town the tax due thereon according to the said Schedule, and taken out therefrom a license for such half-year, shall be liable, on conviction before a Magistrate, to be fined the full amount payable by him in respect of such carriage or animal, and such further sum not exceeding 20 rupees as the Magistrate may direct, and shall also be liable to a further penalty of 5 rupees for every day after conviction, during which he shall neglect to take out such license.

SCHEDULE A.

	Half-yearly. Rs. A. P.
1.—For every 4-wheeled carriage on springs drawn by two horses ..	0 0 0
2.—For every 4-wheeled carriage on springs drawn by one horse or a pair of horses under thirteen hands, or by bulls or bullocks	4 8 0
3.—For every 2-wheeled carriage on springs drawn by a horse, mule, bull, or bullock	3 0 0
4.—For every horse over thirteen hands	4 8 0
5.—For every horse of or under thirteen hands, or mule	1 8 0
6.—For every elephant	12 0 0
7.—For every camel	6 0 0
8.—For every horse of or under eleven hands	0 8 0
9.—For every bullock or bull	0 8 0
10.—For every male buffaloe	0 8 0
11.—For every ass	0 4 0
12.—For every dog	0 8 0

THE Madras Government have [*Madras Mail*] approved and sanctioned the following rates, taxes, and tolls proposed by the Municipal Commissioners for the Town of Madras to be levied under the provisions of Act IX. of 1867 for the year 1871:—

1*st*.—A rate of 7½ per cent. per annum on the annual value of houses, buildings, and lands, as provided in Sections 69 to 82.
2*nd*.—A tax on arts, professions, trades or callings, and liquor license taxes as provided in Sections 57 to 62, and Schedules C and C2, respectively, of the said Act.
3*rd*.—A tax on carriages and animals, under Sections 36 to 43 and Schedule A of the Act.
4*th*.—A tax on registration of vehicles without springs, under Sections 45 to 47.
5*th*.—Tolls on carriages and animals entering the Municipal limits, under Sections 49 to 55 and Schedule B of the said Act.

The probable receipts for 1871 are estimated at Rupees 6,13,600, which with the Government Securities and balance in cash, amounting to Rupees 58,000, places at the disposal of the Commissioners, Rupees 6,71,600. From this amount they propose to expend a sum of Rupees 6,42,813, leaving a balance of Rupees 28,787. The receipts exceed the estimate for the current year by Rupees 40,522, but the expenditure falls short of it by Rupees 9,694. The Government have approved and passed the estimates for 1871. They also sanction, under the provisions of Section 243 of Act IX. of 1867, the revised Schedule of fees for licenses, registrations, &c.

MUNICIPAL FINANCE.—MADRAS.

COMPARATIVE STATEMENT OF REVENUE AND EXPENDITURE FOR 1868, 1869, AND 1870.

Revenue being Current Demand.	For 1868.	For 1869.	For 1870.	Total.	Average of the 3 years.
Rates on Houses, Buildings, and Lands	2,33,000	2,38,000	2,40,500	7,11,500	2,37,166⅔
Tax on Arts, Professions, Trades, and Callings	84,000	84,000	84,000	2,52,000	84,000
Liquor License Tax	11,300	11,200	12,000	34,500	11,500
Tax on Carriages, Horses, and other Animals	51,000	51,000	51,000	1,53,000	51,000
Registration of Carts and other Vehicles without springs	14,000	14,000	14,000	42,000	14,000
Tolls on Carriages and Animals entering the Town	48,000	42,000	48,600	1,38,600	46,200
Miscellaneous	73,700	73,200	75,000	2,21,900	73,966⅔
	5,15,000	5,13,400	5,25,100	15,53,500	5,17,833⅓
Deficit	.....	25,300	.....	.....	.....
	5,15,000	5,38,700	5,25,100	15,53,500	5,17,833⅓

COMPARATIVE STATEMENT OF REVENUE AND EXPENDITURE FOR 1868, 1869, AND 1870.

Ordinary Expenditure.	For 1868.	For 1869.	For 1870.	Total.	Average of the 6 years.
Salaries of Gazetted Officers	47,300	49,370	47,000	1,43,670	47,890
Establishment	39,400	44,380	36,000	1,19,780	39,926⅔
Conservancy Establishment	1,29,200	1,51,500	1,42,000	4,22,700	1,40,900
Do. Charges	16,900	24,450	14,300	55,650	18,550
Public Works, Ordinary, viz., Civil Buildings	3,800	3,060	3,200	10,060	3,353⅓
Communications	67,850	1,08,180	86,700	2,62,730	87,576⅔
Miscellaneous	21,000	40,160	35,700	96,860	32,286⅔
Contribution to Government on account of Police	1,07,230	1,07,230	1,07,230	3,21,690	1,07,230
Miscellaneous	6,900	7,970	14,000	28,870	9,623⅓
Refunds of Taxes, &c.	.....	2,400	2,000	4,400	1,466⅔
Interest on Loan on Water Works	.....	.....	6,500	6,500	2,166⅔
Working of the Contagious Diseases' Act	.....	.....	4,500	4,500	1,500
	4,39,580	5,38,700	4,99,130	14,77,410	4,92,470
Surplus	75,420	.....	25,970	76,090	25,363⅓
	5,15,000	5,38,700	5,25,100	15,53,500	5,17,833⅓

COMPARATIVE STATEMENT SHOWING THE PROGRESS OF HOUSE AND LAND RATE COLLECTIONS MONTHLY AND YEARLY.

Months.	1865.	1866.	1867.	1868.	1869.	1870.
January	2,497 1 3	9,979 6 3	6,268 6 1	5,734 10 10	6,452 1 9	13,048 13 9
February	15,271 4 5	13,484 9 4	15,186 0 3	11,373 3 4	6,103 15 8	10,908 14 5
March	23,649 3 8	13,480 5 3	12,620 5 9	10,856 12 2	6,176 11 2	8,504 9 0
April	15,249 10 5	14,560 9 4	22,808 12 10	7,751 7 1	4,777 6 11	12,750 7 4
May	35,312 11 4	14,386 1 7	26,833 5 11	7,611 2 4	4,809 13 0	22,635 6 7
June	20,554 12 7	40,114 4 0	45,127 11 9	33,579 9 2	7,182 0 10	28,369 9 5
July	19,973 14 2	22,964 9 4	24,200 8 0	33,033 6 2	20,898 11 9	26,174 5 4
August	27,291 12 6	18,350 1 0	22,728 2 0	41,693 13 1	31,763 7 3	22,341 9 4
September	23,136 12 4	16,409 7 10	22,802 11 3	33,695 1 6	55,588 0 8	.....
October	22,261 3 3	21,933 3 11	16,066 7 6	30,611 3 11	40,107 14 7	.....
November	20,941 8 3	20,188 13 4	19,825 8 1	27,019 3 10	25,807 2 0	.....
December	20,943 5 5	16,315 15 11	16,519 15 11	17,704 3 0	16,910 7 2	....
Total...	2,47,083 3 7	2,22,167 7 1	2,50,987 15 4	2,60,663 12 5	2,26,577 12 9	.....

COMPARATIVE STATEMENT OF VEHICLES AND ANIMALS BROUGHT INTO THE REGISTERS FOR 1869-70.

Description.	Average per each half-year of 1869.	For the 2nd half of 1870 up to 20th September.	Decrease.
4-wheeled Carriages on springs drawn by 2 Horses	247	202	45
Do. do. drawn by 1 Horse, or a pair of Horses under 13 hands, or by Bulls or Bullocks	1,628	1,402	226
2-wheeled Carriages on springs drawn by a Horse, Mule, Bull, or Bullocks	967	874	93
Horses over 13 hands	1,595	1,408	187
Do. of or under 11 hands, or mules	1,162	1,010	152
Elephants	1	1	.....
Horses of or under 11 hands	280	257	23
Bulls or Bullocks	2,687	2,232	455
Male Buffaloes	2½	1	1½
Asses	33	32	1
Dogs	604	456	148
Carts	3,237	2,398	839

JOURNALS AND PERIODICALS, &c., &c., FILED IN THE

COMMERCIAL RECORD AND NEWS ROOMS, BOMBAY.

English Papers.

Daily.....Daily News.
Times.
Weekly.....Army and Navy Gazette.
Asiatic.
Athenæum.
Allen's Indian Mail.
Broad Arrow.
Bell's Life in London.
Country Gentleman.
Engineer.
Economist.
Field.
Guardian.
Home News.
Homeward Mail.
Indian Public Opinion.
London Gazette.
Overland Mail.
Pall Mall Budget.
Spectator.
Saturday Review.
Lancet.
Law Times.
Nonconformist.
Liverpool Mercury.
Illustrated Papers.....Graphic.
Punch.
Illustrated London News.
Vanity Fair.
Illustrated Times.
Leslie's Illustrated Newspaper.
L'Illustration.
Kladderadatsch.

Indian Journals.

Bombay.....Bombay Gazette.
Bombay Guardian.
Catholic Examiner.
Deccan Herald.
Gujarat Mitra.
Indian Economist.
Indu Prakash.
Jam-i-Jamshed.
Loke Mitra.
Masonic Record of Western India.
Native Opinion.
Poona Observer.
Rast Goftar.
Sind News.
Summachar.
Star of India.
Times of India.
Madras.....Athenæum and Daily News.
Bangalore Herald.
Cochin Argus.
Madras Mail.
Madras Standard.
Neilgherry Excelsior.
South of India Observer.
Bengal.....Amritsar Bazar.
Bengal Times.
Daily Examiner.
Dacca News.
Darjeeling News.
Englishman.
Friend of India.
Hindoo Patriot.
Indian Observer
Indian Mirror.
Indian Daily News.
North-West Provinces.Delhi Gazette.
Lucknow Times.
Mofussilite.
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Indian Abuses and their Remedies.
Central Provinces.....Central India Times.
Jubbulpore Chronicle.
Ceylon.....Ceylon Observer.
Colombo Times.
Japan.....The Japan Herald.

French Journals.

L'Illustration.
Univers Illustre.
Revue des deux Mondes.
Revue Contemporaine.
Journal des Economistes.

German Journals.

Allgemeine Zeitung.
Triester Zeitung.
Hansa Zeitschrift fur Seewesen.
Kölnische Zeitung.
Bremer Handelsblatt.

American Papers.

New York Times.
New York Herald.
New York Tribune.
New York Journal of Commerce.
Boston Advertizer.
North American Review.
Leslie's Illustrated Newspaper.

Italian and Portuguese Papers.

L'Osservatore Triestino.
O'Ultramar.
O'Patriota.
A India Portugueza.

Reviews, Magazines, &c.

Advertising Review.
Quarterly Review.
Calcutta Review.
Contemporary Review.
Edinburgh Review.
Fortnightly Review.
North British Review.
Westminster Review.
Revue des Duex Mondes.
North American Review.

Blackwood's Magazine.
Banker's Magazine
Cornhill Magazine.
MacMillan's Magazine.
Fraser's Magazine.

The Month.
The Jurist.
Journal of the Department of Agriculture, Washington.
Journal of the East India Association.
,, ,, Statistical Society.
,, ,, Applied Sciences.
,, ,, Society of Arts.

Official Gazettes, &c.

Bombay Gazette.
Burmah Gazette.
Central Provinces' Gazette.
Fort St. George Gazette.
Gazette of India.
London Gazette.
Mysore Gazette.
North West Provinces' Gazette.
Oudh Gazette.
Punjab Gazette.

Hart's Army and Civil List.
Bombay Army List.
Madras Army and Civil List.
Bengal Army and Civil List.

Almanacks, Directories, and Guides.

American Year Book 1871.
Bradshaw's Continental Guide ,,
Dietrechsen & Co.'s ,,
London Street Directory ,,
Statesman's Year Book ,,
Whittaker's Almanack ,,
Street's Colonial Directory ,,
The Indian Traveller's Guide ,,
Madras Asylum Almanack and Calendar 1871.
Times of India Calendar and Directory 1871.
Norman's Indian Bradshaw 1871.
The Poona Guide ,,
Bunsha's Parsee Directory ,,

Indian Periodicals.

Annals of Indian Administration
Agricultural Gazette of India.
Bibliotheca Indica.
Madras Jurist.
Madras Revenue Register.
Records of Geological Surveys.
Revenue Reporter (N. W. Provinces.)
Statistical Reporter.
Journal of the Royal Asiatic Society, Bombay.
,, ,, Geographical Society, Bombay.
,, ,, Agri-Horticultural Society of India.
Bombay Civil List (Quarterly.)
Bengal Army and Civil List ,,
Madras do. do. ,,
Bombay do. do. ,,

Price Currents, Market Reports, Shipping Lists, &c., &c., &c.

(Extra Supplement to the Indian Economist.)

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MARINE LANE,

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G. L. F. CONNELL,
Manager.

BOMBAY, October 1871.

MUNICIPAL FINANCE—MADRAS.

GENERAL ABSTRACT OF THE BUDGET-ESTIMATE OF RECEIPTS FOR THE YEAR 1871.

Ordinary.

RECEIPTS.	Actuals for the first 9 months of 1870.	Estimate for 1870.	Estimate for 1871.	Increase.	Decrease.
1. Rates on Houses, Buildings and Lands and Ground Rents.	1,69,737	2,80,000	2,79,000	.....	1,000
2. Tax on Arts, Trades, Professions, and Callings, under Act IX. of 1867	65,801	85,000	94,000	9,000	.....
3. Liquor License-tax	8,828	12,500	11,700	.....	800
4. Tax on Carriages and Animals	33,419	45,800	51,000	5,200	.....
5. Fees on Registration of Carts	11,481	12,040	12,500	460	.....
6. Tolls on Carriages, &c	32,400	42,000	49,000	7,000	.....
7. { Miscellaneous	75,020	75,738	91,400	15,662	.....
7. { Reserve for unpaid Bills	.....	20,000	25,000	5,000	.....
	3,96,716	5,73,078	6,13,600	42,322	1,800
Balance on 1st January, including Securities	65,881	75,062	*58,000	.....	17,062
Excess in Charges	.....	4,367	.....	.....	.....
Total...	4,62,597	6,52,507	6,71,600	42,322	18,862

* Cash..... 21,500 0 0
Government Securities 36,500 0 0

Rs.....58,000 0 0

Net Increase in 1871, Rupees 23,460.

GENERAL ABSTRACT OF THE BUDGET ESTIMATE OF CHARGES FOR THE YEAR 1871.

CHARGES.	Actuals for the first 9 months of 1870.	Estimate for 1870.	Estimate for 1871.	Increase.	Decrease.
1. Office—Salaries and Establishments	1,63,312	2,30,586	2,23,890	.....	6,696
2. Conservancy Charges—other than Establishments	10,247	14,650	15,660	1,010	.....
3. Public Works—New	23,330	54,840	59,349	4,509	.....
Repairs	48,602	1,09,300	98,800	.....	10,500
Repairs or unpaid Bills	22,628	20,000	25,000	5,000	.....
4. Contributions to Government	82,974	1,12,732	1,17,232	4,500	.....
5. Lighting	17,306	25,000	26,000	1,000	.....
6. Refunds of Revenue	1,441	1,500	1,500	.....	.....
7. Registry of Births and Deaths	4,194	6,000	4,548	.....	1,452
8. Interest on Loan	3,033	36,000	28,500	.....	7,500
9. Census	1,000	12,500	11,500	.....	1,000
10. Miscellaneous and Contingent	19,106	29,399	26,434	.....	2,965
Total.....	3,97,173	6,52,507	6,38,413	16,019	30,113
Balance on 31st December	.....	.....	33,187	.....	.....
	3,97,173	6,52,507	6,71,600	16,019	30,113

Net Decrease of Expenditure in 1871, Rupees 14,094.

Extraordinary.

1. Loan to be raised	.....	3,00,000	3,00,000	.....	.....
	.....	3,00,000	3,00,000	.....	.....
Public Works—1. General Improvements	.....	1,00,000	1,00,000	.....	.....
2. New General Market	.....	1,00,000	1,00,000	.....	.....
3. New Main Drain	.....	1,00,000	1,00,000	.....	.....
	.....	3,00,000	3,00,000	.....	.....

WATER DISTRIBUTION PROJECT, MADRAS.

STATEMENT OF RECEIPTS AND DISBURSEMENTS TO 31ST DECEMBER 1870.

Receipts.	Amount. Rs.	A.	P.	Disbursements.	Amount. Rs.	A.	P.
H. M. Government of India Loan	1,25,000	0	0	Standing advance to Executive Engineer	500	0	0
Municipal Fund Loan	16,000	0	0	Sundries and Superintendence, inclusive of expenditure for preparation of the Distribution Scheme.	24,746	10	4
DELIVERY CHANNEL—				Fountains	7,958	6	5
Amount contributed by Government...30,832 0 0				Delivery Channel	92,584	8	6
Fine recovered from a Contractor for bad chunam..... 300 0 0				Repairing tanks	3,515	1	9
	31,132	0	0	Cast iron pipes	39,575	11	10
Sundries and superintendence, sale of specifications and fines on establishment	202	5	0	Extra charges paid to Mr. May in England, for passing pipes, &c	1,305	7	0
Fountains, sale of bullocks and old materials of house purchased in Vepery, &c.	648	10	7	Messrs. H. S. King and Co., advance to meet contingent expenses in England	1,078	10	5
Repairing tanks, reimbursement from Municipal fund of certain charges incurred on that account.	497	3	10	Mr. R. Woolley, Fixed Deposit with Bank of Madras.	40,500	0	0
Deposits with Tenders, deposit from Messrs. Beck and Co.	210	10	0	Balance with Bank of Madras on the 31st December 1870	2,426	5	2
Mr. Richard Woolley, security for due performance of his contract	40,500	0	0				
Total...	2,14,190	15	5	Total...	2,14,190	15	5

MUNICIPAL FINANCE.—MADRAS.

BUDGET-ESTIMATE OF RECEIPTS FOR THE YEAR 1870.

Heads of Service.	Actuals for the first nine months of 1869.	Estimate for 1869.		Estimate for 1870.	
	Rs.	Rs.	Rs.	Rs.	Rs.
1. Rates on Houses, Buildings, and Lands—					
Probable Balance of arrears	39,281	54,881		30,000	
Probable Current Demand of 1st Division	11,661	23,520		20,000	
2nd do.	23,735	51,616		45,160	
3rd do.	32,456	74,831		64,530	
4th do.	6,730	19,603		19,000	
5th do.	12,068	26,683		27,000	
6th do.	12,035	21,411		21,830	
7th do.	2,884	24,863		25,900	
8th do.	2,902	22,239		22,000	
Total	1,43,752	3,19,647		3,25,420	
Probable Collection	.....	.....	2,60,000		2,60,000
2. Tax on Arts, Trades, Professions, and Callings, under Act IX. of 1865	5,073	.....	25,000		
3. Tax on Arts, Trades, Professions, and Callings, under Act IX. of 1867—					
Probable Current Demand of 1st Division	53,603	This Estimate was arrived at by the Assessor according to classes. Divisional arrangements will be made hereafter.		3,426	
2nd do.				17,461	
3rd do.				28,417	
4th do.				2,283	
5th do.				8,457	
6th do.				5,720	
7th do.				8,426	
8th do.				5,810	
Probable Collection	.....	.....	1,29,000	.....	85,000
4. Liquor License Tax—					
Probable Demand of 1st Division	11,371	This Estimate was arrived at by the Assessor according to classes. Divisional arrangements will be made hereafter.		1,505	
2nd do.				1,870	
3rd do.				2,928	
4th do.				1,068	
5th do.				916	
6th do.				828	
7th do.				1,132	
8th do.				870	
				11,117	
Probable Collection	.....	.....	13,400	.....	12,500
5. Tax on Carriages and Animals—					
Carriages	17,762	24,156		25,056	
Horses	12,837	17,873		18,438	
Bulls	1,853	2,654		2,709	
Dogs	449	828		649	
Other animals	34	47		47	
Probable Collection	32,935	... .	45,500	.....	45,800
6. Fees on Registration of Carts—					
Fees on Registration of Carts	11,224	11,800		12,000	
Fees on Registration of Transfer of Carts	32	.....		40	
	11,256	... ..		.....	
Probable Collection	... .	.....	11,800	.....	12,040
7. Tolls on Carriages, &c.	32,000	42,000		42,000	
Total	.....	.....	42,000	.....	42,000
8. Miscellaneous—					
Government contribution towards maintenance of roads	35,000	35,000		31,500	
Rent of Market Stalls	3,738	6,000		5,250	
Fees for Slaughter-houses	4,390	5,700		5,800	
Strand Rents	704	2,100		1,000	
Fees for licenses for dangerous and offensive trades	3,984	3,500		3,600	
Proceeds of sale of rubbish	247	1,000		320	
Park. Proceeds of sale of People's Park and Cay	3,647	2,000		4,500	
Park. Government grant for Zoological collections	3,960	.....		3,960	
Park. Tiger collections	.....	.....		2,500	
Park. Balance at credit	.....	.....		2,816	
Government grant for drains	298	.....		500	
Grazing and avenues	1,503	2,300		2,300	
Demand and Warrant fees	2,504	3,600		3,300	
Fines, Police	295	800		800	
Do. on Contractors	1,121	1,000		.....	
Do. on Department	3,159	.....		3,600	
Interest on Government Securities	1,493	1,488		1,492	
Unpaid Bills of all Departments	.....	.....		20,000	
Other Items	711	500		2,500	
Total	66,753	.....	64,988	.....	95,788
Grand Total	3,56,743	.....	5,91,188	.....	5,73,078

MUNICIPAL FINANCE.—MADRAS.

BUDGET-ESTIMATE OF CHARGES FOR THE YEAR 1870.

	Actual for the first nine months of 1869.	Estimate for 1869.		Estimate for 1870.	
	Rs.	Rs.	Rs.	Rs.	Rs.
1 OFFICE.					
Salaries—					
President @ Rs. 1,200 ₱ mensem	10,800	14,400		14,400	
Assistant to President @ „ 1,000 for 1869, and Rs. 896 for 1870 ₱ mensem ...	9,000	12,000		10,752	
Collector @ „ 600 ₱ mensem ...	5,400	7,200		7,200	
Assessor @ „ 300 ₱ do. ...	2,700	3,600		3,600	
Executive Engineer @ „ 500 ₱ do. ...	4,500	6,000		6,000	
Assistant do. @ „ 300 ₱ do. ...	3,287	3,600		3,600	
Sanitary Inspector @ „ 300 ₱ do. ...	2,700	3,600		3,600	
Auditor	500	500		.....	
	38,887	.....	50,900	.....	49,152
Establishment—					
General Department	4,527	6,720		5,682	
			6,720		5,682
Collector's Office. House and Land Rates Department				5,682	
Cash Department				1,272	
Remission do.				360	
Distraint do.				3,978	
Carriage License Department				2,028	
Cart Registration do.				558	
Miscellaneous—					
Market Conicopoly				144	
Extra Writers				500	
Commission	21,184	26,310		1,500	
Extra Coolies				500	
			26,310		16,522
Assessor's Office. General				924	
House and Land Rates Department				1,908	
Trade License Department				2,004	
Miscellaneous—					
Extra Writers				280	
Commission to Inspectors				900	
Commissioner's fees				320	
					6,336
Executive Engr.'s Office. In-door	2,253	3,504		3,504	
Out-door...	2,988	4,224		4 224	
			7,728		7,728
Conservancy. In-door } Vide Appendix A. ... ... { Out-door }	1,778	2,244		2,304	
	1,10,650	1,66,110		1,49,002	
			1,68,354		1,51,306
Contingencies—					
Stationery	1,670	3,000		2,400	
Printing charges	1,594	1,300		2,200	
Advertising charges	529	1,000		750	
Extra Writers	1,588	1,000		500	
Law charges including Stamp Duty	1,205	2,500		1,500	
Office rent or Engineer's Office	405	.....		1,200	
Insurance on Office premises, &c.	...	.....		125	
Office furniture...	.....	.....		500	
Compassionate allowance	37	.....		500	
Miscellaneous	1,163	1,500		500	
Census...	1,000	12,500		12,500	
Maps of Divisions...	.....	.....		3,000	
Interest on Loan on Water Works	.....	.....	22,800	36,000	61,675
	1,91,458	.....	2,82,812	.....	2,98,401
2. POLICE—					
Contribution to Government under Section 99 of Act IX. of 1867.	80,424	1,07,232		1,07,232	
			1,07,232		1,07,232
3. CONSERVANCY CHARGES, OTHER THAN ESTABLISHMENTS—*Vide* Appendix A	31,489	36,660		14,650	
			36,660		14,650
4. PUBLIC WORKS—					
Ordinary { New —*Vide* Appendix B., Part I.	81,688	1,90,784		52,490	
Repairs—*Vide* Appendix B., Part II.	97,903	1,14,100		1,23,150	
			3,04,884		1,75,640
5. LIGHTING—					
Maintenance	12,946	18,150		19,000	
Addition	1,964	9,420		6,000	
			27,570		25,000
6. MISCELLANEOUS—					
People's Park	11,563	13,190		14,384	
Fire Engine, Maintenance and Repairs	507	5,400		700	
Workshop Establishment for Repairs	.....	.....		1,000	
			18,590		16,084
7. REFUNDS OF REVENUE	1,158	4,500		1,500	
			4,500		1,500
	5,11,190	.....	7,82,248	.....	6,38,570

MUNICIPAL FINANCE—MADRAS MUNICIPALITIES.

STATEMENT SHEWING THE DETAILS OF INCOME AND EXPENDITURE OF THE VARIOUS MUNICIPALITIES

District.	Municipality.	INCOME.									EXPENDITURE.							
		Rate on Houses, Buildings, and Lands.	Tax on Arts, Trades, and Professions.	Tolls.	Tax on Vehicles and Animals.	Registration of Carts.	Miscellaneous Receipts.	Government Contribution.	Balance from last year.	Total.	New Works, &c.	Repairs.	Conservancy.	Police.	Establishment.	For purposes other than those specified in Section 25.	Miscellaneous.	Total.
		Rs.	Rs	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bellary	Adoni .....about	3,200	...	800	944	400	1,005	1,587	2,871	10,807	500	1,000	3,120	1,877	1,272	156	... ..	7,925
	Bellary	10,027	. ....	4 133	7.161	774	1,382	3,609	1,735	28,823	...	1,884	7,447	5,596	4,347	1,429	.....	20,705
Coimbatore	Coimbatore	6,104	...	10,146	1,315	611	2,215	6,450	3,033	29,877	1,353	5,438	4,558	7,236	2,668	....a	...	21,256
	Coonoo[illegible]	2,064	1,033	1,728	659	55	744	74	1,008	7,368	1,162	.....	594	1,133	1,750	.....	.....	4,639
	Ootacamund	12,622	3,841	3,741	1,896	329	398	5,188	2,886	30,903	6,668	6,250	2,714	9,809	2,685	.....	1,860	29,980
Cuddapah	Cuddapah	5,689	5,629	8,117	1,335	558	1,487	7,062	1,840	31,719	5,557	9,774	2 687	8,245	5,177	.....	.....	31,442
Ganjam	Berhampore	1,601	2,443	5,500	914	509	115	1,646	.....	12,729	587	.....	3,152	4,718	1,763	... ..	.....	10,222
	Chicacole	3,045	...	2,120	427	260	542	911	270	7,578	639	232	1,099	3,619	1,412	.....	.....	7,003
	Coconada	4 030	4,670	1,954	328	.....	3,229	3,658	2,981	20,852	6,092	1,543	1,931	5,300	2,218	1,624	1,755	20,466
Godavery	Ellore	2 125	3,027	3,000	714	418	87	1,360	1,864	12,597	2,918	208	3,734	3,568	2,168	... .	.....	13,597
	Rajahmundry	2,772	3 055	1,610	322	160	405	2,000	416	10,741	1,169	105	3,773	3,873	1,192	225	48	10,389
Kistna	Guntoor	1,652	4,710	6,400	1,119	631	1,756	1,813	6,412	24,495	4,973	1,867	4,161	4,641	2,270	68	619	18,602
	Masulipatam	3 080	6,769	4,517	1,149	202	1,215	4,396	1,124	22,456	1,145	102	3,520	7,248	3,042	.....	45	15,104
Kurnool	Cumbum	1,062	1,114	1,558	467	280	182	1,518	1,540	7,725	54	288	456	4,689	1,317	.....	.....	6,866
	Kurnool	6,784	.....	8,909	2,065	460	2,941	3,732	7,488	32,382	5,591	1,438	3,526	6,620	2,828	2,166	.....	22,170
Madras	Conjeveram	8,623	3,211	.....	1,447	485	289	810	.....	14,866	.....	20	5,375	5,401	1,774	.....	1,177	13,748
Madura	Dindigul	700	1,182	...	1,000	250	...	744	...	3,876	.....	.....	...	1,846	780	.....	350	2,976
	Madura	4,000	10.000	20,000	1,000	900	100	11,540	...	47,540	.....	.....	24,104	17,456	4,599	.....	.....	46,160
Malabar	Calicut	14,237	8,859	.....	906	397	439	8,378	2,700	35,917	4,073	12,888	1,764	10,641	4,144	.....	998	34,511
	Cannanore	1,060	1,343	.....	2,200	142	81	2,075	.....	6,902	150	783	566	....	1,900	.....	.....	3,400
	Cochin	4,626	3,010		93	39	70	1,375	1,485	10,700	1,813	1,112	1,188	.....	1,386	527	.....	6,029
	Palghaut	3,143	1,709	5 211	.....	.....	197	555	530	11,347	663	1,256	2,060	2,489	1,939	.....	.....	8,409
	Tellicherry	1,750	1,590	.....	238	8	150	... ..	1,202	4,938	.... ..	34	790	.....	1,998	663	.....	3,485
Nellore	Nellore	4,608	3,730	2,560	1,531	699	803	5,747	5,432	25.113	7,625	4,631	3,346	6,624	2,772	656	... ..	25,656
North Arcot	Vellore	... .	.....	3,223	271	494	23	482	.....	4,495	24	... ..	974	80	851	.....	... ..	1,930
	Wallajahpett	1,133	3,649	5,225	15	421	73	1,935	1	12,455	493	845	2,199	3,135	3,724	175	.....	10,563
Salem	Salem	11,759	6,932	8,755	1,936	670	2,513	5,704	1,134	39,407	2,520	485	5,648	8,843	3,859	3,288	.....	24,645
South Arcot	Cuddadore	6,866	5,494	9,489	3,355	852	1,043	4,000	1,458	32,560	6,050	1,559	8,986	8,624	3,566	.....	2,400	31,187
South Canara	Mangalore	6,198	4,273	680	...	193	1,198	1,574	432	14,551	65	2,468	958	6,116	3,195	.....	... .	12,804
Tanjore	Combaconum	5,912	12,388	13,346	1,207	561	3,809	4,766	7,083	49,074	3,267	5,300	8,831	15,226	6,158	.....	2,288	41,068
	Mayaveram	3,871	4,508	.....	569	188	624	3,544	1,433	14,739	1,287	2,212	2,620	5,946	1,625	.....	39	13,730
	Munnargoody	.....	6,428	8,153	.....	.....	847	4,745	2,999	23,174	590	8,251	3,126	4,479	1,514	.....	477	18,488
	Negapatam	9,172	13,987	9,857	1,956	702	7,844	8,044	905	52,470	16,051	6,815	8,853	11,527	5,486	.....	.....	48,734
	Tanjore	6,657	20,821	13,501	3,030	549	7,486	12,251	6,844	71,143	9,864	12,803	7,050	15,387	8,799	.....	5,953	59,860
Tinnevelly	Palamcottah	.....	.....	10,579	.....	.....	318	2,812	2,276	15,988	4,102	2,519	1,850	3,674	2,939	890	.....	15,976
	Tinnevelly	.....	.....	16,669	.....	.....	255	3,750	4,008	24,683	10,889	766	2,074	4,847	3,272	1,702	.....	23,552
Trichinopoly	Tuticorin	3,130	2,177	5,871	.....	253	19	3,024	183	14,660	7,440	1,081	1,157	2,934	1,735	.....	.....	14,349
	Trichinopoly	7,689	7,791	20,702	6,150	1,587	2,602	11,244	5,594	63,363	2,183	12,309	21,704	10,851	6,060	2,291	.....	55,400
Vizagapatam	Bimlipatam	.....	2,213	.....	308	5,940	115	2,910	798	12,286	.....	5,066	896	3,986	1,992	.....	126	12,067
	Vizagapatam	.....	9,903	9,242	2,522	159	1,770	8,036	1,935	33,567	1,400	6,186	10,771	9,695	3,708	.....	.....	31,763
	Visianagrum	618	2,075	4,286	2,392	.....	113	3,281	1,554	14,261	2,872	1,652	2,501	5,036	1,964	125	.....	14,152
	Total...	1,71,623	1,73,572	2,31,534	52,952	21,142	50,503	1,58,344	85,472	9,45,146	1,21,832	1,21,186	1,75,880	2,43,025	1,17,869	15,991	18,136	8,13,924

MOFUSSIL MUNICIPALITIES, MADRAS.

We have undertaken some trouble to investigate and tabulate the receipts and expenditure of the various Municipalities of this Presidency, under the impression that in the face of the vastly extended system of local taxation with which we are threatened, it would be well for the public to make some enquiries into the present working of Municipal bodies, the powers with which they are invested, the source of their income, and the objects of their expenditure. We have taken forty-four Municipalities, omitting that of the Presidency town, as its circumstances somewhat differ from the rest, and it works under a special Act of its own. The figures which form the basis of our calculations are those for the year 1869-70. It will be observed that there are but six or eight sources of income open to Municipalities, under the "Towns' Improvement Act." Before levying taxes under some or all of these sources, sanction must be obtained from Government. Every year each Municipality sends to Government an estimate for the forthcoming year, with its expected receipts and expenditure arranged in a prescribed form, and also a report of the past year's income and outgoing. The members of Government,—or rather a young gentleman called the Under-Secretary, without the faintest knowledge of the locality and its wants, freely criticizes both sides of the account, fixes the sum to be paid for the police, and with an affectionate display of "study for the people's welfare," suggests the imposition of fresh taxes. The same officer also, in some artful and mysterious way, wholly incomprehensible, apparently, to the members of a single Municipality in the Presidency, "strikes" the Government contribution for the year. It would take up too much space to give, in detail, the actual sums collected and spent in each Municipality, under every head of receipt and expenditure, so we content ourselves with the total amount raised in 1869-70 by each Municipality, and call it "*The Year's Taxes.*" We arrive at the total of "*The Year's Taxes,*" in each case, by eliminating from the *gross Receipts* all *State contribution, loans, balance forward,* and so forth. In like manner we have calculated the proportion borne by each main head of *Expenditure* to the *gross Receipts* for the year. As, however, the charge for police is a fixed charge against each Municipality, irrespective of any variation in income from *loans, recoveries,* and such like, we have shown the percentage of the police charge to "*The Year's Taxes.*"

Names of Municipalities.	Amount of the Year's Taxes for 1869-70.	Amount of gross Receipts for 1869-70	The percentage yield of each source of Income to "the Year's Taxes."					The per-centage of Police charge to the year's taxes.	The percentage under each head of expenditure to gross Receipts.				
			House Rate.	Arts, Profession Tax.	Tolls.	Carriage and Cart tax.	Fees and Fines.		New works.	Repairs.	Conservancy.	Establishment.	Expended other than under Section 25.
	Rs.	Rs.											
Adoni	13,100	18,600	30	...	42	15	9	10	28	5	16	10	14
Anantipoor	4,600	6,800	17	...	63	14	2	9	12	30	22	17	4
Bellary	47,400	83,300	33	...	37	22	5	16	11	16	22	6	20
Berampore	12,700	20,200	21	19	47	9	1	31	30	4	16	11	18
Bimlipatam	7,800	12,300	...	25	69	4	...	24	39	6	15	13	1
Calicut	19,500	30,900	51	28	...	12	7	54	9	19	15	9	2
Cannanore	4,600	10,900	47	3	...	36	3	25	30	...	27	11	3
Coconada	15,800	27,800	29	39	25	3	2	29	39	10	9	6	8
Coimbatore	17,100	31,000	24	...	55	12	6	29	14	21	16	9	10
Conjeveram	6,700	18,900	7	2	66	18	4	68	7	...	32	9	12
Cochin	7,800	12,200	55	39	...	1	2	46	5	23	14	15	6
Coonoor	6,100	10,800	37	20	...	15	26	25	13	23	23	14	4
Cuddalore	15,800	30,100	18	..	54	24	3	57	4	5	30	13	1
Combaconum	37,800	64,000	35	...	50	6	6	29	30	7	20	4	2
Cumbum	4,700	8,200	28	23	27	15	3	37	22	6	9	16	1
Cuddapah	18,700	28,400	27	27	37	8	1	27	27	13	22	10	7
Chicacole	8,300	12,300	23	.	66	7	1	35	9	11	20	14	16
Ellore	11,200	14,900	20	30	40	8	...	23	43	...	23	9	...
Gooty	8,900	9,600	8	...	75	10	4	6	8	41	32	14	2
Guntoor	15,700	30,300	12	30	38	10	7	28	9	2	18	7	21
Kurnool	17,900	28,300	36	...	42	11	9	35	21	2	25	8	14
Masulipatam	16,600	23,400	25	21	41	7	4	34	18	15	18	7	9
Madura	34,200	105,300	16	20	58	7	1	50	11	3	20	7	9
Mangalore	11,400	22,400	39	35	8	10	6	69	3	12	16	12	14
Mayaveram	16,700	26,700	19	28	43	4	3	21	10	5	22	8	8
Manayndi	13,500	23,000	...	40	56	...	3	29	30	6	6	7	17
Nellore	13,900	17,900	44	...	30	19	4	36	11	14	25	14	3
Negapatam	35,100	51,800	24	31	33	3	8	25	6	14	25	7	19
Ootacamund	19,600	45,400	61	17	...	14	6	46	24	15	20	9	6
Palghat	14,600	24,300	15	8	75	...	2	42	13	26	8	6	2
Palamcottah	14,100	24,700	16	.	63	10	2	25	2	13	11	16	36
Palcondah	6,500	7,600	14	18	61	5	...	...	49	6	8	29	...
Rajahmundry	9,900	15,500	25	29	33	4	6	37	8	22	21	8	4
Salem	26,900	58,000	26	20	39	6	6	22	3	38	18	4	6
Tellicherry	6,200	14,200	64	22	...	8	5	133	...	...	10	14	...
Tanjore	43,800	79,000	24	28	42	3	2	28	12	16	20	7	15
Tinnevelly	17,400	28,200	18	...	69	8	2	25	39	11	11	8	10
Tuticorin	9,000	12,100	...	22	71	3	2	25	1	24	11	15	26
Trichinopoly	48,200	99,100	19	19	[illegible]	15	4	31	16	15	14	7	16
Visagapatam	20,600	28,900	32	...	[illegible]	11	1	28	9	13	25	13	3
Vizianagrum	10,700	13,500	...	19	58	23	1	25	26	7	22	14	...
Vellore	18,900	55,100	15	16	55	11	1	30	9	5	10	4	9
Wallajahpet	6,200	14,900	...	14	77	7	1	35	6	6	23	20	8

This Table offers us such an *embarras de richesses* in the way of anomalies that we hardly know where to begin our comments. Perhaps the point of most importance to the general public is the serious tax on the trade of the country collected in the shape of tolls by some 37 Municipalities. In eleven of these towns, the receipts from tolls average 69 per cent. of the income of the Municipality, SIXTY-NINE PER CENT! It must be remembered that almost every town has also a carriage and cart-tax, yielding about 10 per cent. of the Municipal receipts, the payment of which exempts the residents from the tolls. Unless, therefore, the town is itself a very large centre of trade in which case a certain portion of the tolls may be levied on the carriage of goods brought for local consumption, nearly the whole of this enormous tax is taken—not from any local source—but from the general trader, who so far from having the least interest in the Municipality, may hardly be aware of its existence. In other words, every little colony of settlers who choose to apply to have the *Towns' Improvement Act* put in force in their village,

acquire the power of bleeding the general public to the extent of from 50 to 70 per cent. of the total amount they themselves may consider necessary to repair their village roads, make new drives, and furnish themselves with latrines, lights, whitewash deodorisers, dog and pig-killers, and other sanitary comforts. But some may say, if the general trader uses the Municipal road, why should he not pay toll? We are not advocating the discontinuance of tolls *in toto*, although we are alive to the fact that considering the obstruction to traffic, and waste in the machinery for collection involved, it would be better if the sums necessary for repairing roads could be got in some other way. But we blame the Government severely for permitting the abuse of tolls. Take these eleven Municipalities, in which 69 per cent. of their income is obtained by tolls, and see what percentage of "*The Year's Taxes*" they spend upon *all* their roads, tolled and untolled. .

One town—Conjeveram, where tolls contributed 66 per cent. of income (namely, Rs. 4,462) in 1869-70, spent Rs. 29 on road repairs within the year; and there is no evidence that even this sum was spent on the roads tolled. Nevertheless, the President of the Conjeveram Municipality naively says "the working of the commission has, on the whole, been satisfactory"—satisfactory to themselves we apprehend! The average percentage of "repairs" of every description—roads, drains, wells, &c., to *The Year's Taxes*, in these eleven Municipalities, in 1869-70, is 27. On the ground therefore of some infinitesimal damage done to those portions of the main roads, which are situate within Municipal limits, the internal trade of the country has not only to pay to each Municipality the 27 per cent. of its income, which covers the whole maintenance of main and cross roads, drains, wells, &c., but to contribute 40 per cent. towards the general cleansing and improvement of the town. Is this sanctioned on the ground that each village is a sort of nest for stray cholera germs, which the Sanitary Commissioner is now hunting up throughout the Presidency, and therefore a standing menace to the country at large?

By way of further illustration, take an Ootacamund cart, which goes to the Pothanoor Railway Station for goods; the distance is about fifty miles, of which, possibly, three miles are within Coimbatore Municipal limit. Going and coming the cart has to pay, besides four Local Fund tolls, two or four Municipal tolls (we are not sure which) for plying along that small portion of the highway which runs through the Coimbatore Municipality. The charge is now preposterous; but when Mettapollium and other villages along the route, have *their* Municipalities and tolls, Ootacamund and Coonoor will be virtually cut off altogether from access to the railway.

The tendency of all local taxation, if not carefully checked, is to burden and depress the general interests of the country, for the sake of insignificant local improvements. Tolls are specially open to this objection. If permitted as heretofore, in certain places, they are simply transit duties in the worst form, and will reproduce that state of things which existed in the north of India some years ago from "Town Duties," by which black mail was levied upon articles of commerce in every large town between Delhi, and Calcutta. Octroi duties on three or four articles of general consumption, with certain limitations, seem to us vastly preferable to tolls, because by a proper system of bonded warehouses or drawbacks, the transit of dutiable articles, not intended for consumption within the town, can escape taxation altogether. Take tobacco, betel-nut and betel-leaf, for instance, and confine the local impost to these three articles, it would surely not be difficult to set aside a particular yard or open warehouse, where goods of the dutiable class in transit, and not meant for consumption within the town, might be stored. Perhaps, better still—all such goods might pay on entry, and receive drawback if exported, with or without bulk being broken. In Bangalore, the power to collect a small cess on these three articles is sold by auction, and nearly a lac-and-a-half is netted by the Municipality, without undue pressure, as far as we know. Such taxes are more popular with natives than tolls, and are common all over the continent of Europe Unfortunately our Insular education and prejudices make us test everything by certain rules, well enough suited to ourselves, but not necessarily applicable to all people and places under the sun.

The professed object of our whole political machinery is to extend and develop trade in all directions. If China, or any other conservative country, levies duties or taxes, which interfere with our commerce, all the energies of diplomacy are exerted to remove the obstacles, and even resort to physical force is occasionally considered justifiable. When each petty State, in a country like Germany, taxed traffic under the name of "Customs," everyone saw the intolerable barbarism of the proceeding. Yet, when every town along a highway mulcts the trader, for its own exclusive benefit, by means of tolls, it is merely a wholesome development of local resources! With one hand we spend millions on roads and railways, because in a country where local famines are of frequent occurrence, it is especially important to facilitate communication between district and district; and with the other, we put it into the power of each town or village to lock the wheels of our locomotives. As Ootacamund is not situated on the highway to any other district, and could only levy tolls on the carriage of goods consumed by its own townspeople, we have no Municipal tolls. This inability to compel the rest of the Presidency to pay for our bazaar latrines, obliges us to have recourse to loans, and affords us quite an exceptional claim to State aid.

MUNICIPAL FINANCE.—BOMBAY TOWN AND ISLAND.

REVENUE FOR THE YEAR 1870.

THE following statement exhibits at one view the actual net income of the year 1870, as contrasted with the original and revised estimates:—

	Original Budget Estimate.	Revised Budget Estimate.	Actual Income.
Municipal Fund Proper:—	Rs.	Rs.	Rs. a. p.
House Rate	7,81,718	7,20,395	6,92,783 0 6
Wheel Tax	2,63,000	2,51,313	2,50,581 8 1
Certificate Tax	1,50,000	16,77.	17,655 12 5
Town Duties	3,00,000	6,50,680	5,94,988 8 5
Liquor Licenses	1,40,000	1,30,695	1,23,691 12 0
Land Conveyance Licenses	13,200	8,901	10,401 0 0
Fines and Penalties	20,000	13,120	15,580 9 11
Miscellaneous Fees	50,000	62,617	51,119 0 3
Market Fees	1,50,000	1,53,542	1,80,634 15 6
Tobacco Duty and Licenses	1,57,000	1,45,860	1,39,830 0 0
Halalcore Cess	2,25,000	2,16,723	2,13,197 6 7
Government contribution in lieu of House Rate	30,000	30,000	30,000 0 0
Sundry Receipts:—		26,540	
Books of Fares	.....	....	314 0 0
Loan Fees	....	....	320 0 0
General Sales Account	....	....	783 2 6
Ground Rent	.. ..	.....	267 8 8
Saving on account of unpaid Wages, &c.	.....	....	3,845 12 6
Rent of rooms in Foras Road Stables	.....	....	370 7 11
Government Foreshore at Mazagon.	.....	....	1,409 0 0
Unclaimed Property	.....	....	1,150 0 5
Recoveries for damages to Stores	....	....	4 6 0
Health Department, unpaid Wages, &c.	.....	....	47,416 6 10
Rupees	23,69,918	24,36,255	23,46,244 8 6
Police Account:—			
Police Rate	3,10,000	2,41,432	2,37,643 0 10
Imperial contribution of ¼ of total estimated Expenditure	97,814	99,882	99,882 0 0
Government contribution as Police Rate	12,800	10,000	10,000 0 0
Municipal contribution	....	71,826	68,947 5 4
Rupees	4,19,614	4,33,140	4,16,472 6 2

	Original Budget Estimate.	Revised Budget Estimate.	Actual Income.
Lighting Account:—	Rs.	Rs.	Rs. a. p.
Lighting Rate	2,42,461	2,37,461	2,36,993 15 5
Government contribution on account of Lighting Rate	10,000	10,000	10,000 0 0
Rupees	2,52,461	2,47,461	2,46,993 15 5
Water Works Account:—			
Water Rate	40,00,000	3,80,000	3,66,064 3 10
Do. through Executive Engineer, Presidency	....	....	145 6 0
Sundries as per Income and Expenditure Account	....	....	776 0 0
	40,00,000	3,80,000	3,66,985 9 10
Grand Total	34,42,193	34,86,856	33,76,696 7 11

DIRECT OR ASSESSED TAXES.

The following table shows the gross rateable value of landed properties in 1870 as compared with each year in the preceding decade:—

Years.	No. of Properties assessed.	Rateable value.
		Rs.
1860	14,797	68,66,780
1861	14,913	69,49,985
1862	17,059	69,46,420
1863	17,166	71,59,785
1864	17,924	1,15,81,130
1865	17,959	1,20,76,695
1866	21,100	1,44,84,893
1867	22,629	1,63,09,535
1868	22,010	1,67,49,975
1869	20,629	1,69,41,220
1870	21,454	1,72,20,425

The depreciation in the value of house property was again considerable, although the Assessor enhanced the assessment in 516 cases, and

although 501 properties were assessed for the first time at an aggregate rateable value to Rs. 2,00,754. The gross rateable value of property in Bombay is shown to have diminished by Rs. 2,20,375.

WHEEL TAX.

The gross assessment in 1870 was only Rs. 2,54,561-14-0, against Rs. 2,67,342 in 1869.

The average number of vehicles and animals assessed for each quarter will be seen in the following table :—

Wards in which kept.	Horse Conveyances. Four Wheels.	Horse Conveyances. Two Wheels.	Horses.
Fort and Colaba	445	74	534
Bhoolesshwur	457	182	508
Oomercarry, Masagon, and Parell	362	126	504
Mahim and Camatesepoora	156	86	242
Mandvee	293	78	330
Girgaum and Malabar Hill	548	165	852
	2,361	661	2,970
Public Omnibusses	13	..	62
Hack (4 wheel) Conveyances	47	..	94
Hack Buggies	..	580	1,160
	2,321	1,241	4,286
	Bullock Conveyances.		
Private Riding Hackeries	...	75	150
Public do do.	...	511	1,022
Labour Carts	...	5,641	11,282
	..	6,227	12,454

CERTIFICATE TAX.

This was abolished in the course of the year.

Receipts to the amount of Rs. 17,655-12 5 were realized on account of assessment for 1869.

WATER RATE.

The following table shows the yield of the water rate for each year from the commencement of the water-supply up to 31st December 1870 :—

Year.	Amount of Assessment on House valuation.	Amount of of Meter Assessment	Amount of Mill Assessment without Meter prior to affixing of Meter.	Amount of Government Meter Readings.	Total Yield.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p	Rs. a. p.
1861 ..	27,102 15 8	7,271 4 6	11,245 9 10	.....	45,619 14 0
1862 ..	50,360 15 0	4,460 3 1	8,981 13 0	.....	63,811 15 1
1863 ..	86,406 0 0	6,786 1 0	16,334 13 0	.....	1,09,525 14 0
1864 ..	2,39,070 7 0	7,349 13 0	33,181 12 0	.....	2,79,602 0 0
1865 ..	3,00,288 3 0	37,958 4 0	33,685 13 0	.....	3,71,939 4 0
1866 ..	2,35,713 7 5	1,46,545 5 8	36,559 8 0	.....	4,18,817 5 1
1867 ..	2,27,007 3 11	1,71,752 7 11	.....	.....	3,98,759 11 10
1868 ..	2,34,081 12 10	1,02,715 0 5	.....	1,56,680 0 0	4,93,420 13 3
1869 ..	2,52,046 3 4	76,713 11 3	.....	42,965 6 7	3,71,725 5 2
1870 ..	2,68,916 15 9	78,040 7 5	.....	34,224 2 9	3,81,181 9 11

As compared with the previous year, there is thus an increase of Rs. 9,456-4-9 due to the extension of water-supply to private houses.

GENERAL REMARKS AND RECOMMENDATIONS WITH REGARD TO DIRECT OR ASSESSED TAXES.

The entire cost of collection and assessment was Rs. 1,04,740 in 1870, against Rs. 1,18,678 in 1869, being 5½ per cent. on the gross assessments of assessed rates and taxes, and 5¼ per cent. on the actual cash recoveries within the year.

The following figures will give some idea of the incidence of the assessed rates and taxes, and the labour in recovering them.

The number of householders on the register is 14,533 owning 21,654 properties.

The number of householders paying house rate between

Rupees 1 and Rs.	50 per annum was	11,905
Between Rupees 51 and	100	1,412
do. 101 and	250	615
do. 251 and	500	232
do. 501 and	1,000	233
do. 1,001 and	2,000	83
do. 2,001 and	3,000	19
do. 3,001 and	4,000	6
do. 4,001 and	5,000	3
and above	5,000	9

The police rate is paid by 25,097 persons.
and the lighting rate by 25,099 ,,
while the halalcore cess is paid by 16,007 families served.
and water rate by 10,451 persons.
and wheel tax by 8,263 ,,

Collected half-yearly in advance.
- The House Rate required..... 44,699 bills in the year.
- Police and Lighting Rate and Halalcore Cess, collected together; required..... 89,211

Collected quarterly in arrears.
- Water Rate 41,184
- Wheel Tax 16,677

Total number of bills per annum ..... 185,063.

Besides these bills it was necessary to issue 16,602 notices of demand to defaulting tax-payers, and finally to issue 11,546 distress warrants, of which 7,594 were actully executed. No less than 4,863 of these were for occupiers' rates.

I am constrained here to reprint recommendations made by me in my annual report for 1868, when we had only three years' experience of the present insane system of rate recovery. I then said :—

"We have now had 3 years' experience of the system of recovering rates from occupiers—a system which was introduced by the Legislature without the least previous inquiry as to whether it would be suited to this country or to the special circumstances of Bombay. Making every allowance for alleged lack of supervision and mismanagement, can anybody seriously advocate the continuance of the system?

"I do not propose, as some think, that the house owners should recover all the occupiers' rates for nothing—that would be obviously unfair. What I would say to the owner is,—'My good Sir, you have in your house a number of tenants whom it is difficult for me to get at or find when I want to recover Municipal dues. On the other hand, you have machinery always on the spot for the collection of your rents. Your agents know all the tenants, and can always obtain access to them. You can consequently recover my rates with your own rents at a much smaller cost than I can recover them independently, and with little or no risk of loss. It is your interest and mine that these occupiers' rates and all Municipal rate shall be recovered promptly and at a low cost. Let us then make a bargain. Do you pay all the occupiers' rates to me with your house or owner's rate, and I will allow you a deduction of so much per cent. for the trouble of recovery.'"

But plainly, I propose to utilize the machinery which, for their own rent recovery, house-owners always have on the spot, for the recovery of our assessed rates also, instead of maintaining a separate and expensive staff of our own. The occupier, instead of being called upon to pay half-yearly a sum which, taken in the lump is a burden to him, will pay it in driblets monthly in his rent to the house-owner, without the constant dread of Municipal receivers, notice, and distress warrants.

Besides the reduction in the cost of collection, and consequent diminution of Municipal rates (which I estimate at not less than ¼ per cent.), the tax-payer will make but one payment for the Municipal rate, halalcore cess, and water rate, instead of *four*—for house rate, police, and lighting rate, halalcore cess, and water rate—while the rate payer desiring to clear himself of all demands and annoyances can do so by paying in at once for the whole year, and receiving a debate, 5 per cent. The following are the skeleton provisions of a code to legalize these proposals, and I commend them to the early consideration of the Justices.

INDIRECT TAXATION—TOWN DUTIES.

A statement follows which shows the receipts from the Town Duties in each month of the year, together with the cost of collection.

This is the abstract :—

				Rs	a.	p.
Gross Revenue				6,31,928	4	9
Cost of Collection	23,623	10	2			
Refunds	13,316	2	2			
				36,939	12	4
Net Revenue				5,94,988	8	5

The cost of collection was thus 3¾ per cent. on the gross revenue.

I have pressed continually for the sanction of Government to an arrangement by which the Town Duties may be collected by the Traffic Manager of the Harbour Trust.

I am happy to say this change has been effected. By it the annoyance to the public will be reduced to a minimum, and the cost of collection will be much lighter.

It will be seen that the—

	Rs.	a.	p.
Grain Duty yielded	1,77,569	12	7
Wines and Spirits	1,20,857	12	8
Beer	10,040	14	9
Ghee	1,06,583	15	5
Timber	56,135	14	1
Metals	51,306	13	11
Sugar, &c.	1,07,638	2	5

QUINQUENNIAL REVIEW.

Nearly all the preceding pages were in type early in the month of April, when it first became evident that owing to the falling off in Town Duties' receipts there would be a serious deficit in the income of the present year—a deficit which, added to unforeseen expenditure on the Vehar dams, would amount to nearly one-sixth of the entire Municipal income for the year. Everything gave way to an emergency so great, and during April, May, and June, my attention was constantly devoted to the question of reducing the expenditure, and by every other possible way to bringing about an equilibrium between the income and expenditure.

Great progress had been made up to the middle of June, though the important question of police expenditure still remained unsettled. At this time (the end of June) the meeting for discussing the reform of the Municipal Constitution was somewhat suddenly summoned. In the

ourse of the debate on this question, it was painfully apparent to me that gross misapprehension existed on the most important Municipal questions. For this reason, as well as because I was not able, at a few days' notice, to do more than generally explain errors as they arose, I determined to append to this report a complete review of the first five years under the Municipal Act of 1865, to record what had been done, to analyse and classify the expenditure and income of each year, contrasting the figures with those for 1865, the last year under the old Act, and gradually working out a statement of the financial condition of the Municipality at the close of 1870. Finally, I proposed to make certain important recommendations for the future, based on the results shown for the past.

The labour of preparing the necessary returns has been enormous, and we have been incessantly interrupted in it by Bench meetings. Even now the review is not nearly so complete as I could wish, or as I could have made it, had I had time to perfect it. Such as it is, however, I hope it will be of some use in the discussions now pending.

WHAT HAS BEEN EFFECTED BY WAY OF MUNICIPAL PROGRESS OR IMPROVEMENT.

First (and foremost)—An efficient Health Department has been organised, which is untiring in its labours to maintain the public health, and is ever watchful of the public weal.

Secondly—This department removed 116,127 tons of garbage in 1870, against 45,288 tons in 1865, an increase of about 110 per cent. I commend these facts to those who blindly and ignorantly, or ungenerously assert that the town is no cleaner now than it was in 1865.

Thirdly—A complete halalcore service and halalcore brigade has been organized, whereby 144 tons of night-soil are now daily removed from the centre of the town, against 75 tons removed in 1865.

Fourthly—All dangerous and offensive trades have been removed from the inhabited part of the town, and either driven from the island or located in sparsely-populated suburbs.

Fifthly—The slaughter-houses in the heart of the city have been closed, and the trade banished to the new and commodious buildings at Bandora, nine miles distant.

Sixthly—The five old markets have been destroyed and entirely new markets built in convenient parts of the town; the new properties, including the Bandora slaughter-houses, yielding 11½ per cent. on the outlay, and being valued at Rs. 19,58,000.

Seventhly—All the crowded Christian burial grounds, seventeen in number, situated in populous districts, have been closed, and new graveyards have been opened at long distances from the town.

Eighthly—The old main drain has been intercepted where it became an open cesspool, its contents carried by a low level sewer, being now discharged without cessation. The flow of sewage in the town is thus kept up instead of being ponded back for half the day (during flood tide) as of old.

Ninthly—The foul district of Camateepoora, and a part of the Fort have been sewered.

Tenthly—Vehar water has been supplied to 9,643 houses, against 6,470 in 1865, and the masses have about 100 more points than in 1865, at which they can obtain Vehar water free of charge.

Eleventhly—As a natural consequence of the improvements above recited, the mortality has fallen from 28,631 persons in 1865, to 14,888 persons in 1870—a reduction of nearly 100 per cent.

Twelfthly—The town has been lighted with gas.

Thirteenthly—The town has paid three-fourths of the cost of its police, has purchased and maintained a complete steam fire engine service, and has been relieved by the efficiency of the police from the cost of 1,000 private ramoosees, who have been discharged at a saving to the public of Rs. 1,20,000 a year.

Fourteenthly—Three handsome bridges have been constructed over the G. I. P. Railway, and the trade of the town thus saved from strangulation.

Fifteenthly—The following new roads have been constructed at Municipal expense:—

Norwrojee Hill Road, length	.....	2,173	feet.
Haines (Foras) ,,	,, ...	4,230	,,
Arthur (Foras) ,,	,, ...	1,100	,,
DeLisle (Foras) ,,	,, ...	12,800	,,
Road at Sewree,	,, ...	2,025	,,
		22,328 feet, or 4¼ miles.	

The following new roads have been constructed at the expense of Government or of the Railway Companies:—

Eastern Boulevard, length 2,590 feet.
Four Cross Roads on Esplanade, length 1,370 feet.
Queen's Road, 7,100 feet at the expense of Government, and 5,100 at the cost of the Municipality.

The following roads have also been improved and completed by widening or by constructing of footpaths:—

At Municipal expense, Gilder Road.. ..	from 33 to 80 feet, with footpaths.	
At Municipal expense, Camateepoora, Foras Road	from 30 to 60 feet.	
From Government contribution Bellasis Road	from 30 to 100 feet,	ditto.
By Esplanade Fee Fund, Market Road..	from 60 to 114 feet,	ditto.
By Esplanade Fee Fund, two branches of ditto	from 60 to 114 feet,	ditto.
From Government contribution, Warden Road	footpaths added.	

And 5¼ acres have been added to the public roads by the purchase of frontages from persons applying to rebuild.

It will be seen from the following table that new works from loan were executed costing upwards of 20 lacs of Rupees.

	Rs.	a.	p.
Market Buildings.			
Null Bazaar Market	1,30,770	1	7
Arthur Crawford Market	11,16,492	1	1
Fort Market	29,[illegible]	7	11
Bhooleshwur Market	84,780	15	4
	13,86,109	9	11
Overbridges and Road.			
Overbridges Foras Road, Nowroji Hill Road ..	3,07,895	1	11
	3,07,895	1	11
Drains.			
Fort Sewers..	78,637	4	8
Camateepoora Drains	1,91,047	8	10
Drains in Funnuswady and Agiary Lanes	7,106	6	1
Branch Sewer, Bellasis Road	1,853	12	3
Rs..	2,78,635	15	10
Total Rs..	20,02,640	11	8

Lastly, a general trust in the efficacy of sanitation has been created and a firm belief exists among the masses that disease can be averted by cleanliness and the prompt adoption of sanitary precautions. However impatient the people may be of Municipal taxation (which is still much lighter than in almost any large city) they will never consent to sanitary neglect in future. Each important district of the city will, year by year, insist more and more upon its right to Mnnicipal improvements of every kind, and the very agency now engaged in fomenting the cry for economy will find itself forced to consent to, or even ask for, additional aggregate expenditure.

This change in the feeling of the masses on the all-important question of cleanliness, is, in my humble opinion, worth all the money hitherto spent.

ORDINARY EXPENDITURE ACTUALLY INCURRED FROM 1865 TO 1870, BOTH YEARS INCLUSIVE.

The following statement classifies under 21 heads all the expenditure incurred in every year, from 1865 to 1870. I do not hold myself responsible for the expenditure incurred in 1865:—

		1865.	1866.	1867.
		Rs.	Rs.	Rs.
1	General Superintendence	94,354	1,31,622	61,337
2	Conservancy	8,01,230	7,28,256	7,06,461
3	Halalcore Service.....	...	5,47,790	5,27,435
4	Gas Lighting	8,680	1,31,622	2,33,210
5	Police	1,41,931	3,96,169	4,25,423
6	Water Works (Extension and Maintenance)	3,50,018	3,07,864	3,89,671
7	Drainage	2,33,173	2,69,360	4,71,707
8	Engineer's Establishment	98,777	50,031	43,324
9	Roads—Repairs and Watering	16,93,419	5,40,803	4,30,822
10	Improvements of Streets	7,26,356	33,234	26,798
11	Petty Works	33,804	....	....
12	Assessment and Collection of Rates and Taxes	1,26,472	58,638	71,531
13	Stores, Plant, and Live Stock	5,10,250	82,050	2,70,645
14	Markets and Slaughter Houses (Establishment, &c.)	14,084	1,64,247	1,92,425
15	Panwell Brick Works	....	....	1,43,094
16	Miscellaneous Establishments	9,721	21,250	45,687
17	Contributions	22,628	28,000	33,921
18	Pensions and Gratuities	343	14,430	2,580
19	Miscellaneous Charges	84,796	75,990	67,015
		49,59,341	35,81,375	41,42,994
20	Interest on Loans	.....	20,554	55,860
21	Sinking Fund	.....	....	17,500
	Total ..	49,59,341	36,01,929	42,16,355

		1868.	1869.	1870.
		Rs.	Rs.	Rs
1	General Superintendence.....	70,990	54,664	82,626
2	Conservancy	6,38,855	5,00,075	5,24,563
3	Halalcore Service	3,22,714	1,87,814	1,96,045
4	Gas Lighting	2,59,271	2,84,065	3,34,199
5	Police	4,39,791	3,77,468	4,16,472
6	Water Works (Extension and Maintenance)	2,41,424	2,66,515	3,47,355
7	Drainage.....	1,95,017	1,76,375	88,042
8	Engineer's Establishment	41,096	28,924	46,930
9	Roads—Repairs and Watering	3,43,290	3,29,939	3,78,482
10	Improvements of Streets	42,777	1,24,823	99,707
11	Petty Works	36,499	36,188	1,00,082
12	Assessment and Collection of Rates and Taxes	87,012	66,712	58,916
13	Stores, Plant and Live Stock	3,32,723	67,132	1,46,131
14	Markets and Slaughter Houses (Establishments, &c.).....	84,208	69,184	57,687
15	Panwell Brick Works.....	20,220	4,443	....
16	Miscellaneous Establishments	29,806	27,870	30,799
17	Contributions	6,000	34,166	49,136
18	Pensions and Gratuities	2,733	9,634	10,354
19	Miscellaneous Charges.....	10,981	13,105	69,993
		32,66,067	27,32,164	30,27,816
20	Interest on Loans	1,68,807	1,32,334	1,40,211
21	Sinking Fund	64,670	1,49,400	2,96,900
	Total.....	34,99,695	30,19,899	34,14,927

N. B.—Annas and pies are here omitted.

The ordinary expenditure in each of the six years under review was as follows :—

	Exclusive of payment of Debts and Interest.		Inclusive of payment of Debts.
1865	22,59,242	.....	42,59,242
1866	25,21,275	.....	36,01,229
1867	40,43,994	.....	42,16,355
1868	32,66,068	.....	34,66,066
1869	27,38,165	.....	30,19,900
1870	30,27,515	.....	34,14,927
Total..Rs.	2,17,35,779	.....	2,36,98,519

The figures do not, I submit, indicate "an ever-increasing expenditure" but the reverse; a glance at the details of the statement will show that in most of the principal items of Municipal expenditure there has ever been a steady decrease.

	Cost in 1865.	Cost in 1870.	Decrease per cent.
	Rs.	Rs.	
General Superintendence	94,854	82,626	12 6/16
Conservancy	8,01,230	5,24,863	34 7/16
Halalcore Service, commenced in 1866	5,47,790	1,96,045	64
Vehar Water Works, Maintenance and Extension	3,59,013	3,47,355	3 3/16
Executive Engineer's Establishment	98,777	46,930	52 7/16
Roads	In 1865* 16,93,419. In 1866 5,40,803	3,78,482	30

* N. B—In 1865 the amount spent on roads was exceptionally high, so the comparison is more fairly made with 1866.

ORDINARY INCOME REALIZED IN EACH YEAR FROM 1865 TO 1870, BOTH YEARS INCLUSIVE.

The following statement classifies the income derived from all sources under six heads, viz. :—

	Received in 6 years. Rs.
Direct Taxation	1,01,11,642
Indirect Taxation	29,16,496
Market Revenue	5,88,777
Service Rates	30,98,669
Government Contribution	7,66,258
Miscellaneous	7,34,545

Sources of Income.	1865.	1866.	1867.
Direct Taxation.			
House Rate	10,57,379	7,16,004	9,84,068
Police Rate	....	2,03,688	4,11,040
Lighting Rate	....	98,417	1,82,849
Wheel Tax	2,32,698	3,13,330	2,88,178
License or Certificate Tax	....	2,65,889	2,01,996
Total....Rs.	12,90,077	16,97,323	20,18,131
Indirect Taxation.			
Town Duties	5,04,789	5,132	....
Tobacco and Snuff	....	1,20,390	1,18,426
Liquor Licenses	1,45,873	46,924	1,04,808
Land Conveyance Licenses	2,023	6,776	3,540
Total....Rs.	6,52,685	1,79,222	2,26,774
Markets and Slaughter Houses.			
Stall and Slaughter Fees, &c	28,323	58,301	32,674
Total....Rs.	28,323	58,301	32,674
Service Rates.			
Halalcore Cess	....	1,93,852	1,45,824
Water Rate	1,78,719	6,49,121	3,73,006
Total....Rs.	1,78,719	8,41,973	5,18,830
Government Contribution.			
Towards Municipal Improvement	....	....	....
Towards Police Charges	....	....	1,50,000
Do. Police Rate	....	....	....
Do. Lighting Rate	....	....	....
Total....Rs.	....	....	1,50,000
Free Lands	....	....	....
Miscellaneous.			
Fines and Penalties	58,543	37,269	16,202
Miscellaneous Fees	34,040	46,970	55,869
Sundry Receipts Municipal Fund	29,234	14,273	12,030
Do. Water Works	3,429	3,561	1,144
Do. Drainage	88,137	40,930	329
Do. Halalcore Account	....	5,430	3,429
Do. Police Account	....	....	557
Do. Lighting Account	....	....	4,555
Total....Rs.	2,13,983	1,47,853	94,115
Grand Total....	23,63,787	29,14,672	30,40,524

Sources of Income.	1868.	1869.	1870.
Direct Taxation.			
House Rate	9,30,537	7,59,848	6,92,783
Police Rate	3,75,607	2,68,639	2,37,643
Lighting Rate	2,46,071	2,47,714	2,36,994
Wheel Tax	2,63,514	2,55,893	2,60,561
License or Certificate Tax	1,06,597	1,51,008	17,656
Total..Rs.	21,07,389	16,73,095	14,35,657
Indirect Taxation.			
Town Duties	....	3,08,296	5,04,089
Tobacco and Snuff	1,36,762	1,51,179	1,39,830
Liquor Licenses	1,20,566	2,49,077	1,28,693
Land Conveyance Licenses	12,240	15,692	10,491
Total..Rs.	2,69,568	7,19,245	8,69,002
Market and Slaughter Houses.			
Stall and Slaughter Fees, &c	1,01,780	1,87,064	1,80,635
Total..Rs.	1,01,780	1,87,064	1,80,635
Service Rates.			
Halalcore Cess	3,91,454	2,26,238	2,13,197
Water Rate	4,98,377	3,61,797	3,66,064
Total..Rs.	8,89,831	5,90,055	5,79,261
Government Contribution.			
Towards Municipal Improvement	73,000	30,000	30,000
Do. Police Charges	1,87,129	99,892	99,892
Do. Police Rate	....	15,115	10,000
Do. Lighting Rate	....	31,250	10,000
Total..Rs.	2,60,129	1,76,247	1,49,892
Free Lands	2,40,756	....	.....
Miscellaneous.			
Fines and Penalties	11,924	17,442	15,580
Miscellaneous Fees	48,107	42,459	51,121
Sundry Receipts Municipal Fund	12,250	26,874	26,907
Do. Water Works	1 054	9,188	921
Do. Drainage	70	567	....
Do. Halalcore Account	9,730	4,172	....
Do. Police Account	....	65	....
Do. Lighting Account	110	48	....
Total..Rs.	83,251	1,00,815	94,528
Grand Total..	38,52,674	34,46,521	33,08,965

It will be observed that whereas in 1865 the income from indirect taxation was half as much as that from direct taxation in 1866, owing to the abolition of the town duties, the yield of indirect taxation was only about one-ninth of direct taxation. Direct taxation was thus forced upwards from 13 lakhs in 1865, to 20 lakhs in 1868, but has again fallen in 1869 and 1870, in direct taxation gaining ground, owing to the revival of town duties in 1869.

It is worthy of note that Government, during the past six years contributed the insignificant sum of Rs. 7,36,258 towards Municipal expenditure, which is equal to rather less than 4 per cent. of the whole revenue recovered.

COMPARISON OF SIX YEARS' ORDIANRY INCOME AND EXPENDITURE, FROM 1865 TO 1870, BOTH YEARS INCLUSIVE.

Years.	Ordinary Income was	Ordinary Expenditure was	Deficit.	Surplus.
	Rs.	Rs	Rs.	Rs.
In 1865	23,63,787	49,59,342	25,95,555	....
1866	29,14,672	36,01,929	6,87,257	....
1867	30,40,524	42,16,355	11,75,831	....
1868	38,52,674	34,66,066	....	3,66,608
	1,21,71,657	1,62,63,692	*44,58,643	†3,66,608
1869	34,46,521	30,19,900	....	‡4,26,621
1870	33,08,965	34,14,927	§1,05,962	....
Total....	1,89,27,143	2,26,98,519	45,64,605	7,93,229

Net Deficit.... ¶37,71,376

Deficit up to 1868 ..... 44,58,643*
Surplus.. ..... 3,66,608†
40,92,035

Less—
Surplus in 1869 ..... 4,26,621‡

Less—
Deficit in 1870..... 1,05,962§
3,20,659

Net Deficit ..... 37,71,376¶

The Corporation was thus launched, as the Government of India feared it would be [illegible] of Rs. 23,32,462, and with an ordinary revenue which has never come up to the [illegible] current expenditure only, *without paying any debts.*

Successful financial administration under such circumstances has, of course, been an impossibility. A [illegible] of which year a Select Committee of the Legislative Council endeavoured to ascertain what the true position of the Municipality was, and to estimate what sum would suffice to meet all liabilities.

It reported that 15 lakhs would suffice, and this sum was ultimately advanced by the Government of India. But the actual figures given hereafter prove that this estimate was deficient by Rs. 7,76,928.

Captain Hancock, in his examination, also stated that he estimated that 20 lakhs would be required if everything was to be paid off in December of 1868. But both his and the Controller's estimates were over-ruled.

This is the detail of the Loans remaining due on 31st December 1870 :—

Market Loans	Rs. 6,15,000	Having currency for between 15 & 16 years more.
House Rate Loan	11,83,060	
Government Loan of 15 Lakhs	12,27,090	Payable by monthly instalments in 8 years.
	30,25,500	
New Bank of Bombay Cash Credit account	1,42,534	
	Rs. 31,68,034	

Against this balance, which is equivalent to about one years' income, I have already recorded new works costing Rs. 20,02,460; the balance has gone to provide for the deficits detailed in preceding paragraphs. I have already, under the head of markets, proposed that a further sum of not less than the extra 5 lakhs of rupees which have been spent on markets and slaughter houses should be raised to meet whatever may be the existing deficit.

I have only to add that the present law regarding Debenture Loans is most crude and cumbersome, while the currency of such loans (20 years) is too short. Loans for important miscellaneous public improvements should be spread over not less than 30 years. Loans for greater works, such as Drainage and Water-supply should be extended to seventy-five years, as has, I believe, been recommended by the highest sanitary authorities in England. The burdens of existing rate-payers will thus be materially lightened.

MUNICIPAL FINANCE.—POONA.

From E. T. Richardson, Esq., Chairman, Poona Municipal Managing Committee, to J. E. Oliphant, Esq., President of the Municipality, Poona, dated 24th August 1870.

SIR,—As required by the 13th and 14th of the amended Rules of the Poona Municipality, sanctioned by the Government Resolution No. 686 of the 17th March 1869, I have the honour to transmit a Report on the Proceedings of the Municipality for the official year 1869-70.

The sanction of Government to substitute the octroi tax in lieu of the tolls hitherto levied on vehicles and animals entering the city was received on the 19th March 1869, and after the necessary notices had been published, fixing a day for the sale of the right of collecting the tax, it was sold by public auction on the 30th idem for one year, and was purchased by Mr. Chinto Pandoorung Kalay for Rs. 1,23,000; but after the sale was concluded, Mr. Nusserwanjee Pestonjee, who I presume, regretted not having bid more, and was anxious to get the contract, petitioned the Chairman of the Municipality, praying that the contract might be resold, or that it might be given to him for Rs. 2,000 more than it was sold for, as at the time of sale he was under the impression that only four annas was to be charged on a cart laden with grain, but that he had subsequently been given to understand that eight annas per cart was to be the tax; but as his representation was groundless, as the tariff rates were published by copies being posted in different parts of the city, and distributed to the parties who attended the sale, the matter was referred to the President, and the sale confirmed; but subsequently, about 17 days after the first contract, Mr. Chinto Pandoorung Kalay was induced to give up his contract, in consideration of a sum of Rupees 2,000 being granted him as a bonus; and the contract was then jointly sold to Mr. Nusserwanjee Pestonjee and Trimbuck Luximon for Rupees 1,28,000, or Rs. 5,000 more than it was previously sold for, but the Contractors have failed to pay up their two last instalments, and there is now a sum of Rs. 16,577-11-2 due by them, to recover which, the Commissioners will most likely have to sue them in the Civil Court.

The contract for the collection of tolls last year sold for Rs. 43,500, so that the octroi tax realized Rs. 84,500 more than the tolls, and enabled us to introduce great changes in the scavenging and improvement of the city.

With my letter No. 630, dated the 22nd December last, I submitted surveys and levels of a project for supplying water to the eastern portions of the city, where the inhabitants at present suffer considerably during the hot season from want of water, and have at all times of the year to go to a considerable distance for it, owing to the water supplied from a private aqueduct, known as "Roopram Chowdree's," failing during the commencement of the hot season, from February to June, or until the monsoon sets in, and to our not being able to supply it from the aqueduct to that part of the city, which is on a higher level than any portion of the aqueduct running from south to north through the western half of the city, but upon the correspondence being referred to Lieutenant Buckle, the Executive Engineer for Irrigation Works, that Officer was of opinion that water might be supplied at a smaller cost from the Kurruckwasla Canal, when ready, and this suggestion having been approved of by you, the papers were laid before the Commissioners at a General Meeting, when it was finally decided to adopt Lieutenant Buckle's suggestion of supplying water to this part of the city from the Kurruckwasla Canal: but a further suggestion of the Managing Committee to supply the deficiency at least partially by means of pipes of 3-inch diameter now in the possession of the Municipality, which are lying in heaps in different parts of the city, being laid down from the "Ambyacha-Coondee," and the water from that part of the aqueduct being raised and supplied by means of a Gwynne's Centrifugal Force Pump, worked by manual labour, until the Kurruckwasla Canal is ready, has been sanctioned at a cost of Rs. 2,000, and the work will be completed by the end of January next.

The Municipal Revenues are derived from the several items noted below authorized by Government:—

1. Octroi Tax, or Import Duty on articles brought into the city for sale or consumption.
2. House Tax.
3. Tax on Bands of Music, Booths, and Platforms.
4. Fines of breach of Municipal Rules.
5. Fines on Stray Cattle

Statement showing the Sums realized and Expenditure incurred during the official year ending 31st March 1871, *by the* POONA MUNICIPALITY, *prepared in accordance with the Form transmitted with the Collector and Magistrate's Endorsement No.* 586, *dated 21st May* 1870.

Name of Town.	Year in which the Municipality was established	Annual Income.	Rs.	a.	p.	Annual Expenditure.	Rs.	a.	p.	Balance on the 1st April 1871. Rs.	a.	p.
Poona City	1858..	Realized by the sale of the right of collecting Import Duties	1,14,180	14	0	Correspondence and Collection Establishment	5,794	0	8	16,940	0	7
		Fees levied on Country Music...	1,180	0	0	Aqueduct	804	0	0			
		Do. on European do.	13	14	0	Fire Engines, Establishment for, and Repairs to, &c.....	2,953	8	6			
		Do. on Caste Dinner, and Booths.	163	6	0	Sanitation.....	1,200	0	0			
		Fines levied on Stray Cattle	169	6	8	Vaccination	558	0	0			
		Do. for breach of Municipal Rules ... :	217	12	9	Conservancy and Scavenging.....	31,044	2	7			
		Sale of old Materials	636	7	6	Overseer and Superintending Works.	3,984	0	0			
		Do. of Municipal Rules.....	15	8	0	Remuneration to Auditors.....	300	0	0			
		Do. of Proceeds of City Sweepings and Night-Soil	1,441	8	0	Repairs and Construction of Roads, Gutters, and Bridges in the City ..	40,370	0	0			
		Fines imposed upon the Establishment	45	14	5	Repairs and Construction of Municipal Buildings.....	1,000	0	0			
		House Tax for the year 1869, and arrears of previous years	19,650	0	0	Constructing and extending Aqueduct Works and Cisterns.....	2,497	0	0			
		One-half of the expenses paid by Government for conservancy of the river water for drinking for residents of Camp	2,796	7	10	Miscellaneous Improvements	25,000	0	0			
		Miscellaneous, comprising Interest received from Bank, Sums due to Labourers not claimed, &c., ...	448	10	4		123,111	13	9			
						Balance....	16,940	0	7			
		Total....Rs.	1,40,951	13	4	Total....Rs.	1,40,951	13	4			

NOTE.—The balance on 1st April 1870, not shown in the Statement, is now stated to be Rs. 50,947-0-2.

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Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

Vol. II.] CALCUTTA, MONDAY, 1st AUGUST, 1870. [No. 1.

Agricultural Gazette of India.

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NOTE.

WITH the commencement of our second Volume we have determined to recast this part of our journal, and to issue it henceforth under the title of *The Agricultural Gazette of India*. What India wants, says a contemporary "is the development of *all* its "agricultural resources of rice, and wheat, and millet, as well "as of cotton, of jute and silk as well as of China grass, of tea and "coffee, as well as of Chinchona and ipecacuanha." Indian agriculture is in the most backward state, and of the rudest possible order, throughout wide districts of the country. The Government of Earl Mayo promises to be honorably distinguished above its predecessors by its initiation of a systematic effort to improve the character of our husbandry. *The Agricultural Gazette of India* will be a record of what the State is doing, and of what has been already done, and is already known to the few who are familiar with the Land Settlement Reports of the Provinces.

The subjoined article [illegible] of the *Indian Economist*. The [illegible] mission obtained from many [illegible] this introduction we [illegible]

THE AGRICULTURE OF INDIA.

I.

IF we seem to some of our readers to harp upon the subject of the land, our apology must be the fact that it is the most important subject by far that can engage the attention of the State. The condition of Indian Agriculture can be best illustrated, perhaps, by what we know of that of Europe and we have been at pains for some time past to collect all that is known upon this subject.

The produce of the Wheat lands of Europe is now pretty accurately ascertained and is as follows:—

Arthur Young's Estimates (1,780).

1780	England (average)	1,334 lbs.	per acre.
	Ireland ,,	1,044	,,

Mr. Caird's Estimates (1868).

1868	England (average)	1,620 lbs.	per acre.
	Ireland ,,	1,392	,,
	France ,,	894	,,
	Prussia ,,	993	,,

Mr. Lawes' Estimates (1869).

England (average) 1852-69, 1870 ... 1,670 lbs. per acre.

Estimates from various sources.

1850	England (average)	1,532 lbs.	per acre.
1868	United Kingdom (average)	1,566	,,
1868	Austria (average)	1,334	,,
1868	Spain	1,334	,,
1868	Belgium	1,218	,,
1868	Holland ,,	1,334	,,

For any useful purpose to ourselves it is necessary to look more closely into the question than these averages permit, and we have fortunately the means of doing so in the experiments so long and carefully made and recorded in the last 20 years by Mr. J. B. Lawes. We have seen that the *average* yield of wheat in England during the last century has been as follows:

1780	(average yield)	1,334 lbs. per acre.
1850	.....	1,532 ,,
1852 to 1867	(16 years)	1,670 ,,

And in Ireland:

1780	(average yield)	1,044 lbs. por acre.
1868	,,	1,392 ,,

There has this been a steady and vast improvement in both countries. The Scotch yield per acre is, we believe, about the same as the English, and the average of the United Kingdom is 1,566 lbs per acre. It is important, however, that we should know how this very high average has been reached, and the experiments of Mr. Lawes tell us exactly. That gentleman found by careful experiment that the yield of dressed corn per acre during the years 1852-67, varied as follows according to the character of the farming:

		Average of 16 years.
1852-67	Unmanured land	643 lbs. per acre.
1852-67	Farm yard manured	2,068 ,,
1852-67	Artificially manured.....	2,130 ,,
1852-67	Mean of all	1,680 ,,

The *weight* of the corn, moreover, varied with the character of the farming, and was respectively as follows:

		Average weight.
1852-67	Unmanured corn.....	57·4 lbs. per bushel.
1852-67	Farm yard manured.....	59·9 ,,
1852-67	Artificially manured.....	58 7 ,,

The necessity for taking the average from a long succession of years, arises from the extreme fluctuations of the seasons in England. Thus, the harvests of the seven years 1862-68 were as follows:

1862	per acre	29½	bushels	
1863	,,	35½	,,	
1864	,,	32½	,,	Average of 16 years 1852-67
1865	,,	29	,,	28½ bushels (1,670 lbs.)
1866	,,	25½	,,	
1867	,,	21	,,	
1868	,,	34½	,,	

Thus the unmanured wheat lands of the United Kindom yield on the average no more than 843 lbs. of dressed corn per acre; and as the amount of seed corn is 2¼ bushels (135 lbs.) the return to such husbandry is about six-fold, where high farming gives back the amount of seed sown fifteen to sixteen times over, or 2,100 lbs. per acre. The results of French agriculture also deserve careful study. The average yield of wheat lands in that country is variously stated at 14 bushels (812 lbs.), and 15½ bushels (894 lbs.) per acre. But the eight northern departments of Le Nord, L'Oise, L'Aisne, Somme, Seine-et-Oise, Seine-et-Maine, Seine, and Eure-et-Loire have a yield equal to the English average (1,620 lbs.) It is in the 45 departments which form the southern part of France that the yield is so small to reduce the general average of the kindom "to a mean yield of 14½ hectolitres per hectare." Partly from bad husbandry, but chiefly owing to the dryness of the climate in spring, the average yield of these departments is but 10 to 12 bushels (600 to 720 lbs.) per acre, a five-fold or six-fold return of the seed sown.

The yield of poor farming in Europe is as follows:

England ..... 843 lbs. per acre.
South of France ..... 600 to 720 lbs. ,,
Prussia ..... 993 lbs. ,,

In all these calculations we have assumed the weight of a bushel of dressed corn to be 58 lbs. The English average is said to be 60, but the exact experiments made by Mr. Lawes would seem to shew that the estimate is high, although in the very exceptional harvest of 1868, the average was believed to reach the unprecedented weight of 63 lbs.

We now come to the use of these figures to ourselves. Few persons have any idea of the conflicting character of the statements scattered up and down official records in India upon the subject, but we shall endeavour to summarize these statements for the guidance of our settlement officers and for reference. In this, as in so many other respects, the Mogul Government have set us an admirable example. The *Ayeen Akbary* contains a set of tables formed in the Emperor Akbar's reign (under instructions, no doubt, from his great Minister, Tudur Mull, upon the records of nineteen years' careful observation of the seasons —nineteen years forming a lunar cycle in which the seasons were supposed to run through all their variations. According to these tables the average produce of wheat *all over India*, in the middle of the seventeenth century was 1,155 lbs. per acre As the table is of enduring interest we re-produce it as given by Captain Harvey Tuckett, in his scarce and valuable work upon "The Revenue System of India" (1840.)

Produce per Beegah in maunds and seers, taken from the Ayeen Akbery as the result of 19 years' experiments conducted over the whole of India.

	Highest.	Middle.	Lowest.	Average.	In lbs. per acre.
	Mds.	Mds.	Mds. Srs.	Mds. Srs.	
Wheat	18	12	8·35	12·38	1,165
Barley	18	12·20	8·15	12·12½	1,097
Gram	13	10·20	7·20	10.13½	921
3 sorts of Rice	21·32½	15·1½	8·8½	15· 0½	1,338
Goor	13	10·20	7·7½	10· 9	911
Maash	10·20	7·20	5·10	7·30	690
Cotton (unpicked)	10	7·20	5·2½	7·20½	670
Joar	13	10·20	7·20	10·11½	920
Sesamum	8	6	4	6	534

We are indebted to Captain Tuckett also for the results of nearly 2,000 experiments made by our own Government in the N. W. Provinces to ascertain the average produce of wheat in that part of India at the time the settlement was in progress. The number of trials was:

Wheat	Barley.	Gram.	Rice.	Bajree.	Rab.
512	349	326	256	65	53

The result of these trials was to establish the average produce of wheat lands in the Provinces to be as follows:—

Wheat ..... 1,046 lbs. per acre.
Barley ..... 1,315 ,,
Gram ..... 997 ,,
Rice ..... 1,142 ,,

As the details of these experiments are important, and as Captain Tuckett's work has been long out of print, we reproduce them:—

Districts.	Wheat.	Barley	Gram.	Rices of sort.	Bajra.	Joar.
Crore	850	1,255	1,050	1,008	355	532
Beesulpoor	1,320	1,394	1,257	1,545	429	0
Ujaon	1,456	2,261	1,054	1,217	611	363
Kabur	914	1,072	1,155	975	395	412
Chowmuhla	743	512	773	796	234	0
Shahee	912	1,155	658	724	598	0
Sirsawah	676	1,021	707	1,150	584	412
Furoedpoor	1,253	1,728	1,025	1,078	682	1,257
Ounlah	961	1,101	1,044	1,392	681	0
Suneyhal	1,115	914	701	1,238	1,170	0
Nuwabgunj	1,310	838	1,549	1,348	0	798
Average	1,046	1,315	997	1,142	574	629

Captain Tuckett tells us that it is the practice in the North-West for the people to sow only 110 lbs. of seed corn per acre, but we have no means of testing the accuracy of the statement. He adds to the above experiments a good deal of summarized information, obtained officially, as to the yield of land in the Provinces generally. The average produce of wheat and barley respectively per acre in the following districts, he declared to be as under:—

	Wheat. Irrigated.	Dry.	*Barley.* Irrigated.	Dry.
Mozuffernuggur	1634 lbs.	1080 lbs.	1632 lbs.	1098 lbs.
Bulundshahur	1508 lbs.		1832 lbs.	1098 lbs.
Saharunpoor	1634 lbs.	1080 lbs.	1832 lbs	1098 lbs.

	Wheat.	*Barley.*	*Gram.*	*Joar.*
Meerut	1634 lbs.	1410 lbs.	1434 lbs.	522 lbs.

The late Mr. Thornton formely Secretary to Government N. W. Provinces has recorded that "judging from his own experience he should say that 1,200 lbs. per acre was a high average for irrigated lands, and 700 lbs. for that of which considerable proportion is dry." The estimates furnished by seven other independent authorities *in the Revenue Survey Report of* 1863, based in several instances upon actual experiment, shew the strangest diversity.

Wheat produce per acre.

1. English Zemindar Muttra ..... 1,845 lbs. (actual experiment.)
2. Captain Brown N. Doab ..... 1,571 ,,
3. Agra Settlement Report ..... 1,634 ,,
4. Revenue Officer, Bareilly ..... 1,046 ,,
5. Moozuffernuggur Report ..... 653 ,, (actual experiment.)
6. Do. ..... 794 ,, do.
7. Montgomery's Report ..... 836 ,,

The three first of the returns no doubt refer to irrigated lands: the last for apparently to dry cultivation. If we take the average, they are as follows:—

Irrigated land.

According to Mr. Thornton ..... 1,200 lbs.
,, to English Zemindar ..... 1,845 ,,
,, to Captain Brown ..... 1,571 ,,
,, to Mr. Mansel ..... 1,634 ,,
} Average 1,546 lbs.

Dry cultivation.

According to Mr. Thornton ..... 700 lbs.
,, to Mr. Mansel ..... 1,080 ,,
,, to Bareilly Report ..... 1,046 ,,
,, to Moozuffernuggur do. 653 ,,
,, to Do. 794 ,,
,, to Mr. Montgomery ..... 836 ,,
} Average 850 lbs.

Mr. Mansel was the Settlement Officer of the Agra zillah, and as his estimates were based upon actual experiment we re-produce them below. *(Appendix.)*

The most trustworthy of these authorities compare as follows:—

Ayeen Akbarry (All India 19 years) ... 1,153 lbs. per acre.
Tuckett's 2,000 experiments single season ..... 1,046 ,,

	Dry.	*Irrigated.*
Mr. Thornton's belief	700 lbs.	1,200 lbs.
Mr. Mansel's Report	1,080 ,,	1,571 ,,

Within the last few years Mr. Grant in his Settlement Report of Narsingpore has told us that the Doosb produces at least 18 maunds (1,476 lbs.) per acre. Mr. Maconochie, who has recently settled the district of Oonao (Oudh) tells us that the yield "from first class land in Oudh is almost equal to what is obtained in England," and that it is as follows:—

	Irrigated.	*Unirrigated.*
1st Class Land	21 bushels,	11 bushels per acre.
2nd ,,	16 ,,	9 ,,
3rd ,,	9 ,,	7 ,,

It will surprise Mr. Maconochie to learn that the average yield of the United Kingdom is 28 to 29 bushels. If we class irrigated land in Oudh with manured land at home, and dry land with unmanured, the yield compares as follows :

	Irrigated or manured.	*Dry, or unmanured.*
Oudh	1,218 lbs. per acre.	638 lbs. per acre.
England	2,100 ,,	848 ,,

We are indebted to Mr. Maconochie for the information that the Mogul Government of Akbar divided the land of Oudh into three classes, and estimated the average produce of each to be as follows :—

1st Class Land	18 Maunds.	=	1,476 lbs.
2nd ,,	12 ,,	=	984 ,,
3rd ,,	8 35/40 ,,	=	726 ,,

We are disposed to believe that these figures are the nearest approximation we yet have to the produce of the wheat lands of Northern India ; the first class representing *irrigated* land, the second *good dry* land, and the third *poor* land.

When we come down to Central India we are met by a disclosure of the most startling nature. By the Appendices to the Administration Reports of the years 1867-68 and 1868-69, we are told that the average produce per acre of the Central Provinces during those years was as follows :

	Rice.	Wheat.	Other food grains.
1867-68	579 lbs.	405 lbs.	440 lbs. per acre.
1868-69	218 ,,	351 ,,	316 ,,

Both seasons were unfavorable, but we find it impossible to credit these statistics. That the produce of the wheat lands of the Provinces is very low there can be no doubt, but that it should be accurately represented by these figures is impossible. Mr. Grant tells us in the Report we have already referred to, that the average wheat produce of the Nerbudda valley is six "maunds per acre, and that taking good years with bad, the "average returns for wheat in unirrigated and unembanked lands "in Nursingpore is not more than four-fold,"—*i. e.*, six maunds (492 lbs) per acre, the seed corn being 123 lbs. per acre. In reviewing the report, the Governor General in Council notices that "the return for seed sown seems strangely 'low,' " and expresses a doubt whether the four-fold return spoken of, is exclusive or inclusive of the replacement of the seed sown. The report is, however, clear upon the point, and its facts are corroborated by Mr. Russell's returns of the produce of the Dumoh district of the Jubbulpore division, which are declared to average but 2½ to 4½ fold. Mr. Morris, the Commissioner of the Provinces, has no doubt of "the 'correctness of Mr. Grant's estimates,' and "assures us that the soil is so bountiful and the labour of pro- "ducing the average quantity of food grains comparatively "so much less than in other less-favored tracts, that "the people have grown apathetic to a degree, and do not "care to resort to artificial means for improving the modes of "agriculture or for guarding against the consequences of ex- "hausted fields brought about from over-tillage." Wheat is taken from land year after year without any attempt at relieving it, either by manure, or by a system of rotation, and though its annual tribute is unfailingly rendered, the power of the soil has steadily deteriorated under the strain. On the authority of Captain Sleeman (writing in 1824), Mr. Grant tells us that the same land, newly broken up as virgin soil, returns a harvest fifteen to twenty-fold instead of four. This exhaustion of the soil seems to be general throughout the Central Provinces, so far at all events as the Settlement Reports at present issued are a guide to us.

A consideration, however, remains which it is impossible to reconcile with these estimates. The Central Provinces not only grow all the food consumed by their own population, but contrive to export about 1,000,000 maunds of food in ordinary seasons. The population of the Provinces is 9,000,000, and the average consumption of food grain per head will not be less than 2 lbs. per day. A very simple calculation, therefore, suffices to shew that the harvest *must* at all events reach 8,000,000,000 lbs. or [illegible] thus :—

People.	*lbs.*	*days.*	
9,000,000	× 2 ×	365	= 6,570,000,000
[illegible] 1/4th for seed corn replaced			= 2,[illegible],000
[illegible] 2,000,000 maunds export			= 82,000,000
The Harvest must be			= 8,292,000,000

without any allowance for the consumption of cattle. Now the total acreage under cultivation with food grains in 1867-68 was, we are told :

	Acres.		*Produce.*		*Harvest.*
Rice	2,532,321	×	579	=	1,466,139,159
Wheat	3,313,677	×	405	=	1,342,039,055
Other grains	4,197,561	×	440	=	1,846,907,040
					Lbs. 4,655,082,305

The acreage under grain was well ascertained, and if the produce of 1867-68 was no more than what is recorded, whence did the Provinces get their surplus 3,600,000,000 lbs. of food from ? In 1868-69 the case was still worse. The Administration Report of that year declares the harvest to have been as follows :—

	Acres.		*Produce.*		*Harvest.*
Rice	2,899,280	×	217	=	629,182,410 lbs.
Wheat	3,125,493	×	351	=	7,097,049,040 ,,
Other grains	4,694,869	×	316	=	1,483,577,604 ,,
					Total Harvest 3,209,759,054 lbs.

Thus, if these figures are correct, the harvest of 1868-69 was short of the actual consumption of the province by upwards of two million tons of food. The returns are plainly incorrect. If the acreage is correctly given, then the produce per acre must be more than is supposed, and we cannot doubt that it is.

When we come to Western and Southern India, we find wheat giving place to bajree and jowaree and rice as the staple food of the people ; and we hope, in a future issue, to give such statistics as are to be got concerning the yield of these grains. As to the wheat lands of India, they plainly yield less, even under irrigation, than the manured wheat lands of the United Kingdom, while the dry wheat lands of India do not yield upon the average one-half the produce of the English fields. The soil of India is plainly not the rich, fertile ground it is generally believed to be. It will grow *every* thing from its diversity of climate, and *some* things with great perfection. In the product of others its powers are either exhausted, or were originally mean. The pressure of the land revenue upon the country has a vital connection with the question, and that Government should take steps to ascertain exactly what the average produce is per acre of every staple grown in the country, and in every district of it. The English notion that the soil of India is of inexhaustible fertility clings to us in the teeth of conclusive proof of its poverty ; while here, as in other things, the first step to improvement is exact knowledge of the facts.

APPENDIX.

Agricultural Produce per Acre in lbs. Avoirdupois in *Agra*, *Bareilly* and the *Upper Dooab*.

Zillah.	Wheat.		Barley.		Gram.	Joour.	Bajree	Oordh.
	Irrigated	Dry.	Irrigated.	Dry.				
Saharunpore	1,634	1,080	1,832	1,098	1,434	522	...	872
Muzuffurnuggur.	1,634	1,080	1,832	1,098	1,434	522	...	...
Meerut	...	1,464	.	1,410	1,434	522	.	...
Bulundshahar .	1,508	..	1,832	1,098	1,160	500	...	872
Bareilly		1,046	...	1,315	907	629	574	
Agra No. 1 .	1,234	...	1,186		...	697	530	236
,, No. 2	1,224		1,224	...	477	754	407	216

Memo :—No. 1 for Agra was prepared from a number of trials in 1,247 F. The season, however, was not an average one, and the result is not given with other character than a loose approximation to the truth. The khurreef crop was indeed full one-fifth inferior in yield to an average autumn crop, owing to the scanty rains throughout the rainy season. Again, the rubbee was full one-eighth inferior to an average spring crop, from the scantiness of the rain in the khurreef. From the same cause, and the failure of the madawut, or Christmas showers, the chunnah crop was a general failure in the Agra zillah. In a natural season, the trials of barley would certainly shew an average one-fifth more than that of wheat in the Agra zillah. As it was, 10 trials were made of each article of khurreef in the whole of the pergunnahs, and of the rubbee in five pergunnahs.

—No. 2 for Agra was prepared by Dewan Bahadur Sing, of Bareilly. It is a mere estimate of average acre produce for Agra, and prepared at my instance, in consequence of the 1,247 F. sea-

son failing to supply me with a complete average. This person has a very masterly acquaintance with agricultural statistics in Upper India. He has, however, under-rated the produce of barley in my estimation. *(Mansel's Report.)*

THE AMERICAN YIELD PER ACRE.

SPEAKING generally, says McCulloch, "agriculture is little known as a science in any part of America, and but imperfectly even as an art. In the greater part of the States fertile unoccupied land may be obtained for an almost nominal price, and the invariable practice is after clearing and breaking up a piece of land, to subject it to a course of continuous cropping. When the land is exhausted, new ground is taken up leaving that which is abandoned to the *vis medicatrix naturæ*. In the Eastern or Atlantic States, however, that have been long settled, and are fully occupied, this scourging system is no longer possible, and a better system is being introduced per force; a rotation of crops and the manuring of land being practised with more or less success. Even in the best farmed districts, however, American agriculture is in a very backward state, little better than that of our own Central Provinces. The result is that the produce is very scanty, except upon the best soils. The average yield per acre of the crops in the state of New York contrasts as follows, with that of England:

	New York	England
Wheat .. .	14 bushels per acre	28 bushels
Barley	16 ,,	32 ,,
Oats	26 ,,	40 ,,

Fourteen bushels per acre is but 840 lbs. a yield considerably below the average produce of the wheat lands of India according to the Ayeen Akbarree tables. The State of New York comprises within its borders some of the best corn growing land in the Union. In Ohio which is supposed to be the most productive of all the States, the produce of wheat and barley is as follows:

	per acre
Wheat	15¼ bushels (915lbs)
Barley	24 ,,

"Maize is the great staple of American husbandry and it grows on soil not particularly rich for a succession of years without manure, in all the vigour and luxuriance of an indigenous plant. It has been justly called the "meal, meadow and manure" of the farm as it is used both for human food, and the supply of farm stock in winter, and furnishes more nourishment for man or beast in a given space and with less labour than any other bread corn, but it is not successively cultivated further north than 43°."

The Agricultural Department at Washington in its monthly report for August and September 1869 gives some extraordinary statistics as to the yield of the soil in Northern Colorado. The soil presents great uniformity in regard to quality, being chiefly a light loam in which the silicious and micaceous ingredients predominate. The height of the district is from 3,000, to 7,000 feet above the sea. The heat is intense in summer, and although there is a moderate rain-fall in its early months, it seldom supersedes we are told the necessity of irrigating the land under cultivation? Wheat, oats, and barley produce the most abundant crops when thus irrigated. The usual time of sowing is during March and April, and harvest begins as in England towards the end of July. The yield per acre of wheat has, in some instances, reached 50 *bushels per acre*, 35 to 40 bushels appear to be a common return, and the average yield of the whole district is 28. Well attested cases are known, we are told, where from 65 to 75 have been raised on one acre. The measured bushel of dressed corn weighs on the average 62 to 64 lbs. yielding in some cases as much as 45 lbs. of flour. Of the Vine-land farm near Denver, its owner reports, "I have continued to sow the same ground with wheat every year since 1860, gathering an average crop of 40 bushels per acre." These figures will serve to give us some idea of the vast interval between American and Indian agriculture upon the virgin soil of the former.

The yield of oats is just as extraordinary, reaching 75 bushels per acre on the same farm, while its owner affirms that he has known black oats yield even 125 bushels. The estimated average of the whole district is 35 bushels per acre weighing 30 lbs. to 45 lbs. per bushel. In the colder parts of the territory east of the *Platte*, the average yield of wheat is but 20 bushels of inferior corn per acre. India has no want of sun for her wheat lands—and these figures are full of interest as a standard by which to measure our own agriculture.

EFFECT OF LOW RENTS.

IMPERFECT as at present are the statistics of Indian agriculture, they establish two or three facts which it is of importance for us to know. They shew clearly for instance, that there is a great difference between the yield of the wheat lands of the North West Provinces and those of Central India. We cannot tell exactly the average yield of either soil, but we know, generally, that the produce of the one is little more than half that of the other. We know also that in the original powers of the two soils, the North West has no advantage over Central India. We have seen, moreover, that while the average produce of unmanured land at home, is but 843 lbs the acre, the yield at once rises to 2,000 lbs. when the fields are dressed with manure, either from the farmyard or the guano bed.

The question of the improvement of agriculture in India is beset with peculiar difficulties. In some parts of the country it would seem hardly to admit of improvement, the cultivator lavishing upon his holding the same hereditary skill and loving culture which mark the spade husbandry of Flanders. On the other hand we have the slovenly, improvident scratching of the soil of the Central Provinces, described by Mr. Morris, where Nature too generously bestows a harvest upon the idle husbandman. "In Nursingpore," says Mr. Morris, "the soil is so "bountiful, and the labour of producing the average quantity of "food grains is comparatively so much less than in other "less favored tracts, that the people have grown apathetic "to a degree, and do not care to resort to artificial "means for improving the modes of agriculture, or for guarding "against the consequences of exhausted fields brought about "from over-tillage." (Nursingpore Settlement Report, p: 5.).

Nursingpore lies in the heart of the Nerbudda valley, of which Mr. Grant says "the bed of the valley consists of a deep bed "of black soil, flanked at the base of the hills on either side by "bands of the more recent sand, stone detritus, and scoured "away on river banks by the converging drainage of the "valley. It is from this rich central deposit that "the valley derives its chief wealth. Wheat is taken from "it year after year without any attempt at relieving it, either by "manure or by a system of rotation. But though its annual "tribute is unfailingly rendered year after year, it is useless to deny "that the powers of the soil have deteriorated under so constant a "strain. The average return of wheat is six maunds, or about "eight bushels per acre, being more than four times the seed sown. "Captain Sleeman, writing in 1824, says, that in Sumbut, 1868, "corresponding to 1807, A. D., land newly broken up in this "district yielded from fifteen to twenty returns. That after "twenty years' uninterrupted tillage the returns of the same land "had sunk to from five-fold to eight-fold, but that in the adjoining districts belonging to Bhopal and to Scindia, lying on the "other side of the Nerbudda, the returns were at the time of his "writing equal to those recorded in this district in Sumbut 1863, "and that many cultivators had thrown up their lands be-"cause they only yielded nine-fold. He adds that the average "returns of the Nursingpore district are not more than from four-"to seven-fold, the mean, therefore, being five and a half fold. "Some malgoozar's accounts of seer land for the same period show "the average returns at five-fold and six-fold. The next returns "in point of time consist of an investigation of produce made "in 1828, in which average wheat produce is recorded as five-fold. "Captain Ousely, in his Settlement Report of 1836, though he has "left no regular statistics on the subject, casually mentions in "one place that three-fold is a low return and eight-fold is a very

"[illegible] for wheat; from this it seems probable that in his time "[illegible] of produce was much the same as in 1868, *viz.*, five-fold "[illegible] regarding the present rates of produce have, I "[illegible] been sufficiently extensive to warrant me in saying with "[illegible] certainty, that taking good years with bad, the average re- "turns for wheat in unirrigated and unembanked lands is not "more than four-fold, or six maunds per acre, as noted above."

We are persuaded that Mr. Grant is in error, and that exact enquiry would shew the average produce to be more than he supposes. We have introduced the passage, however, for another purpose than to contest its statements. We accept the picture which the passage presents as truthful, and we want to know whether nothing can be done to change its features. The detailed account which Mr. Grant gives of the husbandry of the district is as follows :—

"The principal implements of husbandry now employed are the 'bukkhur' and the ordinary plough. The former is a kind of scarifier, having, instead of a share, a broad iron-blade set horizontally and at right angles to its body. It is used in preparing the land for the rain-crops, twice if possible before the setting in of the rains, and twice afterwards. The seed is then sown broad-cast, and a heavy beam of wood is dragged across the land to crush in the seeds and to break the clods. For the winter crops a little more trouble is taken. The "bukkhur" is used for about four times before the conclusion of the rains, when a break admits of it. After this preparation the land is furrowed by a regular plough, to which a simple apparatus is attached for dropping the seed as the plough goes on. Another plough follows, marking its furrow a little to one side of the last, and the earth thus turned up covers the seed deposited by the first plough. This rude process, effected by implements of the lightest and most elementary construction, is all that is done for the soil which is expected to produce an unfailing crop of wheat.

"It has been already remarked that the unbroken succession of wheat crops returned by the same land is often surprising, but sometimes the soil shows signs of complete exhaustion In these cases gram or some of its tribe is usually substituted for wheat two or three years. Cultivators are afraid to leave their lands fallow, even for a single year, for the vacant land is immediately occupied by rank 'kans' grass, which no exertions can eradicate till it has run its appointed time. This is, in the best soils, 10 or 12 years,—in poorer land proportionately less. At the expiry of this time of forced rest the land is restored to the cultivator, refreshed and re-invigorated, but so much is the long fallow feared, that landlords will take up, even at a loss, lands unexpectedly thrown out of cultivation by their tenants.

Manuring and irrigation are almost unknown, except for sugar cane and vegetables. There is a fine tract, containing 50 or 60 villages, lying on the borders of the Gadurwara and the Nursingpore pergunnahs, the rates of the rent and revenue paid in which show how profitably both processes might be adopted. The staple produce of these villages is sugar-cane, irrigated from unlimed (kutcha) wells, by means of the Persian wheel. The favourable lie of the sub-strata gives unusual facilities for irrigation here, but there is nothing to prevent the general use of manure except long habit to the contrary. In the adjoining Jubbulpore district, the practice prevails to some extent. In assessing the Nursingpore pergunnah, I came to one village, the rent rates of which seemed unusually high, and yet there was nothing to indicate that they had been felt as oppressive. The revenue was therefore adjusted accordingly, with the result that a second-rate village is assessed higher than many first-class villages. It afterwards came to light (the village was one of those which had been inspected by my predecessor), that it was an instance, perhaps the solitary one, of a liberal employment of manure. *The owners had till lately held as farmers under a large proprietor, at a rent heavy enough to force them to exert all their faculties, and instead of succumbing, as most would have done, they had turned the occasion to positive advantage.*

"The neglect of so important an adjunct to agriculture arises probably rather from apathy than from any want of means. In Upper India, with a far greater deficiency of ligneous fuel, it is found possible to manure a very large portion of the cultivated area. Here although the general excuse for non-manuring is that all the available cattle manure is required for fuel, there are some who are candid enough to admit that the process is too laborious for them. One comparatively enterprising cultivator informed me that he had given it a fair trial, but found that it was no use after the first or second year. He evidently expected that manure, once put in, would permanently improve the land, and could not realise the possibility of burdening himself with a new and never ending labour.

"The nature of the soil has something to do with this apathy. It is deep, retentive of moisture, and most tenacious in its texture. Hence the amount of working and irrigation, which might amply fertilize lighter soils, would here be thrown away. It must be, as in the case of sugar-cane, kept constantly irrigated to prevent the rapid induration, and subsequent fissility, which characterize it in its drying state. Hence irrigation here necessitates more labour and expense than in lighter soils; and, though by softening the soil, cultivators would avoid two great sources of damage to which they are now subject, viz., loss of [illegible] which drops into the fissures of the earth, and occasional loss of the land, which dries up before they can plough it, they prefer the present easy system, under which they are certain of [illegible] maintenance, to a life of laboriousness which would neither [illegible] profits, nor seem [illegible] by their necessities."

We trust the reader will observe carefully [illegible] passage we have underlined. "A rent heavy enough to force the people to exert 'all their faculties" was all that was necessary to introduce "the "liberal employment of manure" What more [illegible] could we have to the impolicy of our late settlements [illegible] in fixing the land revenue everywhere at a quit rent of 8 or 10 annas per acre. Human nature is the same everywhere. "I have not," says Arthur Young, "seen an instance of rent "being very low and husbandry at the same time being good. "Innumerable are the instances of farmers living miserably and "even breaking on farms at very low rents, being succeeded by "others on the same lands at very high rents who make for- "tunes. Throughout my journey I have universally observed "that such farms as were the most wretchedly managed were "very much under-let." The great chief of agricultural antholities recorded this conviction as the result of his observations throughout his tour in the north of England 1770-80. He remarked upon the same fact subsequently in his Irish tour, and modern observation confirms its accuracy. "Estates that are under rented," says McCulloch, "are almost uniformly farmed in an inferior style compared with those that are let at their fair value." The same fact has been observed by our settlement officers all over India. By fixing the land revenue for 30 years at the low rates adopted in the Central Provinces, we have done our best to stereotype the slovenliness of their husbandry, while by creating a race of middlemen therein between the State and the cultivator, we have sown the seeds of a harvest of difficulties in the future. It is easy to see that of the Malgoozar is not extinguished, we shall have, before the century expires, all the evils of sub-letting flourishing in rank luxuriance.

IMPROVED AGRICULTURAL PROCESSES: ARE THEY POSSIBLE?

We have seen how entirely dependent modern agriculture a home is for its returns upon high cultivation; and have given above an example, upon the authority of Mr. Charles Grant, of the effects of a somewhat heavy rental upon the improvement of agriculture in the case of a village of the Nursingpore district of the Nerbudda Valley. The higher rental was all that was needed to force the cultivators upon a "liberal employment of manure." We now direct attention to certain remarks upon the question of improved agricultural processes generally in that part of India which seem to us of very great importance.

These remarks occur in the Hooshungabad Settlement Report, in which, after describing the slovenly agriculture of the district, the Settlement Officer (Mr. C. A. Elliott) proceeds as follows :—

"The first impression made on my readers by my account of the agriculture practised here will probably be the same as that which the sight of which produced on me,—that it is in the highest degree slovenly and wasteful, and that it is a thousand pities that the system of manuring and irrigation which is common in the North-West Provinces could not be introduced here. This is certainly a very natural and plausible view. I shared it fully at first, and expressed it in my earliest report on the assessment of Pergunnah Rajwara. The Chief Commissioner has been unwearied in projecting schemes of irrigation in the Nagpore Valley, and has expressed his desire that similar plans should if possible be framed for this valley. Accordingly I made some measurements and estimates for damming the River Morin and turning its waters into the Seonee Pergunnah; but the plan turned out to be impracticable. I made agricultural experiments, which clearly demonstrated the value of manure and of irrigation, especially the latter, and in an irrigated field I produced a crop such as had never been seen in the district. I made a report on these experiments, which was published in the *Central Provinces Gazette* for August, 1864. Messrs. Ross and Bernard, in a minute subsequently circulated, advocated the extension of irrigation, and expressed their belief that the water would be used, and a high rate paid for it. I have therefore the weight of authority against me, and my own views to recant, when I say that I do not believe high cultivation—*i. e.*, manuring and irrigation—to be advantageous, or in a large extent practicable, in the present state of things.

"I will begin, then, by protecting myself under a very high authority. 'It is long,' says a traveller in the United States, 'before an English eye becomes reconciled to the lightness of 'the crops, and the careless farming (as we should call it) 'which is apparent. One forgets that where land is so plenti- 'ful and labor so dear as it is here, a totally different principle 'must be pursued to that which prevails in most populous

'countries, and that the consequence will be want of tidiness, 'as it were, or finish, or everything that requires labor.' Mr. Mill goes on to say,—'One of the two causes mentioned, the 'plentifulness of land seems to me the true explanation, rather 'than the dearness of labor, for, however dear labor may be, 'when food is wanted, labor will always be applied to produc- 'ing it in preference to anything else. But this labor is more 'effective for its end by being applied to fresh soil, than if it 'were employed, in bringing the soil already occupied into 'higher cultivation.' These remarks seem to apply here as well as to their original subject, and just what American cultivation is to English, that the agriculture of the Nerbudda Valley, with its 150 souls to the square mile, is to the agricul ture of the North-Western Provinces, with its 460. It seems to me a mistake to hope for or to require the same system here as there : each system is good in its own place, and is the necessary outcome of the circumstances among which it arises.

"In this district the recent rise in prices made agriculture more profitable, and the imminence of the settlement prevented the extension of cultivation. Hence for a short time arose a competition of land which will now, I believe, be satisfied by a great increase of cultivation. Putting this exceptional case aside, there has never been any competition for land. There has always been so much land that every new plough found room and occupation, and every cultivator had so much fallow that he could break up a new field and cultivate it when his former field began to be exhausted ; and this, according to Mr. Mill, is more profitable than to expend the same amount of labor on higher cultivation of the whole land. The facts thoroughly bear this out ; for I think it can be proved that the cultivator here raises absolutely a larger gross produce than the cultivator of the North-Western Provinces, and that his net profits are larger also. In the North-Western Provinces a plough covers from five to seven acres, and, taking six as an average, three are under khureef and three under rubbee. Supposing the latter three to be all sown with wheat and irrigated, then (according to the table in Mr. Hume's report) the total produce will be 48 maunds. Here the cultivator sows twenty acres with wheat to one plough, and according to the table previously given, he raised 120 maunds. Thus his gross produce is more than double that obtained by the high cultivation, and a reference to the foregoing table will also show that his net profit is larger.

"It may, however, be argued that one cultivator can water more than three acres. Now Mr. Hume says that, with wells from twenty to forty feet deep, an acre can be watered by three coolies in five days, or six acres a month. The answers I have received from a great number of persons in the North-West inform me that from thirty to seventy days are spent in irrigating the plough area there, and one authority,* taking the plough area at four and a half acres, and the well at thirty feet deep, states that three and a half months are spent in irrigation. Here the cracked and gaping soil certainly will take more water, and therefore a longer time to irrigate. My wheat-field (one-acre) took me twelve days. The sugar-growers of Zumanie reckon five days to an acre, and I think eight may be taken as the average —wheat land being less worked, and therefore more cracked, than sugar-cane. It follows that if six acres can be watered in a month there, only four can here, and therefore even a less area than the North-West can be irrigated by one cultivator. This may be clearly seen by considering the time when the first watering must be given. The sowing is over, say, by November 15th, and by that time the wheat earliest sown is well above ground. The cultivator begins to water them, and waters till the Christmas rains, say one and a half months, or five and a half acres, at eight days to the acre. This is the maximum of irrigation possible per cultivator. But Mr. Hume says that three coolies are required The cultivator must hire two men to help to irrigate. There are not so many men in the district. Three represent twelve souls, and twelve souls to a plough, with 30,000 ploughs, gives 3,60,000 souls. The whole population is 4,40,433 souls, but the agricultural portion of it is only 2,63,143 persons. Making allowance for herding, watching, fencing, and cutting the hay and the khureef, there are probably only enough men in this district to irrigate five and a half acres for every plough. We are still, therefore, forced back on the dilemma of irrigating three acres to each plough, and raising 48 maunds, or of cultivating twenty acres without irrigation, and raising 120 maunds.

"But, again, there is another point which requires consideration : irrigation should be accompanied by manure. I will not venture to say that it is of no use without manure, but it certainly loses much of its usefulness without it. There are two places in this district where wheat irrigation is practised—one is at Doodkuch, from the Ajnal, which flows five or six feet be- field, and the other at Gumheer (Pergunnah Charwa) a little stream is dammed and turned on to the land. crop there is only a very little better than elsewhere ; the is not manured. It stands to reason that, as irrigation is only a way of getting more out of the land, if nothing is returned the land must sooner become exhausted ; therefore, if irrigation becomes the practice, manure must become the practice also. Now what amount of manure do 460 persons and 100 head of cattle to a square mile afford? Mr. Carnegy, Settlement Officer of Fyzabad, in his report on the Assessment of Tehseel Dostpore, reckons that eight cattle (my plough average) will manure two acres, and the house manure of one house will supply half an acre. The cultivator and his plough can therefore manure two acres. He can irrigate three. This probably is the maximum extent high cultivation possible. Even if he could irrigate more would be of little use unless he could get more manure. The systems stand thus opposed : high cultivation at three or acres of rubbee per plough ; low cultivation at twenty per plough : produce of low cultivation more than double that of high.

"It, may, however, be answered that the two systems should be combined : it is not intended that every cultivator should throw up seventeen of his rubbee-growing acres, and irrigate the remaining three, but that he should still cultivate the whole twenty, and manure and irrigate, say, two of them. This might undoubtedly be done, though there are some difficulties in the way. Although a population of 150 to the square mile can supply manure for 50 acres, it could not be done at present, till the cultivators acquire the habit of storing it. The irrigation must be done in the first month after the sowing,—*i. e.* from 15th November to 15th December,—or else it is of no use ; but this is the time when the cultivator cuts his hay and winnows his khurreef crops. But this could be done by laborers, and I do not think there are any serious difficulties in the way of this innovation, except that it is not the habit, and that people will not usually change their habits without considerable pressure. But what I have to say on this point is, that an irrigation of two acres out of twenty is not what the Chief Commissioner contemplates in his Memo. on the Pench Canal, nor what Messrs. Ross and Bernard anticipate. Sir R. Temple, in an answer to my letter on the Morin Irrigation Scheme, stated that in the North-West half the cultivated area might be taken as the average irrigated area. In this district 320 acres cultivated in every square mile, and 160 acres of these are to be irrigated. As in the North-Western Provinces, a cultivator with one plough cannot irrigate more than three acres, it would require fifty-three cultivators to the square mile, instead of thirteen, as at present, to effect this ; or if it be allowed that canal irrigation is so much easier than well irrigation that four acres can be watered from it against three from wells (a proportion which I deduce from Mr. Hume's statement of the respective cost), then forty cultivators to the mile are required, or treble the population and number of cattle now existing in the district. By my modest calculation, if every cultivator can even water four acres to a plough, the irrigated area will be only fifty-two acres per square mile. Supposing canal-water to reach two and a half miles on each side of it, for every running mile of canal, five square miles, or (at my average rate per mile) 260 acres, can be irrigated ; so that a canal which on an average costs Rs. 20,000 per mile will, at the highest conceivable rate of Rs. 2 per acre, bring in a revenue of Rs. 250.

"A question of this sort is always best illustrated by an example, and I will choose as favorable an example as possible, that of Rehsulpore. It is an enormous village, ten square miles in extent, and with a much larger proportion of cultivated land than is usual, or 5,250 acres, out of 6,412. It contains 200 ploughs, and no khurreef at all is sown in it. It is an oval village, and a canal running from south to north would be about two miles long, and would reach nearly every field in the village. I have had a census taken of the population by my Superintendent, which is probably pretty correct, though the number of children is certainly too low. Now, supposing that each plough watered its maximum number of five and a half acres, the total watered area would be 1,100 acres. At a more moderate estimate of four acres, it would be 800 acres. But there are only 443 adult agriculturist males in the village, so that if three men are employed on each field there are only enough for watering the land belonging to 150 ploughs. At four acres to a plough, this brings the irrigable area down to 600 acres. At two and a half acres to the plough, 500 acres can be manured every year, and, as it would probably be sufficient to manure every other year, there would be no difficulty in supplying manure for this limited amount of irrigation. I get, then, the following results as to the irrigable area :—calculating from ploughs, 1,200 acres as the maximum, and 800 the probable area ; calculating from manure, 1,000 acres : calculating from the ber of men, 600 acres. Now the cost of the canal in the is, ex-hypothesi, Rs. 40,003, and the return, at Rs. 2 ..., is for the highest possible area Rs. 2,400 ; for the largest area irrigable by the number of men now in the village, Rs. 1,200. This would hardly be a profitable investment of money.

"In other words, high cultivation requires more hands, and if it is to be introduced either the number of people must be increased, or the same people must ... or they must employ more labor on a smaller space of ground. I have said that I

* Mr. Beckett, of Allygurh, to whom I beg leave to express my obligation for the elaborate returns and calculations he was good enough to prepare for me.

think they can work a little harder, but not much, certainly not enough to make a canal pay. I have shewn that, with their coarse cultivation on a large area, they obtain more gross produce than high cultivation does on a small area, therefore I cannot wish them to abandon their system *in toto*, and take up the North-West one. There remains only one way of improving cultivation, and that is, increasing the population; but so long as Bhopal, Charwa, Khandish and Berar are only half populated, our population will not increase very fast. Still there can be little doubt in what direction the future of the agricultural classes is tending. They will first be forced to use the wells and streams of which they now make no use, and irrigate one acre or two apiece. Then they will be forced to divide their holdings, to cultivate less and less ground, and in a higher fashion, till at last the system will be assimilated to that of the North-West. But this is not a prospect to look forward to with satisfaction, and in all human probability the agricultural classes of the district will never be better off, as regards material comforts, than they are now."

This passage is worth the careful study of Government. The truth is, that a department of agriculture is one of the plainest wants of Government. Mr. Elliott has raised a most important question, and we shall be glad if some of our readers will help us to a careful discussion of it. Lord Mayo is a practical farmer, and will take a personal interest, we are persuaded, in these discussions.

EDITORIAL NOTES.

The estimated average produce per acre of land in Ireland for the year 1855, according to Parliamentary Return was as follows :—

Average Produce, 1855.

CEREALS.		
	Wheat	1,596 lbs. per acre
	Barley	1,948 ,,
	Bere	1,747 ,,
	Oats	1,528 ,,
	Rye	2,240 ,,
ROOT CROPS.		
	Potatoes	6·3 tons per acre.
	Turnips	16·6 ,,
	Mangel Wurzel	18·0 ,,
GRASS &c.,		
	Hay	2 Tons per acre.
	Flax	540 lbs ,,
	Beans and Peas	241 gallons ,,

We quote these figures simply as a rough standard for purposes of comparison.

In a paper on "Complementary Manures," published in the Paris *Journal of Agriculture*, M. Villeroy gives an instance of the extraordinary effect of super-phosphates on calcareous soil: "At a short distance from where I reside," he says, "there is a tract of calcareous land which had been divided and subdivided, ill-cultivated, and badly manured, until the alternate crops of wheat had dwindled down to about eleven bushels per acre; rye was tried, and yielded a little better result. Superphosphate was tried, and the effect in the case of rye was beyond all expectation; with 350lbs. per acre it is not at all uncommon to obtain crops of 44 bushels. This was a veritable revolution for the poor villagers, and every one was astonished to see magnificent crops of rye produced on what was considered wheat land, although it yielded so little. The question is, will the effect be permanent? The farmers think so; being richer in straw and forage, they produce more manure, and are able to give their fields two dressings of manure, alternating superphosphate with manure; thus they hope not only to maintain, but to increase the fertility of their soil. It would be difficult to find a more striking example of the good effects which may be derived from the employment of chemical manures."

We publish below Mr. Rivett-Carnac's Report on the cotton season of 1869-70 in the Central Provinces and the Berars. The appearance of this report, marks, we trust, the commencement of a new era in Indian agriculture. That it is most desirable for Government to do something systematically in the way pointed out by Earl Mayo at the Jubbulpore opening, for the improvement of the agriculture of the country, there can be no doubt. Our Land Settlement reports teem with facts which shew the necessity of our doing so while these experiments of Mr. Rivett-Carnac's, upon the manuring of cotton, deep ploughing, selection of seed, &c., shew the line to be adopted. But Government has made these experiments over and over again, and nothing as yet has ever come of them, and the reason of its uniform failure is, not far to seek. *To succeed, it is necessary to excite public interest in the work, and then to sustain it and keep it alive.*

This, the *Agricultural Gazette of India* will strive to do, and we very earnestly invite the co-operation of the educated classes of the country in the work. Our columns will contain a close contemporaneous account of what the State is doing, while we shall endeavour to rescue the records of past experiments from the mouldy recesses of the Secretariates of the country.

We publish below a letter from the Supreme Government dated 30th June last, to the Governments of Madras, Bombay and Bengal upon the subject of advances (*tuccavee*) to proprietors of land for the construction of permanent works of agricultural improvement :—

"The system says the letter under which *tuccavee* advances or permanent improvements have been given in many parts of India, is identical in principle with that which has been carried out in the United Kingdom, with admirable results, by means of the Land Improvement Acts. The Governor-General in Council believes that this principle may receive a much wider and more systematic development in India than has hitherto been given to it; and he believes that no sounder or more useful principle could be acted upon by a Government which desires to make the resources of the State available for the promotion of the wealth and improvement of the people. There is, perhaps, no country in the world in which the State has so immediate and direct an interest in such questions. The Government of India is not only a Government, but the chief landlord. The land revenue, which yields twenty millions of our annual income, is derived from that portion of the rent which belongs to the State, and not to individual proprietors. There can be no doubt that, throughout the greater part of India, every measure which can be taken for the improvement of the land, and for increasing its productive powers, immediately enhances the value of the property of the State, and adds ultimately to the public resources without the imposition of any fresh burden on any class of the community."

There is the right *ring* about these sentences, and if Lord Mayo but holds fast the policy which they embody and force its expression into *action*, he will leave his mark upon Indian progress. The propriety of such *advances* was pointed out forcibly in the Madras Famine Report of 1866 by Mr. Dalyell. The local Governments are now invited by Lord Mayo to communicate with him upon the subject, and it will be their fault if this great measure is any longer deferred.

Mr. Buck, Settlement Officer at Furruckabad, writes to the *Agri-Horticultural Society* as follows :—

"Potatoes are *extensively* grown in the vicinity of Furruckabad. The ground is loaded with the coarsest manure, often the produce of latrines. The amount per acre is often from 300 to 490 bullock-loads; potatoes are grown every other year," with tobacco and "mukka" intervening. The result is, that of late years the potatoes have deteriorated, and (in consequence probably of overmanuring) are universally diseased, deficient in flavour, and appear wanting in starch. Would not bone manure be beneficial? If so, in what way should it be prepared? The cultivators who grow potatoes are generally *Kachies*, the most intelligent and painstaking class in the North-West, who would spare neither labour nor expense if they could profit thereby; as it is, they frequently spend as much as 20 rupees per acre for manure alone. Some of them have tried saltpetre and indigo seed in addition to the coarser manure, and the former has certainly a partial success. Any information on the subject will be acceptable as to the proper treatment of the soil for potatoes."

Mr. Buck should let us know what weight his bullock load represents. The average yield in Ireland is about 6½ tons (14,500 lbs.) per acre. If we assume a bullock load to be two hundred weights Mr. Buck's yield is 67,000 lbs. to 112,000 lbs. per acre. Have we not a cipher too many in the figures? A yield of 50 tons per acre is surely impossible. Has *lime* been tried as manure?

The very first report we get from Mr. Rivett Carnac concerning the model farms he has recently established in the Berars tells us that the combined effect of deep ploughing and careful selection of the seed has in one case been an out-turn of 255 lbs. of clean cotton to the acre. "The case was, it is true, an exceptional one, as the soil of the field in which the crop was sown

"was superior to the ordinary run of the cotton-growing tracts. "But from ordinary fields in the Farm during this, an unfavour- "able season, as much as 176 lbs. of cleaned cotton was picked "from the acre. The results are, therefore, encouraging."

The results are simply astounding. 255 lbs. of clean cotton mean a return of Rs, 100 to 200 the acre, at the prices which have ruled for the staple since 1861.

The State has now four Model Farms under the control of the Cotton Commissioner. Those at Sheogam, Oomraotee and Hinguughat in Berar, and one lately established at Boolunshuhur in the North West. Mr. Carnac notes the results of deep ploughing at the last named farm as follows:

"So far as can at present be judged, it would appear that deep "ploughing is of great benefit to the plant. Those parts of the "Seed Farms which have been thus treated show very favour- "ably by the side of the fields cultivated according to the "ordinary Native method. The plants on the well-ploughed "fields were much stronger and healthier than their neighbours, "and, as already noticed, 180 lbs. of clean cotton per acre was "picked from these fields. This season an ordinary Native field "hardly yielded 50 lbs. to the acre."

Nothing could be more opportune or more reassuring than these experiments. Fair Dhollera is to day quoted at 6*d.* per lb.; and if India is to maintain any place whatever in the Liverpool market, her whole system of production must be changed.

MR. BRIDGMAN of Furuckpore who has for many years been interested in the introduction of good descriptions of cereals and grasses, writes as follows to the Agri Horticultural Society on the subject of the fine wheat raised at Meerut by Mr J. G. Robertson:

"As Mr. Robertson's seed has been produced by very high cultivation I rather fear that on being submitted to ordinary cultivation, it will revert at once to ordinary seed. The thing which it is desirable to discover is, it appears to me, a variety of country wheat, the accidental product of nature, of which the qualities shall excel those of ordinary wheat, especially in abundance of produce. With that view, at harvest time in the spring, I sent notice to my tenants to bring to me all the ears they could select when reaping their wheat, of which the length, exclusive of the beard, should be 5 fingers, or 3½ inches. For such ears I paid them half a pice each, and for ears of 6 fingers (4¼ inches) I offered them two pice each. I obtained but few of the latter, but of the former I have got a goodly quantity. I propose to sow them both *separately* in my own ground next season; and from each I have selected the largest grains to be sown apart from the rest. I do not propose to subject them to exceptional cultivation, because I think that might lead to fallacious results and defeat the object I have in view. It is of course of much importance to prove to native agriculturalists the pecuniary benefits of high and careful cultivation. This Mr. Robertson's experiment does very fully. But in this part of the country, the introduction of an improved system of cultivation would be a slow process, if attended by much additional labour. They are better satisfied with a small crop produced by little labour than a large one which cost them much trouble. To give seven waterings to a wheat crop would not be practicable on a large scale to any cultivator, however enterprising and industrious he might be."

Mr. A. J. Sturmer of Ghazeepore sends the Society a sample of wheat raised from Australian stock, supplied to him by the Society three years ago, "The first year," observes Mr. Sturmer, "the produce did not come up to the seed sown; the second year rust attacked it; the third year (last) I got about 8 maunds to the beegah."

Baboo Peary Chand Mitra said that the wheat was of a good description, similar, but superior, to "Doodeea," though, small in the grain, value Rs. 3-4 per maund, or perhaps a little more."

CONDITION OF THE COUNTRY.

OUDH.

The prospects of the kharif in Oudh have been somewhat darkened by the continuous rain which in many districts is either retarding sowings or injuring what is already sown. From the 1st June to 22nd July, the rain-fall of the province (rising from 5·5 in Lalgunj, Roy Bareilly, to 39·9 in Baraich) averaged over 21 inches,

WESTERN INDIA.

During the fortnight ending 15th July the fall of rain in the talooka of Belgaum was favorable. The rice crops were doing well. The sowing of jooaree had commenced to a slight extent in some places where there was sufficient moisture, but more rain was wanted for the completion of this operation. The district was generally free from disease, except in the talookas of Bidi and Sumpgaom, where fever and the cattle disease were rife.

In Rutanagherry owing to a favorable fall of rain during the fortnight, the transplanting of rice and wurkus crops was vigorously going on. The crops were in a good condition. The general health of the people was affected by fever, dysentery and small-pox. Cattle disease was also prevalent in a few places.

In Dharwar--the rain-fall had been more or less favorable throughout the collectorate; and all the crops were in a thriving condition, except in the Hooblee and Nowlgoond talookas where the til and jooaree crops had been attacked by grubs. The districts were free from disease.

In Broach--rain had sufficiently fallen throughout the collectorate; the crops of rice, kodra, and vugurdoo were in a flourishing state; and the sowing of jooaree and kupas was in progress. Public health was satisfactory. Cattle were also free from disease.

THE BERARS.

Hinguughat.—The Assistant to the Cotton Commissioner, writing under date the 20th June states,—

"On the night of the 17th, we had the first burst of the monsoon, and the weather since then has been almost continuously drizzling rain.

"The cultivators have not yet begun sowing, and will not begin to do so until three or four more heavy showers of rain have fallen, for as yet the rain has not penetrated to any great depth. At the Mudnee Farm we are quite ready to begin sowing as soon as a favourable opportunity occurs."

East Berar (Oomraotee).—Writing under date the 23rd July the Assistant to the Cotton Commissioner reports:—

"From the 12th up to date, we have had very heavy showers of rain, by which the soil has become so thoroughly saturated that some of the cultivators have now commenced to sow their fields with cotton.

"The rain which fell on the 17th was exceedingly heavy. Rain fell continuously for nearly 48 hours and the water has soaked well into the ground.

"The Monsoon has commenced this time earlier than was expected. On account of the heavy unseasonable showers that fell during the past two or three months, the cultivators seemed to fear that the rains might fail us towards the middle or close of the season, when they will be urgently required. This unexpected early rain has hurried on the sowing operations, and many of the fields are yet to be got into order, and the cultivators are now busily engaged in sowing or preparing their fields.

West Berar.—The Assistant to the Cotton Commissioner, under date the 10th June writes,—

"On the night of the 7th, we had 1 inch 90 cents. of rain, consequently the ground has been pretty well saturated; in fact so much so that I have not been able to do any thing with it for the last two days."

And again, under date the 24th, he adds,—

"We have had very heavy rain, as much as 8½ inches."

Very heavy rain has fallen in the North-Western Provinces, and in Central India, and, as far as I can learn, all over the country; and the prospects in every direction are reported to be favourable.

The following reports have been received by Telegraph:

Hinguughat, 4th July,—Rain-fall up to date 8·49 inches. From the 22nd to the 1st no rain fell. During the last four days the rains have set in again steadily, and the prospects of the crop now look well.

Oomraotee (East Berar), 4th July.—Rain-fall up to date nine inches. Cotton crop most flourishing.

Acola (West Berar), 4th July.—Rain-fall 8·75 inches. Weather fine during last fortnight, and Koonbies (cultivators) busy sowing. Rain is now threatening. Prospects could not be more favorable.

SIMLA
The 4th July 1870.

HARRY RIVETT-CARNAC,
Cotton Commissioner.

NORTH-WESTERN PROVINCES.

ALLAHABAD, *July* 27, 1870.

Along with a south-east wind, which set in on the 18th May, clouds were observed at nearly all the stations to overspread the

sky. These clouds were apparently the forerunners of the south-west monsoon. The clouds, however, came and went all through the latter part of May, and in the first ten days of June were but little seen; but they re-appeared about the 11th or 12th of June, and along with them a notable increase in the moisture of the air ensued, and also the great fall in temperature already noticed. Although no rain fell up to this date, yet the aspect of the weather was that of the setting in of the monsoon. Nearly all the stations had had a good rain-fall on or before the 18th, after which a break ensued till the 20th or 21st, and a second similar interval occurred, especially in places eastward of Futtehgurh, from the 21st to the 25th or 26th. During the last four or five days rain was frequent and heavy all over the North-Western Provinces and Oudh.

The following table gives the total rain-falls for the month of June in this and the three preceding years :—

RAIN-FALL FOR JUNE.

Stations.	1870.	1869.	1868.	1867.
Chukrata..	10·75	3·72	...	..
Dehra	7·09	2·98	6·85	7·30
Roorkee	4·94	2·43	4·24	8·05
Meerut	12·55	0·25	...	3·12
Bareilly	14·20	0·60	..	7·30
Futtehgurh	9·10	0·10	...	..
Agra	4·30	0·20	22·0	3·17
Lucknow..	9·53	0·19	34·0	7·50
Goruckpore	4·70	1·05	...	12·40
Ajmere	3·40	0·00	1·10	1·37
Allahabad.	4·47	...	...	4·89
Benares	4·00	3·60	10·10	5·30

BENGAL.

Orissa.—The months of May and June were unusually dry, and strong southerly winds prevailed, and in a measure prevented and dispersed many of the thunderstorms which gathering over the hills to the north-west frequently during these months, break over the low country affording reasonable moisture generally sufficient for preliminary ploughing and cultivation and for the sowing of the early beallee rice crop. These storms during the present season were few and partial in their effects, consequently cultivation has been retarded. The regular monsoon rains were rather late, the first fall occured in Balasore on the 16th and in Calcutta in the 18th June, when the monsoon fairly set in. Considerable anxiety was felt in this division, as some of the early sown beallee suffered from want of rain, and in Pooree where the absence of rain was more marked than in either Cuttack or Balasore, the hot weather or daloa crop grown under irrigation from jheels and tanks suffered to the estimated extent of about two-thirds. However this dalooa crop, though a seasonable assistance to the people is grown over a very limited area, and variations in the yield would not materially affect the food supply of the district. If the rains which have now fairly set in continue without intervals of excessive drought or flood, all cause for further anxiety will be removed.

Dacca.—The reports from this division are generally satisfactory, and there is no reason to anticipate any distressing failure of crops. In Sylhet the anum crop has been partly destroyed in some parts owing to the sudden rise of the river, and it is now estimated that it will not exceed an 8 anna crop. The aous crop has sustained no damage as yet.

Chota Nagpore.—The reports from the several districts of this division, Singbhoom excepted, are unexceptionably favourable. Unusual drought up to nearly the middle of June interfered with the early sowing in Singbhoom, and it is feared that the returns from what is called the Bera lands will be short. The markets however are very well supplied and the prices of grain below the average. Since the 15th June rain has fallen copiously in every district. In a letter dated the 11th instant, the Deputy Commissioner of Maunbhoom reported that rain had fallen universally and sufficiently in his district for the purposes of cultivation, but that the crops were not sufficiently advanced to judge of the prospects of a good harvest.

Rajshahye.—The accounts received from this district are favorable, though up to the middle of June some alarm was felt owing to the lateness of the rains, but as the regular rainy season set in about that date, all apprehensions for the present are now removed. The anum sowings are now complete, and there is no longer any fear of a deficient harvest, so far as can at present be conjectured.

From Pubna it is reported, "that the promise of a fine harvest "could not be better than it is."

Patna.—The latest reports speak of very severe inundations in the district of Chumparun,—much loss has occurred to the indigo and the early rice crop, but the latter is not a very large crop.

CENTRAL PROVINCES, 23*rd July* 1870.

In Nagpore Rice sowings were in progress in Ramtek and Oomrair, and jowaree throughout the district. In Katole the cotton crop has been slightly injured owing to the heavy rains.

Very heavy rain fell in Chanda during the week. Transplanting of rice continues. The jowaree sowings are still stopped. Bunnee cotton is doing well notwithstanding the rains.

In the Balaghat rice sowings in heavy lands are almost stopped by the heavy rains; the light land transplanting is in progress, and crops are as good as could be wished. Public health good. Thermometer in shade, maximum 85° highest on 19th and 20th, lowest 81° on 22nd; minimum, highest 75° on 17th, 18th and 19th, lowest 71° on 21st.

In Jubbulpore the sowings of paddy, kodo, kotkee, cotton, oorud, and tillee are in progress. In some places the sowings have been completed. The Tehseeldar of Jubbulpore states that the continual downpour of rain has in places proved injurious to paddy

The Khureef sowings are almost completed in Dumoh and the weather has been very favorable for sowing operations.

Rain is steady in Seonee but Jowaree suffers from continuous rain. Public health good.

In the Nerbudda district considerable rain appears to have fallen round Chindwara. General health good.

The Khureef crops look very promising in Nursingpore. No sickness except fever.

In Sumbulpore there has been drizzling rain throughout the week, but not enough to enable the cultivators to plough through the rice. Few heavy showers much wanted.

Weather is very favorable to the crops in Belaspore.

AJMERE, the 15th *June*, 1870.

From—CAPT. H. M. REPTON,

To—COL. R. H. KEATING, *Commr. Ajmere and Mairwarra*,

The extraordinary reports ceased on the 18th April, 1870. I, however, have continued to receive weekly returns and reports from the pergunnah officers, and these show that prosperity is steadily re-asserting itself; the markets are well-stocked, and, though the prices are still high, food is procurable by all classes, and there is enough ordinary labour for the people. The market-rates for May are as under :—

	S.	C.		S	C.		S.	C.
Wheat, ...	9	12	Jowar, .	16	0	Gram,	12	8
Barely,	15	2	Bajra, ...	11	5	Rice, ..	7	0

Last month I was informed that there were some 2,500 persons in the vicinity of Nasserabad requiring work and food. As labourers were then urgently required at the Government salt works at Sambhur, I thought this would be a capital opportunity for accommodating both interests. None of the necessitous 2,500 have yet, however, made their appearance.

The truth is, a very fair spring harvest has been obtained, and the grain is quite sound and unaffected by blight of any kind. Early rains are expected; indeed, only yesterday, I may say the first burst came upon us from the north-east. In a few hours 2½ inches of rain had fallen in Ajmere itself, and ploughing is going on consequently vigorously.

The pergunnah reports show that emigrants are steadily returning to their abandoned homesteads, the numbers recorded to the end of May being 4,450.

Sickness, I am thankful to say, we have as yet been quite free from.

Crime, also a sure index of the condition of the people, has decreased to a minimum.

It will be satisfactory to yourself and Government to learn that the prospects of these districts are once more re-assuring, and that the efforts made to preserve the population are at last bearing good fruit.

INFLUENCE OF CASTE ON RATES OF RENT; AND EFFECT OF PROCEEDING AT LAST SETTLEMENT ON CONDITION OF THE CULTIVATOR.

Report by C. A. Elliott, Esq., dated 16th January, 1868.

PART I.

THE INFLUENCE OF CASTE ON RENTS.

The question of the influence of caste on the fixation of rent has acquired additional importance through the decision of the High Court noted below,* which practically assumes that the custom of making allowance for caste, which is known to exist in some parts of India, exists everywhere.

In order to test the point as to whether this custom prevails in the Kanouj pergunnah of the Futtehgurh district, I selected

* No. 1660, Benee Pershad, *versus* Mahomed Akber Hossein, decided the 16th January, 1868.

twenty villages in which enquiry should be made as to the actual rent-rates. These villages were not chosen by me with any foreknowledge of what the result would be, but simply so as to secure the widest possible representation of all the different conditions existing in the country Some are owned by resident, some by non-resident zemindars, some by single families, and some by proprietary bodies. In some the mass of cultivators are Hindoos, and in some Mussulmans. Some lie in the low land, the old bed of the Ganges; some in the sandy tract between the Kalee and the Ganges; some near the old city of Kanouj; some in the west, where cultivation is impeded and broken by great *oosar* plains; some in the east, where there is the finest soil in the pergunnah. In short, every kind of diversity that I could think of is represented in these selected villages; and I think it will be safe to affirm that what is true of them is true of the whole pergunnah.

The form of my statement is borrowed from Appendix 9 to Major MacAndrew's Report on the Settlement of Roy Bareilly, in which he shows the extent to which caste influences rent in that district. The village area is divided into the five *hars* or classes which formed the basis of my assessment—*gowhan*, *munjha*, irrigated and dry, *burhet*, irrigated and dry.

I show the area held in each *har* by each class of cultivators, the rent paid and the rent per *pucka* beegah (4-7ths of an acre).

I have divided the cultivators into five classes. (1), Brahmins; (2), Thakoors; (3), Mussulmans—the three classes in favour of whom the caste theory is supposed to operate; (4), Koormees, Kachees, and Kisans—our best cultivators, who grow the best and highest class of crops, and may be expected to pay the highest rates; and (5), other castes, including all those who may be expected to be neither favoured nor hardly treated in the matter of rent, and whose rate therefore should be pretty much the average rate of the village.

I submit separately the detailed returns for the several villages. The following table shows the totals and averages for the whole of the twenty:—

Caste.	Gowhan. Area.	Gowhan. Rent.	Gowhan. Rate.	Munjha, irrigated. Area.	Munjha, irrigated. Rent.	Munjha, irrigated. Rate	Burhet, irrigated. Area.	Burhet, irrigated. Rent.	Burhet, irrigated. Rate
	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.
Brahmin	26	140	5 6 6	57	250	4 5 11	416	1,179	2 13 4
Rajpoot	78	435	5 8 11	55	393	4 10 1	206	609	2 15 4
Mussalman	118	658	5 0 9	286	1,292	4 8 3	475	1,481	3 1 10
Koormees, &c.	225	1,224	5 7 7	468	2,065	4 6 7	1,470	4,489	3 0 11
Other castes...	93	461	4 15 4	305	1,345	4 6 8	640	1,891	2 15 4
Total	540	2,918	6 6 7	1,201	5,345	4 7 2	3,207	9,649	3 0 2

Caste.	Munjah, dry. Area.	Munjah, dry. Rent.	Munjah, dry. Rate.	Burhet, dry. Area.	Burhet, dry. Rent.	Burhet, dry. Rate	Total. Area.	Total. Rent.	Total. Rate
	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	Rs. a. p.
Brahmin	417	796	1 14 9	263	272	1 0 6	1,179	2,637	2 3 9
Rajpoot	189	367	1 14 5	252	225	0 14 3	810	2,020	2 7 11
Mussulman	296	613	2 1 1	213	166	0 12 6	1,388	4,411	3 0 7
Koormee, &c.	2,083	4,232	2 0 5	1,112	1,245	1 1 11	5,357	13,255	2 7 7
Other castes.	689	1,422	2 1 1	559	565	1 0 2	2,285	5,684	2 7 9
Total	3,673	7,420	2 0 0	2,399	2,473	1 0 6	11,019	27,807	2 8 5

This table brings out a remarkable and most unexpected result. It shows that no allowance is made for caste in the fixing of rents.

In these *hars* (which are areas of similar and similarly situated lands), sometimes the caste which we should have expected to pay the highest, pay the lowest rates; and sometimes those which, according to the theory, ought to pay the lowest, pay the highest rates. In the *gowhan*, or best lands of all, the Brahmins pay higher rates than any one except Rajpoots; in the dry *burhet*, or worst land of all, they pay higher than any except the Koormees. Only in the dry *burhet* do the best cultivators of all, the Koormees, &c., pay the highest rates; in the better lands, where their superior skill and labour ought to produce most effect, they pay rates as nearly as possible equal to the average. But in all cases the variation is small—a few annas more or a few annas less—so small, that it is quite possible that the addition of twenty more villages to form the average might deflect it to the opposite side; for it evidently proceeds from no fixed principle—no unchanging purpose runs through the *hars*—no one caste is throughout exalted while another is throughout depressed.

This will be still more plainly seen by referring to the detailed statements which accompany this report. Just as in this table the rate paid by any one caste varies from *har* to *har*, and is sometimes above and sometimes below the average, so in the village details, the same caste in the same *har* pays in one village more, in another less, than the average rate.

To show how largely caste does affect rents—where it affects them at all—I copy in here the specimen statement that Major MacAndrew gives in his report of the caste rates of one village.

Caste.	Gowhan. Area.	Gowhan. Rent.	Gowhan. Rate.	Munjha, irrigated. Area.	Munjha, irrigated. Rent.	Munjha, irrigated. Rate.	Burhet, irrigated. Area.	Burhet, irrigated. Rent.	Burhet, irrigated. Rate.
	Bgs	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.
Brahmins	121	619	5 1 0	194	734	3 13 0	156	443	2 13 0
Rajpoots .	23	103	4 7 0	44	134	3 0 0	33	64	1 15 0
Koormees .	81	712	5 12 0	42	289	6 12 0	..	..	...
Other castes .	122	566	4 10 0	235	811	3 7 0	92	255	2 12 0

Caste.	Munjha, dry. Area.	Munjha, dry. Rent	Munjha, dry. Rate.	Burhet, dry. Area.	Burhet, dry. Rent.	Burhet, dry. Rate.	Total. Area.	Total. Rent.	Total. Rate.
	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.	Bgs.	Rs.	R. a. p.
Brahmins ...	23	59	2 8 0	153	281	1 13 0	649	2,138	3 5 0
Rajpoots ...	2	5	2 8 0	32	46	1 6 0	137	354	2 9 0
Koormees .	2	6	3 0 0	3	6	1 14 0	130	1,014	7 13 0
Other castes...	21	38	1 13 0	45	103	2 4 0	517	1,776	3 7 0

Here there can be no uncertainty as to the question at issue. The allowance made for caste is visible at the first glance. It runs through every *har*, and is sufficiently constant throughout the district to form the principal basis of Major MacAndrew's assessment. It would be impossible to decide rent cases in the Roy Bareilly district without taking into consideration the question of caste. But a comparison of these two results shows how far a person would be wrong who should generalize from the facts discovered in one district, and apply them without discrimination to all Hindoostan.

It occurred to me that it was possible that the practice of making allowance in rents for caste might once have prevailed here, and might have died out under the hard and equal pressure of our legal system. If this were the case, it was possible that the records of the last settlement might throw some light upon it. Accordingly, I took the old *khateeonees* for the same villages as the twenty selected for this enquiry; and though I could not recover the sub-division into *hars*, I divided the total area among the castes that occupied it, with the following result:—

Caste of Cultivators.		Area.	Rent.	Rate
		Bgs. Bis.	Rs. a. p.	Rs. a. p.
Mouroosee (hereditary),	Brahmins ...	642 18	1,527 13 6	2 6 0
	Rajpoots ...	817 1½	1,858 11 0	2 4 5
	Mussulmans ...	274 17	806 0 0	2 14 11
	Koormees, &c.	1,442 11½	3,780 10 6	2 9 11
	Other castes...	909 4	2,484 5 0	2 11 9
	Total ...	4,086 12½	10,457 8 3	2 8 11
Ghair Mouroosee (non-hereditary),	Brahmins ...	646 0	1,409 11 3	2 2 2
	Rajpoots ...	607 19½	816 4 0	1 5 6
	Mussulmans .	220 3	344 4 3	1 9 0
	Koormees, &c,	2,023 5½	5,591 4 3	2 8 3
	Other castes...	896 5½	1,763 6 3	1 15 6
	Total ...	4,393 13½	9,924 14 0	2 4 2

Here, again, there is no trace of caste-rates to be found. We do not walk on such firm ground here, for it is not stated what share each caste had of the best and the worst soils; but there is something of a presumption that the Brahmins, who held 1,289 beegahs then, held it sub-divided in much the same way as those who had held 1,179 beegahs in the same villages now. Allowing this, then here again we find no trace of caste-rates. The Brahmins who as *mouroosees*, pay the lowest rates of all, as *ghair mouroosees* pay higher than any caste except Koormees; and the Mussulmans, who pay the highest rates as *mouroosees*, pay the lowest but one as *ghair mouroosees*.—*(to be continued)*.

SYSTEM OF GIVING ADVANCES TO PROPRIETORS OF LAND FOR THE CONSTRUCTION OF PERMANENT WORKS OF AGRICULTURAL IMPROVEMENT.

From E. C. Bayley, Esq., C.S.I. Secretary to the Government of India, Home Department, to the Secretaries to the Governments of Madras, Bombay, and Bengal,—Nos. 323 to 325, dated Simla, the 2nd June 1870.

The Governor General in Council has, for some time past, been satisfied that measures might be taken with great advantage, in many parts of India, for extending and improving the system of giving assistance to proprietors of land for the construction of permanent works of agricultural improvement. I am directed to request the attention of ——— * to this subject, and to state that His Excellency in Council will be glad to be informed of the views of ——— † regarding the measures which might properly be adopted.

2. The Government has always, if not by extensive practice, at least by its legislation, recognized the duty which, in this country devolves upon it of giving advances of public money for the promotion of agricultural improvements. The system of making such advances, usually called *tuccavee*, has existed more or less in the Bengal presidency almost from the commencement of our rule. The existing law upon the subject is contained in Regulation II. of 1793, Regulation XIV. of 1793, Regulation III. of 1794, and Regulation VI. of 1795. The security is complete, since the land on which the improvement is made is declared by the law to be responsible for the repayment of the advances, and they may be recovered by the same processes which are applicable to the recovery of arrears of land revenue.

It appears to the Governor General in Council that it would be desirable to consolidate and amend the existing law on this subject. The provisions of the old enactments that have been quoted are obviously incomplete, and they are, in some respects, hardly suited to the circumstances of the present time.

3. The system under which *tuccavee* advances for permanent improvement have been given in many parts of India is identical in principle with that which has been carried out in the United Kingdom, with admirable results, by means of the Land Improvement Acts. The Governor General in Council believes that this principle may receive a much wider and more systematic development in India than has hitherto been given to it; and he believes that no sounder or more useful principle could be acted upon by a Government which desires to make the resources of the State available for the promotion of the wealth and improvement of the people. There is, perhaps, no country in the world in which the State has so immediate and direct an interest in such questions. The Government of India is not only a Government, but the chief landlord. The land revenue, which yields twenty millions of our annual income, is derived from that portion of the rent which belongs to the State, and not to individual proprietors. There can be no doubt that, throughout the greater part of India, every measure which can be taken for the improvement of the land, and for increasing its productive powers, immediately enhances the value of the property of the State, and adds ultimately to the public resources without the imposition of any fresh burden on any class of the community.

4. The class of works, for the construction of which assistance of the Government might properly be given to the owners and occupiers of land, would not be difficult to define. Advances of money should be usually given for that description of work only which can be designed and carried out, with a small amount of assistance, under the direction of the local proprietors themselves. These advances should not be made for great works requiring, in their design or construction, engineering skill of a high order, or the employment of large bodies of laborers. Such works, if undertaken by the Government, must necessarily be undertaken through the Department of Public Works. The works for which advances might properly be made would commonly fall into some one of the following classes :—

(1.)—Wells and other works for the storage, supply, or distribution of water for agricultural purposes, and the preparation of land for irrigation.
(2.)—Drainage;
(3.)—The reclaiming of land from rivers;
(4.)—The protection of land from floods;
(5.)—The reclaiming, cleaning, and enclosing of waste lands for agricultural purposes;
(6.)—The clearing of land from stones or other obstacles to cultivation.

5. It is believed that it would not be difficult to devise and bring into operation a system under which advances of money might be made by the Government for works of this description, mainly through the agency of the district officers of the Government, and with complete security against loss; and the benefits derived from such an application of capital to the permanent improvement of the land, might be of almost incalculable importance. His Excellency in Council is disposed to think that there are no objects to which a portion of the loans, which it is proposed to raise every year for reproductive works, could be more advantageously and properly devoted. Such portion of the borrowed money of the year as, in the opinion of the Government of India, could be usefully lent for such purposes, would be placed at the disposal of the local Governments. The extension of irrigation canals, and the development of our railway system, will necessarily stimulate agricultural industry, and the importance of facilitating to the utmost the prosecution of minor works of land improvement will, under such circumstances, be specially great.

6. It appears to the Governor General in Council that no elaborate machinery or expensive staff of officers would be necessary for the gradual development of a system which, in all essential respects, has long been known to and approved by the people. In the existing establishment of the Revenue and Public Works Departments, it is probable that we possess already, in the greater part of India, an organization quite sufficient for the purpose. The character of most of the works would be so simple that the Collector or district officer, on whom would fall the chief duty of making the advances and of supervising the execution of the works, would find little difficulty in taking all necessary precautions to prevent the occurrence of abuses, and to secure the proper application of the money to the purposes for which it was advanced.

7. It appears to the Governor General in Council that, in revising the law upon this subject, some such provisions as the following might be adopted.

8. Any person desiring to make an improvement in his land, of the character referred to in the fourth paragraph of this letter, would be authorised to make an application to the Collector for an advance of money to enable him to make the improvement.

The local Government with the sanction of the Governor General in Council, would be authorised to make rules prescribing the manner in which such applications should be made, and in which enquiries relating to applications should be conducted; for determining the conditions under which the advances might be made, and under which they would be repayable; for securing the due expenditure of the advances, the due execution, inspection and maintenance of the work for which the advance was made; and for the keeping and auditing of accounts.

9. Advances would ordinarily be made to the landlord, or to tenants whose interest in the land exceeded the term fixed for the repayment of the advance; but they might, with the landlord's consent, be made to any tenant desirous of making an improvement on the land in his occupation.

10. On receiving an application for an advance, the Collector would make such inquiry as appeared necessary in regard to the propriety of making the advance. If the result of such inquiry should be to satisfy the Collector that the proposed improvement would increase the annual value of the land in which the improvement is to be made, to an amount exceeding the sum to be charged annually upon the land for the repayment of the advance, he would be authorized (subject to the rules referred to in paragraph 8) to grant a certificate sanctioning an advance of money for the purpose of making the improvement. The certificate would state the amount of advance, the conditions under which it was to be made, and under which it was to be repaid by instalments or otherwise; and it would specify the land which, in the event of the conditions not being fulfilled, would become chargeable for the repayment of the advance.

After the certificate was granted, the Collector would be authorised to make the advance.

11. The law would provide that when any sum stated in the certificate became due, it would be recoverable from the person to whom the advance was made, or from any person who had become security for repayment, as if it were an arrear of land revenue due by the person to whom the advance was made, or by his security. If any sum could not be so recovered, it would be recoverable as if it were an arrear of revenue due on the land specified in the certificate.

Any sums expended by the Collector, in accordance with the rules referred to in paragraph 8, in making local inquiries, or otherwise in carrying into effect the provisions of the law in behalf of a person applying for an advance, would be recoverable in the same manner.

12. It is hardly necessary to repeat that the present proposals refer only to advances for works of permanent agricultural improvement. The Governor General in Council is aware that a vicious system formerly prevailed in some parts of India, under which nominal advances, called *tuccavee*, were often made to liquidate balances of Government revenue, and for other temporary purposes. Such advances, unless under very exceptional circumstances, were clearly incompatible with good revenue administration, and they had nothing in common with the system which it is now proposed to introduce.

13. The Governor General in Council requests that ——— * will be good enough to state any opinions which he may hold

* *To Madras and Bombay*—His Excellency the Governor in Council.
To Bengal—His Honor the Lieutenant-Governor.
† The Government of *Madras*, *Bombay* and *Bengal*

in regard to the subject of this letter, and that he will favor the Government of India with any recommendations, the adoption of which may appear to him likely to increase the usefulness of the measures, of which a sketch has now been given.

14. If——— * should concur with the Government of India in the views stated in this letter, and should consider legislation on the subject desirable, I am to request that ——— † will state whether, in his opinion, it would be expedient to pass in the Council of the Governor General a law applicable to ———‡ as well as to other parts of India, or whether ———§ would prefer to deal with the subject in his own Council.

AGRICULTURAL IMPROVEMENTS.

AUSTRALIAN FIELD SEEDS.

(Agri Horticultural Society, Calcutta.)

Submitted the following useful report, dated 2nd May, from Mr. F. Halsey, of Umritsur, on the Australian Field Seeds received by him from the Society in October last. (It would be very desirable if other recipients would follow Mr. Halsey's example. Every applicant for these Australian field seed received a similar printed list, with a request to favor the society with an impartial report as to the kind best adapted for cultivation in their respective districts.)

"The percentage of germination given with the list herewith sent you is the result of two sowings made in October and November 1869 in seed pans; the actual results were not so good, with the exception of the Tares and Grasses. The Turnips were bad; before sowing them I knew they would not germinate. The Carrot seed also was not good, as although it partially germinated in seed pans, very little in the open. But what did grow was fine: the same may be said of the Mangel, but Mangel to be of any use should be sown in Punjab in August or before the 15th September. The Clovers are only suitable for garden cultivation. The perennial Rye and Prairie Grasses grew beautifully; I have no doubt I might have cut them three times before this had not I wished to keep them for seed, of which I have collected a large quantity. The Lucerne I have already had three cuttings of, each of 18-inches to two feet high, and expect to get two more before the rains commence. It is not, however, killed by the rains in this part of the Punjab. I hope also to have the perennial Rye and Prairie Grasses through the hot season.

"The Oat seed was magnificent to look at, and although apparently good to taste and smell absolutely refused to germinate. The Barley the same. The Wheats were not in good order; it was apparent to the eye that much would not germinate. I have not reaped it yet, but when I do I will test them against several different sorts of Punjab wheats and let you know the results; as far as I can judge at present they are infinitely superior to anything in this country, both in weight of grain and length of straw. I shall distribute the greater part of the seed amongst the cultivators in this neighbourhood and next year will let you know the result."

I.—STATISTICAL NOTES ON SOME EXPERIMENTS IN AGRICULTURE

Communicated by Frederick Purdy, Esq., Honorary Secretary of the Statistical Society, to Section F of the British Association, at Exeter, 1869:—

If the man who causes two blades of grass to grow in place of one, is a benefactor to the community, then he who produces four instead of one, has doubly benefitted the commonwealth. This Mr. Lawes of Rothampstead has, we shall find, literally succeeded in accomplishing. As a scientific agriculturist Mr. Lawes is well known, and the last account of his experiments,—investigations that in some instances have been extended over twenty consecutive years,—is an admirable illustration of that patient questioning of nature which Bacon so strenuously enforced. The memoranda of the plan and results, which Mr. Lawes has circulated among his friends, give the issue of upwards of 1,400 separate experiments—not experiments that can be quickly performed like the ordinary ones of the laboratory - but experiments each requiring one revolution of the season for its answer.* It is beyond my scope to attempt a description of these researches in any detail, at the same time I hope to convey some idea of the extreme importance of Mr. Lawes's achievements, by selecting a few salient examples from each process of cultivation employed by that gentlemen:—

Permanent Meadow Land.—The area experimented on was about 6¾ acres, divided into 20 plots—with few exceptions, duly noted, the same description of manure has been applied year after year, to the same plot. The meadow land chosen 'has been probably laid down in grass for some centuries.' It is known that no fresh seed had been artificially sown for thirty years,—nor is there any record of any earlier sowing. When the experiments began, the herbage seemed uniform over all the plots. I take for this crop, and for the two grain crops which in the account follow, the yield of the *unmanured* ground and compare it with the yield of that *manured* plot which furnished the *greatest* product.

The yield of the plots unnoticed here, range at various distances between the extreme results selected for comparison below.

EXPERIMENTS ON PERMANENT MEADOW LAND.

	Produce per Acre Weiged as Hay.	
	Average of Thirteen Years, 1856-68.	1868 alone.
	cwts.	cwts.
Plot (11*a*) dressed with artifical manure, which afforded the *maximum* yield	64½	72¼.
Average of two Plots (3 and 12) *unmanured* continuously during the thirteen years	24	20¾
Difference in favour of the manured Plot (11*a*)	40	51½

Note.—The numbers in brackets after the plots, here and hereafter, refer to the enumeration of the original paper.

Taking the whole period under trial, the maximum plot gave a heavier product than the ground left to unaided nature by 166 per cent. Last year the divergence was wider, for the assisted plot gave more, and the unassisted less than the average, the difference being 250 per cent. in favour of the former as against the latter. The artificial manures applied to the maximum plot were, sulphates of potass soda, and magnesia; superphosphate of lime, ammonia salts, silicate of soda, and silicate of lime. For the quantities and periods of dressing, I must refer to the section in Mr. Lawes's paper, which goes into minute and exact scientific particulars.

Chemistry has taught agriculturists that thier husbandry will not draw from the soil or the atmosphere what is neither in the soil nor in the atmosphere. The corollary of this lesson seems to have determined the operations on plot No 18. The ground was annually dressed with a mixture, per acre, equal to the respective quantities of potass, soda, lime, magnesia, phosphoric acid, sillica, and nitrogen contained in a ton of hay. The average yield of hay for the four years 1865-68, was 32¼ cwt., or 8 cwt. in excess of the two unmanured plots represented in the table above. In 1868 the yield was 27½ cwt. or 6¾ cwts. above the produce of the unmanured plots in the same year just *one-third* of the chemicals was returned to the cultivator by the surplus hay in this year's trial.

Barley.—The area under experiment was about 4¼ acres, divided into 28 plots. The grain sown on the same land year after year, and, for the most part, the same manures used continuously on each plot.

EXPERIMENTS ON THE GROWTH OF BARLEY.

	Produce per Acre. Average of Seventeen Years, 1852-68.		
	Dressed Corn.		*Total Straw.
	Bushels.	lbs. each.	cwts.
Plot [(1)4AAS] dressed with artificial manure, and affording the *maximum* yield	50¼	52¾	33¼
Average of two Plots (1 O and 6 I) *unmanured* continuously during the seventeen years	21¾	52¼	12½
Difference in favour of the manured plot	28¾	¼	20¾

* Memorandum of the plan and results of the Field experiments conducted on the Farm of John Bennet Lawes, Esq., at Rothampstead, Herts, May, 1869.

To Bengal- His Honor the Lieutenant-Governor

* *To Madras and Bombay*—His Excellency the Governor in Council.

† *To Madras and Bombay*—His Excellency the Governor in Council.
To Bengal—His Honor the Lieutenant-Governor.

‡ *To Madras and Bombay* - His Excellency.
To Bengal—His Honor.

§ Madras, Bombay, Bengal

The average yield during the seventeen years of the maximum barley plot, as against the unmanured plots was 168 per cent. of dressed corn in excess. There was also an increase of weight of about 1 per cent. The porportionate increase of straw, viz, 166 per cent., was greater than the proportionate increase of grain. The dressing for the maximum plot was nitrate of soda, superphosphate of lime, mixed alkalies, and silicate of soda. A plot treated with farmyard manure in the concentrated form of *exuviæ*, at the rate of 14 tons per acre yearly, produced on the average of 1852-68, dressed corn 48 bushels of 54 lbs. each, the straw weighing 28¼ cwt. It is noticeable that this plot gave the heaviest weight per bushel of dressed barley. The seventeen years' mean weight per bushel being 52¼ lbs. off the other plots.

Wheat.—Area under experiment about 13 acres, made into 26 plots. Wheat sown on the same land, without intermission, for twenty-five years. Nearly the same description of manure on the same plot each year, especially during the last seventeen years, to which term the following experiments were limited:—

EXPERIMENTS ON THE GROWTH OF WHEAT.

	Produce per Acre. Average of Seventeen years, 1852-68.		
	Dressed Corn.		Total Straw
	Bushels.	lbs. each.	cwts.
Plot [16 (*a* and *b*)] dressed with artificial manure, and affording the *maximum* yield	39½	58	16½
Average of two Plots (3 and 20) *unmanured* continuously during the seventeen years	14½	57½	14
Difference in favour of the manured plot	24½	½	32½

In relative, but not in absolute, excess, the maximum plot shows a large result in wheat than in barley; in the former grain the excess is 168 per cent. The specific weight of grain here also shows but small increase over that grown on unmanured ground. The increase of straw is no less than 232 per cent. This maximum plot had from 1852-64, yearly mixed alkalies, superphosphate, and at the rate per acre of 800 lbs, ammonia salts. A plot treated with farmyard manure at the rate of 14 tons an acre, gave on the average of seventeen years, 35½ bushels of dressed wheat of 60 lbs. per bushel and 34 cwt. straw. Here again the natural manure must be credited with producing the heaviest bushel. It is seen that in 1868 the quantity grown on the maximum wheat plot was much below the average, being only 22½ bushels per acre, but the weight was 62½lbs. to the bushel, or 4½ lbs. above the seventeen years' average. But this year the comparative weights were all largely in excess of the mean. At the same time, the unmanured plot No. 3, the one alone recorded for 1868 separately, gave 16½lbs. per acre, or 2 lbs. beyond the average produce of 1852-68.

There are a number of other patient trials in the growth of green crops and root crops narrated, whose more or less successful results Mr. Lawes has detailed in his paper. The issue of one which the experimenter regards as notable, I give it in his own words:—"In alternating wheat with beans," Mr. Lawes observes, "the remarkable result has been obtained, that nearly as much wheat and nearly as much nitrogen were yielded in eight crops of wheat in alternation with the highly nitrogenous beans, as in sixteen crops of wheat grown consecutively without manure in another field; and also nearly as much as were obtained in a third field in eight crops alternating with bare fallow."

I will conclude this sketch with an abbreviated account of a series of rotation experiments extending over twenty years, 1848-67 inclusively. An area of 2½ acres was divided into three plots, each was sown alike year by year, and in this order of succession:—First year, turnips; second year, barley; third year, beans; fourth year, wheat; the fifth, turnips; again and so on throughout the twenty years. Plot 1 was unmanured continuously. Plot 2, manured with phosphate of lime for the *turnips* only, consequently this was manured once in four years. Plot 3, treated with complex manure (artificial entirely) for the *turnips* only, and therefore once in four years like No. 2.

The average results for the corn and roots are given below; the straw and leaf produce is omitted.

Crops in Rotation.	Corn of Roots Produced on		
	Plot 1, Unmanured continually.	Plot 2, Superphosphate of Lime for turnips alone.	Plot 3, Complex Manures, for turnips only.
1st. Swedish turnips ...cwts.	26½	136½	242½
2nd. Barley .... bshls.*	41½	30½	44
3rd. Beans ..... " *	12½	12½	21½
4th. Wheat ..... " *	33	30½	35½

* All dressed corn.

Plot 1 produced much less of turnips than the others, but the dressing of the turnips on Plot 2 apparently injured the barley much, and the wheat in smaller degree; the beans slightly affected. But on Plot 3, all the crops attained their *maxima*; the turnip produce was ninefold as against the gathering from the unmanured ground of Plot 1.

There are many other and important essays in experimental agriculture, concisely described by Mr. Lawes in the *Memoranda*, but which yielding unreadily to statistical illustration, I have refrained from touching.

II.—THE CHANGES IN AGRICULTURE IN CORNWALL SINCE 1800.

The following paper was read by Mr. John Thomas, of Pradannack, Mullion, at the last monthly meeting of the Helston Agricultural Exchange:—

"Almost the only field crops at the commencement of this century were *wheat, barley and oats*; even potatoes were far from being so extensively cultivated as they were a quarter of a century afterwards; and as for turnips, which now fill such an important part in our cultivation, they were scarcely then known. The only manure available was what was made on the farm, with the exception of sand, where convenient for carrying, and lime in certain localities, and upon certain soils, marl was also used in favourable localities. Farms near the towns at this time were considered of greater proportionate value than they would be in the present day, for the facilities they afforded to obtain town dung; every kind of compost that could be got was carefully cleaned up, such as road scrapings, &c.; this was considered then, as it is now, beneficial for wheat. *Labour being low* many things were then carried as manure which now would not be considered to pay. There being little or no turnips, and very little house or stall-feeding, of course the farmyard manure was little, and that of very inferior quality. Where straw was plentiful, it was thrown about the yards, such as they were, and a favourite way of preparing the dung was to heave it up in a heap in the yard, this was to prevent cattle from treading on it, as it would rot down much faster in this way. The application of the dung was for wheat and barley, but then it was always rotten dung for barley—that is, twelve months' old top-dressing, for dressing on grass was then, I believe, scarcely ever adopted.

"The first thing I wish to notice in the way of cropping, is the cultivation of the *potato*. As I remarked before, at the commencement of this century this plant was cultivated little more than as a household vegetable, yet in a few years after it came to be so extensively cultivated, especially for fattening pigs, that when it began to fail from disease, it was felt to be a national calamity, and the farmer, for a long time, looked in vain for anything approaching to a substitute. It is singular that this root, said to have been introduced into Europe three centuries before, should not have come into general use before the time I speak of, and it is equally singular that it so soon showed symptoms of decay. I estimate about thirty or forty years as the period the potato was under extensive cultivation. *It is amusing to hear of the prejudice by which this root was received by our forefathers, who ascribed every calamity, whether natural or national, to its introduction.*

"The next thing which should claim our attention is the *root crop*, and under this head, of course, the turnip is the chief or most important. This produced a very great change in the rotation of crops, as well as the keeping of stock. I believe the turnip had been moderately cultivated in some countries before the date we have now under consideration; but in this country and this locality, it is not more than fifty or sixty years since the turnip may be said to have been cultivated for the use of stock. It felt its way in at first very slowly; the pioneer was the pasture turnip, and then followed the Swede or rutabaga. I believe I remember the first rutabaga cultivated in the parish in which I reside, and I have seen in that time the cultivation of the turnip increase from —if I were to say 1 to 10 per cent. of the land under cultivation, I suppose it would be a just approximation.

"There is another subject so intimately connected with the root crop, that we can scarcely speak of one without thinking of the other—you will anticipate that I mean the discovery of *new manures*; every other change sinks into nothing compared to this. Other changes have been more or less partial; this has

been organic, and it has affected the whole; this may be regarded as revolution, as affecting the very constitution of things; and had it not been for this revolution, the English farmer must have had a strong constitution indeed to have sustained some of the pressures that have been put on him. It is about thirty or thirty-five years since the introduction of those manures, and it is surprising in that time to what extent and how general they are become. The four principal of the manures to which I refer are *bone, guano, phosphates of lime, and nitrate of soda*; these are frequently called artificial manures, although art or science has had little to do with the two first, or with their discoveries as manures. It would be interesting to know who was the first to apply broken bones to plants; no doubt the discovery was made by observing how tenaciously the fibres of plants clung to pieces of bone in the soil. Any reflecting mind might have suggested the idea of breaking the food for the plant, and as to guano, which is a natural deposit, and had been used by the Peruvians for centuries, of course our traders to that part of the world would ascertain its fertilising properties. I was talking some time since with a gentleman who was the first that ever used guano in this county. He said he had been having artificial food for his cattle from a large house in London; they sent down a bag (2 cwt.) of this stuff, and said it produced wonderful effects in South America, and desired him to try it, to see if there was any good in it. He applied the two cwts. to one acre of oats, and the effect was wonderful—greater than he has ever seen from that time to the present. On the discovery of those new manures, the root crops may be said to have claimed them for their own, and the stimulus given to the growth of green crops was surprising.

If Science had not much to do with discovering new manures, Art has done a great deal by inventing the drill, horse-hoe, &c., without which those manures could not be economically applied, and it would be impossible for the crops to be cleaned. Before the introduction of green crops, a good summer's fallow for wheat was the only chance a farmer had to clean his land; but by the use of the drill, to be followed by the horse-hoe, two ends could be obtained at one time—cleaning the land and raising the crop. Although I may not be willing to admit that we owe so much to chemistry as some claim for that science, yet I conceive we are under immense obligations to the inventive genius of the mechanic.

"At the commencement of the present century, few and simple indeed were the *implements* of husbandry. The plough, harrow, stone roller, and tormentor may be said to comprise all the field implements. These were of a very rude description, compared with those of the present day, and when we think of the plough in use then, with its shoe-like share, put on to the wooden chip, it is surprising how well, in many instances, the work was accomplished. I think it would puzzle some of our best ploughmen in the present day to manage such implements at all. Great attention has been paid to the improvement of the plough, which must be regarded as the first or chief of agricultural implements, until it has arrived at that state of perfection and does its work with such precision that we might justly give it the distinguished title of a mathematical instrument. Not only has a great change been made in those implements which affect the culture of the land, but also in those which affect the *securing of crops*. The change here is marvellous indeed, when we think of the stride from the sickle or old reap-hook, to the graceful reaper drawn by horses and laying down the bundles in such quick succession. The change is equally great in those things which affect the preparing and returning the crops as those of cultivating and securing, within the memory of those who are past the middle age of life. The flail, or *threshall*, as it was locally called, was the principal thing used in beating out the corn, so simple in its construction that it had not undergone any change or improvement since the days of our Saxon forefathers; and then, again, the winnowing, which was principally done by women heaving it up against the natural current of air, subject to all the annoyances of calm, rain, and change of wind. I have heard that when the winnowing machines were first introduced, some objected to them as subverting the laws of nature by making artificial wind. Horse thrashing machines were certainly in use at the commencement of the century; but then they were few, and only on large farms. Cobbett speaks of the beautiful music of two flails and a cuckoo. Of course this had an under meaning; that the farmer who could keep corn till spring or summer, was supposed to be in easy circumstances. Now when we consider the change from the flail and sieve and keiser to the ponderous steam machines that are now moving from farm to farm, and preparing for market its 100 or 200 Cornish bushels a-day, it is almost past our comprehension, and especially when we think that there had been no improvement in that branch of farming, for, perhaps, a thousand years before.

"The next thing I would call your attention to is to the keep and *breed of stock*. It is true, strictly speaking, this is not agriculture; but in common acceptation, it comes under the same meaning, and, I suppose, in a paper of this kind would be expected to be treated of. Sixty years ago very little attention was paid to what is now thought and talked of so much—I mean the breed or blood of stock. First, we will take bullocks. The old Cornish or primitive cattle were then general; the only admixture at all would be the North Devons. It is true that this useful breed had, at the time we refer to, found its way into many parts of the country. Although, at the commencement of the century, there was very little attention paid to breeding, yet there were many fine bullocks reared and fed. The reason was this; oxen were much in use, and all the best or most promising steers were kept for that purpose. These were worked for a few years, and hence they were got to a maturity of growth before fattened; great numbers of steers and oxen were brought down for the eastern part of the country, and it was a source of pride and emulation among the old farmers who should turn out the best oxen. I remember oxen of a thousand weight of the Cornish breed, but these were not general. Cattle, now-a-days, are brought to the market at a much earlier age, and I suppose we may put down, as a fair average, that they are 2 cwt. heavier when brought to the market than fifty years ago. In those days, there being little or no turnips, cattle had frequently a hard time of it to pass through the winter, and in summer, being turned away to commons or the coarsest pasture in low condition; young stock were frequently four or five years old before they came into profit. I must notice here the introduction of a new breed of cattle, the *Shorthorns*, or, as they were first called the Durhams. These were first introduced into this country (as I suppose) by the late Mr. John Penhallow Peters, and I estimate the time about forty years since. The shorthorns have now spread themselves by mixture and other-wise over many parts of the county, and have many admirers, and in some instances are brought to great perfection; but whether they will stand the climate and many of the poor soils of Cornwall, time alone can show. More recently the *Hereford* stock has been introduced, but up to this time has not become very general.

"However great a change has taken place in the breed, keep, and management of bullocks, the same remarks will apply equally to *sheep*. A small hardy sheep, without any introduction of new blood, was all that was to be found in this county at the commencement of the century. The first impetus given to the improvement of this stock, was by the introduction of the Leicester, and, I suppose, like the short-horned cattle, the honour belongs to Mr. J. P. Peters. Southdowns have also found their way into many parts, and recently the Shropshire, which is a larger and better short-woolled sheep. But, however great the change has been in the breed, it is little compared to the improvement in keep and attention given to this stock. By the introduction of two or three new breeds, both in cattle and sheep, of course the crosses have been almost interminable. Many of those crosses have been successful, but it requires great caution in this matter. This is, however, foreign from our present subject. Pigs must now, for a moment, claim our attention; and I must say that they have come in for a fair share of attention with agriculturists generally, and although they are discontented animals, especially without meat, they have no reason to be discontented on this ground.

"We can remember when the large white pig was the only one to be found, with immense ears hanging over its face, and if the elephants recently exhibited here were called umbrella elephants, in consequence of their large ears, I think, if the ladies would allow me, these pigs might claim the name of 'parasol pigs,' for their ears kept the sun out of their own eyes at any rate. The present breeds of pigs are too well known for me to trespass any further on your time. *Horses* were in many instances very good fifty years ago, and there is not the improvement in this as the other stocks we have named. Horses were worked less, and fared harder than at the present day. The horses then, although not generally so large as at present, were characterised for great endurance of fatigue, and were exceedingly sure-footed on the roads. Farm horses frequently, like bullocks, had to winter it as best they could, with no other covering than nature supplied them with; and this leads us on to consider the great accommodation in farm buildings than formerly. Supply and demand have followed each other. Green crops brought more cattle, and more cattle brought more houses.

"*House accommodation* is now one of the first things a farmer has his eye to when taking a farm, and one of the first stipulations with his landlord. I remember once talking with a friend from America, who had been absent from this country over twenty years: he said nothing struck him so much, on his return to Cornwall, as the improvement in farm buildings. Within the last few years there has been a great stimulus given to the improvement of *waste land*. The causes which have led to this are, I consider, in the first place, the

discovery of new manures; secondly, improved implements and lastly, the long continued high price of farm produce, consequent, under the blessing of Providence, on a state of national prosperity, caused, no doubt, by a long peace, and the resources of the nation being turned to agriculture, manufactures, and commerce, instead of the destructive art of war; and we must also admit that we are not a little indebted to the wise and liberal acts of the Legislature. A great deal of waste land was brought under cultivation before the close of the last French war, which, after the peace, in many instances, was again left to run to a state of nature, owing to the depression which fell on the nation after such a long war. But I think it may be safely anticipated that those who enter upon such speculations now, have far safer data to go upon, and they deserve the encouragement and good wishes of the community at large. We might give one word to what is called *thorough draining*. Although wet parts of fields and cutting out of springs had been frequently attended to, yet such a thing was never known as to drain land systematically. Here, again, we are in a great measure indebted to the inventor of the drain pipe machine, as without pipes, stone could never be got in sufficient quantities for such purpose. Perhaps few things have undergone a greater change in agriculture during the last fifty or sixty years than labour. *I estimate that labour in that time has been economised near fifty per cent.* This is principally owing to machinery, though other causes have operated also. During the same period the price of labour *has risen thirty-five per cent.*; and it costs a great deal more in implements and machinery than formerly. The changes in our natural lives are scarcely distinguishable from year to year. As when on a journey our advancement if not sudden, yet, when we sometimes take a stand and look back, we find that we have progressed a long way, so in the subject we have now under notice, we may not have seen great changes from one year to another, yet, in looking back half-a-century, we see a vast difference in that time. There is one thing we should ever bear in mind—that the efforts and inventions of man are puny indeed without the blessing of a gracious Providence; and although some seasons have been more propitious than others, yet the sunshine and the shower have been given—summer and winter, seed time and harvest, have not failed."

COTTON CULTIVATION IN INDIA.

To His Grace the Duke of Argyll, Her Majesty's Principal Secretary of State for India in Council.

The Memorial of the Cotton Supply Association.

Sheweth,—1. Your memorialists are deeply concerned to learn that there is but little progress making in the development of the agricultural resources of India, especially in relation to an increased production of cotton. From the report brought by their Secretary, just returned from India, who has had the opportunity of travelling through the cotton districts, and of conferring with the Collectors, Commissioners, and others upon the subject, they are confirmed in the conviction that had the proposal submitted to Government in their last memorial been carried out, viz., to employ the Collectors specifically in the way suggested for promoting and improving the cultivation of cotton, the anticipated results would have been realized.

2. Your memorialists therefore again beg most earnestly to recommend that the Collectors in the cotton districts, being the officers who have the power and influence necessary to secure real progress, should be expressly instructed to use the best means that can be devised to promote the object desired. More particularly to select a number of the most intelligent and best qualified native agriculturists that can be found, to be first of all instructed at the model farms and seed gardens in improved methods of cultivation, and then to be employed under the Collectors' directions amongst the ryots, in advising and persuading them to adopt such measures as are proved to be advantageous. In this way it is believed that prejudices and objections would be overcome, that care would be taken in the selection of seed, that recourse will be had to deeper ploughing, to manure with irrigation, and that better methods of cultivation would gradually be adopted to render the soil increasingly productive. A native cultivator at Ahmedabad has just reported to your memorialists that he estimates the yield from his manured land at 50 per cent. more than from the unmanured part. The successful efforts of Mr. Shaw in Dharwar and of Mr. Ashburner in Khandeish clearly show how much can be accomplished by intelligent and zealous Collectors to promote and improve the cultivation of cotton in their several districts. Your memorialists have good reason to know that the Collectors themselves, if furnished with competent assistants, are not averse to be employed in the way recommended, and in the absence of any middle class, such as is found in the Southern States of America these officers are the only agents who can effectually influence the cultivators and secure the objects desired. In some cases the Collectors might probably with advantage be provided with a steam plough, to be tried first on a model farm, and then to be lent to such ryots as may be willing either separately or in combination to use it, and whose holdings are sufficiently large for the purpose.

3. Your memorialists urgently recommend that the means which have been found successful in promoting and improving the cultivation of cotton in other districts, should also be employed in the Punjab, the North-Western Provinces, Bengal and Madras, they think that the Cotton Commissioner for the Central Provinces and the Berars might now transfer his services with advantage to Bengal and Madras, especially as application for assistance has been received from the latter presidency, and that if a suitable Commissioner were appointed for the North-Western Provinces and the Punjab, the results could not fail to be in the highest degree beneficial.

4. Your memorialists are of opinion that much benefit would arise from the establishment of small model farms for practically teaching agriculture in connection with the normal and village schools which are largely attended by the children of the ryots. Such small farms under the supervision of the Director of Public Instruction in each district would not only serve to train up a more intelligent class of agriculturists, but by attracting the attention of the koonbies in each locality, would be the means of bringing under their notice such improved methods of cultivation as could there be seen in operation. Your memorialists have reason to believe that such model farms as have already been established have proved of great utility, and they much regret to find that the funds necessary to their efficiency have in some cases been curtailed. They consider it to be of the highest importance that these farms should be well-sustained.

5. Your memorialists again, with increased earnestness, to recommend the speedy construction of the railways into the cotton districts urged upon the attention of Government in their last memorial, and which have already been sanctioned, and of roads, which are so much needed for the transport of produce; also, that additional facilities for irrigation should be provided by means of loans to be raised in this country. They are of opinion that local contributions for this purpose might be obtained if grants or loans were offered to a municipality or district, to provide wells and inexpensive works of irrigation, to make and repair the roads, bridge the nullahs, &c., in each district, and that such local expenditure, under local management, would not only relieve the imperial treasury, but would reach wealthy natives who now evade the operation of a general income tax.

6. Your memorialists are still of opinion that a Cotton Frauds' Bill is a necessity, and, whilst they think that the one proposed by the Bombay Legislative Council is opened to grave objections, and that its stringent clauses require modification, they recommend that it should be re-considered and so altered and amended as to remove the objections urged so strongly against it, and to adopt it to the circumstances not only of the Bombay Presidency but of the other cotton-growing districts of India.

7. Your memorialists, who have frequently been represented as endangering an adequate supply of food by promoting an increased production of cotton in India, have been surprised to learn that an import duty upon wheat and flour from Australia and elsewhere exists, which is practically prohibitive, and to some extent increases the necessity of growing cereals where cotton might otherwise be cultivated. They therefore beg to suggest that such duties as prevent the free importation of food should be at once repealed. In doing this they desire to state emphatically that they have never promoted the growth of cotton in India in any way that could in the slightest degree endanger the sustenance of population, though this has been alleged both in Parliament and elsewhere. On the contrary, the tendency of the measures which your memorialists have advocated has always been to develope the agricultural resources of the country generally, and to increase the fertility of the soil with a view to the production of larger crops of every description, leaving the ryot the option of growing cotton or any other produce that may pay him best. But they submit that wherever cotton is the most profitable crop that can be grown, it is for the interest of the cultivator to be furnished by means of good roads and improved communications, with increased facilities for obtaining from every quarter adequate supplies of food.

8. Your memorialists are constrained again with increased earnestness to press for the introduction of representatives of trade and commerce into the Indian Council. Their attention has recently been drawn to this subject by the return ordered by Parliament of the names, ages, dates of appointment, and other particulars of the present members of the Council of India, and the examination of that return convinces your memorialists more strongly than ever that the interests of the Indian empire imperatively demand the change which they advocate. It is to them manifest that men who have for the most part been so long absent from India as is shown in this return, and who when there spent their lives in services which had little or no connection with the trade and commerce of the country, cannot in the nature of things adequately represent these great interests which from year to year have been increasing in magnitude and importance. They therefore beg most respectfully to urge that this recommendation may receive early attention.

9. Your memorialists are of opinion that the rapid progress which America is making in the production of cotton, by means of fertilizers and improved methods of cultivation, renders it indispensably necessary that no practicable efforts should be neglected for promoting the growth of cotton in India. The danger of losing so valuable a trade, worth at the present moment about twenty-millions sterling, is imminent, and demands the immediate adoption of all suitable measures to ensure its preservation and permanence.

Your memorialists, therefore, beg with renewed earnestness to urge their recommendations upon the attention of Government, and will ever pray, &c.

Manchester, 12th May 1870.

Berar, June 26.

You get plenty of information about the cotton of this cotton-growing land; but I have never seen any allusion, to the *main* cause of its being of different qualities, and of some of it being dirty and some clean. Much has been written about the respective qualities of different kinds of seed; and much trouble has been taken, and much expense incurred to procure and to distribute among the cultivators what are considered to be the best varieties; but I believe that all who have sojourned much among the real cultivators will agree with me in saying, that, difference in the quality of seed has comparatively little to do with the difference in the quality of the crops. Railways and roads make nine-tenths of the difference. Other things being equal, the best seed will of course produce the best cotton; but the difference in other things is so great, that difference of seed is scarcely worth taking into account in calculating the results.

In the vicinity of the railway, and of made-roads leading to the cotton depôts, that is to say, where sufficiently potent influence has been brought to bear upon the cultivators to induce them to deviate from their ordinary modes of procedure, the fields are well ploughed, and the ground thoroughly prepared. The seed is very carefully drill sown. The plants are thinned where necessary, and the fields carefully weeded, kept indeed as clean as a well-tended garden, which they require to be. The picking is begun as soon as a quantity of the capsules have opened, and before any of the cotton has fallen to the ground. Three *well-timed* pickings suffice to secure the whole crop without any of it being allowed to fall to the ground. It is thus got in clean and in the best condition.

To see the reverse of this, we have only to go twenty miles—often much less—from the railway on the one or two made-roads, and the further we recede from them the greater is the contrast. The ploughing becomes less thorough, the clods are not pulverised; the seed is carelessly and irregularly sown, the plants are not thinned where thinning is required; the weed and grass are not eradicated but allowed to grow up, depriving the cotton plants of their nourishment and stunting their growth. In places, far removed from the made-roads, it sometimes requires close inspection to discover the cotton plants amidst the more luxuriant weeds and grass. But the worst is still to come. The value of the cotton in the remoter districts is not sufficient to induce the cultivator with his household to undertake the troublesome work of picking it from the pods. It is allowed to fall to the ground, and is then gathered up at one gathering, with whatever soil may adhere to it. Should rain fall in the interval, as happened last season, it is of course battered into the black soil which is converted into mud; and it is thus lost, for all the purposes of commerce, except adulteration, though still available in some measure for the cultivator's own use.

I need scarcely tell you that the latter phase of cotton culture is the original and normal one, in this part of India at least, and that the extraordinarily different mode recorded in the preceding paragraph has been brought about by roads and railways, the only way by which the "schoolmaster" has hitherto operated with much effect on the genuine agriculturist, the real holder of the plough.

It is not, however, cotton cultivation only that the roads and railways have affected thus powerfully. The effect on wheat and jowaree (staples of these provinces) is equally striking. Away from roads and railways care and industry are conspicuously awanting. Although drill sowing was practised in this country a thousand years before it was heard of in England, so little care is taken in ploughing and cleaning the fields and pulverising the soil, that the wheat has the appearance of having been sown broad-cast, mixed with an equal proportion of weeds and grass. Like the cotton in similar circumstances, it is stunted in its growth, and the produce very inferior. In striking contrast with this, we see near the roads and railways in the cold season, fields of wheat rivalling in appearance those of England. Mile upon mile is to be seen drill sown, perfectly regular, and without a weed. Before it ripens, the vast expanse of bright green brings vividly before the Englishman his own fertile land.

Nothing will move the cultivator to work in any other way than according to his normal lazy procrastinating mode, except a stirring appeal to his self-interest. Where, from difficulty and expense of conveyance, his market is confined to the villages in the vicinity of his fields, he has no inducement to cultivate much land, or to take any particular trouble with what he does cultivate. The demand is small, and little care or labour is required to produce enough to satisfy it. Toil beyond this would be unremunerative. But when by means of roads and railways the market is extended, there is of course a proportional rise in price, which, operating on the strongest propensity in man, savage or civilized, produces results such as I have described.

I might tell also of the rapidity with which the area under cultivation has been extending, but I am afraid I have already exhausted your patience.—*Correspondent, Times of India.*

THE ARECA NUT—SUPARI.

Amongst other articles taxed on entering the Municipal limits of Bangalore, we find the supari forming a very prominent item; and it is a source of congratulation to find that at a time when the general cry of British tax-payers is, that the Natives do not bear their fair proportion of taxation, in this instance, at least, it can be said that the nut being a native luxury, the revenue from it is wholly contributed by the native growers and the beetle-nut-eating public of India.

The supari being a tree of slow growth, it takes many years to become at all productive, in consequence of which few, if any, have the opportunity of reaping the produce of their own labor, and it is only left to another generation to realise the fruits of their predecessors' industry. These are really great drawbacks to the prosecution of such an enterprise, and our oft-disappointed coffee planters whose hearts become heavy at the deferred hope of bumper crops, may well take courage at the patience of the Hindoo. But it is not so much a matter of virtue we suppose that supports the one and discourages the other as the difference of social ties and local influences which divide them. The native from the peculiar nature of his domestic relations is attached to his parental roof and ancestral lands. In his endeavours to support the distant branches of his family, a duty he cannot ignore, he prefers extending the cultivation of lands under his patriarchal guidance, to sending his relations to form new settlements. Whatever labor therefore is bestowed on any agricultural undertaking is viewed as invested interest, though the prospect of a return be remote. The Planter on the other hand is a speculater, and plants nothing that he cannot reap, and in fact from the day he enters upon his speculation he pictures to himself a return to his native land with a suitable fortune.

The Nagar Division of Mysore, in consequence of its hill tracts and moist climate, offers peculiar facilities for the cultivation of this palm. So we find almost every hut, as well as the massive edifices of that small remnant of feudal glory, the Gowdahs, sheltered by a shady grove of nut trees, whose slender forms sway with the breeze, and whose fringy tops, whilst murmuring mid the mountain solitude, cast a fragrance around from their aromatic blossoms.

The land most congenial to its growth seems to be a level cut on the slope of a hill, or some sheltered valley rich in vegetable deposit. That it is a tree requiring much nourishment like the plantain is obvious, from the trees requiring manuring and digging round annually to ensure a good crop of nuts. In Mysore nut gardens are taxed much in the same way as paddy fields, with a fixed assessment, in consequence of these lands requiring a supply of water in the hot season for irrigating them. In those regions of the Mulnad where one would suppose the heavy rains would be sufficient, we find that even there the nut tree droops considerably in the hot season, owing to its succulent roots permeating on the surface. Turning therefore a hill stream through the land revives the drooping leaves and ensures a good blossom. The ripe nuts are gathered, and after being peeled on a sharp knife fixed on a board, are cut in two and dried in the sun. Another process is slicing the nut and parboiling it, all of which when dried form the beetle-nut so much esteemed throughout the East.

There is a duty imposed on the nut leaving the district where it is grown, and we find that in the Nagar Division the quantity of supari which paid halut during the year 1868-69, was 383,821 maunds, realising a revenue of Rs. 428,591.

An article yielding a revenue far superior to the entire coffee halut might well receive a little attention, and we would like to see some investigation and report touching the produce and cultivation of the nut for some years past, together with any particulars bearing on the subject. The supari on being brought into Bangalore has to stand another impost in the shape of an octroi or Municipal tax, equal to about 4 annas a maund: so with the original land tax and the halut in the growing district, which, as we said is about a rupee a maund, taken altogether, we fancy the sweating process is pretty liberally imposed.

The Mysore nut is considered superior to all others, and forms four-fifths of the consumption in Madras. The nut imported from Ceylon and the Western Coast is not so much appreciated, and commands a much lower price in the market. —*Bangalore Spectator.*

Official Papers.

CALCUTTA, 15TH AUGUST 1870.

RICE.

ACCLIMATIZATION OF CAROLINA PADDY.

From D. J. McNEILE, Esq., Officiating Secretary to the Board of Revenue, Lower Provinces, to the Officiating Secretary to the Government of Bengal, General Department,—(No 280 C, dated Fort William, the 31st May 1870)

Sir,—With reference to Government order No 1367 dated 12th instant, I am directed to state that the Board have taken the only measures which can be adopted for the present, with a view to test the productiveness and suitableness of the soil and climate of India for the Carolina paddy seed. They have distributed the seed contained in the twenty-nine barrels received from England to the Governments of the North-Western Provinces and the Punjab, and the district officers &c., in the Lower Provinces, for experimental cultivation. The result will be reported on fully hereafter.

2. The accompanying list shews the details of the distribution of the twenty-nine barrels in question, as also of thirty barrels which have been recently obtained direct from the Madras Board of Revenue, who had more seed than they could utilize. The quantities indented for in the Lower Provinces were greatly in excess of the amounts which the Board have been able to give out of the limited supplies received.

3. The entire quantity of seed received with Government order No. 889 dated 30th March last, was made over to the Agri-Horticultural Society.

4. In conclusion, I am to report, for the information of Government, that in a recent letter, the Collector of Bhaugulpore has reported that, after properly cleaning and removing the empty husks from a gross quantity of 22 seers of seed applied to him through the Commissioner, the paddy weighed 13½ seers only.

List shewing the distribution of the twenty-nine barrels of Carolina Rice Seed forwarded by the Government of Bengal, and thirty barrels received from the Board of Revenue, Madras

To whom supplied.	Out of 29 barrels received from Government	Out of 30 barrels received from Madras	REMARKS
The Government of the North-Western Provinces	5		
Ditto Punjab	5		
Commissioner of Assam	2	4	
Ditto Bhaugulpore	1	4	
Ditto Burdwan	1	2	
Ditto Chittagong	1	3	
Ditto Chota Nagpore	1	4	
Ditto Cooch Behar	1		
Ditto Dacca	1	2	
Ditto Orissa	1	...	
Ditto Patna	1	3	
Ditto Presidency Division	1	3	
Ditto Rajshahye	5	1	
Agri-Horticultural Society	1		
Superintendent, Botanical Gardens.	2		
D. Herklots, Esq.	1	4	
Total	29	30	

D. J. McNEILE, *Offg. Secretary.*

Board of Revenue, L. P., Fort William, 31*st May* 1870.

COTTON.

THE COTTON SEASON OF 1869-70 IN THE CENTRAL PROVINCES AND THE BERARS.

By HARRY RIVETT-CARNAC, Esquire, Cotton Commissioner.

Boolundshuhur, N. W. Provinces, the 25th June 1870.

As the Cotton season has now closed, I have the honor to submit for the information of your Chamber (Bombay,) a brief Report on the cotton trade in the Central Provinces and the Berars, during the past year On my return from camp, the Annual Report of this Department, containing a detailed account of the experiments undertaken at the Seed-Farms during the year, and other particulars connected with Cotton cultivation and the Trade, will be prepared and submited to Government, and copies will, in due course, be forwarded to your Chamber. As, however, I am aware that you are anxious to receive, as promptly as possible after the close of the season, a *resume* of the operations of the year, the following Report has been prepared, which it is hoped may be found to embrace the points of the most immediate interest to your Chamber.

First, in regard to the area under cotton cultivation during the year. In my letter dated the 3rd December last, you were informed that the cultivation had been considerably extended. At that date the figures for all the Districts had not been received. A complete Statement is now annexed, from which it will be seen that in the Central Provinces there has been an increase of 73,152 acres, or about 9½ per cent.; in the Berars, an increase of 129,044 acres, or about 10¼ per cent.; or, taking the two Provinces together, a total increase of 202,196 acres, or 10 per cent. Thus in the Central Provinces, cotton now takes up about 6½ per cent of the cultivated area; in the Berars, about 30 per cent of the cultivated area.

Statement shewing the area under cotton cultivation in the Central Provinces and the Berars during the year 1869-70, as compared with 1868-69

Division	Districts	Acres, 1868-69	Acres, 1869-70	Increase	Decrease	
Nagpore	Nagpore	86,081	102,949	16,868	....	
	Bhundara	..	..	..	...	
	Chanda	19,169	37,527	18,358	....	
	Wurdah	17,914	23,732	5,818	.. .	
	Balghaut ...	..	..	..	..	
	Total	298,764	386,808	87,044	....	
Jubbulpore	Jubbulpore ..	28,180	24,963	..	3,217	
	Saugor	21,189	25,795	4,606	....	
	Dumoh ..	14,200	16,600	2,400	....	
	Seonee ...	5,337	6,451	1,114	....	
	Mandla	1,685	1,262	..	423	
	Total.	73,771	78,251	8,120	3,640	
Nerbudda ...	Burfool ...	557	..	..	557	
	Chundwara ...	26,021	18,405	..	7,616	
	Hoshungabad	16,708	10,896	..	5,812	
	Nursinghpore	11,828	13,895	2,067	..	
	Nimar ..	25,625	26,946	1,321	...	
	Total	111,741	141,271	3,388	13,868	
Chutteesgurh	Raepore	83,446	85,810	2,364	....	
	Sumbulpore .	79,510	75,450		3,190	
	Belaspore ..	72,922	65,974		6,948	
	Total	235,888	228,124	2,764	10,138	
	Upper Godavery	691	73		118	Nett increase, acres 73,152.
	Total	750,857	824,027	100,916	27,764	
East Berar ..	Oomrawtee	182,158	325,692	143,534	.. ..	
	Ellichpore .	80,179	187,944	..	121,230	
	Woon .	131,161	134,343	1,182		
	Total	613,181	648,179	146,891	121,230	
West Berar	Akola .	106,862	111,690	1,828	.. ..	
	Boldana .	102,121	101,761	96,639	....	
	Basseim	62,241	64,157	1,916	....	
	Total ...	664,220	767,607	103,384	.. .	Nett increase, acres 129,044
	Total, Berars	1,286,742	1,415,786	250,274	121,230	
	Central Provinces	750,875	824,027	100,916	27,764	
	Berars . ..	1,286,742	1,415,786	250,274	121,230	
	Grand Total Central Provinces and Berars .	2,037,617	2,239,813	351,190	48,994	
	Increase in Central Provinces		..	73,152	...	
	Increase in the Berars ..	.. .	...	129,044	....	
	Total Increase in the Central Provinces and the Berars	....	.. .	202,196	....	

It is satisfactory, too, to notice that in the Central Provinces the increase in the cultivation has chiefly taken place in the Nagpore, Wurdah, and Chandah Districts of the Nagpore Division, which supply the best class of Hinguughât cotton.

The Jubbulpore Division shows an increase, whilst in the Nerbudda and Chutteesgurh Divisions a small decrease is noticeable. In the latter divisions, however, the settlement has not been completed; and, as the totals include the estimated area under cotton cultivation in the Tributary States, the figures cannot pretend to great accuracy.

In the Berars an increase is shown in both divisions, and there can be no doubt that there the crop is a most remunerative and popular one, and likely long to hold its own. The figures now given will be found to differ slightly from estimates prepared early in the season. The present totals are those most recently received from the District authorities, and are believed to be sufficiently correct to give a fair idea of the area under cotton cultivation. The increase in the Oomraotee District and the decrease in Ellichpore is owing chiefly to territorial exchanges, a considerable cotton-growing tract having, during the past year, been transferred from Ellichpore to the former district.

With such a considerable increase in the cultivation, a larger supply of cotton than usual was, of course, looked for. You are already aware of the cause that have led to the disappointment of these expectations and my Monthly Reports, and the Export Statements furnished to you by Mr. Dunlop, will have shown your Chamber the effect on the crop and on the trade, of the unseasonable rain that fell late in the season, and continued with more or less persistency until March. The season opened with excellent prospects. There was at first just enough sun and rain, and the crop throughout the country promised well. Then came the heavy rain when the plant was in flower, which did considerable damage not only in Central India, but in the North-Western Provinces and other cotton-growing tracts. For long it was hoped that the increased area under cotton cultivation would more than counterbalanced the damage done by the rain. Even comparatively late in the season, it was felt that continued fine weather would revive the plants, and perhaps give a larger crop than had been known in any former year. But rain, and what was equally destructive to the cotton, damp cloudy-weather continued to the end of March, and the crop, already damaged by the rain, suffered most severely from the "boll-worm," too well known in America, but which has never before been regarded with much anxiety in Central India. Although from the first I had been most anxious not to cause unnecessary alarm, still by the commencement of February there had been so little improvement that it then became sufficiently apparent that there would be a decrease in the exports; and writing to your Chamber on the 9th of that month, I was obliged to state that there would probably be a falling off of about one-fifth, or, taking the annual exports from the Central Provinces and the Berars towards Bombay, at from 250,000 to 275,000 bales, the exports for the season would probably fall to about 2,000,000, or 220,000 bales.

The result has unfortunately proved this reduced estimate to be only too correct. The annexed Statement (B.) shows in detail the exports of cotton by Railway from these Provinces to Bombay, made up to the 9th instant, according to the calculation explained in my former Reports. The quantity carried by Railway this season is taken to represent about 208,884 bales of 400 lbs. each, or 104,000 Bombay kandies. To this must be added the exports by road from Berar across the Sawurgaon Ghât into the Bombay Territory. The totals then stand thus—

Exports of Cotton from the Central Provinces and the Berars towards Bombay, during the Season 1869-70.

	Full-pressed Bales.	Half-pressed Bales.	Dokras or loose Bags.
By Railway	122,883	69,351	49,959
By Road	. . .	. . .	17,094
Total Bales . .	122,883	69,351	67,053

Taking the dokra at one-third of a "bale," and the full-pressed bale and half-pressed bale to be equal to about half a "Bombay kandy," or a bale of about 400 lbs., the exports towards Bombay for the season 1869-70 are then as follows:—

By Railway. . . . . 208,884 bales.
By Road . . . . 5,698 ,,
Total . . ... 214,582 bales.

making a total of 214,582 bales, and showing a decrease on the exports of the previous year of 61,130 bales, or about 22 per cent., as will be explained by Statement (C.)

Statement B.

Statement shewing in detail the quantity of cotton exported towards Bombay from the Stations of the Great Indian Peninsula Railway in the Central Provinces and the Berars, during the Season of 1869-70, as compared with the exports of 1868-69.

STATIONS.	Exports in the Season of 1868-69.			Exports in the Season of 1869-70.		
	Full Pressed.	Half Pressed.	Dokras.	Full Pressed.	Half Pressed.	Dokras.
Nagpore . .	....	....	680	....	258	920
Seindee . .	....	....	296	....	....	....
Wurdah . .	4,224	17,409	1,095	9,856	10,769	25
Poolgaon . .	....	8,759	1,536	....	6,188	487
Chandoor . .	....	4,979	654	....	1,368	708
Budnaira . .	23,384	37,608	883	37,986	11,945	182
Moortizapore . .	....	13,980	1,483	....	11,040	2,931
Akolah . .	....	4,804	2,237	....	3,360	733
Sheagaon . .	14,772	50,800	3,921	18,322	16,691	5,465
Khangaon . .	....	....	....	36,948	2,553	2,697
Nandoorah . .	27,801	39,976	17,554	19,768	5,179	1,307
Mulkapore . .	....	....	4,261	....	....	1,718
Khundwa . .	....	....	35,400	....	....	10,406
Boorampore . .	....	....	....	....	....	6,044
Hurdah . .	....	....	....	....	....	626
Seonee . .	....	....	....	....	....	649
Etarsee . .	....	....	....	....	....	818
Sohagpore . .	....	....	....	....	....	7,091
Garrawarra . .	....	....	....	....	....	7,462
Total . .	70,181	177,775	70,000	122,880	69,351	49,959

	Totals 1868-69		1869-70
Full-pressed . .	70,181		122,880
Half-pressed . .	177,775		69,351
Dokras . . 70,000	28,333	49,959	16,653
	÷ 3	÷	3
	271,289		208,884

Decrease in 1869-70 62,405 bales.

Statement C.

Comparative Statement of the cotton exported from the Central Provinces and the Berars towards Bombay during the Season 1868-69 to 1869-70.

	Season 1868-69.	Season 1869-70.
	Bales.	Bales.
By Railway	271,289	208,884
By Road	4,423	5,698
Total Bales . .	275,712	214,582

Decrease in 1869-70, Bales 61,130.

An examination of Statement B. will shew that this decrease has been distributed pretty evenly over the whole cotton-producing country, and that, as compared with the returns of last year, each station shows a falling off in the export. In fact, the damage to the crop was general throughout the Districts of the Central Provinces and the Berars that supply Bombay with cotton. It will be noticed that "Khangaon" now appears in the list of Railway stations, and considering that the season was a bad one, and that the station was opened late in the year, the little line may be considered to have done pretty well, having carried about 40,000 bales of cotton, besides a certain quantity of other traffic. From Nandoorah 25,000 bales were despatched during the season, but nearly the whole of this was exported before the line to Khangaon was opened, and in all probability the whole of this quantity would have been sent from Khangoan had not unfortunate delay occurred in the construction of the Branch Line.

For the first time, too, some of the stations in the north-east of the Nerbudda Valley are included in the Annual Statement of Exports. The quantity of cotton sent to Bombay from these stations is small, and even before the main line to Jubbulpore was opened, they contributed some few bales which were sent down by cart to the Railway at Khundwah. But the effect of the opening of the line, and the extension of Cotton Agencies in the interior will, doubtless, be to stimulate the trade, and to encourage the cultivation of cotton in the neighbouring districts. I am sorry I am not able to include in this Statement the exports from Jubbulpore towards the west, or to give details of the cotton sent this season by railway from the North-Western Provinces to Bombay. I am unwillling to delay this report for this information, which will, however, be given hereafter in my Annual Report. I may mention, how-

ever, that I learnt at Mirzapore that the imports to that mart this season, of cotton from Jubbulpore and the neighbourhood had much fallen off. This was to some extent to be attributed to the bad season. But it is generally believed that much of the cotton that would otherwise have come to Mirzapore had been drained off towards Bombay. At Cawnpore and Agra also, I learnt that one or two consignments of cotton had been sent from those markets to Bombay. But this subject will be treated of more at length in my Report on the North-Western Provinces.

Some of the cotton, for which credit has been taken in the Statement of Exports from the Central Provinces and the Berars, was, doubtless, grown in the Nizam's Territory, south of Berar, and sent to our marts for sale. I am not able at this moment to give the exact figures of such imports, but they will be published, hereafter, when the Trade Returns are received. The Territory of His Highness the Nizam, which adjoins the Berars, has almost as much interest for your Chamber as the Berars themselves. As much of the very excellent note to which is exported to Bombay by the Nagpore Extension of the G. I. P. Railway and the Poonah-Sholapore Line, is grown in this Territory, I availed myself of an opportunity, during the presence in the Berars of His Excellency Sir Salar Jung, G.C.S.I., the Minister of His Highness the Nizam, to represent to His Excellency how valuable returns of the area under cotton cultivation and periodical information regarding the condition of the growing crop, would be to your Chamber, and to all interested in the cotton trade. Sir Salar Jung was pleased to express his willingness to consider the matter favorably, and I hope to be able to send you hereafter full information regarding the cotton prospects in that part of India.

Another point to be noticed in the Statement of Exports is the proportion borne by pressed to unpressed cotton. In my last Annual Report it was noticed how the system of full-pressing and half-pressing the cotton in the interior had extended throughout the Central Provinces and in the Berars. During the season, 1868-69, 8 per cent. of the cotton sent by Railway went down in *dokras* or loose bags, 66 per cent. in half-pressed bales, and 26 per cent. in full-pressed bales: or 8 per cent. of the quantity was sent down as "loose cotton" and 92 per cent. was "pressed." This season sees a still further advance in the proportion of full pressed cotton, 7½ per cent. only of the exports having been sent down in *dokras* or loose bags, 33½ per cent. in half-pressed bales, and the large quantity of 59 per cent. in full-pressed bales. Indeed, although the total exports this season by Railway have fallen short of last year's supplies by 62,405 bales, still 52,699 more full-pressed bales were sent down this year to Bombay than last year. the figures for 1868-69 and 1869-70 being respectively, 70,181 full-pressed bales and 122,880 full-pressed bales.

The great progress made during the last few years in pressing cotton in the districts will be seen by the accompanying Table.

Percentage of Cotton Exported by Railway during the undermentioned Years.

	Dokras or loose Bags.	Half-pressed Bags.	Full-pressed Bags.	Total Dokras or loose Bags.	Total pressed.
In 1865-66...	100	0	0	100	0
,, 1866-67...	85	13	2	85	15
,, 1867-68...	27½	55½	17	27½	72½
,, 1868-69...	8	66	26	8	92
,, 1869-70...	7½	33½	59	7½	92½

Or, in other words, in 1866, the whole of our cotton went down to Bombay in loose bags or *dokras*.

In 1867, the system of pressing was commenced. At first "full-pressing" did not make much way, 2 per cent. only of the crop passing through the full-presses. The half-presses, however, secured 13 per cent. of the cotton, and the nett result was that in that year 15 per cent. of the crop went down pressed. more or less, against 85 per cent. of *dokra* cotton.

In 1868, the proportion of full-pressed and half-pressed cotton advanced to 17 per cent., and 55½ per cent. of the crop respectively, against 27½ per cent., the figures to which *dokras* had sunk, or nearly three-fourths of the crop was pressed against a balance of one-fourth of loose cotton.

In 1869, the number of full-pressed bales rose to 70,500, and the half-pressed bales to 177,000 of a crop of 270,000 bales, that is to say, 26 per cent. of the crop went to the full-presses, and 66 per cent. to the half-presses, making the percentage of pressed cotton to *dokras* as 92 to 8.

Now, during the season that has just closed, the number of full-pressed bales rose to 122,880; the number of half-pressed bales sank to 69,351; and only 49,959 *dokras* were sent by Rail, that is to say, 59 per cent. of the crop exported went to the full-presses, 38½ per cent. to the half-presses, making the proportion of pressed cotton to *dokras* as 92½ to 7½.

The number of full-presses, too, has considerably increased, and the markets of Khangaon, Sheogaon, Akote, Oomraotee, Wurdah, and Hingunghat are now all supplied with machinery for packing the bales for export; and, as noticed in my last Report, the cotton grown in the vicinity of these markets can now be purchased and pressed under the superintendence of European merchants on the spot, and the full-pressed bales may be conveyed by Railway from the press-houses in the Berars to the wharf at Bombay, and put on board ship without any chance of the bales being tampered with, and the Hingunghat or Oomraottee cotton which they contain being mixed with cottons of inferior growths. Believing as I do that this system of purchasing the cotton at the fountain head, and packing it for export on the spot, is calculated to sustain the fair reputation of the cotton supplied by our Provinces, and to some extent, at least, to check adulteration, I confess that, with my present lights, I regard the extension of this system with unmixed satisfaction. I believe that contrary views are held by some gentlemen of great experience, and for whose opinions I have the greatest respect. I am not as yet so prejudiced in favor of any particular system as not to be open to conviction, and I should be glad to receive from your Chamber, which, on all occasions, has been good enough to afford me the most cordial assistance, an expression of opinion regarding the working of this system, and of its effect on the cotton trade.

It is but fair that I should here mention that there has been no recurrence of the blocks on the Railway line which some years ago used to form a prominent subject in my Report, and that the working of the traffic has been satisfactory.

From the Reports that have been from time to time submitted to you, your Chamber must be aware of the steps that, under the orders of His Excellency the Viceroy, have been taken during the year to improve the cultivation of the cotton crop, and to assist the trade in these Provinces. It may, however, be convenient to follow the plan pursued on former occasions, and, at the close of the season, to recapitulate briefly the chief measures that have been adopted towards these ends. You will doubtless remember that, on the samples of exotic cotton grown in the Berars being submitted to you last season, your Chamber expressed, very decidedly, the opinion that "no exotic variety that could be grown in the Berars will equal in value and usefulness the indigenous varieties of the country known as Oomraotee and Hingunghât; and the Committee are of opinion that whatever can be done to maintain the present high character of these varieties, or if possible to improve it, would be one of the most important services that can be rendered to the cause of improved cotton cultivation in the Districts of country under the Cotton Commissioner's superintendence."

The season in which the samples submitted to your Chamber had been grown had not been a favorable one, and it was therefore determined to try these foreign varieties yet once more. And they have now had another and very careful trial during a season which, although unfavorable to the indigenous plant may from the excessive moisture, be considered to be unusually in favor of the exotic varieties. But with all the advantages of constant rain, which the plants seemed thoroughly to appreciate, the result has been unfavorable, the out-turn small, and the produce inferior. Your Chamber will, perhaps, reserve its opinion on the subject until the receipt of the samples of the produce which have been prepared for you. But I shall be surprised if the result should effect the views now held by you on the subject. The exotic plants will receive a further trial this season, and, perhaps, with the assistance of the experienced gardeners who have recently arrived, some success may yet be achieved.

The hybrid plants, sent out by Major Trevor Clarke, have been watched with great attention. It is almost too early yet to give a decided opinion regarding their merits, but the plants are being most carefully studied by the Seed Gardeners, who have already had some experience in such experiments.

In accordance with your recommendation, the greatest attention has been paid to the indigenous varieties. Besides the three Assistants appointed at the commencement of last season, the staff of the Cotton Department has recently been strengthened by the appointment of four experienced European gardeners as Superintendents of experiments. These gardeners have been placed under the orders of the Assistants to the Cotton Commissioner at the Model Farms of Sheogaon, Oomraotee, and Hingunghat, and the fourth has been attached to the Farm recently established at Boolundshuhur, in the North-Western Provinces. At these Model Farms, indigenous seed, selected during the former season on the plan advocated by Major Trevor Clarke, has been most carefully sown and cultivated. Various experiments have been tried with more or less success with manures, deep ploughing, &c. Notwithstanding an unusually bad season, the result has been satisfactory, the staple has been pronounced to be excellent, and the out-turn of cleaned cotton to the acre from the selected seed has been large, and in one case the combined effect of good seed and deep ploughing

resulted in an out-turn of 255 lbs. of cleaned cotton to the acre. The case was, it is true, an exceptional one, as the soil of the field in which the crop was sown was superior to the ordinary run of the cotton-growing tracts. But from ordinary fields in the Farm during this, an unfavorable, season, as much as 176 lbs. of cleaned cotton was picked from the acre. The results are therefore encouraging.

The greatest care has been taken in selecting the seed on the pedigree system from this season's crop, the inferior bolls being kept separate and the *kapas*, or cotton in the seed, being divided into four classes. Much of the best selected seed has been distributed among the most intelligent landholders of the neighbourhood, and the remainder has been reserved for sowing in the Model Farms.

EXPERIMENTS WITH MANURES.

Whilst the most strenuous efforts are being made to improve the *quality* of our produce—the length and strength of the staple of the indigenous cotton, at the same time the hardly less important question of the increase of quantity—the out-turn to the acre—has, as will be seen from the above remarks, received some attention; for the measures adopted for the improvement of the staple will, it is hoped, have some effect on the out-turn also; and it may not unreasonably be expected that the produce of the healthy seed, thus carefully selected, may show a marked improvement in quantity as well as in quality. A variety of experiments have been undertaken at the Farms to ascertain the means by which the increase of the out-turn may be most successfully and economically ensured. The respective merits of the various manures are being carefully tested; the "Fertilizer" sent by the Cotton Supply Association, the Australian guano, of which a consignment was received from the Government of India, and the Jail *poudrette*, of which great hopes, as an effective and economical manure are entertained, have all been put down at the Seed Gardens. The imported manures were unfortunately received too late in the season to admit of the experiments being made as thoroughly as could have been desired, and the same difficulty prevented the combined effect of irrigation and manure on the cotton plant receiving a perfectly satisfactory trial.

IRRIGATION.

During the ensuing season, however, the experiments with irrigation will be conducted on more advantageous terms. The Seed Farm at Sheogaon has this season been extended to 230 acres. The site is admirably situated, and it is hoped that by damming up the neighbouring stream an effective and economical water-supply may be ensured. The Special Irrigation Engineer recently appointed to the Berars is now engaged is examining this site. Besides cotton, a variety of experiments will be undertaken at this and the other Farms with the Rhea plant and a variety of other produce.

The Farm at Oomraottee this season consists of 280 acres of land, and arrangements have been made for a variety of experiments with the assistance of irrigation, manure, &c.

The Farm in the Hinguṅghat country has been moved to a village named Mudnee, in the vicinity of Wurdah, the headquarters of Wurdah District. At Mudnee, a spcial irrigation scheme has been sanctioned and completed, and the experiments will have the advantage of an abundant supply of water.

The Farm at the place where I now am (Boolundshuhur, North-Western Provinces), is in the heart of the cotton country near the great market of Khoorjah, and on the canal, from which a permanent supply of water is available. The site possesses every advantage. About 150 acres are being sown with selected cotton seed.

DEEP PLOUGHING.

So far as can at present be judged, it would appear that deep ploughing is of great benefit to the plant, and those parts of the Seed Farms which have been thus treated show very favorably by the side of the fields cultivated according to the ordinary Native method. The plants on the well-ploughed fields were much stronger and healthier than their neighbours, and, as already noticed, 180 lbs. of clean cotton per acre was picked from these fields. This season an ordinary Native field hardly yielded 50 lbs. to the acre. The experiments of this season have indeed been so encouraging that it is proposed to order from England a Steam Plough for use in the Central India country.

The Seed Farms are also used at Al-fresco Agricultural Schools. The sons of some of the principal cultivators are employed on the Farm, and the various experiments are explained to them, and to the villagers who occasionally visit the Farm to learn the results of our operations, and who express considerable astonishment at the excellent crops, not only of cotton, but of tobacco, Carolina paddy, and other produce raised at the Seed Gardens.

The remaining measures adopted by the Cotton Department during the year relate chiefly to the encouragement given to the extension of the trade in Central India. The greatest importance is attached to these measures, as it is believed that the establishment of Mercantile Firms in the interior, who are willing to pay a good price for good cotton, offers the very best inducement to the landholder to cultivate this crop carefully and to extend its cultivation as much as possible. At the same time the improved machinery for preparing and pressing the cotton introduced by these Farms ensures, there can be little doubt, the arrival of a large portion of the crop in the European market in a creditable condition.

Every endeavour has, therefore, again been made to remove obstacles from the path of the trade's progress, and to supply its requirements. Thus the means of communication in the Cotton Districts have been much improved by the local authorities. The arrangements for the cotton traffic on the Great Indian Peninsula Railway, as already noticed, have been perfected.

The construction of the branch line of Railway to Khangaon was but the commencement of a system for joining our now isolated cotton markets to the main line. As you are aware, this little line was opened in March last, and has already done its share in the carrying of this season's cotton traffic.

The branch to Oomraottee has been surveyed, and it is hoped that the line may be ready for next season's work.

The line through Hinguṅghat to Chanda also has been surveyed, and there is a hope of that market soon enjoying the advantages of Railway communication. I am aware that the importance of the recent discoveries of coal in this quarter are fully appreciated by your Chamber. Besides the cheapening of the carriage of goods by Railway which may be expected to follow the employment of this coal, the discoveries will, it is hoped, prove of great advantage to the Steam Factories for cleaning and pressing cotton which are now at work in the Central Provinces and the Berars. Surveys of both sides of the Wurdah River are now nearly completed, and it is anticipated that the work may be commenced in the early part of 1871. The direction taken by the proposed line of Railway will much depend on the result of the further investigations that are now being made regarding the extent and direction of the Coal Field.

The scheme proposed some years ago by Sir Richard Temple for a light Railway Tramway from Nagpore to the Chutteesgurh country is again under consideration; and, as it has an indirect bearing on the cotton question, it may be noticed here. Chutteesgurh does not produce much cotton, but the available supply of grain in those Districts is very large. If this grain-producing country could be tapped by a Railway and the large supply of grain poured at a cheap rate into the Nagpore country, the cultivators would be able to devote to cotton much of the land which is now taken up with food grains, and the construction of this line, in addition to the other advantages promised, would thus help to extend the cultivation and increase the supply of cotton.

The branch Railway from Khundwa to Indore, and that from Goolburgah to Hyderabad, have also some interest for the cotton trade, as both these lines will carry some cotton. The surveys are now being pushed on.

TELEGRAPH COMMUNICATION WITH THE COTTON DISTRICTS.

During the past season the offices of the Government Telegraph were at work in the cotton markets of Khangaon, Akote, Oomraottee, and Hinguṅghât, and I think it will be generally admitted that, on the whole, the service was well performed. Some delay in the transmission of messages was temporarily caused during the construction of a new line, which was set up by the Telegraph Department with the special object of providing a separate wire for the cotton merchants, and preventing the messages from the cotton districts being delayed by the through traffic between Bombay and Calcutta, which sometimes happened when but one wire was available. And some inconvenience was occasioned by the premature closing of the Telegraph office at Akote. The latter subject has, however, been brought to the notice of Government, and it is not anticipated that any similar inconvenience will occur in future.

As your Chamber is aware, I have been for some time past on tour in Bengal, the North-Western Provinces, and the Punjab. A Farm, on the principle which has been found successful in Central India, has, as already noticed, been established in the North-Western Provinces; and it is hoped that other measures conducive to the improvement of the cultivation and the assistance of the trade in cotton may soon be adopted.

In regard to stocks, there is, I believe, very little cotton remaining in the Districts. The prices that have ruled throughout the season have been so favorable that there has been little inducement to either the cultivator or the dealer to keep his cotton back, and the improved communications now prevent any delay in transit. My Assistants, who have made careful enquiries on the subject, estimate the quantities in stock as follows:—

In the Hinguṅghât country	2,000 bales.
„ East Berar	4,000 „
„ West Berar	2,000 „

In conclusion, I would notice that, although the past season has been, as the proceeding paragraphs will have shown, an unfavorable one, and although the exports have fallen short of the supplies of former years, still the prospects of the cotton trade

in the Central Provinces and the Berars are far from discouraging. A larger quantity of cotton was sown in 1869-70 than in any previous year. And had it not been for the exceptional weather, the crop would undoubtedly have been the largest ever exported from Central India. Indeed, the cultivation has been steadily increasing year by year, and prices have ruled so high during the season that has just closed, and, notwithstanding the damage to the crop, the cultivators have done so well, that there is every prospect of even a still larger area being sown with cotton during the season which has just commenced. But on this and other subjects connected with the state of the weather and the prospects of the crops, I shall hope to keep your Chamber fully informed in my future Reports.—I have the honor to be, Sir, your most obedient servant,

HARRY RIVETT-CARNAC,
Cotton Commissioner.

Dated, Camp Boolundshuhur, 25th June 1870.

P. S. Dated Simla, the 4th July 1870.

This Report has been delayed for a few days, in order that the latest information regarding the prospects of the season 1870-71, which may now be considered to have fairly commenced, might be supplied to your Chamber. Abundant rain has fallen, and as yet, at least, the prospects are favorable.

Hingunghât.—The Assistant to the Cotton Commissioner, writing under date the 20th instant, states—

"On the night of the 17th, we had the first burst of the monsoon, and the weather since then has been almost continuously drizzling rain.

"The cultivators have not yet begun sowing, and will not begin to do so until three or four more heavy showers of rain have fallen, for as yet the rain has not penetrated to any great depth. At the Mudnee Farm we are quite ready to begin sowing as soon as a favorable opportunity occurs."

East Berar (Oomraotee).—Writing under date the 23rd instant, the Assistant to the Cotton Commissioner reports,—

"From the 12th up to date, we have had very heavy showers of rain, by which the soil has become so thoroughly saturated that some of the cultivators have now commenced to sow their fields with cotton. The detail of the rainfall is given below—

			Inches.	Cents.
"Up to the 12th June	....	....	2	23
On the 16th ,,	...	.. ..	0	5
,, 17th ,,		...	4	35
,, 18th ,,	...		0	25
,, 20th ,,		.....	0	33
,, 21st ,,	..		1	30
,, 22nd ,,			0	7
		Total Inches	8	69

"The rain which fell on the 17th was exceedingly heavy Rain fell continuously for nearly 18 hours, and the water has soaked well into the ground

"The Monsoon has commenced this time earlier than was expected. On account of the heavy unseasonable showers that fell during the past two or three months, the cultivators seemed to fear that the rains might fail us towards the middle or close of the season, when they will be urgently required This unexpected early rain has hurried on the sowing operations, and many of the fields are yet to be got into order, and the cultivators are now busily engaged in sowing or preparing their fields.

"The work in our Seed Garden was stopped for four days owing to the heavy rain, as was the case everywhere in the country. I am glad to report that since yesterday at noon the weather has been fine, and the work in our garden is now going on rapidly."

West Berar.—The Assistant to the Cotton Commissioner, under date the 10th, writes,—

"On the night of the 7th, we had 1 inch 90 cents of rain, consequently the ground has been pretty well saturated, in fact so much so that I have not been able to do any thing with it for the last two days."

And again, under date the 24th he adds,—

"We have had very heavy rain, as much as 8½ inches"

Very heavy rain has fallen in the North-Western Provinces and in Central India, and, as far as I can learn, all over the country; in every direction the rains are reported to be favorable.

The following reports have just been received by Telegraph:—

Hingunghat, 4th July.—Rain-fall up to date 8·49 inches From the 22nd to the 1st no rain fell. During the last four days the rains have set in again steadily, and the prospects of the crop now look well.

Oomraotee (*East Berar*) *4th July.*—Rain-fall up to date nine inches. Cotton crop most flourishing.

Akola (*West Berar*), *4th July.*—Rain-fall 8·75 inches. Weather fine during last fortnight, and Koonbies (cultivators) busy sowing. Rain is now threatening. Prospects could not be more favourable.

HARRY RIVETT-CARNAC,
Cotton Commissioner.

Simla, 4th July 1870.

The Planters' Gazette.

CALCUTTA, 15TH AUGUST 1870.

THE ESTATES.

THE most interesting news of the month to planters is, we suppose, the fact that the short shipments of coffee to Europe from the Brazils, and the export of coffee from Europe to the United States, have brought down the stock in Europe from 31,650 tons in excess of last year's to a surplus of not more than 14,000. The brightest feature in the coffee prospects, say Messrs Rucker and Beneraft, "is the large and increasing consumption in the United States which will serve much to mitigate the effects of a third large crop in the Brazils should the anticipations of its abundance be realized" A fact not so agreeable is the appearance of *the bug* upon the coffee estates in the neighbourhood of Coonoor. A correspondent of the *Neilgherry Excelsior* writes to that journal from Coonoor:—"I informed you some time ago of the presence of the bug on neighbouring coffee estates, and also described its appearance, since which the rapidity with which the nuisance has extended seems likely to injure growing crops in some measure. The pest does no material injury to the shrub itself, but hopelessly blights the blossom and fruit, a serious matter to a struggling planter. The microscope reveals upwards of a thousand eggs and larvæ under each minute scale, and the rapid spread of the plague is easily accounted for when it is considered that there are a million or more of these scales, on every effected shrub. There seems no remedy to exterminate the nuisance, though many fruitless efforts have been tried, and we must only hope that it will disappear shortly as mysteriously as it came, when bumper crops will appear on the sufficiently rested trees and more than make up for their previous inactivity With humanity two epidemics seldom appear together, and should the same rule apply to the vegetable creation—presence of *bug* signifying immunity from *hoar*—there is much consolation in the thought"

Messrs Toulmin report, under date of 23rd ultimo, upon this season's teas and prospects. "So far as has been seen of this season's teas, they have not come up in quality, as a rule, to what was expected of them. this may no doubt be attributed in most instances to the severe drought which prevailed in most parts of Cachar and Assam at the commencement of the season, no doubt, as the season progresses. however, the quality will improve, everything being now favorable in these districts for manufacturing. We regret that the last remark cannot be applied to Darjeeling or the Terai, serious accounts being daily received of the damage which is caused to those districts' crops from the excessive rain, which hardens the leaf and renders it almost unfit for manufacturing purposes, thereby affecting the production both in quantity and quality. It has been noticed a great deal of late what a number of teas are wrongly marked or described on the packages, really common Pekoe Souchongs for instance being marked "Pekoe," and common Fannings "Broken Pekoe," and so on. Of course these descriptions can be rectified on the packages if they are sold here, but as unfavorable remarks are constantly coming to hand on this subject from London as well as Calcutta, it might be as well if any Planters to whom these remarks may apply were to be more particular in describing their teas before sending them out of their factories, as of course wrongly described teas having been once or twice shipped and unfavorably reported upon by London brokers render the said brands liable to be cautiously dealt in for the future, whether the tea be sold in London or Calcutta."

COFFEE.

The Coffee Duties.

The following letter was received from Mr. Leake by the last mail from London :—

London, 5th, May, 1870.

The Secretary of the Planters' Association, Kandy.

Dear Sir,—Referring to my previous letter on the subject of the British Duties on Coffee and Tea, I have now the pleasure of forwarding to you a copy of a return printed by order of the House of Commons, of 22nd March, last.

This return gives full information as to the consumption and price of these articles since 1862, and you will see that I have added a column shewing the percentage of the duty on each article for each year.

Two things seem to be clearly deducible from the figures of the return. First, that even on even terms coffee cannot compete with tea for the British consumption—secondly, that from 1866 coffee has been heavily weighted in the race.

Previously to 1862, I believe, that the consumption of coffee increased with the population of Great Britain. But it must be remembered that the duty on tea was then more than double as heavy as that on coffee. At the same time the fact that from 1862 the consumption of coffee in Britain, has decreased in spite of an increase of population, coupled with the fact that in other countries the consumption has increased during the same period, seems to shew conclusively that the successive reductions of the duty on tea have been the direct cause of the decrease of the consumption of coffee. If this be so, there is a good case from the Planters' point of view, for a reduction of the duty in the name of of fair play.

But the ground on which the *total abolition* of the duty seems to be generally expected in the event of a surplus next year, is even stronger. The Chancellor of the Exchequer said lately in regard to the demand for a free breakfast table, that taxation was like a table and must have several legs to stand upon.

The tea and sugar duties form a good strong leg which in time of need will bear a heavy load, and they therefore must be in part retained. But the coffee duty can never give any valid support to the revenue. It yielded last year only £360,000, and it is almost certain that either an increase or a reduction of the duty would diminish the amount collected, for if the consumption dwindles away at present, much more would it do so under an increased duty.

If the Association resolve to make a representation in favour of either a reduction or the abolition of the duty, I would suggest its being placed in the hands of Mr. Crawford, M. P., for the City of London, who has already expressed himself in the House of Commons in favour of some relief being given to coffee.

I remain, &c.

Wm. Martin Leake.

P. S. Let the Association beware of an argument that I have seen put forth more than once in the London papers, viz., that the duty being paid on raw coffee which loses 20 per cent. in roasting, is by so much heavier on the roasted berry. Those who argue thus forget that by the loss of weight in roasting the value of the article by weight is increased in exactly the same proportion as the duty. The duty as an "ad valorem" duty remains the same—W. M. L.

The following are the important portions of the official return :—

Quantity Consumed in the United Kingdom.

	Tea.	*Coffee.*
1862	£78,793 977	£34,451,766
3	85,183,280	32,763,025
4	88,599,235	31 360,450
5	97,834,600	30,505,973
6	102, 265,531	20,630,236
7	110,958,209	31,282,023
8	106,815,262	30,356,818
9	111,795,639	28.839 100

Average consumption by each individual of the population.

	Tea.	*Coffee.*
1862	2·11	1·3
3	2·14	1·2
4	3–	1.1
5	3· 5	1
6	3. 7	1 .
7	3·11	1 1
8	3·8	1
9	3·10	·15

Amount of Duty Received on.

	Tea.	*Coffee.*
1862	£6,681,262	£481,228
3	4,651,495	409,679
4	4 429,991	392.152
5	3,18 ,130	381,552
6	2,556,714	383,093
7	2 774,774	391,082
8	2,670,629	379,562
9	2,795,162	360,523

Percentage of Duty on price in bond.

	Tea.	*Coffee.*
1862	84·6	36·4
3	69·6	35·3
4	95·7	38·0
5	39· 1	37·5
6	31·2	38·7
7	37·7	39·3
8	31·3	44 9
9	33·3	44·1

Size of Coffee Trees.

A correspondent of the *Ceylon Observer* writes to that journal from Padulla :—In the villages round Namanakoly, near Happutale, Wilson's bungalow and Gampaha, can be seen fields of native coffee vastly superior to the best of coffee about Ballangoda (I hope my Ouvah friends will not be riled at the comparison, Ouvah, coffee *can bear* 15 and 18 cwts. per acre, while Ballangoda can only average 3 to 5 cwts. per acre. But I have been digressing from the biggest trees to the biggest bearing; if any one is curious enough I can shew them in this town coffee trees with stems from 24 to 32 *inches* in circumference, one foot above the ground, and I have no doubt I could find bigger trees if I were to search the surrounding villages, but, I do not think the owners would be willing to part with these trees for nothing, or I could send you a stem or two by the return of the traction engine which is expected here in a few days.

Coonoor, *July* 1870.

This year has on the whole been very favourable for all the estates about here with a few exceptions, these exceptions being some estates on the east side of Coonoor, which had most strangely suffered from want of rain, while properties to the south have had abundance and to spare. The estates on the east side have consequently lost one of the principal blossoms, though since they have also had *quantum sufficit* and will abundantly retrieve the failure on the coming season.—*Neilgherry Excelsior.*

The Coffee Duty in England.

Mr. Harrison, the Chairman of the Planters' Association in Ceylon, writes to that body as follows under date 3rd June 1870 :—

"A number of gentlemen interested in the coffee trade waited this morning at the Bank of England on Mr. Crawford, M. P., with the view of obtaining his help in the House of Commons towards a reduction or abolition of the Coffee Duty. It was urged that owing to the withdrawal of the Gun Licences and also of the change in the manner of exacting the Railway Duties the Chancellor of the Exchequer would have in his hands about £250,000 more than he expected : further that on Monday night (30th May) the Chancellor of the Exchequer in reply to some remarks of Mr. Wren Hoskyns, in regard to the Coffee Duty, said that he could give no hope of any further reduction of the duties on tea and sugar, *but that the Coffee Duty* was still under consideration. Putting the two things together, it would seem that the present is a peculiarly favourable time for urging the claims of coffee with a chance of success.

Mr. Crawford told the deputation that he himself was very strongly in favour of something being done for coffee. In March last he wrote a long letter to Mr. Lowe on the subject. After the Budget Mr. Lowe told him he had made out a good case, but that this year, if the sugar duties were to be dealt with once and for all, there was no room to touch coffee. Mr. Crawford read several passages of his letter to Mr. Lowe—one passage, containing an argument quite new to me, especially attracted my attention. He pointed out in it that the result of exacting a duty on an article of which the total importation bears a very large proportion to the Home consumption (as is the case with coffee) is that a great part of the proceeds of the duty are swallowed up in the charge for collection. To exact a duty on some 30 millions of lbs. of coffee the Customs House has to take charge of more than 130 millions of lbs. This argument, it will be observed, goes only for an abolition of duty.

There was a good deal of conversation in regard to the effect of adulteration of coffee with chicory in restricting the consumption of the former. One of the deputation mentioned that a certain grocer who always sold the articles separate was able to sell scarcely any chicory. When mixed it was supposed that often 90 per cent. of the mixture was chicory.

Mr. Pasteur had brought with him a paper entering very fully into the whole question of the coffee duty. He was able to show that on the Treasury order being passed forbidding the sale of coffee and chicory mixed, except when labelled as such, the *consumption* of coffee had at once increased very largely on the subsequent rescinding of the order the consumption again decreased.

Mr. Pasteur is to have his paper printed at once and I hope by next mail to send you a copy of it. In order to help him to make it as full as possible Mr. Crawford gave him a copy of his letter to Mr. Lowe.

There seems little hope of anything being done this year; but next year, unless some accident happens to the surplus, the duty should be knocked off altogether."

The Coorg Planters' Memorial.

To the Honorable the House of Commons of Great Britain and Ireland in Parliament assembled.

The Humble Petition of the Coorg Planters' Association in India,

Respectfully Sheweth,

1. That your petitioners are producers of coffee, and in regard to the duty of three pence per pound on coffee imported into London, your petitioners beg to draw the attention of your Honourable House to the continued depression of the coffee trade and interest for many years past,

and the falling off in Home consumption, exportation, and price owing to the high rate of import duty, while the price of labour in the producing countries has increased year by year.

2. That in comparison to the article of tea which, as a manufactured article is charged six pence a pound, the rate of three pence a pound, upon coffee in a raw state cannot fail to be considered unnecessarily high, when it is remembered that the value of tea, manufactured and ready for the consumption, at least is 150 shillings per cwt., that of raw coffee is only from 60 to 65 shillings or the same weight, which, in the ensuing process of preparation for consumption, is reduced by 20 per cent and, therefore, the duty of three pence a pound; of 18 shillings for one hundred weight raw, becomes a duty of nearly 34 shillings for every hundred weight of coffee ready for consumption.

3. That the reduction of the duty on tea to six pence a pound, caused an increase in the consumption of that article from 62 millions of pounds in 1854 to about 107 millions of pounds in 1868, while on the other hand the consumption of coffee has gradually decreased from 37 millions in 1854 to 30 millions in 1868.

4. That notwithstanding a decline in consumption, the importation of coffee into London has increased by the extension of the cultivation in new countries, and your petitioners believe that the pressure of the heavy duty upon raw coffee, is the cause of an extensive mixing of chicory with coffee powder, and the main reason why the habitual use of pure coffee is not more appreciated by the labouring population of England, and yet there is every ground to believe that the genuine article, if only cheap, would speedily find favour, and its enhanced consumption prove advantageous both to the Government revenue and the producer.

5. That on the 20th March 1870, the stock of coffee in London was 1260 tons *more* than on the same date in 1869. The Home consumption in the first twelve weeks of this year was 150 tons *less*, had decreased by nearly 2,000 tons; and in consequence of the increased import duty on coffee lately decreed by the North German Customs' Parliament, it is to be feared that the figure under this head, will be still further reduced.

6. That all the above facts clearly show that the coffee trade, interest and production require relief, and your petitioners therefore, humbly pray, that your Honorable House will take into your consideration the propriety of abolishing or at all events reducing the import duty on coffee

And as in duty bound your petitioners will ever pray.

(Signed) RALPH N. TAYLOR, *President*
HENRY MANN and DONALD STEWART *Members*

Mercara, 3rd June, 1870.

MANURING COFFEE ESTATES

1st July, 1870.

DEAR SIR, —Many kinds of artificial manures are now being used, amongst which bone dust mixed with poonac, and bone dust alone, are extensively applied to coffee I should say, on an estate where you have a small stock of cattle, (say from 25 to 40 head), keep all the manure you make from them for such portions of the estate as are seedy and really look shuck (through heavy bearing or bad soil)—in other words say your 20 acres or so of the worst coffee on the estate Now about artificial manure. I would suggest that 1 lb of bones is a "good dose" for a tree, let the holes be cut 7 inches by 20 and 9 inches deep, and about 10 inches from the tree, (an 8d coolly will cut from 100 to 120 of these holes per day) Mode of applying, say 1 part in bulk to from 2 to 3 of earth, well mixed, and let this be scraped into a heap along the side of the hole nearest the tree. the applying of this costs at 1,200 trees to the acre If "bone dust and poonac is used, I would say put one part in weight of bones to two of poonac, but about 1¼ lb. of this mixture to each tree, and mix with about twice the quantity, in bulk, of earth This manure will act very well and put a good crop of both wood and coffee on large trees that require manure. In the space of 5 years an estate of 200 acres may be manured throughout with bone dust, with the reasonable quantity of 20 tons per year, and many an old estate, especially high places, may be made to look young again with this treatment, and to say the least, will, with additional bearing, do *a little more* than cover the cost of the manuring with this fine fertilizer

If some of your numerous planter correspondents will write and let every one else know how they apply their artificial manures and give their opinions on the mode generally, they will do a great deal of good, and a few letters of this kind before the next meeting of the members of the Planters' Association will surely be of great service —Yours truly,

A PLANTER

COFFEE.

We place before our readers some remarks by a London Tea Broker on two samples of prepared Coffee Leaves forwarded to him during the present year. No. 1. sample was prepared from the large leaves of suckers, whilst No. 2. was from the small leaves of the same. The result so far certainly appears encouraging, and will no doubt lead to further larger trials of coffee leaves :—

Impressions regarding two samples of dried coffee leaves received 6th May 1870, *from Ceylon,*

No. 1.—Infused leaf. Small, broken, yellowish green, rather leathery and herby. Liquor rich, dark, and strong; very stringent. Worth about 1s. 2d. to 1s. 3d. per lb.

No. 2.—(B) Infused leaf. Small, broken, greenish yellow, strong leathery flavour. Liquor rich, dark, and strong, but herby, 1s. 3d.

The samples were far too small to enable any one to report with confidence, and not being packed in lead may have contracted the objectionable leathery and herby flavours by endosmose from contact with some other produce. Should sheet lead not be obtainable for any future sample, vegetable parchment will no doubt be as well.

It might be worth while to subject the leaves to various degrees of natural fermentation, besides endeavouring to give them a curl or twist when they are soft and full of moisture.

London, 12*th May*, 1870.

In a letter forwarding the above the Broker says : —

"I received the samples of coffee leaves dried and roasted, which I put through the pot in the usual way The quantity is far too small for me to report on, as, in addition to the usual commercial opinion, I should like to give at once a Broker's report, and an analysis, together with the result of a microscopical examination. At present my impression is very favourable regarding the ultimate success of the manufacture, an impression in which I have been confirmed by other two tea people who have tasted the infusion I made to-day As already hinted the quantity is too small for me to give such an opinion as I would care to give abroad, but I may say in confidence that the coffee-tea is superior to what I anticipated as the result of a first trial. Its strongest point is in the great astringency it seems to possess united to the rich dark colour it yields to boiling water, but against those advantages must be put an herby flavour which resembles leather, too strongly to be altogether agreeable, nevertheless I consider such tea would fetch a price here no less than 1s. 2d. per lb., and if the old boot's flavour could be eliminated or superseded by that of some fragrant shrub, such as the Olea Fragrant, which the Chinese use for scenting, a better price could no doubt be obtained At the same time it must not be forgotten that its present flavour does not differ much from that of some Indian tea which sells regularly here for about 1s. 2d. to 1s. 4d. per lb Some improvement might be effected by a short period of fermentation prior to roasting, but as regards strength, it has little or nothing to gain I should hope that this essay will not discourage the Ceylon Planters They must not forget that it has taken India nearly forty years to acquire her dexterity in the production of tea, and that she is still far from perfect."

THE BORER – CARBOLIC ACID.

The following extract from a letter of Messrs. Calvert and Co of Manchester, as to the mode of applying their carbolic acid to coffee trees, to prevent the attacks of the Borer, is published, for the information of Planters The plan recommended is very simple, and if the carbolised lime-wash be applied at the time when the beetles are on the wing, and the females depositing eggs, there can be no doubt that it will prove a most effectual preventive. Of course if the eggs have hatched and the larva commenced to burrow it can be of little or no use. "The stems of the plants to be washed, and the soil round them to be sprinkled with a white-wash of ordinary consistence (made with quicklime) in every 3 gallons of which 1 oz of carbolic acid has been well mixed If this strength be found not sufficient to destroy the insects, then experiment can readily be made with larger proportions of carbolic acid in the lime, till it is ascertained what strength the coffee plant can actually bear without being injured"

CLOSE AND WIDE PLANTING ON COFFEE ESTATES, &c.

A Planter of large experience writes :—"5 × 5 (but 5½×5, i.e. 5½ feet between the rows, 5 feet between the trees, is better) is very close tho' good on low hot estates, when you want the ground to be sheltered from the sun as soon and as much as possible But on good soil, at a high elevation, I should consider 5×5 almost ruinous. I consider certain fields near the top of —estates have been permanently injured in bearing by being too closely planted – but they are much more widely apart than 5 by 5. You want all the sun you can get at a high elevation; how can sun get to the lower branches of luxuriant trees only 5 feet apart? I remember many years ago noticing two fine fields of about the same elevation (not in the same neighbourhood, however), one of which widely planted (8 by 8 I think) bore very much more heavily than the other, closely planted. But comparing fields on the same property, I consider the wide-planted fields (high up) bear decidedly heavier crops than adjoining fields more closely planted. In my own places, the best coffee I have is the most widely planted.

TRAVANCORE COFFEE ESTATES

Judging from the glowing language, in which correspondents write regarding the Coffee Estates on the western slopes of the ghauts, and facing Travancore, one might imagine, that they had reached the fabled Canasa. It would appear, that from Asambu to Augustier Malei, the plantations are in the most promising condition, the fertility of which is alluring over many of the Ceylon planters. The climate is of the most salubrious kind for the people, who enjoy an entire immunity from the Coorg borer, and revel in the sea-breeze the whole year round. Owing to this sea-breeze, malaria of all kinds are unknown along the whole

range. But let us quote the words of the writer: "Forests, many of them of the extent of 2,000 acres a piece, roll over the hills and valleys in splendid sheets of verdure, fringed and islanded by green plots of grass land, and intersected by copious streams, and at each side of the range, lies a thickly populated province, where labour is cheap, and from where the supply of laborers is abundant." In these parts, fever is unknown, and drought also unknown, and all the Estates are well managed and productive. The elevation is from 2,000 to 3,500 feet above sea level, and the roads are connected one with another, by a good riding road. Every thing combines therefore to make a residence on these Hills healthy and agreeable. It has been fixed upon as a Sanitarium by the Missionaries of the different Societies, two of whom have residences here, for occasional occupations from Tinnevelly. Pleasure and profit have attracted many to open out large estates on these Hills. The First Prince of Travancore and Sir Mad ava Row have large estates, and in conjunction with others, the estates on these hills are tolerably numerous. Every thing seems to combine to make an investment in coffee in these parts a safe and profitable one. Jungle fever, which is so destructive in other estates, is, as report says, unknown here. We have therefore much pleasure, in pointing to a locality, where salubrity of climate, and magnificence of scenery, co-exist together.

COFFEE IN NEW CALEDONIA.

It may be within the recollection of some of the *Observer* readers that a statement appeared in our columns indicating that during the voyage of our Sub-Editor from Galle to Sydney last year he made the acquaintance of a French officer of Engineers on his way out to supervise the construction of Public Works in New Caledonia. Captain Pate promised to send an account of the progress of coffee cultivation in that young and distant French colony, and in a letter received some months ago, we find the required information which, translated, reads as follows :—

"I promised to give you my impressions of the culture of coffee, a new cultivation, and have not done so sooner because the impressions are like the plantations themselves, it is necessary to travel a considerable distance to come across a few. The cultivation of coffee has yet to attain the proportions of a staple industry. It is now from four to five years since the plantations have been formed at places very distant from each other and on soils of a very varying character. The smaller plantations are also of little importance, for each is not at the outside more than an acre : usually the larger are from fifteen to twenty acres. Some are on very deep soils and on the slopes of hills and thrive very well, being already loaded with berries. Others shew only mean and stunted plants. Some planters shew them an example of the necessity of abandoning coffee : but they ought not to content themselves with such a result, and if you examine the soil on which these poor plants grow, you will find that it is composed only of a mineral and not vegetable earth, without which it would appear that the root will not flourish. My conclusion, after seeing several samples, is that coffee will grow very well in New Caledonia and that there are an infinite number of localities in which it will make good progress. The only obstacle in the actual development of this culture is, the inexperience of the great number of colonists from Europe and Australia. But I was told to-day that our coffee is of very good quality and will soon figure honorably amongst similar products. The greater part of the plants come from Reunion, which all know has a special reputation, at least in France (*Cafe de St. Lucie*), and from Moka. I hardly know whether it is of special advantage to make a good selection, amongst the plants of different countries, but you must excuse me. We are in a colony which has only recently come into existence and which has in consequence much to do. I hope meanwhile that your coffee will be made known to us."

TEA.

The total number of labourers under contract in Cachar at the close of last year was 11,087. Of time-expired laborers there were supposed to be 15,908. In Assam there are 11,593 laborers under contract. The number of time-expired men here has not been ascertained. The mortality at some of the Upper Assam gardens is perfectly appalling, ranging as it does from 11 to 42 per cent. for the half-year. Steps are, we see, to be taken for closing the worst of these cemeteries. On the whole, however, the managers of gardens take tolerably good care of their coolies, though we must admit Government has a strong case to warrant inspection and sanitary control.—*Pioneer.*

GREEN TEAS.

To the Editor of the Pioneer.

DEAR SIR,—It is a subject of congratulation to Cachar and Assam that, not being producers of green tea, they cannot be comprehended in Dr. Muter's charge of adulteration with copper. As to the iron filings found in a specimen of Indian tea, I can only account for them on the supposition that somebody, trying to turn out a blacker tea than usual, must have used them and forgotten to add the infusion of gall nuts, which he no doubt had ready secreted in some dark corner of his tea house. As to the man who has been "coppering" his teas can't he be spotted ? How, and above all why, did he do it ? Where did he get his copper pan, and how often a year does he scour it ? If he made use of copper in some other form was it the "Arseniate" or some of the more innocent preparations ? and could not have done the things as well with indigo or Prussian blue or something that would tell no tale in the ashes. The copper pan theory of green teas is too facile to be readily relinquished, and yet a moment's reflection would show that a scoured pan would at the temperatures used for manufacture yield no colour to anything not greasy or acid and certainly not to an astringent like the tea leaf. Supposing the pan with sinister intent to be kept coated with verdigris, still the effect would only be that that coating would at once get covered with a coating of the astringent juices of the leaf and be prevented from doing any harm—Yours,

Cachar, July 13. GREEN.

Comparative Table of Tea exported from Calcutta for 5 months of 1870 against the same time in the previous 9 years.

	Great Britain.	Foreign Europe.	America	All other places.	Total lbs.
May . 1870	164,812	...	3,082	3,890	171,748
Previous 4 months . .	3,392,587	207	21,787	10,121	3,425,852
Total for 5 Months 1870	3,557,399	907	24,819	14,011	3,597,136
Same time in . 1869	3,292,421	.	1,702	48,095	3,342,218
Ditto in . 1868	3,265,314	9,513	3,513	4,092	3,282,154
Ditto in 1867	2,845,370	112	86,820	11,350	2,943,661
Ditto in 1866	484,645	. .	15,567	216	500,428
Ditto in 1865	486,491	...	.	635	487,126
Ditto in 1864	333,769	. .	...	...	333,769
Ditto in 1863	277,265	.	...	2,777	280,042
Ditto in 1862	255,995	3,025	1,690	500	261,210
Ditto in 1861	262,080	...	. .	240	262,320

KANGRA TEA.

Major Paske, now in England, having submitted samples of this tea to the well-known tasters, Messrs. Thompson, has been favored with their opinion, from which the following extract may be interesting:—

"Judging from all the musters that we have seen, it seems clear that the North-West cannot produce tea of the fulness and strength of that grown in Assam and Cachar ; but tea of higher fragrant quality can be made, such as, if up to the type of excellence, will equal in value that from Assam.

"If, however, below this standard of high quality, the tea falls into a lower grade altogether, as from its comparative want of strength, it loses its great value for mixing purposes, and will only rank with common tea.

"The green teas from the North-West have also differed a good deal,—some yellow and dusty, of ordinary grade; others in flavor almost equalling the China Moyunes, and if more carefully made would command a preference in the market, on account of the strength of the water. The water of green teas should be pale,—the opposite of that of black tea."—*Indian Examiner.*

ASSAM.

The following summary of the capabilities of Assam is from a correspondent of the *Englishman* :—

It will be seen that there is ample room in Assam for 3,000,000 acres of tea. This might be brought into cultivation for a capital of £9,000,000 which would give a profit after five years of £9,000,000, and produce one hundred million pounds of the finest tea. This, with what is grown in other parts of India, would equal the whole consumption of Great Britain.

I have also shown that there is ample room to grow all the cotton which is now purchased in America. It would surely be better to keep all this money in our own pockets than for us to be enriching other countries with it.

Better for the English people to exchange the rich nutritious tea of Assam for rubbish now sent from China and consumed by our working classes. It is a well-known fact that millions of pounds of tea are sent from China which have been already once used and redried. Nor would enterprise end with the production of tea and cotton. Were the country once opened, all the wealth which may be obtained from other sources would soon be sought for.

Thousands of coolies would be required to cultivate the land, and for these, thousands more would be required to grow food, and as cultivators were attached to the spot, Assam might

become the richest food-producing country in India, for the rice land is of so fat a nature that thirty maunds of clean rice may be obtained per acre. I have actually seen the lazy Assam ryot produce such luxuriant crops that he would rather let it rot on the ground than be at the trouble of taking it home, though the tea planter would have given him Rs. 2-8 per maund for it.

This is the only real difficulty which the European in Assam will encounter—the utter laziness of the populations. The whole of the Assamese are inveterate opium-eaters; they are vicious and lazy, and any calculations having reference to labour should be made without any reference to the native population, as with the exception of the Cacharies in Durung, there is no labouring population at all. The fact is that on a small plot of ground, the soil and climate being so luxuriant, a family can grow every necessary and even every luxury, and the only thing that will induce an Assamese to work is to get opium. That once obtained he will work no more while it lasts.

But it must be borne in mind that at the very threshold there is a superabundance of labour to be had. The Americans engage work people in far distant China, Mauritius, and West India. Sugar planters obtain our own coolies at great expense for their plantations, and surely Englishmen ought to have no difficulty in obtaining labourers in their own country at a rate far more favourable than the American, the Chinese, or the West Indian. If he cannot, there must be something most lamentably wrong in the administration of the country.

This is a question requiring the most earnest consideration of Government. In all other parts of the world, it is considered of the greatest advantage to obtain capital from any source whatever for the advancement of commerce and agriculture. Every encouragement is given elsewhere, and it would be worth ascertaining why capital invested in India is so frequently unsuccessful.

Take, for instance, the tea-growing interest in Assam. There are millions of acres of the finest tea land in the world. In India there are millions of starving coolies who could work it. In England, there are millions of capital ready to work the land and feed the starving, and a market where there is an unlimited demand for the tea, which would pay the grower cent. per cent. for his money. When, with such a combination of circumstances, nothing but failure results, it is worth while for Government to enquire into the cause of that failure and, if possible, apply a remedy. I have no hesitation in saying that had a valley like Assam been in the hands of English colonists during the time it has been in the hands of the Indian Government, the present produce would be in tea one hundred million pounds and five million bales of cotton and probably three million maunds of rice, independently of other valuable produce. There are none of the great valleys of America equal to Assam in soil and climate, and Assam has what America never had, an unlimited supply of cheap labour at command; for there is no doubt Indian coolie labour is much cheaper than slave labor. It is estimated that slave labour cost in America in first outlay three hundred rupees per acre, whereas if any proper system were adopted by Government for the supply of labour, it would not cost more than Rs. 30 per acre in Assam. The after-cost of maintenance would be about the same.

When the question of remunerative works is occupying the attention of Government, it would be well to consider how far it would be justified in opening out farms in Assam for the produce of cotton, rice, and tea. Such works would pay a far higher rate of interest than canals or railways, and what is of far greater importance, might be made the means of averting the horrors of famine which are now desolating the land. It would be far better to send the surplus population where they could live in wealth and comfort, and at the same time produce food which could be supplied to districts where scarcity prevailed, at moderate prices, than to keep them in their own districts with bare life in their bodies and destroying all self-reliance and independence of spirit by the present system of charity, than which nothing can be more pernicious.

Were the Government to adopt some well-devised system such as that suggested, it might safely rely on producing rice at six annas per maund, cotton at four pence per pound, and tea at thirty-five rupees per maund. The profits on these commodities can be easily calculated.

If these facts were once made patent to the English public, the Government would soon be relieved of any further trouble in the matter, and the millions of money now almost idle in England would flow into the land.

TEA CULTIVATION IN INDIA.

By C. H. Fielder, Esq., Hon. Secretary of the India Tea Planters' Association, and Secretary to the Lower and Northern Assam Tea Companies.

The tea plant in British India was discovered by Major Bruce, to whom this society, very justly, gave its gold medal for the important discovery. He was in the province of Upper Assam prior to the British entering it in 1824-25, when they drove the Burmese out, and advanced to Sudiya. The tea was first brought to the notice of the British officers by Sing-Fo chiefs, and the late Mr. David Scott, Commissioner of Assam, sent down specimens of the leaves and seeds to Dr. Wallack, the Superintendent of the Botanical Gardens at Calcutta, but it was not until, by the reports of the then Colonels Jenkins and Charlton, in 1834, all doubts were removed of its being genuine tea, and proofs given of its quality by samples sent down prepared by the latter officer, that Government tea nurseries were formed, under the charge of Mr. C. A. Bruce; and a commission was sent up from Calcutta, consisting of Drs. Wallack, Griffiths, and Maclean. In 1839 and 1840 the bulk of the tea gardens thus experimentally planted by the Government, under the management of Mr. Bruce, and afterwards of Mr. Masters, in the Seebsaugur and Debroghur districts, were handed over to the Assam Company.

The plant is a shurb, nearly allied to the genus *Camellia*, from which the tea of commerce is manufactured, and those discovered by Bruce, and since cultivated in British India, are merely varieties of the same species as those cultivated in China. If left to their natural growth they attain a height of from thirty to forty feet, with numerous branches; the main trunk attains a diameter of from 10 to 20 inches, and the lateral branches from one to four inches; but in a state of cultivation it is kept down by judicious pruning to a height of from three to five feet. The leaves when full grown are of a length of from five to nine inches, and are lanceolate or oblong, and dotted copiously with distinct pellucid dots, usually spread minutely over the whole surface, interspersed with larger dots.

The green and black teas of commerce are made from the same plant, the difference arising solely from the difference in the manufacture, the green tea being made direct from the green leaf, while the black is allowed to wither by exposure to the sun or hot air before manufacture.

The tea plant appears to flourish best in a sub-tropical climate, *i. e*, in China in N. lat. 24° to 35°, and British India in N. lat. 25° to 28°, and requires a most excellent soil, a very large average rainfall, and a comparatively high temperature. The cultivation of tea has already become an important feature, and the gradually increasing consumption of it here tends to show, beyond doubt, that it has taken root in the general tea trade of this country.

The tea districts, at first confined to Upper Assam, have since greatly extended, and teas arrive now from various parts, offering a good assortment of useful to very fine qualities. The best black tea that China produces compares but poorly, even the finest first crop requiring a certain quantity of the better description of Indian to be mixed with it, the latter being so much more brisk and pungent in flavour. Indian tea possesses extraordinary strength, a property invaluable for mixing purposes; and, looking to the comparatively inferior teas of China growth, I lean to the belief that those from India will continue to merit the attention of our dealers no longer as a curiosity, but with a view to satisfy the requirements and taste of the general public.

The lands actually at the disposal of the Government of India, *i. e.*, 1859 and 1860, in districts suitable to the cultivation of the tea plant, were as follows:—

	Square Miles.
Tenasarim	14,176,011
Arracan	4,860,000
Cossyah and Jyntiah hills	453,000
Assam (7 districts)	6,500,000
Dehra Doon	141,652
Darjeeling	250,000
Kumaon	No return
Sunderbunds	809,648
Cachar	200,000
Chittagong, space for any number of European settlers.	

Of these, about 546,000 acres have been taken up, and 56,000 brought under tea cultivation.

The above is an abstract of returns made to Government, which are not considered complete, as none of the land has been surveyed. Grants of land were published by the Government on easy terms.

It was generally believed that all the best teas that reached England were grown in the north, the climate of which is temperate, and in winter very cold. By the most eminent men of the day the slopes of the Himalayas were recommended as offering the best prospect of success to cultivate the tea plant of commerce. The Assam plant was satisfactorily proved to be real tea; a question then arose, is it identical with the tea plant of China, or a new species?

The China tea shrub delights in high situations, and all fine green teas of China grow in the temperate climate of the north; the finest black teas on the slopes of the Bohea Hills. In China the best of all tea is procured from high mountains, viz., Vu-ye. Assam will grow, and has grown as good, if not better, certainly stronger tea than China, hence we have a right to anticipate as good results from the slopes of the Himalayas. From the Himalayan range we could ensure a supply of one hundred

millions lbs. annually, which would be distributed through the commercial centres of the world by the London brokers. From one district in Assam, Luckimpoor, there is a report to Government that there are 228,634 acres of waste land available for tea cultivation, and that wherever factories are established comfort and plenty is provided. Similar evidence is forwarded from Nowgong, and Seebsagur.

The Kangra Valley is about four thousand feet above the level of the sea. A tract of land of about a thousand acres was secured by Mr. Fortune, and it is described as being bounded on the east and west by mountains, well supplied with water, and admirably adapted for tea cultivation. In 1852, 20 acres were planted; 1853, 300 acres were planted; 1854, 300 acres were planted; thus in three years there was a fine plantation.

The tea plant, if planted out at the proper time, viz., in the rainy season, does not require irrigation, except to supply the want of rain; the seedlings in nurseries do require occasional watering, and in the planting-out season if attention is not paid to this they will certainly die. Once a tea plantation is formed, and the plants are from three to six years old, they may be considered safe, and independent of artificial irrigation.

Mr. Fortune says of Nagrowta, in 1855, it produced 300 lbs. an acre; the soil is of loam and rich in vegetable matter, well suited for tea cultivation; the plants are healthy and vigorous. At the plantation of Holter, in the Kangra Valley, Mr. Fortune says the condition of the plants is highly satisfactory; they are healthy, vigorous, and quite equal to the best plantations I have seen in China; much to the credit of Dr. Jamieson and his overseer, Mr. Rogers.

In 1856 tea had been fairly established on the Government plantations, and encouragement was given to Natives and Europeans; but the Europeans were not inclined, and the natives had not capacity for the work. Dr. Jamieson continued to prosper with his seed and nursery seedlings, and he was almost embarrassed with his riches, until he was obliged to distribute in thousands to native planters, and even to Assam.

The Kangra district comprises, with nominal exceptions, all the hill territory belonging to the English Government between the rivers Ravee and Sutlej. The area contained can only be conjectured, as it has never been surveyed, but the rough estimate is 8,000 square miles. Various races of men, speaking different languages, are distributed over its surfaces; hills just above the sea's level, mountain crests higher than any peak of the Andes. Every zone of climate and variety of vegetation, from the scorching heat and growth of the tropics to barren heights, destitute of verdure, and capped with perpetual snow. It was found that the plant was indigenous to Cachar also, which was immediately turned to good account, and, in 1862, in this province 68,149 acres had been leased to tea planters; 6,077 are in cultivation, with an estimated crop of 336,800 lbs. per year, and 6,719 labourers. The produce was quite equal in quality to Assam.

Darjeeling.—There is great difference of opinion as to this being a tea growing district, the elevation being 7,000 feet; some think it too cold for young seedlings, and that the summer heat is not sufficiently strong to ensure fine flushes. In opposition to this, practical planters have taken up 25,865 acres, and have now in cultivation 8,762 acres, of which there are planted out 5,152 acres.

The area of Assam is about 34,345 square miles, and the population was in 1854 about 1,200,000. The total stated by Colonel Vetch before the House of Commons was about 1,000,000, and this agrees with Captain Butler's figures, as Assam proper is generally reckoned without Goulparah.

The large importation of labour into Assam, Cachar, and Sylhet began in 1863:—

	Where from May, 1863, to January 1868.			
	Coolies Embarked.	Mortality during Voyage.	Percentage of Deaths.	Duration of Voyage.
Assam	55,352	1,712	3·14	1 Month.
Cachar	52,155	2,456	4·70	"
Sylhet	2,473	82	3·21	2 Weeks.

These high death rates were caused by cholera, overcrowding, and a bad selection of emigrants. Where a careful supervision has been exercised on the recruiting, losses by deaths on the voyage are the exception. The average rate of wages per month in Assam was from 2 rupees 8 annas (*i.e.*, 5s.) to 3 rupees (6s. previous to 1857. In 1859 the wages rose to 4 rupees per month, and since then to 7 and 9 rupees per month, through competition.

The satistics available are very meagre, but it may be stated that the average rainfall is from 70 to 100 inches in Upper Assam, and 60 to 90 inches in Lower Assam.

The variety advisable to cultivate is from indigenous or true Assam Seed; that called the "China," introduced by Fortune into the Himalayas and Upper Assam, not yielding, after full growth is attained, so much leaf per acre, nor is the strength and flavour equal to the Assam. A variety called the "hybrid" was in great favour for some time, but it has been found to relapse more into the "China" character after some years' growth, and more especially in the seed obtained therefrom.

The distances the plants are sown or planted apart vary extremely, viz., from 6 ft. by 6 ft to 3 ft., by 3 ft., and are regulated greaty by the nature of the soil, and the description or variety of plant to be grown.

The general opinion is, that a garden that can give an average of four chests, or maunds, of 80 lbs. each per acre, say 320 lbs. of manufactured tea, is a good one; there are many gardens undoubtedly in British India that have given, over an extensive area of cultivation, much more than this average, but they are at present exceptions; a safe average may be taken at three chests, or 240 lbs.; and as each chest or maund of tea manufactured takes, on an average, four maunds, or 320 lbs. of the green leaf as gathered to produce this, it will be seen that even with double the average crop, the return of green leaf per acre would only amount to 1,920 lbs., or less than one ton, which ought to be considered a very moderate result for crops that are gathered in on an average fifteen times per annum. The out-turn per acre will again depend—on the nature and quality of the soil; the locality of the garden in reference to aspect and average rainfall; variety of plant cultivated; the distances the plants were originally staked or planted out apart, and more especially on the amount of labour available.

The amount of out-turn per acre on good lands, and where the trees are of the Assam variety, may truly be said to depend on the labour available to work them. Gardens have been known to yield six, seven, and every nine maunds of 80 lbs. each of manufactured tea, or from 480 lbs. to 720 lbs. per acre. One adult to each acre under tea cultivation is considered the lowest amount of labour that a garden can be kept in a state of moderate cultivation with.

At present there are far too many subdivisions of qualities, owing to the number of small concerns that are engaged in its manufacture. It is recommended that eight qualities should be made, viz.:—Fine Pekoe, or all flowery leaf tea; Pekoe, little flowery, with small leaf; Pekoe Souchong, larger leaf, few ends; Souchong, larger leaf, without ends; Congou, all coarse, dark, leafy sorts; broken Pekoe siftings to fine Pekoe Pekoe; broken black, siftings of Pekoe Souchong Souchong; fannings, siftings of Congou, old leaf. The classes would be found quite sufficient for all requirements of trade: nor will the difference in price between any two consecutive sorts be so much as to preclude the trade from buying either. It may appear that too much broken tea is advised, but the qualities of these differ so greatly that it is doubtful if they can be reduced to two alone. Teas such as Kangra Valley, Tukvar, Kursiong, Dehra Doon, and some Darjeeling kinds, should be made into green teas, as when made into black the liquor is always so thin and highly burnt that prices are very irregular. Indian green teas fetch usually what would seem to be paying rates. The proportion of China green to black is about 1 to 10. Nothing at the moment can be said as to what qualities it would be advisable to manufacture, as their appearance here is so rare. Uniformity in tares and weight of contents of the packages is a great desideratum. It would be advisable to fix a limit of weight of tea to a chest say 80 lbs., a half chest 40 lbs., catty box 20 lbs., or with very fine sorts, even 12 lbs. It would also materially facilitate the working of the teas in the warehouses here if the tares were to be even, the chests or packages properly marked with the correct quality, as at present the names marked on the chests are most arbitrary. Thus a Souchong is often marked Pekoe and *vice versa*. Some have thought that Indian teas might eventually become an article of export to Russia, for when comparing a flavoury, though somewhat weak Pekoe Souchong with fine black leaf China tea a great difference in intrinsic value is apparent. Many Pekoe Souchongs selling at 1s 7d. and 1s 10d. are far better than Monings fetching 2s. 3d. and 2s. 6d. and some, though deficient in strength as an Indian tea, are better in flavour and equal in strength to fine China black leaf. It is thought, were this class of Indian tea separated from the stronger qualities, and bulked in marks of not less than 100 chests, they would find a good market on the Continent.

With respect to thin, sour teas, the quantity of these becomes smaller every year, so that their presence among the stronger sorts would not be apparent after bulking if they were moderately used.

The example of the Assam Company ought to be followed as much as possible in all the details of mixing, bulking, and packing and evenness of tares, and scarcity of small breaks. Many items of expenditure could be saved by an amalgamation taking place among the competing interests.

The quantity of Indian tea imported in—

		lbs.
1851	was	262,839
1861	"	1,520,000
1864	"	3,285,000 (increase over two-fold in 4 years.)
1868	"	8,133,000 (increase nearly three-fold in 4 years)

The quantity delivered from warehouses in—

		lbs.	
1861	was	1,292,000	
1864	"	2,781,000	(increase over two-fold)
1868	will be	7,320,000	(increase nearly three-fold)

The stock on 31st December—

		lbs.	
1861	was	1,028,000	
1864	"	1,783,000	(increase three-quarters)
1868	"	3,691,000	(increase over two-fold)

It will be seen that the increase in the eight years, 1861-8, of import, was five and a-half-fold; ditto, delivery, five and a-half-fold; ditto stock, nearly four-fold. These figures cannot be regarded but as favourable in comparison with China tea—

	1867.	1868.
Import from Jan. 1 to Nov. 30	109,000,000	135,000,000
Delivery " "	131,723,000	129,683,000
Stock on Dec. 1st	61,955,000	73,652,000

It may be fairly stated that no crop is more dependent on an adequate supply of labour than tea. Until the trees have become fit to pick leaf from, it requires at least one man to each two acres for clearing, hoeing, and planting; afterwards one man to the acre as a minimum, for in addition to keeping the ground clear of jungle, the leaf picking, when a flush is out, employes every hand, and the leaf, if neglected for even forty-eight hours, becomes unfit for the manufacture of the higher quality of tea, such as Flowery Pekoe, Pekoe, and Souchong. The labour question, therefore, in the words of the "Tea Commissioners of 1868" is the question to look to in the future.

The Commissioners were appointed to inquire into the "State and Prospects of Tea Cultivation in Assam, Cachar, and Sylhet, in accordance with the resolution of the Government of Bengal dated November, 1867," and it appears that after a careful and lengthened investigation, and taking evidence on the spot, they came to the conclusion (vide p. 14 of their report) that—"On the whole we see no reason to believe that as far as soil and climate go, tea cannot be grown profitably in Assam, Cachar, and Sylhet. The whole matter may be reduced to the one question of the supply of labour. If this can be obtained in sufficient quantity and at reasonable cost, gardens properly planted and economically managed ought to return a fair profit on the outlay.

The revenue from Assam in 1852-53 amounted to 7,50,000 rupees, or £75,000 while in 1864-65 it had reached a total of 26,30,000 rupees, or £263,000, over £100,000 of which was from land and forest revenue, while £150,000 was received from excise and stamps, and thereby mainly (*i. e.*, to the extent of £143,500) from the sale of opium to the labouring population. To the use of this pernicious drug may be attributed the indolence and degeneracy of the bulk of the inhabitants of the Valley of Assam. The increase in the quantity sold, and the revenue obtained thereby have been as follows:—

	Sold.	Revenue.
1859—60	32,720 lbs.	£21,400.
1864—65	155,200 lbs.	£143,500

The total revenue has since much increased, and has, as regards land, lately been in some districts doubled by the Government. It is now felt that the Government ought to immediately aid the planters, by expending not only a larger proportion of the revenue obtained from the province on public works, but that a free circulation of native labour should be promoted, the market enlarged and equalised. Facilities for cheap locomotion by steam vessels would transfer the surplus labour of Bengal and many other parts to Assam, Pegu, and other places where there is a scarcity of labour.

They should also improve the water communication by keeping up the bunds and embankments not only of the smaller rivers Dehing, Dhunsaril, Disang, which are so neglected now that large tracts of former cultivation are now deep morasses or dense swampy jungles.

The trunk roads should be considerably raised, and the water ways or bridge openings widened. The trunk and minor roads should be completed and the old native roads where possible improved and utilized and the planters should be encouraged by liberal grants to give their personal attention to these urgent requirements, and to making them in sections, the Government should send up the labour required in lieu as hitherto of competing with the planters for the small amount of local labour and time-expired imported coolies,

The necessity of extension of telegraphic communication to Debrooghur was pointed out by the commissioners' report of 30th March 1868, and also that Government should supply from local treasuries cash required by planters in lieu of the latter sending up specie from Calcutta in exchange for drafts. The Hon. William Grey, Lieut. Governor of Bengal, visited Assam in 1867, and, in reply to a deputation of planters, on 14th September in that year, stated that he hoped the communications would be improved, the roads repaired, the ferries rendered efficient, and the navigation of the smaller rivers made easier by the removal of the snags, &c., and that telegraphic communication would be extended—but as yet no action has been taken thereon.

The memorial of the planters to the Government was as follows:—

1st. That the whole of the revenues of the tea districts of Eastern Bengal be expended in the civil administration of these provinces, and that a sufficient sum in addition be provided annually either from the immense surplus revenues of Bengal proper, or from loan specially raised for the purpose, as has late been done in other cases, for the early completion of a system of bunds roads, and bridges, which shall improve the sanitarium of these districts, place them in communication with the neighbouring and more populous provinces, and generally improve the internal communications of the country.

2nd. That measures be adopted for giving effect to the desire expressed in Lord Cranborne's Despatch (Public No. 3, dated India Office, London, the 3rd December, 1866), "to facilitate the acquisition on the part of the planters of an adequate supply of labour to the utmost possible extent," and that labour be imported also by Government in sufficient quantities for the execution of public works.

3rd. That Courts of Justice be increased to such an extent as will enable Government to enforce the due performance of contracts in the tea districts, and to mete out impartial justice to all Her Majesty's subjects whether employers or labourers or other persons, and that all special legislation, other than as aforesaid, and that may be considered necessary for sanatary transport be at once withdrawn.

The recommendations of the Tea Committee referred to previously were to a similar effect, and that cattle trespassing should be severely dealt with; that an extension of terms of engagement of coolies be made, say from three to five or seven years; and that an abolition of the minimum rate of wages by enactment for imported labourers take place, for, as a rule, they are a lazy set, and would simply do nothing if the rule of minimum rate being given were acted upon; the consequence is it is not carried out by either the planters or the officers of the Government on the Public Works Department.

There are records of thirty-eight joint stock companies engaged in Indian tea production. Their nominal capital amounts to nearly four millions and a-half sterling. Their subscribed capital is about three millions and three-quarters sterling, and that called up amounts to three millions.

The above statistics do not include a number of companies in course of liquidation.

The number of private planters is estimated at two hundred, but the want of reliable Government statistics on the foregoing points is one of the chief reasons for conferring on the rise and progress of tea cultivation in British India before your Society, and the action necessary for its future profitable development.

In conclusion, it must be admitted that the future of tea cultivation in British India must depend greatly on the action of the Government of Bengal in relation to labour, and it is believed that they are now fully alive to the importance of fostering, instead of obstructing, the cultivation of the tea plant; considering the amount of capital engaged in its development, and the revenue derived from what was a few years ago mere waste land, it is trusted that the recommendations of the committee appointed on the tea cultivation of India will be carried out, and the competition between the Government engineers making roads, &c., and the planters cease, and the Government import the labour they require for their works. The rate of wages has become nearly reduced to that formerly ruling in Lower Assam through combination; and planters in the upper provinces have only to abandon the senseless competition hitherto existing to benefit likewise. The employment of machinery for the manufacture of the tea and the cultivation of the soil, together with rigid economy in the expenditure, is now being generally introduced and enforced, and the cultivation of tea in British India ought for the future to yield at least remunerative returns on the capital employed.

There were twenty-eight exhibitors of Indian teas from seven provinces in 1862. One hundred and fifty-three different kinds of tea were examined. Four "medals" and seven "honourable mentions" were awarded, and the teas were of most excellent quality. The manufacture is rapidly increasing. Seven million pounds are expected this year in England. A good deal is used in India, and the export of it to Thibet and Central Asia has commenced from the north-western portion of the British Himalaya, *viâ* Ládak, where we now have a British agent to look after our commercial interests, which have been so long obstructed and interfered with by our tributary ally, the Raja of Cashmere.

Of Assam, the finest district on the list, and the most important one, Mr. Fielder has given you full particulars.

Of Cachar I have no information, except that tea is very good; and of Chittagong I cannot speak either.

The first trial of tea at Darjeeling was made by me in 1842, at an elevation of 7,000 feet. It grew well; but subsequent trials at the same elevation showed that the frost killed the seedlings, and that the succession of "flushes" were too few to promise being profitable, although it was proved, in 1845, that tea could be grown. So slow are people to try new discoveries, that it was not for 14 years afterwards that tea was tried as a mercantile speculation. Major Samlee was the first to venture it; and he

chose elevations under 5,000 feet. Since then tea has become an established fact in the Darjeeling hills. Many thousand acres of waste land have been converted into "gardens," and the return this year will be far above a million pounds of a most excellent tea. The best elevations to secure high flavoured tea, and a healthy locality for the European planter, are probably from 2,500 to 4,000 feet.

Within the last three years a new experiment has been tried in the Darjeeling district. Tea is grown in the Turai, or low lands at the foot of the hills, where the elevation is not more than 1,000 feet above the level of the sea—about the elevation of Assam gardens. In this case the European planter has his residence on the hills, above the malarious level, where he sleeps, going down daily to work in his plantation. The coolies employed are Meches, natives of the Turai, or Dhanguri, who have an immunity from malaria.

It appears that the growth of the plant is more rapid than in the hills, a crop being taken in the third year, equal to that obtained on the hills—at 4,000 feet elevation—in the fifth year. The quality of the tea is good. Whether it will equal the mountain article in flavour remains to be seen. The succession of "flushes" will, no doubt, be more frequent, and labour is cheaper than in the hills. As regards labour, Darjeeling has been pretty well off. The supply is chiefly from the neighbouring country of Nepal, and is generally equal to the demand, and at moderate rates, varying from 4 to 6 rupees per mensem for coolies, and 7 to 10 for sirdars.

Tea cultivation is popular with all the hill tribes around Darjeeling, and the women and children gladly take work in leaf-picking in the manufacturing season. There is still a good deal of land, I believe, available for cultivation, and the road communication with the plains is much improved. Railway communication, however, is still urgently required to develop fully the progress of the district. The Darjeeling tea is sent to England; it is also used on the spot, and in Bengal. There will no doubt be a market for it in Thibet by-and-bye. It is always a slow process to alter the course of trade anywhere, and Thibet has always been supplied direct from China. In recent times the Chinese government has become much less powerful in the countries lying between China proper and Thibet, and its hold on Thibet itself is becoming weaker. With increasing misrule in these countries, and the weakness of China in Thibet, the opening for Indian teas will greatly increase. Everyone in Thibet lives on tea.

Of the cultivation of tea in Dehra Dhoon, Kumaon, and Kangra, I have no personal experience, but I have the pleasure to present a report of Dr. Jameson's on the subject, which, although of old date, (1862) will interest the members of our Committee; and I shall read some extracts from it to show the capabilities of those districts for tea cultivation, and the assistance which was given by the Government to the first private tea planters, native and European. After showing how admirably the tea plant is fitted to the Kohistan or hill districts of the North-Western Provinces and the Punjaub, Dr. Jameson gives the return in one season of tea seed and seedlings in the Government gardens, and how they were disposed of. The return of seed was 3,636 maunds, or 130 tons. He says the soil and climate of Chota Nagpoor are suited to the cultivation of the tea plant. A well prepared specimen was exhibited in 1862, and I learn that Mr. Stainforth, late of the Bengal Civil Service, who is settled at Ranchee, has a large tea garden there. The elevation of Ranchee is about 2,000 feet above the level of the sea, the climate is healthy for Europeans, and labour most abundant; indeed, it may be called the metropolis of labour, as the Chota Nagpoor district has an overflowing population of coolies and Dhangues, who go in search of work over the whole of Bengal, and search for it also in Assam, the Mauritius, Reunion, West India Islands, and Demerara. If there is any gentleman present who could give us information about the quality and the rate of produce of tea in Chota Nagpoor, where labour is so abundant, it would be very valuable.

Of tea in the Neilgherries I am not able to say more than that the climate and soil are suitable to its cultivation; but Sir William Denison, the late Governor of Madras, who is a member of our Committee, will perhaps be induced to favour us with information on the subject. I shall only remark on the subject of Lahore, that I always observed at Darjeeling, and I believe it is the same all over India, that officers of Government, and the planters who were best known to the natives for strict and unswerving justice, with kindliness of feeling, and who were the most considerate of their habits, customs, and peculiarities of thought, and who were the most conversant with their language, were always the best off for coolies, and had their work best done.

The employer of labour in India is differently situated from the same person in England. Here the workmen grumbles about his wages, enters unions, and strikes, with large bodies of his fellows. When a factory is closed by his means, the employers and the employed meet, argue and discuss the matter in dispute, when an arrangement of some kind is come to, and all goes on smoothly again. In India, when discontent exists among the coolies, it is borne in silence, smoulders, and accumulates, ends by flight, leaving the employers helpless. This is particularly the case in wild and frontier districts, into which labour has to be imported in large masses. It was so in the early days of our settlement at Darjeeling, when we had no shelter and very little food to give our coolies, who were principally Dhangues from Chota Nagpoor, brought in large numbers for the Government works of road-making, building bazaars, barracks, &c.; and it is the same now in Assam, I believe, in tea cultivation.

I shall detain you no longer with these very imperfect notes, which, in my desire to meet the wishes of the Committee, I have troubled you with.

Mr. Bainbridge believed, from Parliamentary reports and such statistics as were received at home, the question was but little understood. Without entering into the question of labour and other details, it resolved itself into the broad question whether the growth of tea in the provinces alluded to, and more particularly in Assam was remunerative at the present time or not; and if not, what were the circumstances which prevented it being adequately remunerative? because, though a profit of 6 to 10 per cent. might be earned, that was not a remunerative return for colonial enterprise. He might state that most of the estates in Assam had come under his inspection, in the various appointments he had held; and he had besides a considerable personal stake in various districts. He would say, in the first place, there seemed to be a good deal of justice in Mr. Williamson's remarks with regard to the expenditure of the Government revenue in the province; but this was lost sight of, that the Government revenue was quite insufficient to meet the wants of the province. After paying the expenses of the several administrations, and the various police charges, and the public works absolutely necessary, there was not sufficient margin to carry out those extra public works that were required in that country. It was well known that works of this kind, whether new or old generally had to be carried out by loans. If they considered Assam, it was a remote province and not very valuable, and there could be no doubt that there were many other provinces of India which had a prior claim upon the notice of the Government. There was no question the climate of Assam was against it. The people would not readily emigrate to it, and hence it was very sparsely populated. He felt sure nothing could so perfectly develope the province of Assam as the construction of a railway through it; but he did not think, in the present state of the revenues of India—and looking to the fact that there were many other provinces of more importance than Assam—it was to be expected that the Government would saddle the revenues of India, with a guarantee interest on half-a-million of money necessary to make a railway through that province. He considered the tea interests in Assam had been brought from a legitimate industry to the verge of ruin by the over-speculation of recent companies; consequently, with the exception of the old Assam Company, which was in possession of a very large and valuable acreage represented by a comparatively small capital, almost every other concern was working in the face of great difficulties created by this speculation. When labour was cheap, and gardens were constructed at a small comparative cost, tea could be worked at a considerable profit—such a profit as he looked on as remunerative for colonial enterprise; but when labour rose to the extent stated by Mr. Fielder, which was beyond control—for in Upper Assam they had to work almost entirely with imported labour, which could not be reckoned at less than nine rupees per month—then the case was different. The rate of wages paid in India compared with the amount of work done was out of all comparison with the work of a full-bodied labourer in this country. When, therefore, they worked with such costly labour, and when they considered the prices obtained for the article were lower than they used to be, it was not difficult to understand why tea planting was not remunerative. It was impossible that a planter, as the employer of paid labour at certain wage, could expect to compete with the class of peasant labour in China; and if Indian tea was to be brought into competition with the produce of China here, it could not be produced, at the prices obtained, at a price which would pay for the cost of production. Take the case of Upper Assam, where the principal plantations are situated. In that district they had no population working for hire. There was at one period a certain amount of labour available, but the wants of the Assamese were few; those who had laboured became enriched, and were not available for hire. Consequently, in Upper Assam the plantations were worked almost entirely with imported labour, and though the climate might be somewhat better than that of Lower Assam, and the rains three weeks or a month earlier, the result of experience showed that the great difference in favour of Lower Assam was in having a local population working for hire, which gave the lower country better results though the produce might not be so high. The population of Lower Assam was available for hire, but those who knew the nature of the Assamese were aware that they would sooner work for two rupees per month in their native province, than for eight rupees per month in another. Coming now to a few statistics of Upper Assam, the result of his experience was that taking the whole of the charges in the

province connected with the manufacture of tea, they could not be put, in a large concern, at under 1s. 3⅜d. per lb. To that might be added 4½d. for the charges connected with tea from the time it left the factory to the sale, so they had 1s. 7½d. per lb. as the cost of the tea. Though they had heard a great deal about a yield of three or four maunds, and even more, per acre, he could say, is his own experience, he had never known a plantation producing anything like that quantity over the whole area. He thought 220 lbs. per acre might be taken as a fair average yield over the whole area of a good plantation. Taking that at the cost price of 1s. 7½d. per lb., they would find a result which, he hoped, would not cause dismay amongst the proprietors. If the tea was sold in London, it produced a gross price of 1s. 11½d. per lb. He thought that was a good price. That would leave a profit of 4d. per lb. upon the tea manufactured. The expenses would be, in India, for cultivation per acre, about £14, and the expenses connected with Calcutta, and home charges, would be about £4 per acre. Taking the produce at 220 lbs. per acre, this at 1s. 11d. per lb. would leave £3 10s. per acre profit, at the present rates of labor. Taking, then, the capital to be represented by £50 per acre—and he thought that was not putting it too high—that gave a net profit of 7 per cent., but he did not call that a remunerative profit for such an enterprise, attended with such risk. His figures were based upon the average of seasons. Taking the case of Lower Assam, where local labour was obtained without importing it, the expenses were 1s. per lb. and the home expenses 4d., making the cost up to the sale in London 1s. 4d. per lb., at the average price of 1s. 11½d. per lb., but estimating the yield, in consideration of the climate being less favourable, at 180 lbs. per acre instead of 220 lbs., that would leave a profit of 7⅜d. per lb., as against 4d. in the other case. Taking the expenses at £9 per acre, and the colonial and home charges at £4-£13. That left them £1 12s. 6d. profit per acre in favour of the lower district, upon a yield of 18 per cent. less per acre. That result was attributable to the want of population in one case, and the existence of a considerable population in the other case. The next question to be considered was, how things could be altered so as to make the cultivation of tea more remunerative? He deprecated the interference of government or any attempt to induce legislation on the subject. He thought the laws of supply and demand would regulate themselves, and if persons found that the capital they had embarked, and the speculation they had undertaken, proved to be not sufficiently profitable, they would find some way to overcome the difficulty. One great difficulty was the utter want of unanimity amongst the planters themselves. He could not describe the jealousies that existed. If they were asked to continue in one line of action they considered it as an endeavour to get some advantage out of the transaction, and that they would be the losers, and all attempts to get anything like a united action invariably failed. He thought some unanimity of action was desirable to overcome the difficulties of the uncertainty of the home market. There was no relying upon the price the article fetched from week to week, and that was a great deal within their own control. There was no proper competition for the tea, and there was a great deal of by-play in the market which outsiders did not understand. He believed some unanimous course of action might be arrived at which would remedy that, because he thought the produce of India must to a certain extent remain as a fancy article in this market, and was not yet reduced to the level of China teas, which sold for what they would fetch. Another point, the difficulty of supplying population to Assam, was one they could not get over, because the climate was against imported coolies, and was held in such dislike and terror by the Bengalese, that willingly they would not go into the province, and the prospect of a railway in Assam was somewhat remote. There was, however, one point which those interested in this question should take up—that was the introduction of machinery in substitution of manual labour, which was so scarce and dear. He had done a good deal himself in introducing machinery when he was last in Assam, in 1867, and he could say success had attended his efforts; and he believed that machinery for the manufacture of tea had been largely used since then. But that was a small matter compared with machinery to do out-door work. He believed most of the cultivation could be carried out by the aid of machinery, so that they might be to a great extent independent of hand labour. Till that was done in Upper Assam, he did not think the planters would receive a sufficiently remunerative interest upon their capital; and this was a question which deserved immediate attention, because if the cost of producing the article went on increasing, and the price in the market went on decreasing, it was only a question of time when the whole thing must cease.

Mr. George Campbell (Commissioner of Nagpore) remarked that on occasions like this they were apt to have people who took too sanguine views, but as far as they had yet gone the speakers who had addressed the meeting had taken a very unsanguine view. The first speaker, who he gathered was not a planter, but spoke from theory, made an observation to the point. He said truly they had extreme difficulty in inducing a Dorsetshire labourer to migrate from his native country, in which he could barely subsist, to one in which he could live in comparative luxury, but it was still more difficult to induce the coolie to migrate to another part of India. This was the real difficulty in regard to tea planting in the remote parts of India, where, though they had land in plenty, they had not labour. They had heard the speech of Mr. Bainbridge, a thoroughly practical man; the observations of that gentleman seemed unduly discouraging. They could all see he had practical knowledge, and he had explained his views in a practical manner, but the results appeared to him (Mr. Campbell) extremely discouraging. He had told them they could not hope to compete against the free labour of China in tea, but he did not understand the remedy he suggested for that difficulty. He told them the difficulties with regard to the cost of cultivation of tea in India; that they could not expect to cultivate there except at a heavy expenditure, and that the profit which planters could hope to obtain was barely remunerative, and not adequate to the risk of carrying on cultivation at so great a distance. The first remedy which he understood Mr. Bainbridge to suggest was one which he thought would not be regarded with much favour in these days of free trade, viz., that the sellers should combine together not to submit to the exigencies of the market, and sell their teas at too low rates. That would not succeed. The other was, no doubt, in principle, the right thing, viz., that where labour was dear they should substitute it as much as possible by machinery; but, while Mr. Bainbridge told them that machinery intended for the manufacture was comparatively a small matter, they could hardly introduce machinery for doing the out-door labour. That was looking to perfection of machinery to which they were hardly likely to attain in the present generation, because up to this moment they had not succeeded in getting an efficient ploughing machine in this country, and they could hardly expect to get a machine to set out tea plants, gather the leaves, and do all that sort of thing. Therefore, if the hope of a large export of tea from India depended upon machinery brought to that perfection it must, he thought, be a forlorn hope. He would like to put before the meeting another view, which was this—He understood Mr. Bainbridge estimated the capital sunk in the tea companies at an average of £50 per acre. If the calculation was made on that basis they could hardly expect the thing could succeed. But he (Mr. Campbell) submitted that was a false and unnatural basis, and the result of that over-speculation to which Mr. Bainbridge had alluded. For his own part, he did not believe the actual expenditure amounted to anything like the £50 per acre mentioned. It seemed to him that the real reason why tea planting was so discouraging was, because a large proportion of the gardens were formed, not to grow the tea, but to sell; and that £50 per acre represented, not the *bona fide* capital expended in bringing the land into cultivation, but the artificial and nominal price obtained by those people who made the gardens to sell; therefore, those who had paid fancy prices for their plantations, must make up their minds that they would have some difficulty in getting a fair interest for their capital; but those who had gardens which they had themselves brought into cultivation, and had not put down more than they had actually expended in bringing the land into cultivation, might hope to get a fair return by industry and perseverance. In that view only it was possible that tea cultivation in India might eventually be successful. They knew that plantations carried on at a great distance by absentee planters, under the charge of an agent, were carried on at great disadvantage. Take the case of ordinary farming in this country; they knew that agriculture was an art which required skill, industry, and perseverance, and by their exercise good returns could be made for capital and labour; but they knew, as a rule, gentlemen farmers were seldom successful in a commercial point of view; and gentlemen who sat at home at ease, and sent out agents to plant tea for them, would, very probably, lose their money. At the same time, it was by no means a thing to be disregarded by vigorous young men of our own country, who possessed a little capital of their own. He believed, for such, tea-planting in India would be an extremely good field of operations; and if they invested their money in that way, they might yet hope to make a good thing of it.

Mr. Leonard Wray thought the cultivation of tea in India ought to be discussed in a wider sense than as it affected the province of Assam. It was true the tea plant was first discovered there, and a large amount of capital had been expended in its cultivation; but they knew the first efforts of the Old Assam Company resulted in a great success, through the energetic management that was brought to bear upon it. That company he believed, eventually paid as much as 25 per cent. dividend, and was looked upon as one of the great successes of Indian enterprise. They knew that enterprise was killed, and he thought many in the room knew why. They knew that a lawyer of Calcutta, who scarcely knew a tea plant from a cabbage stem, was placed as manager, and bound himself in that appointment for three years, and the whole affair, instead of paying a good dividend, paid nothing. It was not from the intrinsic value of the undertaking, but from bad management. It was looked upon as one of the greatest enterprises ever undertaken in India. It gave great hopes to those who subsequently embarked in like concerns; but many who followed in the footsteps of the first Assam Company embarked their money as a means of deceiving others.

They planted gardens, regardless of expense; and as long as they made money, they did not care who lost it. But, apart from bad management and dishonesty, no doubt the climate, and want of population in Assam, were against such enterprises. It was situated in a remote part of India, and very far from the labour market, which was Chota Nagpore. There was the great fault. They tried to take coolies from one part to another where it was very unhealthy, and where Europeans could hardly live. Why not cultivate in other parts? The vicinity of Nagpore was healthy if not for Europeans at all events for natives, with abundant population, and labour at from three rupees per month. He had had them come to him in gangs to work at three rupees per month and find themselves, and he never knew a finer set of working men. If they could not take the labour to the plant, why not take the plant to the labour? Tea would grow in Nagpore as well as in Assam. Why was it that plantations were formed on hills? Because in a great portion of the low-lands miasma and hot winds prevailed. Nagpore was not subject to either of these. They could grow tea there with as much certainty as in any part of Assam. It was something like smelting in the present day. Instead of smelting the ore in Chili they took it to where the coal was, and it was the same all over the world, and in this case, he said, take the plant to the labour. In Nagpore they had a good climate, abundant rains, and fertile soil, and Mr. De Merley, the manager of the company, with which he (Mr. Wray) was connected, had reported that Chittagong was eminently suited for the tea plant. Another field of operations was to be found in the Ghauts settlements, and Mr. De Merley had sent to Assam for seed for planting in the Ghauts settlements. They all knew that the quality of tea differed according to the plan on which it was made. The China plant differed from that of India. The former was more delicate in flavour, while that of Assam was stronger flavoured and better for blending, consequently it fetched a good price, and it was just the plant which was wanted in the Straits Settlements. It was not necessary to confine the cultivation of tea to one district of India alone, because the plant was not indigenous to any one part of the country. Everyone had made a rush to Assam, and great jealousies had arisen not only as to labour, but as to seed, and the consequence was there was no unanimity, and tea-growing in India was at a discount. He begged to thank Mr. Bainbridge for the honest way in which he had given expression to his opinions. It was refreshing to hear him; it had the genuine ring of the true metal. They had the views of a practical man who had worked out the whole subject. They knew now how much it cost per lb. to grow tea in Assam. The question was, could they grow it elsewhere at a cheaper rate and with larger profit to the planter than in Assam? He said they could, but let them not take the labour to the plant, but rather take the plant to the labour.

Mr. Samuel Ward (Secretary of the Lebong Tea Company) thought the great difficulties in connection with tea cultivation in Assam had arisen in the matter of labour, and he would say, in Darjeeling, where attention was paid to the comfort of the coolies, they had found no difficulty in getting labour at from 3 to 5½ rupees per month, and at those rates they got all the labour they required. Everybody who had spoken appeared to take a depressed view of tea cultivation in India. He was happy to say personally he took a more favourable view as regarded Darjeeling, with which he was acquainted, than he did a year ago. The company with which he was connected had already more than a thousand acres of land under tea cultivation, but to obtain that quantity they had opened out two thousand acres. The thousand acres were in full plant, and he anticipated that this year the yield would be 2,000 maunds of tea (last year it was 1,500 maunds,) which would bring the produce to two maunds per acre. A great deal of the plantation was young, and a portion was hardly commenced at the time the Chairman left India. If they made two maunds per acre this year, they might calculate in a few years the yield would be 4 maunds per acre. The best results were obtained from that portion of the estate which immediately joined that of the hills. On the hills estate, the cultivation was necessarily carried on in detached pieces, which added to the expense. It was essential to get the plantations as compact and well together as possible; and it was necessary to have skilful and trustworthy managers. Sub-managers were to be avoided as much as possible, because to be successful, the cultivation must be carefully conducted; and he thought it desirable that natives should as far as possible be placed in positions of trust and responsibility. With regard to Indian tea being a fancy article in the market, he thought that was an erroneous view. Tea must always stand on its own merits. It was impossible to control the market. If they produced a better article than China, it would bring higher prices.

Dr. Barry said it was in the year 1856 that Mr. Williamson and himself first embarked in tea cultivation in Cachar. At that time the average price of labour was 3 rupees per month; and upon the supposition that labourers and artisans could be obtained at those rates he was led to embark his capital in tea cultivation, in which he was joined by several friends. It had been stated by Mr. Fielder and Bainbridge that wages had gone up from 6s. to 18s. per month. What was the cause of that? Simply competition. When he invested his money, and that of his friends, in this enterprise, he hoped to do some good to the country, as well as benefit himself, and for some years he had a prospect of making the returns spoken of, viz., 25 per cent. He believed, in some instances, a larger return than that was being made. If he were at liberty to do so, he could mention the name of one house which was now making that return from their tea cultivation. When that cultivation was in embryo it paid in some cases as much as 50 per cent. profit, and he had made 25 per cent. himself. There were reasons why it did not pay so well at the present time. Competition was one of the principal reasons. The moment a person went to take gardens, he was followed by scores of people—little better than convicts from Australia—men from the streets. Any man could get a grant of land. The result was that those who had capital, and could have managed the property successfully, could not get labour. The effect of that was that managers and superintendents who had been trained on states from boyhood threw up the engagements to which they were bound for higher salaries. He ventured to say there was not a tea garden which was fully stocked with plants; instead of 4,000 plants per acre, as there ought to be, the average was not more than 1,800 or 2,000. He had himself been deceived, and he was sorry to say he had been the means of deceiving others. About twelve months he received a telegram, stating that estates in which he had a large interest were going to ruin. He at once started for India, and those estates which were reported to be on the verge of ruin were now in a fair way of yielding a good return. Why was that? Because he turned out the rascals! Previously, he had no choice, but now people came begging for appointments, and they could elect honest men, and by doing that they would be certain of success. Last year the cost of the estate was £12,500. When he went there last he found some 20 body servants in attendance upon the manager. The result of the measures he took was that the cost of cultivation was reduced from £12,500 to £9,000 per annum, and, instead of a yield of 140,000 lbs., it was 200,000 lbs., which result was obtained by having honest managers, and an honest day's work for his money. The Assam gentlemen were much to blame. They had not, as a rule, taken proper care of their coolies, and occasionally a fearful amount of mortality among them resulted. On the occasion of his last visit to Cachar, he had £5,000 more to his investments there. He had more hopes for tea cultivation than ever, and he had no fear but that the teas of India, manufactured in a scientific way, would hold their own against the teas of China, which had to be carried 500 miles in small portions to be manipulated. He was warranted in saying the manufacture of tea in Cachar was scientifically conducted, and those teas which had been made upon the new process had been pronounced by the brokers to be of excellent quality, and were valued at 2s. 8d. per lb. in the market. He was convinced that tea cultivation would prosper under honest management and ordinary industry.

Dr. Barry said the result of the previous evening's discussion, was to show that there was a great want of confidence both here and in India, as to whether the cultivation of tea in that country would pay as a speculation; but this was easily accounted for when they considered the difficulties which for many years it had had to encounter. He would commence by enumerating some of them. In the first place, when the Assam company was proved to be successful, there was a great rush of the public into tea cultivation, and as it had happened with railways and other things, over speculation had caused a great depression. Those who were entrusted with the selection of land had not sufficient judgment, and large tracts had been bought which were utterly unfit for the purpose. He was speaking principally of Cachar, in which his own experience had been gained. The second cause was the want of seed; they had to rely almost entirely on Assam, and when the cultivation was commenced, there was very great difficulty in obtaining it. The Cachar Company refused to sell it at all, but as he had had the means of rendering valuable services to that company in his capacity as a medical officer, as a personal favour he was allowed 40 maunds of tea seed. A great deal of discussion had lately taken place in the public newspapers with regard to the adulteration in England of clover and grass seeds, but that gave a very small idea of the extent to which the adulteration of tea seed was carried.

The Chairman inquired how the seed was adulterated?

Dr. Barry replied that windgalls were sold, and sufficient care was not taken in selecting the seed, which was of the utmost importance. It also required very peculiar treatment in order to bring it into a fit state for germination. The third cause of failure was that proper men were not selected to carry out the enterprise, and in many cases it was found that when a good man had been secured, owing to the great speculation, he resigned his appointment for the sake of a monetary inducement to go elsewhere, and in this way the best plans were sometimes frustrated. It was within his own knowledge that all classes of men, from convicts up to bankers, had been engaged in this enterprise. Fourthly, when he first went to Cachar he was

informed that ordinary labour cost about four rupees and three shillings a month, and that the skilled artisan's wages would be six shillings a month ; but the fact was that now he could not get a carpenter under twenty shillings a month, and the wages of ordinary labourers now averged about fifteen or sixteen shillings. Fearfully great losses were sustained through the plots of agents in Calcutta. It was necessary for every tea planter to employ an agent for selecting his implements. From calculations he had himself made, he found that by exercising great care in this department he had saved one per cent. on his capital. Supposing that every acre represented £40 of capital, which was necessary to bring it into cultivation, 100 acres requiring a capital of £4,000, the saving would be very considerable. Then some of the agents had acted very injudiciously in sending coolies. He had lately had a letter from a manager of a tea plantation complaining that some of the men who were sent up, and who had to cultivate the plants, did not weigh more than five stone ; it was quite evident they were utterly unfit for such occupation. Sixthly, they had a bad market for their teas, the agents in Calcutta not exercising a sound discretion. Only last year he went into the tea marts, and noticing the price at which teas were selling, he had bought in a considerable quantity, which never ought to have been sold there at all, by which he had realised threepence a pound, which never ought to have gone into his pocket, but if proper discretion had been used should have gone to the tea planter. He had before referred to the labourers being badly selected, and he would add that 20 per cent. of the labourers sent up to Cachar were not fit for tea cultivation. As he had saved one per cent. on the purchase of implements, so he had saved four per cent. by properly selecting his labour, and five per cent. in sending the tea on to a proper market, which, added together, amounted to ten per cent. clear gain, simply through having a proper agency. There were many tea gardens which just paid their expenses, but if they could save these percentages there would be a clear ten per cent. profit. Then there were causes detrimental to the tea cultivation which affected the Government of India. In the first place they required roads. Not being an engineer, he could not say much as to the best method of constructing these roads, but he would strongly recommend a pamphlet which he had seen that day, by Mr. Login, which described the most suitable means for road-making, for a country such as India, which could be supposed possible. Then, again—and this was the eighth difficulty which they had to contend with—different legislation was required. He had been taken to task for finding fault with the Emigration Bill, but he considered there were grave defects in it. They wanted to be under the same conditions as the Ceylon planters ; that small courts with stipendiary magistrates should be appointed for the purpose of meting out justice between the employer and employed. Instead of that, however, the Government had appointed what was called a Protector, and the injurious effect of that was almost impossible to describe. He understood that in Assam, where the agent appointed possessed very great abilities and a very humane disposition, good results had followed, but in other parts they were so prejudicial that for the last two years he believed that part of the Act had been allowed to remain inoperative. He would now venture to make a few suggestions as to how tea cultivation should be made profitable. He had not the slightest doubt that this could be done, for he had done it. The first thing necessary was to have an honest and judicious agent ; and, secondly, the manager must be not only honest and industrious, but intelligent and skilful, and these qualifications were to be obtained. The best men for such positions were skilled gardeners. He had sent out four such men from this country to India, and they were all doing well, and made tea-gardens pay. It had often happened, however, that directors of companies sent out their sons to fill such positions, and that system of nepotism had been one of the greatest causes of failure. With regard to the coolies they would suffer almost any inconvenience, provided they had good water ; and it had been found that on those estates, where this point was not attended to, the mortality had been very great. Then the labourers must be properly housed and fed. Rice and other necessaries must be provided for them at a cheap rate, and they must be properly clad. These matters were of the greatest importance, although they had often been entirely neglected. For instance, the huts were generally made of the most perishable materials, and covered with grass ; when the hot months came on they became so dry and parched that the slightest thing would ignite them ; and then if the natives were burned out just before the rainy season set in they speedily fell victims to diarrhœa, dysentery, and cholera. He believed that felt, which was most extensively used in England, would form a most admirable substitute for thatch for these huts, as it was not easily ignited ; being a non-conductor, it would be found equally as cool as thatch. All these matters must be attended to, from motives of economy not less than feelings of humanity. Again, there were many things to attend to in the culture and manufacture of tea. Great advances had been made in Cachar in the way of trenching, hoeing, and manuring. Last year experiments had been tried on a considerable scale in the way of making an 18-inch or 2-feet trench, and filling it in with manure, which were found to answer admirably, giving an increased crop to the extent of 30 or 40 per cent. Then, in the manipulation of tea, they had now given over in the best gardens the system of firing, and also of putting the tea in heaps, by which it sometimes fermented and turned sour. It was now dried in the sun, which rendered it flaccid and fit for rolling, and then dried rapidly over charcoal. This plan was found to succeed admirably, the tea being of a very uniform standard. He might mention that he was present at the last sale in October, before he left Calcutta, when the teas of that meeting averaged 2s. 9d. per lb., and he had since been informed that the quality was very superior. With regard to the cultivation of tea, they should not be guided by the opinion of brokers in London who, no doubt, acting to the best of their judgment, sent out instructions as to what kinds of tea should be made. The fact was, they must make the tea as the leaves came. If they found that the plants brought forth a flush of leaves which it would not be injurious to pluck, they should take them and manufacture them into tea, but if it would injure the plant to take them they must not do so ; the only safe guide was to follow nature, and by so doing, they could not fail of obtaining the best results. Returning to the road question, he might remark that various memorials had been presented to Government for assistance, but there was one fund on which he thought they had something like a claim. It appeared that there were now 35½ lacs of rupees lying in suspense, raised from the sale of waste lands, which the Government did not know what to do with, and he thought it would be only just that out of this fund some assistance should be given in bringing labour into connection with the land which required cultivation. This amount had accumulated since 1858. He hoped, therefore, that a memorial would be presented to Government for this purpose, and also to alter the system of the Protectorate, or at least not to allow it to remain in abeyance as at present. In conclusion, he would say, that he had no doubt of tea cultivation being made to pay, for he knew an instance in which a tea garden had paid 25 per cent. on the capital only last year; people, therefore, who had invested money in tea, should not despair, but they must go in for retrenchment, for honest and able managers, and look well after their own interests.

Dr. Barry said he had extracted oil from tea seed, but it could not be done at a profit. With regard to the mixing of tea, it was all a matter of taste. He preferred pure Cachar.

Mr. Horne said he had seen a good deal of tea planting in Kumaôn, but there was no importation of coolies, the labourers there being, generally speaking, natives of that part of the country, though in some places it was very difficult to get them. The rate of wages averaged from three to six rupees a month, or from six to twelve shillings. The commoner or coarse kinds of tea sold for about 12 annas a pound of eleven ounces, or at the rate of 18 per English pound, while the finer qualities sometimes sold as high even as 4s. a pound. It was found that the local sale of tea paid much better than exporting it, and they had lately been trying to imitate the brick tea, so much in use in Thibet. This was found to contain a small quantity of opium, and was mixed up with various gums. It had been successfully imitated, and by the last reports he understood that it was finding considerable favour in Thibet, and even as far as Bokhara. It was also selling to some degree in the Punjaub. He believed that the demand for tea among the natives was incalculable—speaking of the plains, not the hills. The greatest treat they could give a servant was a pinch of tea, and this was one of the things which it was always necessary to keep under lock and key. Mahommedans, Bhuddists, Hindoos, and Tartars, all drank tea, and he believed the demand would be sufficient to absorb the whole amount produced if they could get it at a fair price. It was considered by the natives a cure for all diseases under the sun, and was readily taken by all castes, from the Brahmins downwards.

Sir Charles Trevelyan, K.C.B., said he attended the conference to a great extent as a matter of curiosity, having no modern experience on the subject to communicate. He saw the first germ of what was now being discussed when a young civilian at Calcutta many years ago, when he was appointed by Lord William Bentinck, in the last few months of his administration, one of the members of the Tea Commission, for the purpose of inquiry into the practicability of growing tea in British India. The first thing they did was to send out circulars to all parts of the country, asking for information, but the utmost they ventured to ask was, whether any plants of a cognate character were grown in the neighbourhood, which would hold out some hope that tea might be cultivated. The answers read were various, but from Upper Assam they read the extraordinary reply that tea itself was growing there in whole forests, and although this could hardly be believed at first, further inquiry only proved the correctness of the statement. A Scientific Commission, as it was called, was organised to go and investigate the matter on the spot, and they found, as it had been stated, that the tea plant was growing in Upper Assam in ancient forests and he understood that even to this day the tea plants in Assam

were of a strong, wild nature, and produced tea of a very strong character, while the finer and more delicately flavoured kinds had to be produced from imported plants. He recollected that one of the suggestions made to Lord William Bentinck at that time was, that he should establish an agricultural school, but his reply was that the instruction given in such places was very exceptional even in England, and that the best agricultural school in India would be the establishment of indigo plantations, and the settlement of Europeans in the country. The first great requisite in tea cultivation was an absolutely secure tenure of land; nothing less would suffice, but it should be remembered that there were two ways of securing this—either purchasing land out and out by the lump sum, or by paying a a certain fixed quit rent. The latter plan had been adopted in the Madras Presidency, and it had many advantages—the Government were secure of a fixed annual revenue, and the planter was not called upon to cripple himself at the outset of his labours. In Bengal and Assam the Government had required that the land should be purchased out and out by the payment of a lump sum, but that was not found to answer so well, and, ultimately, a variation had been introduced by allowing it to be paid for by instalment; but even this was not so beneficial in his opinion, as a system of a fixed quit rent. The next Government requisition of course was labour. He recollected Mr. Jordan, a member of the firm in Calcutta, being sent to bring over some Chinese labourers, but he did not think that, on the whole, the experiment answered, partly, perhaps, from difference in climate, and partly because the wages were so low as not to offer them a sufficient inducement. There was an abundant supply of labour in India itself, if it could be made available. There were large classes there who would emigrate to any part where labour was required if only their confidence could be secured, and a sufficient pecuniary inducement held out to them. Great exertions had been made by Sir John Lawrence's Government to bring about that state of things, which was beneficial both to the coolies and to the planters, but there was still room for greater efforts in that direction. In his opinion, all the indications pointed to the conclusion that the tea cultivation would ultimately prove a great remunerative industry in India. In the first place excellent tea could be grown; and in the next place, there was an unlimited demand for it, not only in England but in India itself, and above all, in those extensive Tartar countries to the north, the population of which were much disposed in its favour. Of course it had to struggle, not only with the fluctuations to which all crops were liable, but with many difficulties incident to all novelties, and, of course, judgment must be exercised in the locality selected for the experiment. He doubted himself whether the Dherra Dhoon was suitable for tea production.

Mr. Arthur Hall said he had been stationed for some time in the Neilgherry Hills, and, although not much had been done there, it was clearly established that tea would grow, the plants attaining a large size, and yielding very fairly. The principal drawbacks to its cultivation were the want of proper means for preparing it for the market, and the great distance from Calcutta. Just when the matter was being taken up coffee was introduced, for which the climate was found very favourable, and it had in fact practically superseded tea. However, the fact which some had doubted was clearly established, that tea would grow well at an elevation of 6,000 feet, and the flavour was very good, very similar to the Assam. The want of labour was the great difficulty, but that was not so much felt as in Assam. Tea had also been grown on a neighbouring range called the Pulney Hills, but it was mostly sold on the spot, instead of being sent to the English market, for want of persons skilled in its preparation. At one time it was proposed to get a few Chinese, and some did come, but the experiment did not answer very well, possibly from the climate being too cold for them. The main reason, however, for the discontinuance of the tea cultivation was that coffee had taken its place. Any one who was disposed to speculate would find a beautiful climate, and land might be got on easy terms, and with a secure tenure. There were also good roads, and a railway at the foot of the hills. It took about five years, with an expenditure of from £30 to £40 per acre, to bring tea gardens into proper bearing. He did not know what produce per acre might be expected, nor the cost of cultivation afterwards. He should like to know if this had been calculated elsewhere?

Dr. Barry said that matter had been carefully gone into in Cachar. The cost per acre in 1868, for all expenses connected with the cultivation, was 120 rupees per acre; this year it would be about 90 rupees.

THE MARKETS.

LONDON, 17*th June* 1870.

COFFEE.—At last the short shipments to Europe from the Brazils, and the export of Coffee from Europe to the United States, consequent on the late great rise in the Brazilian exchange, have produced an important change in the position of the stock as compared with last year. A glance at our subjoined table will shew that the surplus in the principal European ports is now computed at only 14,050 tons as compared with last year, against a surplus last month of 31,850 tons. There being so limited a supply of Brazil cargoes afloat, and a want of a few cargoes having arisen for the Mediterranean, prices for these have rallied about 1s. to 1s. 6d. per cwt. About six cargoes Rio were thus disposed of last week at 45s 3d afloat for the Mediterranean. On the spot here all kinds of common Coffee and the lower samples of Plantation Ceylon have been so abundant that prices have further given way 2s to 2s 6d per cwt. The medium qualities of Plantation are also 1s to 2s lower, but superior and fine samples, of which a better supply is now looked for are as dear hither as before. Native Ceylon, of which the import is so short this year, is nevertheless rather lower from competition with Foreign Coffee, Java, Manilla, &c., of this standing. The deliveries have during the last few weeks been very satisfactory from London, and the stock here is now only about 3,200 tons more than last year at this season. Large arrivals are now as usual at this season taking place from Ceylon, and the immediate future of the market will to a great extent depend on the policy which may be adopted by the Dutch Trading Company. As we have before remarked, the brightest feature in the Coffee prospects is the large and increasing consumption in the United States, which will serve much to mitigate the effect of a third large crop in the Brazils, should the anticipations of its abundance be realized. The Brazil Coffee afloat for Europe is still much less than that year.

The stocks of Coffee in the principal European ports on 1st June, were—

	1870	1869	1868	1867
United Kingdom.....Tons	19,750	15,000	16,950	12,750
Holland..... „	42,000	40,300	34,550	27,950
Antwerp ..... „	3,700	4,900	6,400	4,150
Hamburgh ..... „	12,500	11,000	13,500	8,000
Trieste ..... „	3,300	2,750	4,000	3,400
Havre..... „	17,500	10,750	13,540	10,900
Total.....Tons	98,750	84,700	88,950	67,150

—*Rucker & Boncraft's Price Current.*

CALCUTTA, 16*th July* 1870.

INDIGO.—Indigo has assumed a serious position this week, and as compared with the good prospects of the growing crop only a week since, proves the unreliability of any estimates of the crop made at this early part of the season—as a matter of fact the actual out-turn may be 60, 80, 100 on even 110,000 maunds, at present nobody can foretell. Unusually heavy rain has fallen throughout the districts during the week, flooding the country and doing extensive damage to the plant. The rivers have risen to a most unsual height, and grave apprehensions are entertained for the Indigo crop, but as yet it is impossible to say to what extent injury has been done.—*Toulmin's Circular.*

CALCUTTA, 23*rd July* 1870.

As yet no estimates of the damage done to the growing crops by the heavy rain and floods referred to in last issue have been received; it has, however, been ascertained that the loss is not likely to be serious owing to a favourable change in the weather. The rainfall has abated, the rivers are fast falling, and altogether prospects have much improved during the week; it may, however, be repeated that the actual out-turn of the crop is still as great an uncertainty as it was a week ago.—*Ibid.*

CALCUTTA, 30*th July* 1870.

The damage sustained by the growing plant during the late inundations has not been of a very serious nature, and, so far, as the manufacturing has proceeded up to date, the out-turn shows an increase on the crop of last year. It is very generally believed that the total yield for the current season will exceed that of last season, although as yet the crop is by no means secured, and various accidents may still occur, affecting both the quantity and quality of the crop before the manufacturing season draws to a close.

INDIAN TEA.—Business during the week has been confined to a few small private sales, very little Tea having come to this market. A fair quantity is expected to arrive in the course of a few days, but as it is quite impossible that shippers can meet the views of many of the holders of Tea here, no doubt a very large proportion of the arrivals will be shipped on grower's account. There is nothing of importance in the manufacturing districts to remark, excepting that in Darjeeling the rains have become more moderate, and consequently more beneficial, while in Upper Assam some of the gardens are reported to be inundated by heavy rains. London telegrams continue to report a falling market.

Private sales during the week comprise:—

Assam... ...	Dahingeapar Tea Estate.—Pekoe, Broken Pekoe, Pekoe Dust	44 chests, all round annas 15
„	Durrung Tea Company, "Ld." Pekoe and Broken Pekoe	56 chests, all round annas 15-0
„	East India Tea Company, "Ld."—Pekoe Rs. 1-2-0; Broken Pekoe annas 15½; Pekoe Souchong annas 12; Souchong annas 8½ to 10; Broken Congou annas 6½	66 chests, average annas 13-9
Cachar	East India Tea Company, "Ld."-Pekoe annas 14; Pekoe Souchong annas 12; Broken Pekoe Souchong annas 10; Souchong annas 10.	33 chests, average annas 11-6
„	East India Tea Company, "Ld."-Pekoe annas 12½; Souchong annas 8½	22 chests, average annas 11-0
Dehra-Doon.	Young Hyson, Hyson, Gunpowder, and Imperial	37 half chests, all round as. 10-9

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AGRICULTURE OF INDIA.

FIRST STEPS.

"*The fertility of the soil of India is equal, if not greatly superior to that of England.*"—Such was the statement, without qualification of any kind, made by the late Mr. Mackay, the Commissioner who was sent out some 20 years ago by the Chambers of Commerce of Liverpool, Blackburn, and Glasgow to report upon the hindrances to the growth of Cotton in India. Mr. Mackay spent a considerable time in the country and was an able and impartial observer. His statement that "the fertility of the soil of India is equal, if not greatly superior to that of England," was simply a reflection of the belief everywhere entertained that the fact was so. That the belief is erroneous, and that it is only in some of the most favoured parts of the country that the soil of India approaches in fertility to the soil of England, is a fact that exact observation goes we fear to establish beyond doubt. None will rejoice more heartily than overselves if exact enquiry should show that we are mistaken, and that the popular belief is well-founded. We are compelled to regard this belief as of the same order as that entertained of the fabulous wealth of the Mogul and the Native princes of India, in the days of our early intercourse with them. Now it is most necessary that this delusion should be dispelled, that an intelligent public opinion may be formed amongst us as to what the proper action of the State must be in those circumstances.

The first step undoubtedly would seem to be, for Government to call upon every Collector in the country for as exact an account as he is able to furnish of the character of the husbandry in the districts under his charge, and of the average yield per acre or beegah of the staple products of the collectorate. We do not want long-winded dissertations upon political economy, or the advantages of high farming, but a simple record of what the land is believed to yield per acre, and the general character of the husbandry of the district. We want from every talook in India a record of such facts as the following:—

(*a*) The staple food of the people.
(*b*) The average yield per acre of each staple, and the authority on which the yield is affirmed.
(*c*) The proportion of wet to dry land.
(*d*) The general character of the husbandry.
(*e*) The condition of the actual cultivator, indebted or otherwise.
(*f*) The improvements made within the last ten years at private cost.
(*g*) The special wants of the district, its special drawbacks, and special advantages.
(*h*) The assessment per acre, and the rental paid by the non-proprietary cultivator.
(*i*) The average price of the staple food of the district in 1820, 1830, 1840, 1850, 1860, 1870.
(*k*) The average wages of the agricultural labourer of the same periods.'

Government, by its Minister for Agriculture, would probably issue a circular order calling for a Return of this information from every talook of the country. These Returns should be rendered in precisely similar forms from every district, and all local measures should be reduced to their equivalents in the Imperial standards. Thus, the beegah must be converted upon the spot into the acre, and the local weights reduced to the Imperial seer. The Madras Returns must drop their *garce*, and give us the Indian maund in its room

With returns in a uniform shape from every district, it will be an easy matter to collate and summarize them, when their suggestions and teachings will readily be grasped by the Statistician. The high condition of Indian agriculture in some districts will serve as a standard by which to judge of the capacities of others with equal advantages but in a more backward state. We shall begin to see for the first time exactly where to apply the energies of the State, and to discern the varying nature of the assistance required.

In *this* district it will be seen that irrigation is what is wanted; in *that* a heavier assessment as an incentive to exertion; in a third, access to markets; and in another, a model farm in its neighbourhood. Exact observation will begin to be recorded of the character of the seasons, the average harvests, the food reserves of the district, and the real resources of the people. Within 20 years, we shall know every thing and have introduced a new era altogether into Indian Agriculture. Arthur Young has somewhere remarked that that portion of national wealth which is employed in the improvement of the lands of a State is the best employed for the general welfare, for that while the capital sunk in trade and manufactures yields only a net average return of 5 to 10 per cent., there is almost no limit to the returns from capital judiciously invested in the soil. As yet nothing has been invested in the soil of India. We stand at the very threshhold of our work, but are happy in having found out that it is our work.

THE YIELD OF THE LAND.

The average return of dressed corn per acre to modern Agriculture in Europe is as follows :—

England	1,670 lbs. per acre.
Ireland	1,392 "
France	894 "
Belgium	1,218 "
Prussia	993 "
Austria	1,334 "
Spain	1,330 "
Greece	960 "

Wheat is the staple food of the people throughout a great part of India as well as Europe, and the average returns of the soil, according to the Administration Reports of the last two years, is as follows :—

	1868 9
Punjaub	631 lbs per acre
Oudh	878 "
Central Provinces	351 "

As these figures represent the first attempt made by the State to ascertain the condition of Indian agriculture, and as the season was marked by severe drought, it is impossible to regard them as furnishing any index whatever of the powers of the soil. They are of great value, however, as commencing a series of records which, if pains are taken with them, will by and bye, give us an exact knowledge of the agriculture of the country, in the absence of which all attempts to settle the Land Revenue for long periods of time are impossible. We observe that no effort whatever is being made either in Bengal, Madras, Bombay, or the North West Provinces to compile similar returns to those which are being annually prepared by the minor governments of the country.

While Burmah, Oudh, the Central Provinces, Mysore and the Punjab are presenting us, year after year, with a mass of agricultural statistics upon a uniform plan which are simply invaluable, the older Governments of India are making no effort whatever to follow their example. The fact is most discreditable We positively know far more of the agriculture of the Punjab than we do of that of Bombay or Madras, or any of the older provinces. We shall soon be able to speak with certainty of the resources and economic condition of provinces that came under our rule but yesterday; while we are in Egyptian darkness as to the condition of territories that have been under that rule for a hundred years.

We would call the attention of Government to the furthe fact, that at this moment the only trustworthy information we have as to the produce of the soil of India consists of the tables framed by the Emperor Akbar in the seventeenth century. These tables were framed upon a series of experiments made over a period of 19 years, a lunar cycle in which the seasons were supposed to run through all their variations. Thus two centuries ago, the Mogul Emperor, or his minister, Tudur Mull, instituted over all India a series of experiments which have never been attempted with English agriculture at home to this hour. England is indebted to a private gentleman for the only exact information she possesses of the yield of her land; while the Government of India is dependent to this hour upon the experiments of what we call our 'barbarian' predecessors for the same information concerning the soil of India. That the tables in the *Ayeen Akbery* represent the exact yield of the soil in the 17th century there can be no doubt. and, in view of the stereotyped condition of the country, the probability is that they do so still. These 19 years' experiments, which were conducted we are told, over the whole of India, made the average produce of the land per acre to be as follows :

Wheat	1,155 lbs. per acre.
Barley	1,097 "
Grain	921 "
Rice (3 sorts)	1,338 "
Goor	911 "
Maash	690 "
Cotton (kupass)	670 "
Joarce	920 "
Sesamum	554 "

But these results, while reliable, are unfortunately of little use to us in this highly summarized form. We want to know the average yield of the soil in each province and talook of the country separately ; for the agriculture of the provinces of India differs as widely as that of the European kingdoms.

LOW RENTS AND SUBLETTING.

Whatever may be the exact yield per acre of wheat in the Central Provinces, that agriculture is in an exceptionally backward condition throughout them is but too manifest. The average produce is officially declared to be no more than 480 lbs. of wheat to the acre, a yield which compares with the poorest husbandry of Europe and of other provinces of India as follows :

1	United kingdom *(unmanured lands)*	343 lbs. per acre.
2	Prussia	993 lbs. "
3.	South of France	600 lbs. to 720 "
4	Oudh *(poorest lands)*	420 lbs. to 660 "
5.	Central Provinces (average)	312 lbs. to 560 "
6	Punjab "	631 lbs.

Now this miserable result is *not* wholy the fault of the land. Mr. Morris (Central Provinces) tells us that "the soil is so boun- "tiful, and the labor of producing the average quantity of food "grains comparatively so much less than in other less-favored "tracts that the people have grown apathetic to a degree, and "do not care to resort to artificial means for improving "their modes of agriculture for guarding against the conse- "quences of exhausted fields brought about from over "tillage." Again, Mr. Grant in his Settlement Report of Nursingpore tells us that the very same land in the Nerbudda valley which, when taken up as virgin soil returns a harvest of fifteen or twenty-fold, now yields a miserable result of 480 lbs. to the acre. Is there any remedy for this state of affairs? Can we apply any stimulus to the people which shall lead them to better husbandry? Whether Sir Richard Temple had, or had not, the problem distinctly before his mind, he has lighted upon two devices in the Provinces which are directly calculated to stereotype the poverty of their agriculture (1) low rents, and (2) the gratuitous creation of a race of middlemen. As to the demoralizing effects of unduly low rents upon the cultivator, experience both in this country and at home is at one.

"It might seem," says McCulloch, "on a superficial view of "the matter, that the circumstance of a farm being low- "rented would not lessen the enterprise or industry of the "tenant, seeing that every thing he could make it produce "over and above the rent would belong to himself. Such, "however, is not found to be the case ; and it is difficult to say "whether the over or under-renting of land be most injurious. "If a farm be too high-rented, that is, if no exertion of "skill, or reasonable outlay on the part of the tenant, will "enable him to pay his rent and obtain a fair return for his "trouble, he gets dispirited. The farm is, in consequence, "ill-managed; scourging crops are resorted to; and ulti- "mately it is thrown on the landlord's hands in an impover- "ished and deteriorated condition. But the disadvantages "attending the under-renting of land are hardly less obvious. "To make farmers leave those routine practices to which "they are very strongly attached, and become really indus- "trious and enterprising, they must not only have the power "of rising in the world, but thir rents must be such as to im- "press them with a convictiou that if they do not exert "themselves their ruin will assuredly follow. Estates that are "under-rented are, uniformly almost, farmed in an inferior "style, compared with those that are let at their fair value ; "and the tenants are not generally in good circumstances.

"I have not, says Arthur Young, 'seen an instance of "'rent being very low, and husbandry, at the same time, "'being good. Innumerable are the instances of farmers, "'living miserably, and even breaking on farms at very "'low rents, being succeeded by others, on the same land, "'at very high rents, who make fortunes. Throughout my "'journey I have universally observed that such farms as

"'were the most wretchedly managed were very much "'under let."'

The settlement reports of our own officers bear witness to the very same fact, that the fixing the assessment at a very low rental, instead of leading to more careful husbandry, simply makes the cultivator the apathetic, indolent creature who is at this moment scratching the soil of the Nerbudda valley for a return Nature is too bountiful in allowing him. That we have done the cultivator positive harm by fixing the assessment at the ridiculous rate of nine pence per acre for 30 years to come there can be no doubt. Are we likely to do him any good by that other device of Sir Richard Temple's, the creation of a race of middlemen (the Malgoozar) between the State and the cultivator? We have quoted Arthur Young upon the influence of unduly low rents upon agriculture; let us now see what he says about the Malgoozar. The passage is long but is so weighty and full of instruction for us that we cannot persuade ourselves to curtail it :—

"The very idea, as well as the practice of permitting a tenant "to re-let at a profit rent seems confined to the distant and "unimproved parts of every empire. In the highly fertile "counties of England the practice has no existence, but there "are traces of it in the extremities; in Scotland it has been "very common; and I am informed that the same observation "is partly applicable to France. In proportion as any country "becomes improved, the practice necessarily wears out.

"It is in Ireland a question greatly agitated, whether the "system has or has not advantages which may yet induce "landlords to continue in it. The friends to this mode of "letting lands contend that the extreme poverty of the lower "classes renders them such an insecure tenantry that no "gentleman of fortune can depend on the least punctuality "in the payment of rent from such people; and, therefore, "to let a large farm to some intermediate person of substance "at a lower rent, in order that the profit may be his induce-"ment and reward for becoming a collector from the inter-"mediate occupiers, and answerable for their punctuality, be-"comes necessary to any person who will not submit to the "drudgery of such a minute attention. Also, that such a "man will at least improve a spot around his own residence "whereas the cotter can do nothing. If the intermediate "tenant is, or from the accumulation of several farms be-"comes, a man of property, the same argument is applicable "to his re-letting to another intermediate man, giving up a "part of his profit to escape that trouble, which induced the "landlord to begin this system, and at the same time accounts "for the number of tenants, one under another, who have "all a profit out of the rent of the occupying farmer. In the "variety of conversations on this point, of which I "have partook in Ireland, I never heard any other argu-"ments that had the least foundation in the actual state of "the country, for as to ingenious theories, which relate "more to what might be, than to what is, little regard should "be paid to them.

"That a man of substance, whose rent is not only secure, "but regularly paid, is in many respects a more eligible "tenant than a poor cotter, or little farmer, cannot be "disputed. If the landlord looks no further than those "circumstances, the question is at an end, for the argument "must be allowed to have its full weight even to victory. "But there are many other considerations I was particu-"larly attentive to every class of tenants throughout the "kingdom, and shall, therefore, describe these middlemen, "from whence their merit may be the more easily decided. "Sometimes they are resident on a part of the land, but very "often they are not. Dublin, Bath, London, and the country "towns of Ireland, contain great numbers of them; the merit "of this class is surely ascertained in a moment, there "cannot be a shadow of a pretence for the intervention of a "man whose single concern with an estate is to deduct a "portion from the rent of it. They are, however, sometimes "resident on a part of the land they hire, where it is natural "to suppose they would work some improvements; it is "however very rarely the case. I have in different parts of "the kingdom seen farms just fallen in after leases of three "lives, of the duration of fifty, sixty and even seventy years, "in which the residence of the principal tenant was not to "be distinguished from the cottered fields surrounding it. I "was at first much surprised at this, but after repeated obser-"vations, I found those men were generally the masters of packs "of wretched hounds, with which they wasted their time and "money, and it is a notorious fact that they are the hardest "drinkers in Ireland. Indeed the class of small country "gentlemen, chiefly consisting of these profit renters, seem "at present to monopolize that drinking spirit, which was, "not many years ago, the disgrace of the kingdom at large: "this I conjecture to be the reason why those who might im-"prove are so very far from doing it; but there are still "greater objections to them.

"Living upon the spot, surrounded by their little under-"tenants, they prove the most oppressive species of tyrants "that ever lent assistance to the destruction of a country. "They re-let the land, at short tenures, to the occupiers of "small farms, and often give no leases at all. Not satisfied "with screwing up the rent to the uttermost farthing, they "are rapacious and relentless in the collection of it. Many of "them have defended themselves in conversation with me, "upon the plea of taking their rents, partly in kind, when "their under-tenants are much distressed. What, say they, "would the head landlord say, suppose him a great nobleman, "do with a miserable cotter, who, disappointed in the sale of "a heifer, a few barrels of corn, or firkins of butter, brings his "five instead of his ten guineas? But we can favor him by "taking his commodities at a fair price, and wait for re-im-"bursement until the market rises. Can my lord, do that? A "very common plea, but the most unfortunate that could be "used to any one whoever remarked that portion of human "nature which takes the garb of an Irish land-jobber! "For upon what issue does this remark place the ques-"tion? Does it not acknowledge that calling for their rents, "when they cannot be paid in cash, they take the sub-"stance of the debtor at the very moment when he cannot "sell it to another? Can it be necessary to ask what the "price is? It is at the option of the creditor, and the miser-"able culprit meets his oppression, perhaps his ruin, in the "very action that is trumpeted as a favor to him. It may "seem harsh to attribute a want of feeling to any class of men; "but let not the reader misapprehend me; it is the *situation*, "not the *men*, that I condemn. An injudicious system places "a great number of persons, not of any liberal rank in life, in "a state abounding with a variety of opportunities of oppres-"sion, every act of which is profitable to themselves. I am "afraid it is human nature for men to fail in such posts; and "I appeal to the experience of mankind, in other lines of life, "whether it is ever found advantageous to a poor debtor to "sell his products, or wares, to his richer creditor.

"But farther, the dependance of the occupier on the resi-"dent middle-man goes to other circumstances. Personal ser-"vice of themselves, their cars and horses, are exacted for lad-"ing turf, hay, corn, gravel, &c. insomuch that the poor "under-tenants often lose their own crops and turf, from be-"ing obliged to obey these calls of their superiors. Nay, I "have even heard these jobbers gravely assert that without "under-tenants to furnish cars and teams at half or two-"thirds the common price of the country, they could carry on "no improvements at all; yet taking a merit to themselves "for works wrought out of the sweat and ruin of a pack of "wretches, assigned to their plunder by the inhumanity of "the landholders.

"In a word, the case is reducible to a short compass; inter-"mediate tenants work no improvements; if non-"resident they *cannot*, and if resident they *do not*; "but they oppress the occupiers, and render them as incapa-"ble as they are themselves unwilling. The kingdom is an "aggregate proof of these facts; for if long leases, at low "rents, and *profit incomes* given, would have improved it, "Ireland had long ago been a garden. It remains to enquire

"whether the landlord's security is a full recompense for so "much mischief.

"But here it is proper to observe that though the inter- "mediate man is generally better security than the little "occupier, yet it is not from thence to be concluded, as I have "often heard it, that the latter is beyond all comparison "beneath him in this respect; the contrary is often the case, "and I have known the fact that the landlord, disappointed "of his rent, has *drove* (distrained) the undertenants for it "at a time when they had actually paid it to the middleman. "If the profit rent is spent, as it very generally is in claret "and hounds, the notion of good security will prove visionary "as many a landlord in Ireland has found it: several very "considerable ones have assured me that the little occupiers "were the *best* payers they had on their estates; and the inter- "mediate *gentlemen* tenants by much the *worst*.

"By the minutes of the journey it appears that a very con- "siderable part of the kingdon, and the most enlightened "landlords in it, have discarded this injurious system, and "let their farms to none but the occupying tenantry, their "experience having proved that the apprehension of a want of "security was merely ideal, finding their rents much better "paid than ever. At the last extremity, it is the occupier's "stock which is the real security of the landlord. It is that "he distrains. and finds abundantly more reliable than the "laced hat, hounds, and pistols of the gentleman jobber, from "whom he is more likely in such a case to receive a *message* "than a remittance.

"And here let me observe, that a defence of intermediate "tenants has been founded upon the circumstance of lessen- "ing the remittance of absentee rents, the profit of the "middleman was spent in Ireland, whereas upon his dismis- "sion the whole is remitted to England. I admit this to be "an evil, but it appears to be in no degree proportioned to "the mischiefs I have dwelt on. It is always to be remember- "ed that in the arrangement of landed property, the *produce* "is the great object; the system of letting, which encourages "most the occupying tenant, will always be the most ad- "vantageous to the community. I think, I have proved that "the middleman oppresses the cotter incomparably more "than the principal landlord; to the one he is usually tenant "at will, or at least under short terms, but under the other "has the most advantageous tenure. This single point, that "the person most favored is in one instance an idle burden, "and in the other, the industrious occupier sufficiently decides "the superiority. To look therefore at the rent, after it is "paid, is to put the question on a wrong issue; the payment "of that rent, by means of ample products, arising from "animated industry, is the only point deserving attention; "and I had rather the whole of it should go to the antipodes, "than exact it in a manner that shall cramp that industry "and lessen those products.

"When, therefore, it is considered that no advantages to "the estate can arise from a non-resident tenant, and that "a resident intermediate one improves no more than the poor "occupiers who are prevented by his oppressions, that the "landlord often gains little or nothing in security from em- "ploying them, but that he suffers a prodigious deduction in "his rental for mere expectations, which every hour's ex- "perience proves to be delusive—when these facts are duly "weighed, it is presumed that the gentlemen in those parts "of the kingdom, which yet groans under such a system of "absurdity, folly and oppression, will follow the example set "by such a variety of intelligent landlords, and be deaf to "the deceitful asseverations with which their ears are assailed, "to treat the anecdotes retailed of the cotter's poverty with the "contempt they deserve on coming from the mouth of a "jobber; when these bloodsuckers of the poor tenantry "boast of their own improvements, to open their eyes and "view the ruins which are dignified by such a term, and "finally determine, as friends to themselves, to their posterity "and their country, TO LET THEIR ESTATES TO NONE "BUT THE OCCUPYING TENANTRY."

It is impossible to add anything to the force of this extract. A moderately severe rental as a stimulus to exertion, and the suppression of that curse of agriculture wherever he is allowed—the middleman—are the great natural means we are told to improve husbandry. Sir Richard Temple has, on the one hand, deliberately created a race of middlemen for us in the Central Provinces, and on the other, fixed the rental so low that the actual cultivator feels no interest whatever in exerting himself. By-and-bye, he will be rack-rented by a middleman: in the meanwhile, we have deprived him of all incentive to industry.

EDITORIAL NOTES.

A GRANT of Rs. 90 per mensem has, we are informed, been sanctioned for the experimental cultivation of the Rheea plant at Dehra Dhoon and Saharunpore.

AN attempt is to be made, we are told, to introduce the culture of the silk-worm into the Coimbatore Jail. As a preliminary, it is necessary to promote the growth of the mulberry tree about the place, and with this view, cuttings are being laid down extensively. If these efforts succeed, the rearing of the worm will form one of the employments of the female convicts in the Central Jail.

ACCORDING to the Madras Board of Revenue the cultivation of rice in that Presidency has advanced from two millions of acres in 1849-50 to three millions in 1868-69, while the exports have fallen from 124,200 tons, the average of five years from 1849-50 to 1853-54, to 79,000 tons, the average of the last 5 years.

Madras rice has almost ceased to be exported to European and China Markets. It pays a land-tax of six rupees an acre and contributes one and three-quarter millions sterling to the Imperial revenue. The Board are satisfied that the export duty cannot be maintained without seriously affecting agriculture.

A WRITER in the *Indian Medical Gazette* of 1st ultimo, after congratulating the Government upon the success of the cinchona plantations of India, affirms that it is popular error only which attributes the great mortality from fever in the Hooghly and Jessore districts to the want of nourishing food. This belief, we are assured, is entirely erroneous, and that if quinine and the other cinchona alkaloids were but generally in use, the malaria would be likely to be stayed. If, says the *Pioneer*, this writer is correct, the cultivation of cinchona will certainly come to be considered one of the most philanthropic enterprizes of the Government. The same journal points out that, in the report of the Sanitary Commission on the Hooghly malaria, the use of quinine as a febrifuge was more than once declared to be common. Our contemporary finally suggests, that, until quinine becomes cheap enough for the poorest to buy it, good results might be attained by the extract of cheap quinine from the common *Kurinda*.

THE necessity of instituting close enquiry into the agriculture of the several provinces of the empire is being forced upon our attention in almost every Report that reaches us concerning the Land Revenue of the country. Thus, we are told in Mr. Dalyell's Report upon the famine of 1866 in Madras, that the Revenue Settlement Department of that Presidency, after elaborate enquiries and experiments extending over ten years, estimate the produce of an acre of the best rice land in the districts to be as follows:

Produce of best Rice Lands.
Madras Measures.

Southern Districts.....	1,080	about 30 cwt.	per acre.
Godavery and Kursool.....	1,200	,, 33	do.

Produce of the Worst Lands.

Southern Districts.....	300	about 8 ,,	per acre.
Godavery and Kursool.....	533	,, 14 ,,	do.

This must of course be paddy (rice in the husk). We are further told, that 20 cwt. of paddy, or 10 cwt. of cleaned rice

"may fairly be taken as a good average of the productive powers of the 5½ millions of irrigated land in the Presidency, and about 5 cwt. as the average produce of the *dry* land, whether devoted to raggy, cumboo, or cholum." We have tried to get the original returns thus vaguely summarised, but in vain. They are of course useless in the present shape for any purpose of exact enquiry. The returns from British Burmah make the average yield of its rice lands to be 1,844 lbs.. per acre, but do not tell us whether of mere paddy or of cleaned rice. The Mysore returns shewing an average yield of 1,577 lbs. per acre fail in the same way. We have indicated above the 'first steps' to be taken to educe light and order out of this confusion.

THE *Hindu Prakash* in the course of some observations upon the subject of *tuccavee* advances by the State says: "That the solution of the question depends very much upon the conditions upon which such grants are proposed to be made. If the grant is fenced with hard restrictions, such as the exacting of heavy rates of interest in case of arrears and penal processes of recovery, there is hardly a chance of any occupant of land coming forward for assistance of this kind. The Resolution states that when any sum becomes due from the person who has received such advances, it will be recoverable from him in the same manner as an arrear of land revenue, and in the case of non-recovery, such means would be adopted as are put in force for the recovery of arrears of revenue. Now it is a well-known fact that in this presidency [Bombay] arrears of land revenue are charged with interest, at the rate of *half a pie per rupee per day*, or about 9¼ per cent. per annum. And if this rule were made applicable, to the case of *tuccavee* advances, Government may rest assured that not a single occupant of land will ever come forward for loans of the kind. As a general rule, people in the Mofussil prefer a private creditor to Government."

These remarks are worth the attention, we think, of the Bombay Government.

THE same journal complains of a certain "well assessment in "Guzerat which acts oppressively and tends to check all agricul- "tural improvements." "The removal," it says, "of this most "unpopular impost will do more to advance agricultural im- "provements by giving impetus to the construction of wells in "Guzerat than positive grants of money."

We invite the *Hindu Prakash* to return to the subject, and to tell us exactly what the grievance is. Our contemporary possesses peculiar opportunities, we believe, of ascertaining exactly what it is the people complain of. Let him assume that we know nothing about it, and give us the whole history of the matter as the cultivator views it.

IF we had, says the *Food Journal*, a Minister of Agriculture the reclamation of wastes or inclosure of commons would have proceeded with more order; earlier provisions would have been made for the drainage of settled estates, but above all, had there been such a minister, it would have been impossible that in the last twenty years, manure sufficient to grow 400 million quartern loaves, could have been consigned to pollute the rivers and waste in the sea. Such a minister, with a few clerks, would have looked after these and other matters. He could also have inquired into the cattle plague; and he would long ago have organized an agricultural census. His small yearly Blue Book on the state of agriculture would let us know, step by step, how far we were right, or how much we could rely upon; and more than that, it would have enforced on us our deficiencies. It is not an expensive administrative staff which necessarily follows from the establishment of a ministry—it may be a small staff—but it is the constant and organized supervision, and the adequate enforcement of responsibility, which does the effective work.

A CORRESPONDENT writes to us from Kumaon on the 29th July concerning the facts of the tea planting on that district as follows: "It is really too bad of Dr. Jameson after the blunde he has committed which led us all wrong and caused us to waste thousands and thousands of rupees in finding out things for ourselves—to commence *again*, especially as the errors have been exposed over and over again.

"The statement that tea can be made or produced on the plantations (he *means* sold) at 8*d* and 10*d* is sheer nonsense and calculated to do us an infinity of harm. We can't possibly make tea under eight annas per pound. There is not in Kumaon to my *certain* knowledge more than one or at the most *two* planters who make it as low as that; most of them are manufacturing at 12 annas to one rupee. The prices are no criterion, all the plantations, i. e. all the companies are just "carrying on" selling at a loss every year, under the vain idea of holding out till others with less capital shut up.

"Some of the most seemingly flourishing concerns are selling every year at a loss of four annas per pound, others barely paying their expenses. The letter reflects discredit on a man of Dr. Jameson's length of service and opportunities for acquiring correct information."

THE GOVERNMENT EXPERIMENTAL FARM AT MADRAS.

MAIZE.

AT THE GOVERNMENT EXPERIMENTAL FARM, MADRAS.

The Superintendent of the Government Experimental Farm, has been making some important and interesting experiments with Queensland maize. The cultivation of this grain is common enough in India, where the grain is highly prized as food for man and beast; and the experiments were intended to ascertain whether the superior sorts of maize grown in Australia could not be profitably produced in the light soils of India. When it is remembered that a cob of Queensland maize produces more grain than twelve cobs of Vellore maize the importance of the experiments will be seen. The results of Mr. Robertson's experiments seem to prove that this species of grain can be very profitably cultivated in India. In October 1869, 240 pounds of yellow maize was received from Sydney, and the greater part of it was sown in four separate plots at the Experimental Farm, the soil of which is described as "very poor and hungry" containing nearly 90 per cent. of sand. At the end of four months the crop was got in, and it was found that a profit ranging from 15 Rs. 1 anna on one plot, to 38 Rs. 6 annas and 2 pies on another had been made. It is explained, however, that the larger profit made on one of the plots was due to the fact that nothing had to be spent for manure on that plot, and Mr. Robertson takes the profit per acre as Rs. 25. He argues that if such a profit can be made from maize cultivation on a poor soil, a large profit must be made on good soil. The soil of the experimental farm is described as not only "deficient in the elements of plant food", but "physically a bad soil," since it parts with its moisture too rapidly, and in hot weather becomes very hard and compact. Yet out of that land 25 rupees per acre has been taken from the cultivation of the maize. The high value of the straw does a good deal towards producing this result. It is said to contain a large quantity of saccharine matter, and is so sweet that the coolies eat it as they would sugar-cane. All kinds of stock are fond of it, and it is valued at 10 rupees a ton. The grain is worth 50 rupees a ton, and according to Mr. Robertson's tables, an acre of manured ground may be expected to produce about 50 rupees worth of grain and straw, of which about one-half may be profit. A circumstance that considerably enhances the financial success of the experiment is that the maize can be harvested in time to allow of a gram crop being obtained before the hot weather begins. Indeed it is reported that after a maize crop the soil is in the best possible condition to grow gram, and in proof of this it is noticed that the best gram growing at the farm last March was on land from which a crop of maize had been taken. The following is the "summary" attached by Mr. Robertson to his report:—

1. The seed is preserved from the attacks of squirrels, crows, etc., when perfectly tarred.
2. It is only advisable to steep the seed when the weather is dull and showery.
3. The seed is best sown on drills about three feet apart with intervals of ten or twelve inches between the seed. It may be planted two inches deep, at the rate of 30 pounds per acre.
4. Maize should always be well manured; from fifteen to twenty tons per acre may profitably be applied.
5. The cobs should be well matured before being gathered. If the weather during the harvesting of the crop be favorable the skins are best kept on the cobs until the seed is perfectly hardened and glazed.

6. From 2½ to 3 tons of dry straw per acre may be expected; it is rich in saccharine matter, and is valuable for all kinds of farm-stock.

7. On good soils 2,000 pounds of grain may be grown per acre without extraordinary management.

8. One average-sized Queensland cob yielded more grain than 12 of the cobs grown in the Vellore Districts.

9. The average cost of production may be estimated at Rs. 25, while the gross return will vary according to the quality of the soil from rupees 50 to rupees 60 per acre.

10. The profit may vary from 25 to 30 rupees per acre according to the quality of the soil: the better the cultivation, the larger the profits.

11. Queensland maize is only a 4-month crop, and may be harvested in time to allow of a crop of gram being grown before the commencement of the hot season.

12. Maize is valuable as a food for the people, more so, indeed, than ragi, cholum, comboo, etc, generally cultivated in this district.

13. Maize is valuable for all kinds of farm-stock. Working bullocks fed on maize increased 71 pounds in weight, whilst those fed on a similar quantity of gram only increased 3 pounds.

14. Sheep yield more mutton when fed on maize than on gram.

15. Maize can be sold at 50 rupees per ton, and leave a handsome profit to the cultivator.

16. The large quantity of straw yielded by a crop of maize renders this crop particularly valuable in a country like this.

17. Maize can be profitably cultivated on a soil so poor as one containing 90 per cent. of sand; but the better the soil, the better will be the crop.

18. Maize for feeding purposes is best given crushed and mixed with some other food.—*Madras Times.*

CAROLINA PADDY.

Selection of Soil,—After the crop is harvested, select in the experimental plot, from the upper six inches of soil, in three or four different parts of the ground samples of about one pound each, mix the whole thoroughly together and take one pound of the mixture which must be placed in a carefully labelled bottle, and forwarded for analysis along with the sample of the grain produced to Madras to the Superintendent of the farm.

Preparation of the Soil.—Experimenters should carefully note the nature of the operations performed in preparing the soil for the seed, as well as its physical condition at the time of sowing, whether in a puddle or in a loose friable state: if in a puddle they should note whether it had begun to ferment, and set free sulphurretted hydrogen, which they may readily determine by the strong pungent smell of this gas, "the gas which gives to rotten eggs their nauseous smell." They should also note the nature of the implements used in the preparation of the soil,

Manures.—In addition to a description of the manure, its quality should be noted, and its weight and measurement accurately recorded.

Seed.—If the seed was steeped, or dressed with any chemical preparation before being sown, full details of the process should be recorded.

Transplanting.—A few notes on the cost of transplanting, and the relative growth of a transplanted and a sown crop, would be valuable. The comparative growth of the roots of the transplanted and sown crop should also be noted

Watering.—Actual data is much needed for determining the quantity of water required for cultivating a certain area of Carolina Paddy. Experimenters should note the date of each watering from the commencement to the end of the experiment. An approximation to the actual volume of water used can easily be made. A gallon weighs ten pounds, a cubic foot of water measures about six and-a-quarter gallons The source of water supply should be noted, whether a river, tank, or well.

Observations during the growth of the crop.—Notes made during the growth of the crop, recording its appearence at different stages, will be valuable.

Harvesting.—Experimenters should note whether all the ears on a plant came to maturity at the same time, and whether the variety of paddy, sheds its seeds at an earlier stage of ripeuness than other varieties.

Yield, etc.—The number and weight of the ears on an average sized plant should be noted, also the quality of the straw, and its value as cattle fodder. As early as possible after harvest, about twenty ounces of the grain should be enclosed in a bottle and forwarded along with the bottle containing the sample of soil, the "Experimental Results," etc.

Quality of seed.—A good deal of old and useless seed is sown. Indeed a very large proportion of those who report on "Carolina Paddy Cultivation," express their opinion, that want of success was owing to the inferior seed sown, yet in *no instance* is there any record of any trial of the vitality of the seed before sowing. *Every experimenter should have a knowledge of the percentage of the seed that will germinate.* I have seen samples of seed, of which 90 per cent. would not germinate. Some seeds lose all power of germination, when exposed to a temperature of 100 degrees; in this country seeds might perhaps be exposed to a temperature of 150 degrees. Each experimenter should test his seed before sowing. The operation is simple.

Take a shallow vessel, a soup-plate will answer admirably; place about one inch deep of good garden soil in the place, and scatter over the soil 100 paddy seeds, cover this with a piece of muslin, and over the muslin place about half an inch of soil. Keep the soil damp. After a few days, the muslin with the upper soil may be lifted off, and the condition of the seed ascertained. The number of seed germinated will give the *percentage* of vital seeds. Duplicate experiments had better be made.

Plough, water, puddle, and manure, as for ordinary paddy; the more completely these operations are performed, the better will be the crop.

2. The seed may he sown at once in the paddy beds, or it may be sown in seed beds, and afterwards transplanted into the paddy beds *Circumstances may justify either procedure.* When the area to be sown is large, the season late, labour scarce, and seed plentiful, I should broad-cast the seed at once over the paddy bed. But if the area to be sown is small, the supply of seed deficient, labour plentiful, and the season favourable, then I should prefer to sow in the seed bed, and transplant the seedlings into the paddy bed. If it is determined to broad-cast the seed, germinate it previously, as is done with country paddy, and scatter it evenly over the puddled surface of the paddy bed. If the soil is poor, and crows, squirrels, etc., troublesome, sow from 14 to 16 measures per acre; if the soil is well manured and fertile, and the crop can be protected from the depredations of birds and animals, 10 or 12 measures will suffice. When transplanting is preferred, take care to have the seed bed *deeply dug and thoroughly manured*; the large rootlets complained of by some experimenters, are due to the poverty of the soil upon which the plants have grown. Manure and cultivate highly the soil of the seed bed, and roots of the plants will be less lengthy, more compact, and more easily lifted. For transplanting. sow 8 measures for each acre you intend to plant, less will probably do; however it is very disappointing when your land is ready for planting, and the weather favourable, to find that white ants, the squirrels, or rats, have attacked your seedling plants, and that you have not enough plants for the area of ground you intend to crop; besides the extra 2 measures of seed, *will only cost about* 3 *annas.* Plant two seedlings together in each hole, and place the holes from 6 inches to 12 inches apart; according to the quality of the soil. If the soil is very poor place each bunch about 6 inches apart; if the soil is in good condition and fertile, plant from 9 to 12 inches apart. If water is plentiful and cheap, water as for country paddy, if it is scarce, and costly to raise, then apply about two-thirds the usual amount. It is only necessary to keep the soil damp, though when water is cheap, *it will pay,* to apply more.

MAIZE.

1. *Preparation of the soil.*—Plough and cultivate, as for any other dry crop, the better the land is ploughed and worked, the more satisfactory will be the results.

2. *Manure.*—Manure the soil freely, apply sheep and cattle dung; decayed leaves, ashes brickyard dust, tank-mud which has been thoroughly exposed, wild indigo, madder leaves, etc. No crop pays better for a thorough manuring. The manure should be spread evenly over the land, before the last ploughing takes place.

3. *Preparation of the seed.*—To prevent crows, squirrels, etc. destroying the seed, tar it before sowing; the process is as follows:—

Take one and half pints (half Madras measure) of hot water and add to it one-twelfth of a pint (quarter ollock) of tar, mix together, and after cooling, pour the solution through about twenty measure of seed. After dusting with sand, ashes, or sawdust, to prevent the seed adhering together the grain is ready for sowing.

4 *Sowing.*—Sow 30 lbs. per acre, in rows, 24 inches apart, plant the seed about 2 inches deep, and about nine inches apart.

5. *Cultivation during growth.*—Keep down the weeds, cultivate between the rows, with hand hoes and ploughs.

6. *Harvesting.*—When the outer covering of the cob begins to open, and the seed is hard and glazed, it is time to commence gathering. If the season is favorable, do not be in a hurry to peel the cobs. If stored with the skins on, they must be frequently examined, lest they should heat or mould. The straw is excellent fodder, and should be carefully stored for consumption during the dry season. It is most economical to chaff or steep the straw before giving it to farm stock. The cobs may be shelled when dry, and the grain used, as food, or it may be used in feeding horses, cattle or sheep, direct experiments have proved, that weight for weight, it produces better results than gram.

(Signed.) W. ROBERTSON,
Superintendent

13 April, 1870.

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.

The Usual Monthly General Meeting was held on Thursday, the 24th of June 1870.

GUM OF THE "COORTAH" TREE OF CACHAR.

The Secretary read the following letter from Mr. Charles Brownlow, of Cachar, in respect to the above gum :—

"I have just forwarded a larger sample of the gum of the "Coortah," *Sapotaceæ*. This tree is called by the Calcutta coolies here the "Jungly Mhowah." The flowers are smaller and not so fleshy, nor so sweet as its cultivated congener, but they are pleasant to the taste and would probably yield spirits if distilled. My particular object in sending the sample of gum is to ascertain its probable value for telegraph cable and other purposes, and I hope the quantity will prove sufficient for experiment. A sample I sent you a couple of years ago [in June 1866] was altogether too small for the purpose.

"I am well assured that if this gum fetches anything like the price of Gutta Percha, the quantity the district could produce would be very much greater than that of India Rubber, because the tree occurs in large numbers (very much larger than India Rubber) in all virgin forest lands.

"The mode of tapping is somewhat different: the gum does not consolidate into leaves on issuing as the India Rubber, and bamboo joints must therefore be placed under the grooves cut in the bark: these gradually fill and are emptied into a larger vessel, the milk is then boiled or else dried in the sun to a proper consistency. Coortah timber figures largely in the local timber market; it is a second-rate wood with a pink or red heart, and white sap wood which soon rots outdoors and on the ground."

It was agreed to send this gum to Dr. Forbes Watson, of the India Museum, for report on its quality and applicability for purposes for which Gutta Percha and Caoutchouc are employed.

BRAZILIAN GRASS.

The Secretary mentioned that although he had distributed the Brazilian grass seed, *Panicum spectabile*, received from Dr. Hooker in December last, to upwards of 50 applicants, the demand had been so much greater than the supply that he had been obliged to solicit that gentleman's kind offices for a further quantity. Amongst others who had applied were the Collector of Khandeish, for the Model Farm at that station, and Major Woodcock, in charge of the Government Garden at Linsoogur, in the Deccan, who both required large quantities. Mr. Bridgman reports that he has two plants now raised. "I may, therefore, hope that more will grow when the remaining seeds are sown at the beginning of the rains; but those two will, I trust, be sufficient to secure to me this valuable plant." The Secretary added that if those who succeeded in raising this grass would remember to send to the Society in due course we should soon be independent of any further importations, and a most valuable grass be thus generally introduced throughout India.

FLAX.

Mr. P. Burke, of Purneah, in forwarding the sample of raw flax referred to under the head of contributions, writes regarding it as follows :—

"My object in sending the fibre is to ascertain its market value, and if it would find sale in Calcutta.

"At present linseed is grown for the seed alone, and the stalks from which the fibre is extracted is burned or thrown away; if all this waste could be turned into fibre for the English market at rates sufficient to pay for its extraction, and the trouble of collecting and investing money, it would be so much money added to the resources of the district, as well as affording profitable occupation to hands that are not now used in field-labour: and all this without any extra outlay in cultivating the linseed, for the seed pays for the expense of cultivating, as well as leaving a small profit."

Mr W. Stalkart remarked that though short in length this flax is of good strength, and would be very serviceable for canvas making, and if kept up to quality in large quantity would be worth Rs. 8 a maund.

COTTON.

The next subject that came under consideration was the sample of raw Nankin Cotton and cloth made from it in the Nagpore Central Jail. Dr. Brake states, he believes, the seed was originally obtained from the Society, and now the whole process from sowing the seed to making garments from the cloth is conducted within the jail-walls. "At present" (adds Dr. Brake) "the demand for Nankin cloth exceeds the supply, but I am having a large stock of land in and near the jail sown, and have forwarded a small quantity of seed to Puchmurree, a hill-station in these provinces, now under trial as a Sanatarium."

This cotton is of good quality, and the cloth was admired by the members present for its great strength. Dr. Brake was requested to send a larger piece for a fair examination and report.

In connection with the above, the Secretary read the following extract of a letter from Mr. Burke :—

"Some years ago I addressed you on the subject of cotton cultivation, and have ever since made trials directly or indirectly, as well as observations on the subject, with the same result—*viz.*, the plant grows luxuriantly, gives a very heavy yield of good cotton, (2 to 300 pods to a plant), but nearly all the pods were destroyed by a small caterpillar. I had the diseased pods bottled up, and ascertained the kind of pest we had to deal with, but could hit on no remedy.

"I am going to make another trial this year on long staled acclimatized seed procured in the district."

SILK.

In his communication on the subject of cotton, Mr. Burke offers the following remarks as to the cultivation of silk in Purneah :—

"About 6 years ago I made a trial on silk. I imported diseased worms from Maldah; the fly chrysalis was brought in the silk cocoon. I had the worms fed on uncultivated mulberry of all kinds, as I had no mulberry cultivation, from March, until June. The cocoons increased 25 per cent. in weight. I cut the worms out of 100 of the imported cocoons, and the same number out of the acclimated cocoons, and found the last to have increased in weight; but during the rains, for want of proper food, they fell off to the original weight, but improved with the dry season. As it rained very heavily and incessantly during that season, and the supply of food was very precarious, many of the worms died, but the greater portion recovered on the weather clearing up. The fly, which was imported with the silk-worm from Maldah, attacked the worm in its third or fourth generation, and destroyed a good many worms; but I had the diseased worms bottled up, and discovered the kind of fly which caused so much damage. A remedy was easily devised by throwing a cover over the worms that would keep out the fly; but as I had no plantation of mulberry trees, I had to abandon the experiment with the intention of resuming it as soon as I could get up a small plantation.

"The whole of this district is perfectly well-adapted to the rearing of the silk-worm. The mulberry grows without care, and the worm thrives as in the neighbouring district of Maldah. It only requires a little money and a supply of good mulberry, with a batch of good cocoons.

"Any information, &c., required about this part of the country will be given, and I would not mind helping to start a silk factory, or join in one if necessary, if the necessary plants or seeds could be secured."

In connection with the above the Secretary submitted two letters from Dr. Bennett, Honorary Secretary of the Acclimatization Society of N. S. Wales at Sydney, the first acknowledging the safe receipt of eggs of the annual silk-worm ("Boro Pooloo") *Bombyx textor*, and promising to communicate further particulars by an early opportunity; and the second, in respect to the case of eggs and cocoons of the "Eria" or castor-oil silk-worm (*Attacus Ricini*) which were despatched about four months ago. This second has unfortunately proved a failure as shewn by the following extract of Dr. Bennett's letter;—

"Your favor, dated 11th February, advising us of the despatch of the package of castor-oil silk-worms, arrived in due course, together with the case itself.

"We think you have exercised excellent precaution in adopting the two methods of packing, and that it is very probable we may yet effect the introduction of this most desirable species of silk-worms in the present instance. We have not been so fortunate as to have any success. Upon landing, the box was found to have been roughly used—so roughly that the soil in the Wardian case had been turned over, covering the ova and burying most of the cocoons in one part. The young ricinous plants had manifestly been dead not less than three weeks and the glass broken. In the other compartment everything was firm, except that the lines attaching the cocoons to the cylinder were loose, and the strings adrift. The cocoons must have been good, for all but three had emerged, including all in both compartments, and probably some had been alive until within quite a few days of arrival.

* * * * * * * * *

"Upon consultation we can discover no reason why we should not succeed, and this Society trusts you will continue us your most valuable assistance this season, for according to Mr. Braly's opinion, the period at which this letter should reach you, and for some weeks after, would be most propitious for despatch and the immediately succeeding time the best for this particular worm to arrive in this hemisphere. We should, therefore, feel greatly obliged if you will afford us your valuable co-operation and repeat the experiment as soon as practicable.

"We have official despatches from your Government this moment to hand, to which we will reply by next mail; in the meanwhile we beg you to accept our best thanks for your kind attention."

THE POISONOUS PROPERTIES OF ANDROMEDA OVALIFOLIA.

The Secretary next drew the attention of the Meeting to a paper by Dr. Cleghorn, published in Society's Journal, Vol. 14, on the poisonous properties of certain species of *Andromeda*, more especially in respect to *A. ovalifolia*, so common in our Himalayan stations; and to another paper from Mr. Landells, in Vol. I, New Series, on the agricultural capabilities of the

Hazara country. In this communication Mr. Landells refers to the mortality amongst goats and sheep in that locality caused by eating of a particular shrub. Mr. Landells submitted the leaves of this plant to the Society, which he (the Secretary) not being able to get identified here had forwarded by a recent mail to Mr. Grote for submission to Dr J. L. Stewart (at present in England), who had explored the Flora of Hazara and Khagan, and published an interesting paper thereon in the Society's Journal. Mr. Grote mentions in a recent letter that Dr. Stewart had compared this specimen with herbarium specimens at Kew, and pronounced them to belong to *Andromeda ovalifolia*. The foliage of the plant, Dr. Stewart states, varies considerably.

MISCELLANEOUS COMMUNICATIONS.

The following letters were also read :—

1.—From J. Hunter Blair, Esq., Honorary Secretary, Government Experimental Farm at Sadapet, Madras, enclosing a report by Mr. Robertson, the Superintendent, on horse-gram (Kooltee) *Dolichos uniflorus*, as a green fodder plant under dry cultivation.

Mr. Blair was requested to favor the Society with a quantity of this Bean for trial in Bengal.

2.—From F. Halsey, Esq., Umritsur, in reference to *Dodonæa Burmanniana* as a hedge plant. The following is an extract of Mr. Halsey's letter :—

"In the Proceeding of the Meeting of the Society of 19th May, I observe some remarks made by Mr. Jennings, with reference to the *Dodonæa* (not *dioica*) but *Burmanniana*. Although the treatment recomended by Mr. Jennings will answer, yet it is far preferable to sow the seed where it is to remain, as the plant has a longer tap root than another plant I have ever seen. It is found in its wild state in the Salt Range in the Punjab, and is universally used here to make hedges, and I can assure you there is no better or more beautiful plant in existence for the purpose. This tap-root I have spoken about I am afraid will prevent its introduction to Calcutta and Lower Bengal, unless it were sown upon a bank. It should be surrounded and watered, so that it may be up before the heavy rains *fall*. It will then grow with great rapidity.

"I have plenty of seed freshly gathered which I can send you; but perhaps a trial had better be made with what you have got from Mr. Jennings, and should it succeed I can collect for you any amount you may want next year. *It must not be sown in a low place.*"

The Secretary mentioned that so great had been the demand for this *Dodonæa* seed, that he had requested Mr. Halsey to send some of his recently gathered stock.

3.—From T. M. Kirkwood, Esq., Canal Revenue Superintendent, Bengal, submitting for perusal a memo. on cocoanut cultivation on the Orissa Canal, and requesting the favor of any suggestions that may occur.—Complied with.

4.—From the Secretary, Chief Commissioner, Mysore, asking for information in respect to the best description of foreign grasses for introduction into that province as forage for cattle.

5.—From the same, tendering the thanks of the Chief Commissioner for the information afforded, and requesting to be furnished with such of the seeds of foreign grasses as can be supplied.

6.—From the Commissioner, Nagpore Division, applying for Rheea plants for the garden of the Nagpore Society.

The Secretary stated he had given the same reply to this as to numerous previous applications for Rheea plants, to the effect that since the resumption by the Government of Bengal of the Society's garden, they had not been in a position to meet this or other constant applications for useful plants.

7.—From T. D. Forsyth, Esq., Sealkote, applying for seeds for distribution in his approaching visit to Yarkand and Kashgan. "Having been ordered by the Viceroy," writes Mr. Forsyth, "to pay a visit to Yarkand and Kashgan, and to endeavour to open out friendly communication between the people of Eastern Turkistan and Hindostan, I think advantage should be taken of the opportunity to introduce our European seeds of all kinds into those countries, and in return I propose to bring back samples of the cereals and vegetables, fruit, &c, from there.

"I have seen at Leh in Ladakh some wheat brought from Yarkand, and it was equal to the finest flour imported from Europe. Yarkand is said to be famous for its fruit.

"Will you kindly send me a parcel of seed, as much as you can spare, and I will distribute them in Yarkand and send your Society as large a parcel of Eastern Turkistan products as I can collect."

The Secretary intimated he had at once forwarded to Mr. Forsyth such seeds as were then available, with the promise of sending large quantities as soon as the Society's new supplies are received.

For the above contributions and communications the best thanks of the Society were accorded.

A. H. BLECHYNDEN,
Secretary.

AUSTRALIAN FIELD SEEDS IN THE PUNJAUB.

Mr. Halsey, of Umritsur, has sent a report to the Agricultural and Hortioultural Society of India, upon the results of his sowing a quantity of seeds he obtained through the Society from Australia. In this report he says. "The percentage of germination given with the list herewith sent you is the result of two sowings made in October and November 1869 in seed pans; the actual results were not so good, with the exception of the Tares and Grasses. The Turnips were bad; before sowing them I knew they would not germinate. The Carrot seed also was not good, as although it partially germinated in seed pans, it very little did in the open; but what did grow was fine: the same may be said of the Mangel, but Mangel to be of any use should be sown in the Punjab in August or before the 15th September. The Clovers are only suitable for garden cultivations. The perennial Rye and Prairie Grasses grew beautifully; I have no doubt I might have cut them three times before this had not I wished to keep them for seed, of which I have collected a large quantity. The Lucerne I have already had three cuttings of, each of 18 inches to two feet high, and expect to get two more before the rains commence. It is not however, killed, by the rains in this part of the Punjab. I hope also to have the perennial Rye and Prairie Grasses through the hot season. The Oat seed was magnificent to look at, and although apparently good to taste and smell absolutely refused to germinate. The Barley the same. The Wheats were not in a good order; it was apparent to the eye that much would not germinate. I have not reaped it yet, but when I do I will test them against several different sorts of Punjab Wheats and let you know the result; as far as I can judge at present they are infinitely superior to anything in this country, both as to weight of grain and length of straw. I shall distribute the greater part of the seed amongst the cultivators in this neighbourhood, and next year will let you know the result."

	Per cent. germinated	
Turnips		
Grey Stone	—	Seed bad, did not
Purple top Scotch Yellow	—	germinate at all.
Green top do. do.	—	But all these sorts
Carter's Purple top Swede	—	will grow to great
White Globe	—	perfection in the
White Strap leaf	—	Punjab.
Carrots.		
Altringham	10	
White Belgian	10	All suited to the
Newark Improved	20	Punjab.
James's Intermediate	nil	
Dutch Horn	10	
Mangel.—		
Long Red	10	
Red Globe	10	Perfectly suited to
Yellow Globe	20	the Punjab.
Tare.—		
Golden	100	Should be sown in
White	100	August. Grow with great luxuriance in the Punjab.
Clover and others.—		
Trifolium incarnatum	10	
,, hybridum	nil.	Suited only for
,, pratense	30	garden cultivation.
,, pratense perenne	nil.	
Grasses.—		
Perennial Rye	—	Every seed grew; the first three
Prairie	—	highly desirable in-
Lucerne	—	troductions; the
Lawn	—	last grows beautifully, but gets killed when the great heat comes on.
Potato Oats	—	Not one seed germinated.
English Barley	—	do. do.
White Lamas Wheat	20	The produce of
Purple Straw do.	60	wheats magnificent;
Red Tuscan do.	60	every cultivator who sees it desires seed.

MANURIAL VALUE OF TOWN SEWAGE.

In a recent article we shewed how the vast quantity of water, which is mixed with town sewage, had a direct influence upon its value, by really and practically lessening the amount or percentage of ammonia available for our plants. We also adverted to the influence which the mere question of bulk has on its value; especially taking into account the low value which even its out-and-out advocates assign to it. In dealing with even a manure like farm-yard manure, which is of very much greater value, this question of bulk cannot be ignored, and virtually it limits the range of its transport to within very narrow limits. It will be well to glance, however briefly, at some of the points involved in connexion with this part of the subject. According to one authority, it appears that to get the fertilizing value of one ton of Peruvian guano, no fewer than 1,500 tons of sewage of nominal value would have to be applied to land. The farmer knows that by a dressing to grass land of from 2 to 3 cwt. of guano per acre he will get a paying increase of produce; but he would be disposed to pause in carrying out a sewage application scheme, if told, as authorities do tell him, that no less a weight of sewage would have to be applied during the year in five or six applications than 8,000 to 10,000 tons. The mere quantity of water here to be dealt with is no trifle, and the labor connected with the application, even by the most simple means, would not contrast favourably with the one application of guano. Moreover, while the benefit of mere irrigation is undoubted, farmers know that irrigation gives its best results when carried out at certain seasons only. Now the sewage once taken to a farm is a constant quantity—that is, there is always a supply of it—so that if not used it is obviously wasted, and the expense of taking it to the farm, and of the distributory appliances, will thus have to be spread over not the whole of the sewage taken to the farm, but only to that portion of it to which it is necessary to apply it. We do not overlook the fact, that the enthusiastic advocates of sewage maintain that this view will not be a deterrent one, inasmuch as they hold that it—the sewage—can be applied not only in much larger quantities to grass lands than has hitherto been considered safe, but to all crops, and even to fallow land. On the other hand the best authorities doubt this universal application of sewage, and so far from going with it, express the wish that extensive experiments were carried out, to test practically to what land, and to what crops, the sewage is really applicable; a wish which obviously includes this fact, that such extensive and authoritative experiments have not been carried out. So the farming community have yet to wait for further evidence on this point. Further, the manurial value of sewage is influenced by this fact, persistently overlooked by some, that its fertilizing constituents are constantly varying; thus the value of sewage at one part of the day in London, as tested by a great number of experiments, was different from that of another part of the day; and it is obivious that the sewage of one town may be much richer or much poorer than that of another; and further, that in very rainy seasons, the amount of rain water passed into the sewers must deteriorate the value of the sewage. But, as we have before hinted at, the out-and-out advocates of sewage hold that the very fact that the sewage is a liquid is altogether in its favour, as it can be, in consequence, sent into the country and taken to the farm at a very cheap rate. Thus it has been estimated, that if a ton of any manure can be sent a certain distance, say for 15*s.*, for the same sum no fewer than 72 tons can be sent the same distance. It is obvious that the point to decide the value of this statement rests upon the relative value of the two manures—72 tons of sewage at 1*d.* a ton, set for example, against a ton of Peruvian guano at £12 10*s.* a ton. But this delivery of the 72 tons only includes its delivery at the outskirts of the farm, and does not include the cost of the distributing apparatus, which, be it remembered, *must* be put down before the sewage can be used. Mr. Lawes, referring to this illustration of the much greater bulk of sewage which can be conveyed for the same amount of money, as against the conveyance of a solid manure, disposes, however, of it thus:

If the seventy two tons weight of sewage were so diluted with water, as researches have as yet shewn that they are, it would only contain about seven eighths of the average annual excrement of one individual; and the most ardent admirer of water would perhaps agree with him that the extra cost of 9*s.* or 10*s.* would be paying rather dear for the solution of 5*s.* 6*s.* worth of manure. —*Country Gentleman's Magazine.*

Official Papers.

COTTON.

GOVERNMENT EXPERIMENTAL FARMS.

The report of Mr. Pillans, the Superintendent of Experiments in charge of the seed farm at Oomraotee, shows that the effect of the manure laid down at the farm is already noticeable. Under date the 11th of August he writes:—

"I have the honour to report on the present state of the seed farm and crops in the neighbourhood of Oomraotee. The farm crop is looking very well, the plants that were touched with the heavy rains are picking up now, the last few days being fine. In one field the plants are six inches high, that field being first sown. I have now nine acres in that field manured with the country manure and sown with indigenous Bunnee, Jurree, and Hinguughat, three acres of each; and where the manure was put on the land in small heaps, before spreading, the plants on those patches are much stronger and better than the others, as the heaps of manure lay there during some heavy rain, and a quantity got washed in. All our seed is sown, and we are busy cleaning and thinning. All the crops in the neighbourhood are looking very well indeed. We have had a few fine days of late, and the crops have picked up wonderfully, especially the jowaree. The field of cotton at Kudgaon that I mentioned in my report No. 6, dated 19th July, as having been sown during the first rains, I saw yesterday. Some of the plants are 18 inches high, but the average height is 12 to 14 inches; the plants are looking well, having improved much in the last few days. Our total rainfall up to date is 27 inches and 6 cents."

SHEAGAON, WEST BERAR.

The rain-fall in this part of Berar has not been so heavy as towards Oomraotee, the total registered at the seed farm from the 1st of June up to the 17th August, being but 20·58 inches, But at Akola and Sheagaon itself, and in other parts of the district, the fall has been somewhat heavier. Mr. Dunlop, Assistant Commissioner, gave, on the 8th August, the following account of cotton prospects:—"With reference to my No. 406/82 dated the 1st ultimo, I have now the honour to report that a welcome change has taken place in the weather, and we are at present enjoying bright sunny days, which is having a most beneficial effect on the crop. Occasionally heavy showers fall in parts of the district, but, on the whole, there is every sign of a change of weather. The heavy rain has somewhat retarded the crops, and in badly-drained parts, the plants are of a yellow colour; but generally they are strong and healthy, and a few days of sun-shine will make them all that can be desired. On the whole they are most promising. Towards the Poornah, the natives speak of a four-anna loss, but such reports must always be received with caution. It is quite true that we have had more rain than was required, but up to date, except in badly-drained fields, or where rivers have overflowed their banks, I do not think the cotton crop has suffered. The young cotton in the farm has, like the other crops, been thrown back, but the plants promise well, and the natives are immensely pleased with them. The seed I distributed over the district has given great satisfaction, every one who has received any, speaks well of it, and I could now get rid of any quantity. From information I have lately received, and which has been confirmed by merchants of this town, I am inclined to estimate the quantity of cotton held in stock at present at about 25,000 *bhojahs*. About 3,000 *bhojahs* have of late accumulated in Khangaon, and the same quantity may, as I said before, be in the country beyond the hills. The balance is said to be held in the Nizam's country, and is expected to come here after the rains. My former estimate, as regards Berar, was not incorrect, but I did not calculate for the above cotton, which it appears has been contracted for by petty dealers."

In this report of the 18th instant, Mr. Dunlop's opinion of the favourable turn in affairs is confirmed. Under that date he writes:—

"Since writing last week, I have seen a considerable portion of the country in the Bellapore talook, and my favourable opinion of the crop previously formed has now been fully confirmed. Had the rain lasted longer than it did, there would, doubtless, have been serious damage done, but, under the circumstances, I consider the loss so trifling that it will not be felt. I have received similar reports, both from the northern and southern parts of the Akola district."

Mr. Batcock, the Superintendent of Experiments at this farm, confirms the favourable opinion of the effects of manure on the crop noticed by the Superintendent of the Oomraotee farm. An extract from his report, dated the 17th August, is annexed:—"The weather has, generally, been open, with passing clouds and very favourrble for the crops and for working operations. Weeding and thinning have been pushed on rapidly. About thirty acres have been weeded. The crops are looking well; some of the largest of the earliest sown cotton plants are showing flower. The smaller plants, which had become stagnated in growth by the excess of rain, are now beginning to make progress. The jowaree crops are looking well, and have generally a fine healthy growth.

"The cotton manure seems to have a very beneficial effect upon the young plants. It is somewhat early to give any report upon this point, but the superior growth of these plants on the ground manured with it, is at present so marked that a passing notice of it is necessary. A fuller report on this will be given hereafter.

"The amount of rain fallen during the week is 0.08 inches, making a total since the 1st June of 20·58 inches."

OTHER PARTS OF THE BERARS.

The Reports of the Deputy Commissioners of the Berar districts confirm the information contained above regarding the heaviness of the monsoon, and predict some falling off in the out-turn. I am, however, in the hopes that the damage to the crop may turn out to be less serious than at first supposed. The cultivator, as a rule, is an alarmist, and makes the worst of every unfavourable turn of the weather. It is not unusual, early in the season, to hear most dreary reports of the damage to the crop by rain or excessive heat. A few fine days of seasonable showers soon change the complexion of affairs, and the calculations made early in the season are completely thrown out.

THE BOOLUNDSHUHUR SEED FARM, N. W. P.

In this part of India, also, the rain was at one time unusually heavy, and a small portion of the farm was destroyed by a flood. On the date of the last report from the Superintendent of Experiments, rain was much wanted, and I regret to say the cotton enemy had appeared The report of the Superintendent of the Experiments, Mr. Simpson, is given below:—"The work for the week ending 15th August has been much the same as the previous one, being almost confined to cleaning of grass. On the 15th I had a few men thinning out some of the first sowings. For the past week there has been no rain, and with the strong winds from the north and north-west, the ground has now become dry and hard, which is stopping the growth of young seedlings. Rain is at present much wanted. The report I heard some time ago of the cotton plant being destroyed by some sort of insect, I am sorry to say is showing itself here. During the last three days I have come upon several plants with the top or leading shoot perfectly withered, and upon examining them, found the damage was caused by a worm having pierced the stem near the top, where the wood is quite soft, and after feeding itself upon the *pith* of the plant for a short time, it appears again to leave it, for out of a good few I examined, I only found the worm in two of them. The worm is apparently similar to that which destroyed so many of the bolls of cotton in Berar last year, the only difference is its colour, being of a very *pale green*. The green food, on which it lives, may, perhaps, account for that."

The Collector of the Boolundshuhur district, writing early in the present month, stated:—"The reports of the cotton crop from all parts of the district are very favourable." It is not easy as yet to estimate the area sown with cotton this season. But I doubt there being any appreciable decrease. Last season's prices, although below the average of the former years, certainly paid the ryot right well, and although, towards the close of the season, there was a sudden and heavy fall in the price of cotton, still it was not the ryot who suffered thereby. It is also to be remembered that the great fall took place late in the season, when most of the arrangements for sowing had been made. I doubt then there being any likelihood of the cultivators curtailing the cotton acreage this season, and if the weather plays us no further tricks, we may expect a full crop and large exports.—I have, &c.

HARRY RIVETT CARNAC,
Simla, 25th August 1870. Cotton Commissioner.

EXPERIMENTS IN BENGAL.

From D. J. McNEILE, Esq., Officiating Secretary to the Board of Revenue, Lower Provinces, to the Officiating Secretary to the Government of Bengal, in the Revenue Department,—(No 250 C, dated Fort William, the 12th May 1870.)

Sir,—In compliance with the the instructions in paragraph 3 of Government order No. 1200, dated 24th March 1869, I am directed to submit the accompanying abstract of the progress reports of experiments made in the Lower Provinces up to the end of December last, in the cultivation of Hingunghat cotton seed.

2. The reports now received from the several Commissioners shew that in some divisions, at least, it is not desirable to make any further experiments. In support of this conclusion the remarks of the Commissioners of the following divisions are quoted:—

Cooch Behar Division.—"The experiments of last year conducted in five or six localities seemed to show that the climate of this quarter was not suitable to the plant, and I have had no application for seed from Europeans or Natives."

Burdwan Division.—"The cultivation of the seed is reported to have been almost a total failure, owing to different causes. I am of opinion that it is not desirable to try any further experiments on behalf of Government at present: with an important and valuable article of commerce it may be safely left to private interest and enterprise to undertake the cultivation,, if it is likely to be really profitable to the grower."

Patna Division.—"The results are so far from satisfactory that a further experiment seems scarcely worth attempting."

Chittagong Division.—"The experiment has, generally speaking, proved a failure."

In the Rajshahye and Grissa divisions also, the previous experiments made were unsuccessful.

3. The Commissioner of the Presidency division does not think that any just conclusion as to the possibility of growing cotton in the districts of the division can be drawn from the experiments already made, and he submits a special proposal that on any future distribution of seed the Collectors and sub-disisional officers should be authorized to rent a beegah or so of suitable land in the neighbourhood of their stations, to pay for all cultivation, and to promise the ryot an ample remuneration for his crop if successful, and at any rate a fair compensation for his time and labor. The Commissioner of the Burdwan division on the other hand, as above quoted, has suggested that the cultivation "may be safely left to private interest and enterprise."

4. The Board concur in opinion with the Commissioner of the Burdwan division, and are opposed to the suggestion of the Commissioner of the Presidency division to try further experiments under the immediate supervision of the sub-divisional officers and at the expense of Government.

5. I am to add therefore, with advertence to Government order No. 4282, dated 13th December last, that the Board do not wish at present to indent upon the Cotton Commissioner for any further supply of Hingunghat cotton seed for experimental cultivation.

HYBRIDIZATION OF COTTON.

Mr. Rivett-Carnac, Cotton Commissioner, Central Provinces and the Berars, has sent to the Government of Bengal, the following extract from a letter received from Major Trevor Clarke, on the subject of hybridization of cotton.

Extract from a letter from Major Trevor Clarke, to H. Rivett Carnac, Esq., dated Welton Place, Daventry, the 7th May 1870.

"I have just had a letter from Ashburner with some beautiful Hingunghaut bolls, and some from a selected plant with naturally yellow-tingled staple. I do not know if you are acquainted with *Coconada*, which is a cotton of this sort; now the said *Coconada* is much sought for by spinners, strange to say, on account of the *colour*. I have grown Coconada, and pronounced it at once to be allied to the Hingunghat. It would be well, I think, to look out for and propagate a *slightly* Nankeeny Hingunghat-race. Such a breed might be produced by crossing with a good yellow *Indian*, not American, sort. A nankeen cotton is cultivated in India, which is of occidental race, not *G. Herbaceum* at all. This would not cross with the real Oriental breeds.

"Your samples of seed came too late in the English year to do much with that season, but I managed to get a crop or two, the seed by great care being got to ripen during the late autumn and winter. Amongst others, I believe, I have crossed purple-flowered *G. Arboreum*—your "Nurmah," with Hingunghat. I wish you would make your people test the capabilities of this plant. There are several accounts of its having been tried, and

all apparently with favorable results; but nothing further appears to have come of it. The staple is undoubtedly good, strong white, and fine, and was much admired by a spinner, a friend of mine—a first rate judge. The crop will come quicker to maturity and should be longer, softer, and more to the boll. The only Indian cottons that at all come up to the *bulky* properties of uplands, according to my experience, are produced by that breed of which the bolls are dumpy and cob-nut-shaped, and only *half* opening when ripe. Dholera and Western Madras as supplied to me are of this kind. Now a cross between a high class plant of this form and a good Hinguughat would be a great step, because the big close-pod sort produces a hard staple, at least as far as I have seen. Let your people turn their attention to the task of observing and tabulating, as it were, the *peculiarities* of *breeds*, especially as to adaptation to different soils and climates. As far as selection goes, soft staple should be looked for amongst harsh fibred, but otherwise good sorts, and hardy varieties in the case of first-class stapled kinds which are constitutionally tender.

"My cross Hinguughat by Nurmah (Arboreum) is good, that is, has taken effect. Also Hingunghat crossed by the largish stapled close-pod sorts. Also the Assam Hill cotton by Hinguughat.

"I have just had a sample of this very interesting kind from the Agri-Horticultural Society, through Mr. Arthur Grote. I enclose some of its long, many-seeded tufts grown by myself. I wish the staple was as long in proportion. I shall enclose with this a few more seeds of the "former" sorts, in case any of the first lot may have been unsuccessful, also a few other such sorts as I think may be useful or interesting. The crosses, Sea Island by New Orleans, by New Orleans and the Hybrid Georgian, are most beatiful cottons, Orleans staple, as soft as silk. I do hope they may succeed with you. I am also very curious to know the behavior of the sort I call Parnambuco and its crosses. It is shortish in staple, but the very hardiest sort I have ever met with. In crossing it I went in for a *hardy* Sea Island, and cannot help thinking I have effected my purpose.

"My most interesting cross, *viz.*, Hinguughât by Arboreum (*i. e.* Nurmah) is thriving and will soon flower, showing that it has secured the early flowering habit of the Hinguughât parent; of it I send you one or two seeds. I had only one small boll come to perfection.

"Among the seeds now sent are a number between Hinguughât and the broad leaved type in the close-pods, and strong bulky staple. I hope this will produce sorts with more expanded pods and finer staple combined with *length*. The Hybrid Georgian, as I call it, and the Sea Island, twice crossed with New Orleans, are most beautiful cottons. Try your best to get these into fruit. I send also several kinds of Uplands and Sea Island."

Cotton Cultivation in the Punjab.—1869-70

The area under cultivation in 1869 was 811,749 acres, against 679,294 in 1868, and 687,321 in 1867. There has been a considerable increase in cultivation in the year under report. This increase has taken place in twenty-one districts. In six districts there was a decrease both in area and out turn, in one or two there was a decrease in area, but an increase in out-turn; while in two districts, Goorgaon and Hissar, the crop was almost an entire failure. In these two districts the area sown with cotton was 88, 843 acres, or about one-tenth of the entire area of cotton cultivation in the province.

2. The out-turn is calculated at 618,900 maunds of cleaned cotton, or 30 seers 8 chittacks (nearly 61 pounds) per acre. Had the area in Hissar and Goorgaon produced an out-turn equal to the average of the province, the total out-turn would have been about 679,322 maunds, or about 33 seers 7 chittacks per acre.

3. From enquiries made, it was found that the orginal returns of eight districts had shown uncleaned cotton instead of cleaned. The necessary corrections have been made.

4. Taking the returns as they are, the divisions in order of productiveness stand as follows:—

	Seers.	Chittacks per acre.
Jullundor ...	49	6 ,,
Peshawur ..	48	5 ,,
Umballa ..	46	9 ,,
Derajat	45	6 ,,
Umritsur ..	35	13 ,,
Mooltan ...	28	8 ,,
Rawulpindee ...	24	12 ,,
Lahore ..	22	10 ,,
Delhi ..	22	0 ,,
Hissar ..	20	9 ,,

Even at the best, the yield of cotton in the Punjab and in Upper India generally is very poor, as compared with other countries, where the cultivation is more carefully carried on. In Egypt the yield is 500 lbs. per acre.

With respect to the extent of area under cultivation, the order of divisions is almost exactly the reverse of the above, which leads to the strange result that cotton is most extensively cultivated where it is least successful. There are, however, other reasons that influence the extent of the cultivation. The case of the Delhi division is exceptional this year, owing to the failure of the crop in Goorgaon.

5. The most extensive cultivation is in the four districts of the Rawulpindee division, which have the advantage of an easy means of export down the Chenab and Jhelum rivers. The same may be said of the districts of Mooltan and Moozuffergurh of the Mooltan divisions, which export their surplus cotton down the Indus. In the Lahore division, there is considerable cutlivation in the districts of Lahore and Goojranwalla. The cultivation in Ferozepore is small, but a large export trade down the river is carried on.

6. The average price of cotton was somewhat higher in 1869 than in the previous year. The average highest wholesale price was Rs. 19-13-8 per maund, and the lowest Rs. 17-3.

The price was particularly high in the following districts, which are important export marts:—

Ferozepore ...	Rs. 23 per maund.
Shahpore ..	,, 23 ,,
Mozuffergurh ..	,, 24 8 ,,
Dera Ghazi Khan ...	,, 25-8 ,,

In Goorgaon the price was also high (Rs. 23-2), owing to the local scarcity of the article.

The lowest wholesale price in any district was Rs. 14 per maund.

7. The trade returns for the third and fourth quarters of 1869-70, that is for the cold season, during which the cotton crop of the autumn of 1869 was brought into the market, show that 72,556 maunds of cotton were exported down the Indus to Kurrachee. The town returns show an export of 82,594 maunds—the difference represents the quantity exported in other directions.

The largest export shown in the town returns was from Mooltan, 49,720 maunds.

8. From the remarks of the Deputy Commissioners it would appear that from 150,000 to 200,000 maunds of cotton were expected to be available for export towards the sea-board. The river returns of boat traffic received from Sukkur, as above-noted, show nothing like this quantity. A considerable quantity of cotton was exported from the district, where it is produced, to other districts where native cloth is manufactured, such as Hoshiapore and Kangra. It is also to be remembered that the surplus of cotton districts is not all exported at once—some of it is held back for higher prices.

9. The steamer and railway returns do not show any very considerable quantity of cotton export this season. The Indian Flotilla steamers carried only 1,300 maunds. In the railway returns for the third quarter, cotten is not shown separately from cloth and wool. The returns for the fourth quarter have not been received. But the cotton exported by railway to Mooltan reappears in the returns of exports from Mooltan, and in the returns prepared at Sukkur.

10. The total export of cotton from the Punjab to the sea-board, *viz.* the Indus, during the six months from October to March last, was not much above 80,000 maunds, which, though more than last year, is considerably less than in previous years. Owing to the scarcity of food during the last two or three years, the cheap and durable native made cotton cloth has been increasing in demand among the classes who are unable to puchase the dearer and lighter imported cloth, and the result has been to detain a considerable proportion of the stock of raw cotton for local cosumption.

11. It is very generally believed that the local manufacture will maintain its ground, until Manchester sends to the East a cheaper and more durable fabric, and one better suited to the wants of the poorer classes.

12. From an interesting calculation made by a native Deputy Collector in the North Western Provinces, and published in the *North Western Provinces Gazette* of 11th May 1870, it appears that the amount of cotton required to clothe the population of an ordinary district, is only from 3 to 4 pounds per head per annum. It is estimated that the better class of adult males use nearly 8 pounds, while the lower classes use less than 2 pounds each. A considerable quantity of raw cotton is required for stuffing *ruzais*, which are used by all natives of the better, and most oven of the lower, classes in Upper India, except in and near the hills, where woollen blankets are often used. The amount of money which the mass of the people can afford to spend upon cotton clothing is very limited, and unless a cheap and lasting material is imported from England, they will continue to manufacture cloth according to their own taste.

13. It is estimated that the province contains 223,000 cotton looms, giving employment to 700,000 people, and turning out 122 lacs of rupees worth of cotton cloth. This quantity, divided over the whole population of 17½ millions, gives an average of a little over 11 annas per head; according to the calculation above given, the population requires only about 2 seers or less of cotton per annum, which would be worth in a manufactured state, say two rupees, but a considerable proportion of this is used in its unmanufactured state, so that the amount spent on

Note to para 10.—Traffic returns received since this report was written, show that nearly 30,000 maunds of cotton were taken down the Indus to Kurrachee between the 1st April and 30th June 1870.

imported cotton cloth is very small. It is, however, very difficult to determine the exact proportion.

14. The external trade returns of 1868-69 show that 8,000 maunds of country cloth were imported and 9,156 maunds were exported. The average value of it was about Rs. 40 a maund. The quantity of European cotton cloth imported is stated at 31,991 maunds, and that exported at 29,002 maunds, which would leave very little for the consumption of the province. This imported cloth is worth Rs. 100 to Rs. 130 per maund all round;—but the reports are probably understated.

15. Deducting the export of 80,000 maunds from the total out-turn of the crop, would leave some 530,000 maunds for internal consumption. This at the average price of Rs. 18 per maund, would be worth a little over 95 lacs of rupees. The looms of the province turn out, as above stated, 122 lacs worth of cloth, but this represents only so much of the year's crops as is turned into cloth—there remains that portion of the crop used in its raw state. These figures are somewhat rough, but they are sufficient to show that the export of raw cotton and the consumption of English cloth, are very small, as compared with the internal consumption and manufacture.

16. Hingughat cotton seed was sown in a large number of plots in all parts of the province during the season of 1869. From the reports received it appears that the experiment was for the most part a failure. The plant is apparently not so hardy as the indigenous cotton, and exhibits a tendency to run to leaf and wood. Even under the most favourable circumstances, the yield was usually less than that of the common cotton of the country.

17. Upon the whole, the prospects of the cotton cultivation in the Punjab are encouraging. It is extending in some of the districts best suited for it. Prices are steady, with a tendency to rise, so that the cultivation may be considered to be beyond the risk of loss, except from unfavourable seasons.

By order,
J. A. E. MILLER,
Secretary to Financial Commissioner, Punjab.

Lahore, the 18th July 1870.

INFLUENCE OF CASTE ON RATES OF RENT; AND EFFECT OF PROCEEDINGS AT LAST SETTLEMENT ON CONDITION OF THE CULTVATOR.

Report by C. A. Elliott, Esq., dated 16th January, 1868.

Concluded from our last Number.

THE EFFECT OF OUR PROCEEDINGS AT THE LAST SETTLEMENT IN PRODUCING PERMANENCY OF OCCUPANCY TENURE.

In the same twenty villages I instituted an enquiry, the object of which was to show how far the proceedings at the last settlement and the conferment of occupancy rights on the older cultivators succeeded in attaining their purpose, and creating a permanent occupier class. It will probably be allowed on the one hand, that the tendency of our rule has been greatly to increase the insecurity of the cultivator's tenure, and that in two ways—(1), the agricultural population has increased so that competition for land has become keener; (2), the zemindar, having no longer occasion to call on his cultivators to take up arms for him, enters the market more untrammelled, and accepts the best cultivator with no *arrière pensée* as to whether he is as good at quarter-staff and broadsword play as he is at ploughing. On the other hand, we have deliberately set ourselves by law to oppose this increase of insecurity, by bestowing a new security on the old cultivators—a legal prohibition against ousting. It is interesting, therefore, to enquire now, after the lapse of 30 years, which has been stronger—law or nature? Has King Canute's *fiat* kept back the rising tide, or not?

The accompanying statements give the details of the enquiry for each of the twenty selected villages. The following table shows the general result of the whole:—

Cultivators.	Cultivators of the last Settlement, who personally or by their heirs, are occupying now.			Cultivators of the last Settlement, of whom no representatives now exists.		Cultivators now in possession, who neither themselves nor their forefathers cultivated at the last Settlement.	
	No.	Area cultivated in 1836.	Area cultivated in 1868.	No.	Area occupied.	No.	Area.
		Bgs. Bis.	Bgs. Bis.		Bgs. Bis.		Bgs. Bis.
Mouroosee (hereditary), *Ghair Mouroosee* (non-hereditary) ..	73	4,195 11	4,547 7	52	694 12	373	2,966 18
	139	1,266 7	1,467 15	371	2,887 4	388	2,072 6

This shows that out of 125 *mouroosee* cultivators existing at last settlement, 73 have maintained their rights through the thirty years period, and 52 have lost them; while, at the same time, out of 510 cultivators who did not receive *mouroosee* rights 371 have disappeared, and only 139 survive. These, too, of course, long ago became *mouroosees*, and have therefore been artificially preserved; but for the acquirement of rights by the accretion of time, in all probability most of them, too, would have been overwhelmed. If we look at the area occupied, the contrast is still more striking: the 73 *mouroosee* cultivators who survived held pretty nearly 60 beegahs a piece; the 52 who perished held only 13. Out of 9,043 beegahs of land occupied in 1836, 5,462, or 60 per cent., is now in the same hands that tilled it then: those men, increasing in wealth, have enlarged their tenancy to 6,014 beegahs; so that out of the present cultivated area of these twenty villages —11,053 beegahs—6,014 are held by the old tenants, and 5,000 by new men introduced since 1836. This table, then, shows clearly enough that the conferment of occupancy rights has been no dead letter; whether for good or for evil, it has held its own against the numerous influences which, war against permanency, has given us a large class of tenants who may fairly be compared with the yeomen of our own country. As they existed at a time before the large culture set in, we have no available statistics by which to compare the amount of change which has taken place with the amount which would have taken place had *mouroosee* rights not been created by us. But a comparison of the amount of change among the *mouroosees*, with that which has occurred among the *ghair mouroosees*—protected as the latter, too, have been by the gradual accretion of rights to them—would almost justify the hypothesis that not one of the old cultivators would have been left, but a complete sweep have been made of them (at the cost of how much suffering and distress of mind no one can calculate), but for the action of this beneficent law.

PART III.

THE EFFECTS OF THE CONFERMENT OF OCCUPANCY RIGHTS ON THE CONDITION OF THE CULTIVATOR.

I was much struck some years ago by an article in the *Calcutta Review*, in which, attacking the justice of the creation of occupancy rights, the author wrote to the following effect:—"True, the abstract argument in favour of occupancy rights "are strong and unanswerable. But they do not bear the "test of facts. Look at the North-Western Provinces, where "the policy has had full play for thirty years; has it had "the effect predicted? Can any one tell me that the *mou-* "*roosee* tenant is better fed, better housed, better clothed, owns "better and more bullocks—is, in general terms, better off "than the tenant-at-will?" I have often put this question to men who had good opportunities for judging, but have never got a satisfactory answer. No one was able to assure me by the evidence of his own eyes that the contrast was discernible. In such matters, however, I think our observation is often very faulty, and, seeing that the appeal was to statistics, I determined to take the first opportunity I could of answering it by statistics.

Accordingly, while the investigations which I have already detailed were going on in the twenty selected villages, I extended the enquiry to this point also. I had a census taken in each village of the number of carts, bullocks, cows, buffaloes and horses owned by each cultivator, and of the number of men who wore English, or wore native cloth. The statements which I submit separately whom the details for each of the twenty villages.

The table which follows gives the total of the twenty, comparing all the *mouroosees*, as a class, with all the *ghair mouroosees*.

Class of Cultivators.	No. of Cultivators.	Bullocks.	Cows	Buffaloes.	Horses.	Carts.	Average No. of Beasts per man.	No. of cultivators wearing	
								English cloth.	Native cloth.
Mouroosees	523	1,315	230	352	36	45	3·3	24	499
Ghair Mouroosees...	218	390	80	88	7	8	2·65	4	214

This return shows the superiority of the *mouroosees* in all kinds of worldly wealth in a very striking way. In the matter of wearing English clothes, indeed, there is not much to be said, so few of either class wear them; but in all the points that denote the prosperous agriculturist, the protected tenant is 50 per cent. better off than the tenant-at-will. If these facts become generally known, it will hardly be possible in future for any one to declare that theories of political economy—so far as they bear on the advantages of the people of the *petite culture*—look very well on paper, but do not bear the test of actual experiment. Here, as with all true theories, the logic of facts agrees with the logic of the closet.

The Planters' Gazette.

CALCUTTA, 15TH SEPTEMBER, 1870.

THE ESTATES.

The action of the French Government, says the *Ceylon Observer*, in levying a war-tax on coffee and tea, must affect the consumption of those articles by a people who have hitherto been amongst the best customers of the coffee planter. On the other hand, the United States legislature has passed a bill reducing the import duty on coffee from the 31st December next from 2½*d.* to 1½*d* per pound. This step cannot fail to exercise a good influence on consumption, especially as the same legislature, in striking contrast with the policy of Mr. Bright, has fixed the import duty on *chicory and all other substitutes for coffee* at 2½*d* the pound, or nearly double the rate levied on the genuine article.

Under date of 22nd. July, Messrs. Cook and Co. write : "In 1866, on the termination of the Austrian and Prussian hostilities, coffee recovered very rapidly a considerable portion of the loss which had been suddenly encountered, but in the present instance, although prices of *Ceylon* are 10*s.* and of *Brazil* 3*s.* @ 4*s.* below the most depressed period of that year, the general disturbance of credit will probably cripple the trade for a more lengthened period, whilst the larger supplies in prospect may interfere with any important improvement until consumption contrasts somewhat more favorably with production, than has been the case of late years. It is impossible to foresee to what extent coffee may be further affected. Some stimulus may be given for the immediate wants of the troops, but supplies for such purposes can be readily drawn from the ample stocks held in both countries, without materially influencing prices. London, probably, will be made a general entrepôt, and importations will accumulate to such an extent that for a time the article may be almost unsaleable. The announced blockading of German ports, however, can scarcely be sufficiently effective to deter all importations from neutral countries, and the rates current in our market are therefore likely to regulate, to a considerable extent, the value on the Continent. On the other hand, foreign commerce being interrupted, the stocks abroad will diminish slowly, and with a protracted war may be reduced to a low point by the time the trade is again free to flow into its usual channels, when the abundant supplies, particularly from the Brazils, will be available to meet the renewed requirements of Europe."

The *Civilian* says that "enormous and probably unprecedented shipment of coffee to France" were made early in August with a view to escape the increased customs duty about to be levied there. These casual causes of fluctuation are of trifling interest, however, to the coffee planter, whose anxiety is chiefly awakened by the competition with which Brazil so seriously threatens him. The aggregate quantity of really *fine* coffee shipped from all parts of the world is said to be comparatively small however—and the Planters of Wynaad, Mysore, and the Neilgheries may take heart from the fact.

Considering, says the *Ceylon Observer*, that whatever happens in Europe, consumption is advancing so rapidly in the United States as to be likely to overtake the whole production of Brazil, we think there is good reason why those interested in coffee enterprize should indulge in very opposite feelings to those of despondency.

The stocks of Coffee in the principal European ports on 1st July, were :—

	1870.	1869.	1868.
United Kingdom.....Tons	21,150	19,800	18,800
Holland..... ,,	44,750	39,600	35,600
Antwerp ..... ,,	4,100	5,500	5,800
Hamburgh ..... ,,	11,500	14,000	13,000
Trieste ..... ,,	3,600	2,300	4,200
Havre ..... ,,	39,300	13,200	15,050
Total...Tons	104,400	94,400	92,450

Thus the stock of 1870 which in May last was 30,650 tons in excess of 1869 was reduced by the 1st of July to a surplus of 10,000 only, and owing to the small quantity afloat is now probably still less.

Messrs. Toulmin & Co, complain under date of 20th August, that—"The character of the Cachar teas does not improve as was hoped might be the case, as the season progressed, for nearly all the teas which have come to market from that district up to the present time, must be pronounced poor and weak in cup, even the broken teas, which are almost worthless, without strength, participating in this serious defect. In fact they have scarcely the strength of the Darjeeling teas, without being able to compare with the latter in regard to flavor or pungency. The London market continues to remain in a very wretched and unsatisfactory state, Pekoe and Green teas suffering the greatest depreciation. It is not very probable that the supply of tea from China would be affected in the event of hostilities being undertaken against that country on account of the dreadful massacre at Teintsin, for all fighting would most probably be confined to the scene of the outrage and its neighbourhood, from the fact of Teintsin being the direct route to Pekin, and but a comparatively short distance only from that capital ; and every body who is conversant with those parts knows that the Chinese Empire is such a nondescript affair, that active trade in one place and active warfare in another is quite compatible with the laws and customs of the country. It is hardly necessary to remark that Teintsin is many hundreds of miles distant from any of the tea (or silk) growing districts. At the present there is every prospect of a full crop from China this season, for although the last accounts received show a rather smaller export than last year, this is to be accounted for by the fact of the market not having been opened at Foo-Chow-Foo till an unusually late date, not because the Tea was wanting, but because the teamen where holding out for higher rates than shippers were willing to pay, and consequently the tea already exported is nearly all from Shanghai and the Yangtze district, but now that operations have commenced at Foo-Chow, the export will probably be reported by next China Mail as fully equal to last years, or perhaps more.

CINCHONA.

The Government will not proceed further with Cinchona on the Khond Hills than completing the experiments. Should it become climatised, Government will not compete in its cultivation with private enterprise.

CINCHONA IN TRAVANCORE.

The Cinchona Garden, established by the Sircar at Peermade about seven years since, continues to prosper.

The following statement shows the state of the Garden in the year under review :

No	Botanical Names.	Commercial Names	No. of plants	Growth in inches	Height of the tallest.		Girth of the thickest.
					ft.	in	
1	C. Succirubra	Red bark	2,952	2	19	10	Close to the ground, 22 ins ; 5 feet from ground 13 in.
2	C. Micrantha	Grey bark.	341	..	18	0	Close to the ground, 12½ ins.; 5 feet from ground, 7½ ins.
3	C Peruviana ...	Finest grey bark ...	109	...	15	4	Close to the ground, 12 ins.; 5 feet from ground, 7 ins.
4	C. Nitidæ..... ..	Genuine grey bark	66	..	7	10	Close to the ground, 7½ ins.; 4 feet from ground, 4½ ins.
5	C Condamenia	Rusty Crown bark...	74	...	12	1	Close to the ground, 9 in.; 5 feet from ground, 5 ins.
6	Cinchona	Name unknown	10	...	9	4	Close to the ground 6½ ins. ; 4 feet from ground, 5 ins.
		Total.....	3,552				

The Superintendent of the Garden has been authorized to sell to any planters, plants to the extent of 2,000, at the rate of one anna each, or 6 rupees per 100 plants. The planters, however, have not availed themselves of the arrangement.

The trees are looking remarkably well, and it is said that they would favorably compare with any in Wynaad in Malabar.

So far then, the experiment has proved a complete success. But as the cultivation of the febrifuge does not promise to be remunerative to private individuals, only a few are found willing to take the plants even free of all charge.

A few plants have, however, been laid down in some estates simply to try how they will get on. And the Superintendent has been directed to plant numbers in eligible sholas in a diversified manner, in view to see if they would grow without much attention and become naturalized

GOVERNMENT CINCHONA ESTABLISHMENT AT RUNGBEE.

We have long threatened a visit to the Government Cinchona Establishment at Rungbee, and accordingly, at the commencement of the week, the weather promising to be somewhat finer than of late, we bent our steps thitherward with a view to seeing what we might be able of the growth and manufacture of the far-famed quinine.

We had, however, as it turned out, reckoned without our host (we don't mean Mr Clarke, superintendent of the Calcutta Botanical Gardens, who is at present in charge of the plantation for the purpose of starting the manufacture of the drug), but the weather which was as inhospitable as that gentleman was the opposite.

Mr. Clarke, however, advised us that a visit to the plantation under existing circumstances would be useless To say nothing of the continuous downpour of rain, which was of a most soaking character, the mist, arising from the valley was so dense as to render a view of anything, 30 yards distant, out of the question, and this description of weather they had experienced for the past ten days without intermission The road, besides, to the plantation at Rishap, which lies some miles beyond Rungbee, and some 3,000 feet lower down has been rendered almost impassable by the heavy rain

We learn from conversation with Mr Clarke that, in order to get anything like a fair knowledge of the nature of the works in operation, it would be necessary to spend a long day in viewing the plants in their several stages of growth, not to mention, besides, the preparation of the drug as a marketable commodity, which has not yet commenced owing to the want of alcohol for the purpose. Mr. Clarke speaks most sanguinely of the prospects of the undertaking, commercially and says that, from his own personal observation and the results apparent up to the present time, he considers the soil and climate of this neighbourhood (of course paying attention also to aspect and site) far more suitable to the production of the red and yellow descriptions of bark than the Neilgherries, where he has visited both the Government and several private plantations, professionally, on behalf of the Government, with a view to reporting thereon Mr. Clarke has lately compiled a voluminous report on the subject, which is now in the hands of Government, and will doubtless be printed in due course, when, should we be so fortunate as to obtain a copy, we purpose extracting largely therefrom, and we furthermore purpose, after we have had the advantage of subsequent personal observation, to give our own views upon the subject for what they may be worth

Mr Clarke intends, so soon as he has everything in readiness, to commence the preparation of cinchona alkaloid, for the use of the Inspector General of Hospitals, and he states that the alkaloid is itself available as a medium, possessing as it does the same curative properties, as the sulphate, commonly in use, without that excessive bitterness which renders patients, in a greately reduced state from weakness, unable to retain it on the stomach and that it is presently used under such circumstances by the Government Medical Department in Madras with great success

Mr. Clarke considers the prospects of the Poomong plantation, the property of Mr. Lloyd and Colonel Angus, to be exceedingly promising; though he states that the portion of the Estate, at present under cultivation, suffers from being on the sunny side of the valley, facing to the south; still there are many other available places with proper aspect.

The actual expense, per acre, for growth and propagation, including all charges thereon, will only amount to Rs 100 per acre during the past three years at the conclusion of the present year, the necessary pruning will produce bark worth Rs. 300 per acre, at present rates, so that the cultivator (in this case the Government) will be Rs. 200 in pocket, and will have, moreover, an acre of forest cinchona trees which will thereafter require little or no attention, and which will have become each succeeding year progessively, reproductive, and, should prices not fall, Mr. Clarke calculates that at the end of ten years they would return, Rs. 3,000 per acre for the year.

They are at present engaged, at Rungbee, distilling alcohol from proof rum, just received, for the purpose of producing the alkaloid

It stands to reason, of course, that the increased production of cinchona must tend to a considerable reduction in price, and that were there no other use for it but for medicinal purposes, the question of its cultivation, to any great extent would be extremely problematical, but, fortunately, it can be employed, on a gigantic scale as a base for vegetable dyes of any colour, and for which purpose it cannot be surpassed by any known product.—*Darjeeling News.*

CINCHONA AT THE NEILGHERRIES.

Report on the Number, Distribution, and Condition of CINCHONA Plants on the NEILGHERRIES for the half year ending 31st January 1870.

Species	Botanical Names	Commercial Names	Number of Plants	Value per lb. of dry bark in the London market. s.	d.
1	Succirubra	Red bark	1,215,963	2	9
2	Calisaya	Yellow bark	40,395	2	8
3	Frutex	}		2	7
	Vera	}		2	6
	Officinalis	}		2	10
	Var Condaminea	... Original loxa bark	1,133,159	2	10
	,, Bonplandiana	Select crown bark	87,509	2	10
4	,, Crispa	Fine crown bark	4,335	1	8
	,, Lancifolia	Pitayo bark ...	279	1	8
	,, Nitida	Genuine grey bark ...	2,736	1	8
5	,, Species without name	Fine grey bark	8,500	1	10
6	,, Micrantha	Grey bark	46,730	1	8
7	,, Peruviana ..	Finest grey bark ...	3,389	2	9
8	,, Pahudiana	Unknown	425	2	10
9	,, Lancelate leaved variety of C. Officinalis...		1,563	Unknown.	
10	,, Pitayo, from the seeds sent by Mr. Cross ...		123	Do.	
11				Do.	
		Total number of Plants	2,595,176		

Table showing the growth of the different species of plants planted out in the Plantations for the half year ending 31st January 1870.

Number of Plants	Species.	Where planted	When planted.	Maximum growth.	Average growth	Height of the tallest tree	Girth near the ground
				Inches	Inches	Feet	Inches
12	C Succirubra	Neddiwuttum	30th Sept 1862...	25	15¼	24½	32
12	C Micrantha	Do.	1862	19	9½	23½	25
12	C Officinalis	Dodabetta	30th Sept. 1863	18	10½	18¼	13½

Table showing the propagation, distribution &c., of plants and seeds during the half year ending 31st January 1870.

Date	Total number of plants propagated.	Total number permanently planted out.	Total number of plants distributed to private individuals.	Total quantity of seeds distributed.
				Ounces
August 1869...	350	4,589	.	10
September ,, ...			..	28
October ,,			105	10
November ,,	420		100	2
December ,,		...	...	5
January 1870 ..	129	..	50	..
	899	4,589	255	55
Previously	2,595,277	1,143,844	178,605	240
Grand Total ...	2,595,176	1,148,124	178,605	295

REMARKS.— The number of plants permanently planted out in the plantations is 4,580, making the total 1,148,424.

This increase by propagation is 899, the monthly average being 150, making the total 2,595,176.

The number of plants distributed to the public is 255, giving the total distribution of 178,605 : fifty-five ounces of seeds have also been gratuitously distributed, making the total 295 ounces.

Ootacamund, the 28th February 1870.

W. G. McIVOR,
Supdt. Govt. Cinchona Plantations.

[No. 150.] Order thereon, No. 371, dated 18th March 1870.

Copies of the Report received with this letter forwarded to the Secretary of State, to the Supreme Government, to the other Governments in India, and to the Superintendent of the Cinchona Plantations in Java.

R. A. DALYELL,
Acting Secretary to Government.

REMARKS BY THE SECRETARY OF STATE FOR INDIA IN COUNCIL.

Upwards of a million plants are now permanently planted out in the Government Plantations, some of which are 25 feet high and 32 inches in girth. The time, therefore, seems to have arrived for your Government to adopt some systematic course with reference to utilizing the very large quantity of febrifuge alkaloids which is now stored in the bark of these trees. I am of opinion that this subject should receive consideration from your Government at an early date, and that, in consultation with Mr. Broughton and Mr. McIvor, a regular system of procuring and utilizing an annual harvest of bark should be commenced and developed as further experience is acquired in future years.

The plantations will require thinning from time to time, and strict injunctions should be given that no bark, not even that of the smallest twigs, should be wasted. The bark which is useless for the extraction of quinine is valuable as a febrifuge for the use of coolies in the form of a decoction or infusion. But a certain number of larger trees must now be annually in a sufficiently advanced stage of growth to yield bark suitable for the extraction of alkaloids. It will be a point for your decision whether this bark should be used in the manufactory at Ootacamund for the supply of hospitals in India, or be sent to the London market, or whether a portion should be sent Home, and a portion worked up on the spot.

In considering the course to be adopted with reference to the Government plantations, the question will arise whether they should remain permanently in the hands of the Government for the supply of quinine in the hospitals, and the distribution of seeds and plants throughout India, or whether they should eventually be disposed of as in the case of the Government tea plantations. If the latter course appears preferable, it will be necessary to decide at what stage of its development the connection of Government with the enterprise should cease.

In considering this important subject, many other points will arise which I am not in a position to specify ; but I trust that the whole question, in all its bearings, will receive full consideration from your Government, and that your conclusions may be communicated to me in time to allow of a regular system being adopted for the ensuing year.

From E. C. BAYLEY, ESQ., C. S. I., Secretary to the Government of India, Home Department, to the Chief Secretary to the Government of Fort St. George,—No. 3093, dated 28th June 1870.

Referring to the 5th paragraph of the despatch from Her Majesty's Secretary of State for India, to the Government of Fort St. George, No. 13, dated the 19th May 1870, regarding the course to be adopted with reference to the cinchona plantations on the Neilgherry Hills, whether they should remain permanently in the hands of Government, or whether they should eventually be disposed of, as in the case of the Government tea plantations, I am directed by His Excellency the Governor General in Council to request that no proposals for the sale of the said plantations may be made without first communicating with the Government of India.

THE "CINCHONA EXCELSA."

Mr. Broughton has made the following valuable communication to the Madras Government on an analysis of the bark of the "*Hymenodictyon excelsum*," commonly called the "*Cinchona Excelsa*."

Certain chemical 'researches' which I have made on an indigenous febrifuge have just been completed. I herewith beg to communicate the broad results of the inquiry according to G. O., No. 241, of 22nd January, 1870. The large forest-tree "*Hymenodictyon excelsum*" is a native febrifuge of considerable interest, not so much from its proved efficacy in medicine as from its history and botanical relations. It belongs to the same natural order as the true cinchona, and it so greatly resembles them in appearance that it was named for many years *cinchona excelsa*. Being thus considered a cinchona indigenous to India, very considerable expectations were entertained that it would be found at least a most valuable febrifuge if not an actual source of quinine. Writers on Indian *Materia Medica* allude in doubtful terms to the bark of this tree. Ainslie, speaking of the various substitutes that had been recommended for Peruvian bark, mentions the bark of *cinchona excelsa* as having been ascertained to possess powerful tonic and antifebrile virtues. O'Shaugnessy speaks of the bark as follows:—"The two inner leaves of the bark possess great "bitterness and astringency ; the bark is used by tanners, and "also as a medicine among the Hindoos in cases requiring "astringents. We have analyzed the bark of *cinchona excelsa* "from the Botanic Gardens of Calcutta, but could not detect "any alkaline ingredient : nevertheless, the trees of hilly "regions may furnish the valuable desideratum. The stamina "being contained within the tube afford much ground for ex- "pecting the discovery of a febrifuge alkaline in this species."

The writers of the New Indian Pharmacopœia mention the bark as follows:—"Considering the natural order to which "the tree belongs and the sensible properties of its bark, it is "not improbable that it may prove a valuable remedy. In all "future inquiries into the subject of Indian anti-periodics, this "bark should be one of the first to which attention should be "directed."

These circumstances, therefore, led me to make a full investigation of the chemical constituents of the bark, in the hope that I might be fortunate enough to discover a proximate principle, whose constitution might perhaps throw light on that of the true cinchona alkaloids. By the kindness of Lieutenant-Colonel Morgan, Deputy-Conservator of Forests, I obtained a supply of the fresh bark from the neighbourhood of Mudumullay in Wynaad. The bark possesses the remarkable property of being bitter when quite fresh, but this bitterness diminishes on keeping, so that after a few days, it has so decreased that the bark becomes nearly tasteless. After much labour I was enabled to obtain the principle in a pure crystalline state. A full examination and analysis of this substance showed me that it was identical with æsculin, the fluorescent and crystalline principle of horse-chesnut bark, discovered by Frischmom, and subsequently analyzed by Fromsdorff in 1835. The chemical details of the investigation and the data for this conclusion are scarcely suitable for detail here. They are to be found in the Pharm. Journal, Volume. IX., page 418. It is a somewhat singular circumstance that the bitter principle of this Indian tree should be the same as that of the horse-chesnut. It is also remarkable that the bark of the latter has obtained a certain reputation of being like the *Hymenodictyon* in India a good substitute for cinchona bark. Lindley and other authors mention that it has been recommended as a valuable febrifuge in intermittents. The very general impression that this Indian false cinchona contained quinine receives explanation from the properties of æsculin. The solutions of this substance like those of quinine are fluorescent, and are even more beautifully so. An observer, who did not examine the other very dissimilar re-actions of the two substances, might thus be misled by the coincidence of so peculiar a property. The loss of bitterness undergone by the bark on keeping is now also readily explained, since æsculin, in contact with decaying organic substances is decomposed, and produces a comparatively insoluble substance, *æsculetin*, which has but a slight bitter taste. Being informed that there were certain differences in the *Hymenodictyon* of South India, and that of the mountain ranges of Bengal, I was desirous of testing the latter before communicating my results as being perfectly general. By the kindness of Mr. C. B. Clarke I was supplied with some bark of the original *Hymenodictyon* bark of Roxburgh from the Calcutta Botanic Gardens. This enabled me to prove that there was no essential chemical difference in the bark of the Bengal tree and that from South India. The bark of *Hymenodictyon excelsum* thus differs entirely in its chemical character and products from cinchona bark. Containing no trace of quinine or related alkaloid, the expectations once entertained of its medicinal value appear to have little support in fact. As æsculin will eventually be both a dearer and less plentiful product in this country than the alkaloids of cinchona, and is certainly of inferior therapeutic value, it appears to me to be scarcely necessary to make any medical trials with it. Should it, however, be thought desirable to do so, I shall of course be ready to supply the necessary material in a pure state.

Order thereon, 30th June, 1870.—Mr. Broughton's experiment shows that the bitter principle inherent in the bark of the tree "*Hymenodictyon excelsum*" is identical with "æsculin," which is also obtainable from the horse-chesnut tree, but is of little therapeutic value where the alkaloids of Cinchona are procurable. The report of the Government Quinologist will be communicated to the Supreme Government and to the Inspector-General, Indian Medical Department, and a copy of it will be transmitted to the Secretary of State.

CINCHONA IN BENGAL.

From C. B. CLARKE, ESQ., M. A., Officiating Superintendent, Botanic Garden, *to* Secretary to the Government of Bengal,—(No. 188, dated Botanic Garden, Calcutta, the 29th April 1870.)

SIR,—I beg leave to submit the annual Report on the cultivation of Cinchona in Bengal, for the year ending 31st March 1870.

2. The three species of cinchona, of which the cultivation has been extended during the year are *C. Succirubra, C. Officinalis* and *C. Calisaya.*

The number of plants of these species in permanent plantations were as under.—

	C. Succirubra.	*C. Officinalis.*	*C. Calisaya.*
31st March 1869...	615,733	312 719	220
31st March 1870...	1,055,100	406,899	4,000
Increase...	439,370	94,180	3,780

3. The increase of permanent plantations of *C. Succirubra* and *C. Calisaya* has been made about Rishap at an elevation of about 2,500 feet, and at Rungbee, at an elevation of 4,500 feet.

4. The average growth for the year of the ten measured plants of *C. Succirubra* planted in March 1867 at Rishap, has been fifty-one inches, which fairly represents the unsatisfactory general growth of the *C. Succirubra* plantations.

5. The average growth for the year of the ten measured plants of *C. Officinalis* planted in October 1861 at Rungbee, has been twelve inches, which fairly represents the unsatisfactory general growth of the *C. Officinalis* plantations.

6. The average growth for the year of the ten measured plants of *C. Calisaya* planted in June 1867 at Rishap, has been fifty-two inches, which represents the average growth of all the plants in the plantation catalogued as *C. Calisaya.* But several important varieties are included under the name *C. Calisaya,* and the tree variety raised by seed in February 1867 and planted out in June 1867 had attained a height of 12 feet in October 1869, and a tree of this age, lately cut down has produced two pounds of dry bark.

7. As fully explained by Dr. T. Anderson in his annual Cinchona report in Bengal for the year ending 31st March 1868, the exceeding steepness of the hills, combined with the large rainfall, prevents any tilth on these cinchona plantations. The grass and low jungle having been cut close, the young cinchona plants are planted out in the permanent plantations. The weeds having been merely headed down, not eradicated, grow with great strength in a moist and warm climate, and continual scouring of the young plantations is necessary. This is the chief expense under this system of cultivation.

8. *C. Succirubra* and *C. Calisaya* (tree variety) grow so freely, that by the third year the young trees in the platations are all locked; they then crush the jungle beneath them, and can take care of themselves, and little further expense upon them is called for.

9. But *C. Officinalis* shews no inclination to become a tree at these plantations; it remains a shrub with very scanty foliage, and even on the plantations which are five years old, there continues the same expenditure in scouring.

10. *C. Succirubra* and *C. Calisaya* are planted about 1,200 to the acre; *C. Officinalis* about 4,000 to the acre.

11. In the fifth year of growth in permanent plantation an acre of *C. Officinalis* carries less than one-fourth the bark carried by an acre of *C. Succirubra,* and costs more than four times as much annual expenditure. Moreover, the *C. Officinalis* then appears disinclined to grow much larger, whereas *C. Succirubra* will clearly grow into a considerable tree

12. I calculate that at present it has not been discovered how to grow *C. Officinalis* to economic profit at Rungbee. I therefore stopped its extension in September last, though I was aware of the high quality of the grey bark. The present quantity is large for an experiment; and as an experiment, a few acres of *C. Officinalis* were planted in September last at a somewhat higher level (5,000 feet) than the main plantation. Also, in all the *C. Officinalis* plantations below the level of 4,000 feet (above which level *C. Succirubra* does not thrive), *C. Succirubra* has been planted between the ranks of *C. Officinalis,* and will doubtless soon overgrow it

13. The propagation and extension of *C. Calisaya* has been pushed as fast as possible. There is no difficulty in multiplying *C. Succirubra* and *C. Officinalis* by cuttings, but at Rishap there is found the greatest difficulty and uncertainty in multiplying *C. Calisaya* cuttings. Herr von Gorkom, the Director of the Dutch Government cinchona cultivation in Java, informs me that there the same difficulty with *C. Calisaya* is found; but on the other hand, Mr. McIvor says, that in the drier climate of the Neilgherries cuttings strike with perfect success.

14. Herr von Gorkom has sent me on several occasions most valuable packets of *C. Calisaya* seed, which germinated excellently; but if it could be discovered how to grow *C. Calisaya* by cuttings, I should greatly prefer that method, as by it I am sure of getting exactly the variety which I wish to propagate. Mr. McIvor is of opinion that not merely do the varieties cross freely, but that many hybrids are formed from different species of cinchona.

15. The most valuable bark known in the European market is the *C. Calisaya* bark: this species grows admirably at Rishap, and during the past year propagation has been almost entirely confined to it. In growing for profit, I believe it will ultimately be found advisable to grow one or two species only on these plantations: and that it is best to discard a species at once which is clearly inferior with us to *C. Calisaya* and *C. Succirubra.*

16. I have lately brought from the Neilgherries two new kinds of cinchona, one provisionally named *C. Mirabilis* of Mr. Broughton, the other *C. Pitayo.* In *C. Mirabilis* the bark contains the astonishing quantity of 13½ per cent. of quinine alkaloid and more than 9 per cent. of crystallisable quinine. *C. Pitayo* is a rich bark from Peru, a very high-level species, said to be found growing through the snow.

17. During the year both *C. Succirubra* and *C. Officinalis* ripened seeds: 5¾ ounces of the former and 5¼ ounces of the latter were distributed. One ounce of seed will raise nearly 50,000 plants.

18. There were distributed from Rungbee during the past financial year cinchona plants as under:—

	C. Succirubra.	*C. Officinalis.*	*C. Calisaya*
Mr. Wernicke, Kursiong ...	2,500	50	.....
Dr. Jameson, Saharunpore ...	1,500	260	500
Mr. Robson, Tukvar ...	.....	200	.....
Colonel Strutt, Kangra Valley	12	.....	.....
Total	4,000	522	500

19. The amount of propagation having been greatly reduced, a considerable number of the old frames and glass were sold. The receipts for the past year of the cinchona plantation paid into the Darjeeling treasury were as under:

	Rs.	a.	p.
Rent from land let	1,130	0	0
Price of a Wardian case	10	0	0
Sale of cinchona plants	156	4	0
Sale of old glass	187	8	0
Total ...	1,393	12	0

20. The total expenditure for the year on the Sikhim cinchona cultivations was Rs. 50,224, being Rs. 18,642 less than the estimate, and Rs. 18,040 less than that of the preceding year.

21. The *C. Succirubra* trees stand 6 feet in the plantations, and, as an experiment in January last, a small portion of the denser plantation was thinned by cutting down three trees out of every four. This was found to produce 300 lbs. of dried bark, worth about Rs. 250 per acre.

22. At the same time a considerable portion of the more advanced trees were pruned by the removal of the lower branches. There was stored from the thinnings and prunings in all 2,400 lbs. of dried bark.

23. The only private plantation in Sikhim, which (so far as I know) is extending cinchona planting on a considerable scale, is that of Mr. Lloyd and Colonel Angus, known as the Darjeeling Cinchona Association, and which occupies the north side of the Rungbee valley. This association now has about 500 acres of permanent plantation of *C. Succirubra,* and has cut a considerable quantity of three year old bark during the late cold weather, and sold it in the London market.

24. The Government cinchona plantation at Nunklow, in the Khasi Hills, was formed for the supply of cinchona plants to the planters in Assam and Cachar. Seed is now easily transmitted, and I believe the discontinuance of the plantation at Nunklow has been decided upon by Government.

Number and Distribution of Cinchona plants in the Government plantation near Darjeeling on the 31st March 1870.

Names of species of cinchona.	Number in permanent plantations	Number of stock plants for propagation.	Number of seedlings or rooted cuttings in nursery beds for permanent plantations.	Number of rooted plants in cutting beds.	Number of cuttings made during the month.	Total number of plants, cuttings and seedlings.
C. Succirubra	1,055,100	20,000	164,625	None	None	1,239,716
C. Calisaya	4,000	10,000	8,768	33,274	2,000	57,032
C. Micrantha ..	29,667	None	None	None	None	29,667
C. Officinalis, & varieties	406,899	10,000	10,000	30,753	Ditto	930,704
C Pahudiana .	5,063	None,	None	None	Ditto	5,093
Total..	1,500,758	40,000	370,325	340,178	2,000	2,262,212

C. B. CLARKE,

Offg. Supdt. Botanic Garden, and in charge of Cinchona cultivation in Bengal.

COFFEE.

The season reports of Coorg for the last month state that the borer continues his ravages, and that it is probable that some of the estates in that province will have to be abandoned.

To the Editor of the Ceylon Observer.

MANURING OF COFFEE ESTATES.

P, A., Kandy, 23rd June, 1870.

DEAR SIR —At the request of the Committee of the Planters' Association, I beg to forward, for publication, two letters from Mr. Swan, inviting information on the subject of the manuring of estates with poonac and bones, as also with woodashes. As the subject is of great importance to the planting community the Commitee are hopeful that a good deal of valuable information will be elicited.

I need hardly say that I shall be glad to receive any letters that may be sent me in reply to Mr. Swan's, or on any subject of interest to the planters, and will lay them before the Committee, who will, in due course, authorizes their publication, unless specially requested not to do so.—I remain, dear Sir, yours faithfully,

H. BYRDE,
Secretary.

The Borders, 21th April, 1870.

MY DEAR BYRDE,—There are two questions (both connected with manuring) which are interesting me much, and on which I should be glad to profit by the experience of others; and I have no doubt many planters would be glad to get information on these points. They are, to what extent and in what proportions, can bone-dust and poonac be applied without stimulating the trees injuriously? Bone-dust alone has, on the Borders, put on one of the finest crops I ever saw.

Secondly.- What *proved* good effects in increased bearing have resulted from the application of wood-ash? I am applying this considerably, but should like to hear definite reports of the benefit wrought by it, elsewhere. It is a cheap manure—easily prepared and easily applied.

Yours very truly,
(Signed) W. A. SWAN.

The Borders, 23rd May, 1870.

TO THE SECRETARY OF THE PLANTERS' ASSOCIATION.

DEAR SIR—I doubt if I shall be able to attend the meeting of Committee to-morrow, so I send in herewith a few notes of what I have observed of the action of the manures specified.

Bone-dust and poonac, combined, I have tried largely on one estate. The mixture does not seem to stimulate injuriously, but yields a fair amount of both wood and crop. About 1 lb. a tree was applied. Bones alone (1 lb. a tree) seems to put on a still bigger crop. On a field of fine large trees manured with bones alone last year, a crop of 11 to 12 cwts an acre has been brought out, nor do the trees appear as yet, to be suffering from it. I consider the crop is nearly double what it is on the unmanured portions of the same field. How bone-dust would answer, alone, for a succession of years, on small trees, I am not in a position to state, but its good effect in bringing out crop on large, but sluggish, trees is undeniable. Woodash alone, 2 measures to a tree, and on one field 2 lbs. to a tree, has produced a very fine crop, giving perhaps 4 cwts. an acre additional. In company with two other old planters, I examined, some days ago, a field so manured; we estimated the crop is at least double that on an *adjoining* field, unmanured. Say, in the one case, 8 to 9 cwts. an acre, in the other 4, manured about a year ago. As bone-dust alone, and wood-ash alone, produce such good effects, I do not think I can go wrong in mixing them; I intend to apply this season (especially on all my high fields, where the crop is not in proportion to the fine large trees) over 30 tons of bone-dust, in the following proportions: ½ lb. bone-dust and one measure (heaped) of wood-ash to a tree. I believe this mixture has also the approval of our late Chairman, Mr. Wall, who has studied the subject of manures (especially of the two specified) most carefully. But I shall be very glad to learn any information on the subject that may be elicited at the meeting to-morrow.—I am, yours faithfully.

(Signed) W. A. SWAN.

P. S.—I pay 6d. a bushel for wood-ash well sifted. I put down the crop on the field manured with bone-dust at 11 to 12 cwts. an acre; but another old planter estimates it still higher.

COFFEE PLANTING—SHADE OR OPEN?

To the Editor of the Madras Mail.

SIR,—I observe it stated in a recent issue of your paper that at a late meeting of the Coorg Planters' Association one of the members raised the question whether the encouragement of charcoal shade on coffee estates was advisable, to which the President replied that he "he was satisfied that coffee planted under shade would not yield sufficient returns." In addressing you I desire to court further discussion on this important point, as it is obviously advisable that the matter should not be allowed to rest thus, but that others who have means of supplying information should come forward and give the public the benefit of their experience.

On one point all are agreed—that next to a certain amount of elevation moisture is essential to the support of the plant: thus its thriving condition in the open in Ceylon depends mainly on the frequent showers with which that island is favored, and so also in high elevations of 4,000 to 5,000 feet it benefits from the greater amount of moisture in the atmosphere, although some men of experience consider that even there light shade and irrigation are of advantage, as a return for the exhaustion of the soil. Evidently, however, a number of Coorgites living in a different climate are still persuaded that the plan which succeeds elsewhere is applicable to their land, notwithstanding the long and trying hot weather to which their plants are subjected. But something indeed must be rotten in the state of Denmark, when when we find the Superintendent stating in his last report the melancholy fact that many of the estates must shortly be relinquished on account of the borer: and no wonder, since the soil has lost its original virtue consequent on years of drought, and from not a vestige of vegetable mould being left. Therefore, it is very plain that the only hope of recovering estates is by the immediate planting of shade, which has already been the saving of some bored estates. To answer the inquiry put at the meeting, I may take that charcoal shade is looked upon as a poor makeshift till plants of an approved description can take their place The scanty foliage affords little nutriment to the soil, and when the tree dies out, which it does wholesale, the rot affects the coffee plants all round. Now in lieu of the ancient forest trees, what better substitute can be provided than good fruit trees, which, while they yield shade, will bring in themselves some return both in fruit and in the vegetable mould supplied to the coffees trees The jack can be raised in any number and at little trouble or cost from seed put down all over the estate, and in six years will be 20 ft. high. Mangoes, Shevaroy pears, cinnamon, limes, oranges, guavas and loquats might also be added with advantage · also cinchona, nutmeg and cocoa were Government to lend their assistance. The pepper and vanilla vines are likely also to prove of use. The worst of it is that novelties have little attraction, and few are to be met with who will turn aside from the *beaten* path. Yours faithfully

A CONVERT TO SHADE.

To the Editor of the Madras Mail.

SIR,- I have just read the letter of "A Convert to Shade" in your issue of the 7th instant. I quite agree with the writer thereof that the subject of shade or no shade should be thoroughly ventilated, and a better plan than by means of the public press cannot well be conceived for more reasons than one. An important reason is given in fact in this very letter of "A Convert to Shade." What I allude to is, that in discussing the question of the advisibility of one mode of cultivating the coffee trees the writers of letters to public prints frequently exhibit a want of real knowledge on other points in connection with the subject besides the one immediately under discussion, and give an opportunity to others to point out their errors and put them right. The writer of the letter in your issue of the 7th is open to one or two corrections, I think.

With regard to his first axiom, if I may so call it, viz., that the necessity for moisture is secondary to that of elevation, I think he stretches the point too far, and that he will find, if a vote were taken, that sound planters would agree that moisture is absolutely more necessary than elevation, and that good coffee could be grown on the sea-coast itself provided you had the *soil and moisture.* Therefore, I think, we may assume that moisture comes before, and not after, elevation.

Again, at the end of the same para: I quote "light shade and irrigation are of advantage, as a return for the exhaustion of the soil."

Now granting for the moment that shade trees do give something to the soil, I pass on to the real weak point of the para: viz., the idea of irrigation returning anything to the exhausted soil. It being a well known fact, to any planter of the least experience in such matters, that if sand planted with coffee or anything else is irrigated in the ordinary manner with only water, the exhaustion of the soil is greater than if only the ordinary crop had been taken off it and *must be manured or go out.* If your correspondent meant irrigation with liquid manure he should have said so, and even then he will find that the energy imparted to the coffee tree by the moisture in the liquid manure will enable it to take nearly if not all of the fertilising properties contained in the liquid, so that what remains only goes to supporting the tree during the remainder of that season, and fresh manure must be applied the next. Your correspondent is right in one point, viz., that charcoal is a very poor shade alone, but I'm not sure that it is not quite sufficient in places, where the

forest has been a little too much cleared and a trifle more shade is found to be required.

A dead charcoal certainly does play mischief, and therefore if for that reason only, should be got out of the ground, as soon as other shade begins to be of use from its height.

But I beg to differ as to the jack being raised in any number or with little trouble. Try it in a place where cattle are liable to get into the estate and then see, or where even there are many spotted deer or jungle sheep.

Then, again, I think the shade of the jack is *too dense*. I may be wrong, of course, but fancy a lighter foliaged tree would be better. Cinnamon, I can't agree with, it being a well known fact, that if a cinnamon tree dies in an estate the whole of the coffee for some distance round dies also.

The Vanilla *Vine*, allow me to inform your correspondent, is, unless I am very much misinformed on the subject, an orchid.

And now for the subject of shade. Does it pay?

Munzerabad is the only coffee growing district, I believe, where shade has been recognized as a *sine qua non* of coffee planting. By Munzerabad I would be understood to mean that taluq and those in immediate contiguity to it, such as Builoor, Wastara, &c. There for some years coffee was grown under shade by the old hands, such as Cannon, Green and others, and they made it pay. Then came a new King in Egypt, who knew not Joseph, or the benefits of shade planting, and began felling every thing, and so successful for a few good seasons did the, to these parts, new system appear, that nearly every body followed suit. Some, however, early took alarm and allowed secondary jungle to spring up for shade, and to-day the proprietors of those estates may thank their stars they did so. Others kept on following the open system, and all went well till the borer in one very dry season shewed how it could spread under favourable circumstances. Field after field of coffee had to be abandoned, till it was recognized finally that shade and shade only in a climate like that of Mysore would do for coffee.

Then came the question raised by your correspondent. Does it pay?

Now compare the two systems.

Coffee in the open, must, to do any good, be constantly kept weeded on account of the deteriorating nature of the weeds which spring up if this is not done. Coffee in the shade rarely requires more than two weedings in the year, and one of these may be done with a grass knife merely cutting down weeds and creepers. Coffee in the open will cost on an average Rs. 300 per acre to bring it into full bearing; coffee in the shade, notwithstanding the fact that it does not give full crop till its fifth year, may be opened and kept up for that time for Rs. 150 per acre, or thereabouts. But the parties in favour of open planting point to their returns when they do get a crop. Good coffee in shade gives in Munzerabad and the neighbourhood an average outturn of 2¼ cwts. per acre. This brings say Rs. 90. The working expenses, all told, having been about Rs. 50 during the year.

Does coffee in the open pay better?

Coffee in the open of course will pay more on the same extent of land, but as far as my experience goes requires a far larger capital to open and work it, and must have more superintendence A good man will look after twice as much under shade, as he will or can do in the open. The only drawback, as far as I can see, to shade planting is, that where a running fire has wilfully or by accident got in when clearing away the underwood, the large forest trees, though they do not at the time appear to be injured, keep falling year after year, causing great gaps in the shade and doing more or less injury to the coffee growing under them The best way to remedy this is, I imagine, to proceed, as described in the Revd. G. Richter's season report for June, viz., clear as little as you possibly can so long as you are able to line and hole; then after the first momoty weeding at the end of the monsoon, put in a gang with axes and billhooks, and cut down as much of the superfluous shade as may be necessary, lopping the same up small and laying it in rows between the coffee plants. It will generally be found, I think, that by this system, the whole of the shade necessarily to be removed cannot be accomplished in one season as the cut-down trees take up too much room on the ground; but this is no harm, as it can be done over again the following year, when the first cuttings are decayed, and the young coffee trees more prepared to stand a further amount of sunlight.

Many planters in Mysore are, I think, keeping far too much shade over their new clearings, but this is a fault on the right side which can easily be remedied as compared with having too little shade. However, I would draw attention to one point, viz., that where too much shade has purposely been left at first, the superfluity should be got rid of as soon as possible, as it stands to reason the felling of moderate sized jungle trees even on the top of good sized coffee must do some harm, whereas if felled whilst the coffee is in its first year it does very little harm indeed, if any. Mr. Richter in his report would seem to hint that coffee ought to be grown under shade, in certain climates, to keep away the borer. If this is his meaning, I would warn him that it is a fallacy. The borer has attacked and will attack trees under the densest shade. Shade is of more use in dry climates for saving the crop from being burnt off in a bad season, than for any other purpose, though it is of use also as a secondary preventive of the borer, in this way, that where the coffee tree has reached maturity under good shade *and is then* attacked by the borer, it is not so liable to be permanently injured.

This is one point, however, in connection with shade planting to which I wish to draw attention and if possible get some one to find a remedy. At this season of the year, it is a painful fact that many coffee trees under shade become affected by a kind of blight, which rots the leaves and a good deal of the crop. Some think this is attributable to the drip of water from the shade trees. It may be so, but for my own part I cannot help thinking it is owing to a want of drainage. It may be as well to remark that I don't know of a single estate under shade that is drained so that experiment has still to be tried unless there is a shade estate in existence that has been drained. I have never seen the same thing occur in the open, even on undrained estates, but that I imagine would be, because the sub-soil drainage on land with no forest trees standing would be more rapid than on land where shade is left standing. That the surface drainage or wash is greater in the open is an undoubted fact I take it. However I'm not at all certain on this point. I would invite the opinions of older heads than that of—Yours truly,

July 12th, 1870. NOVICE.

ORER AND BUMPER CROPS.—COORG.

The Rev. G. Richter in his Coorg Season Report, for the half year ending 30th June 1870, observes that conflicting as the statement may appear its correctness can hardly be questioned, that never before, has the devastation on plantations by the coffee-borer been more manifest than now, and that the expected crops all over Coorg will be larger than in any former year.

"When in my last report I stated, that the borer was then less spoken of because its disappearance was looked upon as a certainty, the last assumption was based on an illusion, and planters, who then made light of the borer question, are now convinced by an unpleasant ocular demonstration that, whereas in past years some only suffered severely, now all may be liable to a like fate; but whilst some planters take the gloomiest and most desponding view of coffee cultivation, others are as hopeful as ever, though with considerably lowered expectations, taking into account the heavy income-tax and land assessment.

"Owing to the borer-beetle's habit of depositing its eggs into the bark's natural fissures only, which are most prominent on the lower part of the stem, old trees are chiefly tunnelled near the ground, and down to the very roots and thus hopelessly ruined. Hence the alarming loss on old estates. On a small scale it will prove both practicable and efficient, to rub the bark of the coffee stem and free it of all crevices, so as to deprive the laying beetle of any hiding place for its eggs, and a subsequent washing of the stem with carbolic acid or coal-tar would answer the purpose still more completely. Even 25 acres, treated in this manner, would prove more remunerative than 100 infested by the borer. Owners of young estates may thus, if not entirely escape, yet control, and repress the pest, if at the same time from the beginning every bored tree is mercilessly removed and destroyed.

"It is a remarkable fact, that the Coorgs, who, alarmed by the appearance of the borer, abstained of late years from extending their plantations, have this season entered with new energy upon the cultivation, fully determined, however, to plant only under jungle shade without burning the cut underwood and without spending more money than actually necessary for clearing and planting, which in their case is very little indeed.

"Near Nalknad there is the largest native plantation, Sudamane-Kadu, extending over 300 acres, thus got up; it is now five years old and was, when I saw it in March, in a most promising condition, without borer, and yielded its owners, comparatively speaking, a much larger profit, than any European has yet derived from coffee planting in Coorg. This example may commend itself as worthy of imitation especially to planters of moderate means.

"Those interested in coffee will have observed the curious phenomenon, that unsuspected, yet bored trees show, chiefly after the early showers, sudden symptoms of disease. The cause may perhaps be thus explained:—with the spring rain the circulation of the exuberant sap is revived and the larvæ which during the dry weather directed their tunnelling operations towards the most interior of the stem are now by an unerring instinct led to return to the still juiced outer wood, round which they work close under the bark, and cutting off the ascending flow of the sap, thereby kill the trees as soon as they have completed one circuit, which may be done in a single day.

"It appears from a communication from Western Africa that on the Gold-coast, near Acropong, a small coffee plantation was opened out about ten years ago, an insect—a grub—is now doing the same work of destruction as with us, and there is little doubt but that our notorious Xylotrechus will prove the culprit."—*Madras Mail.*

COFFEE.

To the Editor of Allen's Indian Mail.

SIR,—It is fully admitted that the consumption of coffee is gradually falling off in England; I would venture to point out what a disadvantageous position it occupies in comparison with tea. As Mr. Crauford stated, with perfect correctness, in the debate on the last Budget in the House of Commons, that whereas, in the purchase of tea, a highly manufactured article was bought, which might at once be consumed, in the case of coffee, the article was bought in a raw state, and had to go through a considerable amount of preparation before being brought into use.

Take the case of coffee at 80*s.* per cwt., this would be per pound	8 57*d.*
Duty at 3*d.* per pound	3*d.*
Roasting at 3*s.* per cwt. would be per pound	0·32*d*
	11·89*d.*

112 pounds raw coffee at 11·89*d.* per pound is equal to £5. 10*s.* 11 68·100*d.*

As an cwt. of raw coffee produces only, upon an average, 92 pounds, when roasted, the cost per pound, after roasting, would be equal to	14·47*d.*
The first cost having been	8·57*d.*
	5·90*d.*

An advance of 5·90*d.* upon 8·57*d.* would be 68·84 per cent.

Coffee would therefore cost the consumer in consequence of the duty being imposed upon it, when raw, 68·84 per cent. advance upon an average on the first cost in bond, and it therefore follows that the grower of tea to the extent of the loss and charge attending the roasting of his produce, and that consequently, if it be desireable that these two articles should be subject to equal burdens, the grower of coffee has a claim for relief to the extent indicated. It is to be hoped that the Chancellor of the Exchequer may see fit to take the facts submitted into favourable consideration. I may add that cocoa has for a considerable period only paid 1*d.* per pound duty. Sago-flower and other untaxed compounds, to increase its consistency, are added, and the article is sold retail at about 6*d* per pound.

The coffee grower would, however, be at once relieved to some extent, and the consumer also much benefited, by an alteration in the existing law, which regulates the retail sale of chicory. At present, I believe, permission is accorded to retail grocers to supply packets to the public, labelled coffee and chicory, and this procedure, practically, extends official sanction to the adulteration of the former, to the loss of all concerned, save the dishonest retailer, whose illegitimate gains are thereby very large. As has been observed by a correspondent of great experience, let retail grocers sell coffee and chicory separately, and mix them under the eye of the customer, if so desired. The increased duty on chicory is of no avail, because this article becomes then, in turn, the subject for fraud. If the Chancellor of the Exchequer would reduce the present duty on coffee from 3*d.* to 1*s.* per pound (the total amount of the existing duty is under £400,000) and an alteration be made in the law, as to the retail sale of chicory, a great and early increase in the consumption of genuine coffee might reasonably be expected, which would most probably supply the temporary loss to the revenue involved in the reduction of duty, while to the poorer classes the boon would be invaluable, as they would then be able to drink one of the most exhilarating and strengthening of beverages, which would prove a very powerful rival to the poisonous dram and well-drugged beer.

Dr. Hassall tells us that the article called coffee, sold at the petty coffee shops, consists chiefly of burnt liver!

Finally, a reduction of duty would be also of the greatest value to our possessions in the East and West Indies. One of the most prosperous of our colonies, Ceylon, by the indomitable energy and perseverance of her planters, aided by the liberal action of the imperial and local Governments, has become, I allude especially to the interior of the island, a splendid and extensive coffee garden.

Should, however, unfortunately, the consumption of coffee continue to fall off, and coffee planting cease to be remunerative, the condition of that magnificent island, now so flourishing, would, it is apprehended, rapidly retrograde, financially and otherwise.

Having passed the best portion of my life in the public service of Ceylon, and having been for some years in civil charge of the Central Province, in which the greater portion of the coffee plantations are situated, and having afforded from time to time all the official aid in my power as the chief executive authority of the province and a member of the Island Legislature, to measures calculated to develop its resources, I am, naturally, sincerely desirous of seeing the prosperity of the colony continued and extended, the more particularly when such prosperity must be considered to be in strict accordance with, and not in antagonism to, the best interests of the mother country.

I remain, yours faithfully, E. RAWDON POWER,
Retired List, Ceylon Civil Service.

Tenby, South Wales, May 31 1870.

COORG PLANTERS' ASSOCIATION.

Proceedings of a Meeting of the Coorg Planters' Association, held at Mercara, on Friday the 3rd of June, 1870.

President—Captain Ralph Taylor.

Messrs. Donald Stewart, C. Grant, W. Wright, J. Finlayson, A. Stephen, J. Russell, H. East, J. Brewer, W. Scobie, G. R. Evans, J. H. Morgan, Henry Mann, A. R. Alston, H. L. Johnstone, and the Rev. A. Fennell.

The President said that it was ommited to be recorded in the votes of the last Meeting that he had mentioned publicly on that occasion, that in order to test the correctness of those principles which he had already laid before the Association, and on which he based his conviction, that the price of food and and necessaries of life for native coolies having fallen so low as to allow of a cooly living on 2 rupees a month, the time had arrived when proprietors might with safety and justice reduce the rates for labour on their respective estates, he, the President on one of his estates had given notice to the Maistries who were gone to their country, that on their return the highest rate for an able bodied cooly would be 5 rupees a month, and the rest in proportion. Capt. Taylor hoped his neighbours and others would follow this example, so that it might become general; and he intimated his intention of informing the Association of the result of his experiment.

The President read the Petitions to the House of Commons on the subject of the Income Tax and Home duty on coffee, and it was resolved that they be printed and circulated with these proceedings.

To the Honorable the House of Commons of great Britian and Ireland in Parliament assembled:

The Humble Petition of the Coorg Planters' Association in India

RESPECTFULLY SHEWETH:

1. That your Petitioners are producers of coffee, and in regard to the duty of three-pence per pound on coffee imported into London, your petitioners beg to draw the attention of your Hon'ble House to the continued depression of the coffee trade and interest for many years past, and the falling off in Home consumption, exportation, and price, owing to the high rate of import duty, while the price of labor in the producing countries has increased year by year.

2. That in comparison to the article of tea which as a manufactured article is charged six-pence a pound, the rate of three-pence a pound upon coffee in a raw state cannot fail to be considered unnecessarily high, when it is remembered that, while the value of tea, manufactured and ready for consumption, at least is 150 shillings per cwt. that of raw coffee is only from 60 to 65 shillings for the same weight, which in the ensuing process of preparation for consumption is reduced by 20 per cent., and, therefore, the duty of three-pence a pound, or 28 shillings for one hundred weight raw, becomes a duty of nearly 34 shillings for every hundred-weight of coffee ready for consumption.

3 That the reduction of the duty on tea to six-pence a pound, caused an increase in the consumption of that article from 62 millions of pounds in 1868, while on the other hand the consumption of coffee has grdaually decreased from 37 millions in 1854 to 30 millions in 1868.

4. That notwithstanding a decline in consumption, the importation of coffee into London has increased by the extension of the cultivation in new countries, and your petitioners believe, that the pressure of the heavy duty upon raw coffee, is the cause of an extensive mixing of chicory with coffee powder, and the main reason why the habitual use of pure coffee is not more appreciated by the laboring population of England; and yet there is every ground to believe, that the genuine article, if only cheap, would speedily find favor, and its enhanced consumption prove advantageous both to the Government revenue and the producer.

5. That on the 20th March 1870, the stock of coffee in London was 1,260 tons *more*, than on the same date in 1869. The home consumption in the first twelve weeks of this year was 450 tons *less*, than the year before, whereas the quantity exported had decreased by nearly 2,000 tons; and in consequence of the increased import duty on coffee lately decreed by the North German Customs' Parliament, it is to be feared, that the figure on this head, will be still further reduced.

6. That all the above facts clearly show, that the coffee trade, interest, and production require relief, and your petitioners, therefore, humbly pray, that your Hon'ble House will take into your consideration the propriety of abolishing, or at all events reducing the import duty upon coffee.

And as in duty bound, your Petitioners will every pray.

(Signed) RALPH N. TAYLOR, *President.*
HENRY MANN and DONALD STEWART, *Members.*

Mercara, 3rd June 1870.

To the Honorable the House of Commons of Great Britain and Ireland in Parliament assembled :

The humble Petition of the Coorg Planters' Association in India.

SHEWETH,—

1. That your Petitioners form a body of Planters, both European and Native, all more or less interested in the cultivation of coffee in the Provinces of Coorg, and your petitioners respectfully represent to your Honourable House, that the enterprise in which they have embarked has become so over-burdened with taxation, both in this country and in England, in addition to being subjected to seven years consecutive bad seasons, short crops, and low prices, that the whole capital of your petitioners sunk in the cultivation of upwards of 50,000 acres of land, as well as the revenue derived by Govt. from the same, is in danger of being irretrievably lost and sacrificed.

2. That the chief burdens which fall heavy on the producers of coffee in this country are:

(*a.*) The assessment on his land whether cultivated or not.

(*b.*) The Home duty upon coffee in London.

(*c.*) The Income Tax.

3. That your petitioners have already addressed a memorial to Her Majesty's Government of India on the subject of coffee land assessment and a separate petition to your Hon'ble House on the subject of the duty on coffee, and they desire now respectfully to represent to your Hon'ble House that in consequence of either the want of experience or incapacity of those to whom has been entrusted the care of the Finances of India an imaginary deficit has been declared in the Budget of 1870-71, the Government of India has been induced to pass a Bill in a hasty and unconstitutional manner ; Members of the Legislative Council actually voted for the Bill against their own convictions ; and your petitioners in common with all Europeans and all servants of Government, whether Civil or Military, have been most unwisely and improperly subjected to the imposition of a war tax amounting to 3½ per cent.

4. That your petitioners respectfully protest against a system of legislation in matters of finance, which admits of a Finance Department, or Minister, whether competent or not, rendering abortive the Legislative Council of India, and causing precipitate and ill-considered action on the part of of the Executive Government, to the prejudice of the whole people of India.

5. That your petitioners maintain that by Sir Richard Temple's own showing, there was no necessity whatever for an Income Tax of 3½ per cent. ; that the deficit created in the Budget, is caused by extravagance of Admmistration and excessive expenditure both in England and in all Departments of Government ; that India possesses resources, such as a successive duty, a tax on tobacco, or a tax on marriages, of which the Finance Department professes to have no knowledge, and that the Income Tax in India, at any rate, is partial in its operation, unjust to those whose incomes are known, not justified by the figures and facts of the Budget of 1870-71, and has been imposed without proper discussion and debate in the Legislative Council of Her Majesty's Government of India.

6. That your petitioners, therefore, humbly pray, that your Hon'ble House will be pleased to advise Her Gracious Majesty the Queen, to appoint a Royal Commission, to enquire into the Finances of India, with view to the abolition of the Income Tax, the reduction of wasteful and excessive expenditure, and a restoration of equilibrium by the soundest rules of Finance.

And your petitioners as in duty bound will ever pray.

(Signed) RALPH N. TAYLOR, *President.*
HANRY MANN AND DONALD STEWART, *Members.*

Mercara, 3rd June. 1870.

Mr. Russell brought to notice the danger arising to coffee estates on the side of the main road from the practice of post runners carrying large flaming torches along the road, during the dry weather especially, and that the Association should address the Post Master General on the subject with a view to obtaining the substitution of a small lantern for the present torch, from Mercara to the boundary of Coorg.

Seconded by Mr. Stewart and carrieded.

With reference to the returns of vital statistics called for by Government, it was resolved that the Association, should communicate with the Superintendent, Coorg, through the President, in order to point out certain modifications in the returns which would be advantageous to the object in view, and save both labour and expence.

A discussion arose on the subject of cultivation of coffee under shade, and Mr. Stewart said he would be very glad to hear the practical opinion of Planters regarding shade, specially what is called charcoal shade, which he had heard once highly praised, and how it was abused on all sides. Mr. Mann said he had always been against shade, because he had always observed that the coffee tree, bore heavily in the open, while on the other hand it bears little under shade, and he did not believe that fruit of any description, would succeed well in the shade of trees. After a long discussion on this subject, Mr. Johnson suggested, with reference to the memorial to the House of Commons on the subject of reducing the coffee duty, that the coffee brokers in London be requested to join in the movement ; and the President said that Mr. Mann, would be furnished with a copy of the memorial to take to London for the purpose of informing the brokers of the action taken by this Association in the matter.

The President gave notice that unless necessity arose, he would not call a meeting of the Association, until after the monsoon, but due and public notice would be given hereafter of date and time of next meeting

(Signed.) RALPH N. TAYLOR, *President.*

POPULAR FOOD ANALYSIS.—COFFEE.

Chicory, the chief adulterant of coffee, is the dried and roasted root of the common endive, so dear to the lovers of winter salads, as a substitue for lettuce. This plant is to be seen growing wild in many of our hedgerows, and belongs to the botanical order of *Composite*. It is very similar to the common dandelion, which belongs to the same order, but it is readily distinguished by the colour of the flower, which is blue, while that of the dandelion is yellow. The chicory root also bears a great resemblance to that of the latter plant, being, like it soft, and exuding when squeezed the milky juice so well known to all of us who have enjoyed, as children, the pleasure of wandering in the fields.

Our wild English plant is not, however, so much esteemed in the market as the German and French varieties, which are specially cultivated for mixing with coffee. The following analysis will show the composition of chicory root in its dried state, and also that of its ash, to which we shall have occasion to refer hereafter.

I.—*Dried Chicory.*

Moisture	17·480
Gum	20·416
Sugar	11·166
Extractive (bitter)	18·000
Fat	1·066
Woody fibre, &c.	29·202
Mineral matter.	2·670
	100·000

II *Composition of the Ash*

Potash	0·672
Soda	0·408
Lime	0·408
Magnesia	0·250
Iron	0·185
Sulphuric Acid	0·284
Chlorine	0·127
Carbonic Acid	0·078
Phosphoric Acid	0·303
Sand	0 279
	2·670

From these results it is evident that this plant contains no principles which would render it to any extent a useful substitute for coffee, as we look in vain for the *caffeic acid*, or the *theine*, already shewn to exist in the latter article. But what shall we say if, besides containing nothing valuable, it should be proved to be positively injurious when freely consumed ! Let us hear Dr. Johnston on this subject :—"Taken in moderate quantities, the ingredients of chicory are probably not injurious to health, but, by prolonged and frequent use, they produce heartburn, cramp in the stomach, loss of appetite, acidity in the mouth, constipation with intermittent diarrhœa, weakness of the limbs, tremblings, sleeplessness, a drunken cloudiness of the senses, etc. At the best, therefore, chicory is a substitute for coffee to which only those to whom the price is an object ought to have recourse." To these remarks we would add, that we prefer not being poisoned even at the most moderate cost ; and in cases "where price is an object," we would advise the public to abstain from paying anything at all for such a filthy beverage, as chicory-coffee undoubtedly is, to persons of unvitiated taste. We might bring up many other charges against this nasty infusion, but we will only give one more, and that is a dictum of Dr. Boer's, to the effect that the continual use of chicory causes *amaurosis*, and consequently blindness. Since giving our coffee results last month, we have been seriously remonstrated with by a grocer, who declares that he and his brother tradesmen put nothing else into their coffee but chicory This is, however, only a repetition of the old story, told long ago by Dr. Pereira, who said that "while the grocers, on the one hand, cheat their customers by adulterating coffee with chicory, the chicory dealers in turn cheat the the grocers by adulteraring chicory." Whether the grocers are, or not the chief sophisticators, is comparatively immaterial, for the fact remains that the public continue to suffer. The grocers cannot, however, be held innocent, as they buy *ground chicory*, which article *they can purchase at a cheaper rate than they could the dried root itself* ; and of what then do they in their innocence, imagine it to be composed ? Out of twenty samples of ground chicory purchased lately in London (but of the analyses of which we have not space at present to give details) more than half were found to be adulterated.

We now turn to the detection of the adulterations of coffee. Many simple processes have been from time to time proposed, to ascertain whether this article be pure or not,

without saying exactly what is the adulterant; and of these we subjoin a few.

1.—Take the packet of coffee as it comes from the grocer's in your hand; and, having given it a good squeeze, lay it gently on the table, and open it. If the contents be found adhering together in a cake, the sample is not pure.

2.—Drop gently a teaspoonful of coffee on the surface of a glass of water, and observe if any of it sinks immediately; if so it is bad. Let the whole be now slightly stirred, and notice the colour imparted to the water; if this be a decided brown tint, then the coffee is adulterated, most probably with chicory or burnt grain of some kind.

3.—Make an infusion of the coffee in the usual way, pour some into a cup, and let it stand till cold; if a skin or scum should form on the surface, there is reason to suspect baked animal matter, such as horses' liver.

If, however, we seek methods of discovering the precise adulterants employed, by means of chemistry, the subject becomes at once much more difficult, and the result not always reliable.

As in this world partisans can be found for almost any dogma, no matter how ridiculous it may be, provided that it is only asserted loudly and unblushingly enough,—so our grocer friends have, by dint of continual asseverations, got a large number of people to positively believe in chicory-coffee, and call this filthy root an improvement! The terrible absurdity of this idea must be manifest to any one who glances for a moment at the subject. Chicory is a root, while coffee is a seed. The former, buried in the ground, deprived of the influence of sunlight or air, only contains a few of the crudest vegetable matters, so to speak; while the latter, flourishing under a tropical sun, has all those complicated and refined organic principles, such as alkaloids, for the formation of which the action of light, etc., appears to be absolutely necessary. The advocates of chicory adulteration know well that it produces a sensation of oppression in the stomach, and they take advantage of this to pretend that chicory-coffee has strength, and are believed by ignorant persons who cannot discriminate between that quality and indigestion, and whose palates have long since been thoroughly vitiated. Another cry of these apologists for adulteration is, that thanks to chicory, coffee is brought down within the means of the poor who otherwise could not afford to drink it. This is very like bringing down champagne for the use of the poor, by adding three-fourths of small beer, only that in this case two good things would be spoiled, whereas chicory is too nasty to spoil at all. The simple fact is that, as a rule, the poor get little or no coffee in their shilling mixture, the grocers get that sum per lb. for a substance which would not fetch 6*d.* per lb., if it were sold in its own name. But we live in a country of "vested interests," and, as the grocers have a "vested interest" in this adulteration, it is temporised with, and was for a time actually legalised, under a trifling restriction which was seldom even complied with.

In conclusion, we have simply to ask that the public should somewhat bestir themselves, and apply the spur to our tardy legislators, so that it shall be made a misdemeanour to sell, under any circumstances, a mixture of chicory and coffee. This would not hurt any of the chicory epicures, as they could still buy their succulent mouthful in a separate form, while it would protect the great mass of the community from a daily perpetrated fraud. Our authorities every now and then make a spasmodic dash at something, and lately their hobby has been "tea dust" and "redried leaves;" but after all, even with the terrible addition of their frolicsome Chinese pigs, about which we have heard so much during the last few weeks, the sale of such commodities is no worse than the daily winked-at traffic in chicory-coffee.—*Food Journal, April* 1.

J. Mutter, Ph. D.

COFFEE IN TRAVANCORE.

About 2,100 acres of forest land fit for Coffee were advertized for sale in the year 1868-69. Of these, 700 acres were taken up. Regular title deeds were issued to the grantees of coffee lands in 19 instances.

The number of coffee estates owned by Europeans at the end of the year was 50, containing in the aggregate about 14,700 acres. This is, of course, apart from the estates and gardens owned by natives both on the hills and in the plains.

The total tariff value of coffee exported in the year was about 2,52,000 Rs.; but this speculation is yet in its incipient stage of development.

Dimboola, Ceylon, July 1870.

There is no abatement in the expenditure in manuring of coffee estates nor in the interest manifested in the best means of effecting this desirable end. Some further interesting facts have come to light: the results of experiments on the estates under the direction of one leading Firm are unfavourable to the idea of renovating old, worn-out estates by means of artificial manure, and preference is being given to a system of preparing a substantial bulky compost on the estates mixed with a small proportion of poonac and perhaps bone-dust. On the other hand sombreorum has given most important effects from its application throughout the Kallibokka Valley, and managers in that direction, formerly sceptical, have now arranged to give it a trial on an extensive scale. In one case where a very experienced, observant planter has applied it with marked benefit, the *modus operandi* adopted differed considerably from that recommended by Mr. Tytler, the earth being dug up round the tree and the sombreorum fairly mixed with it (the quantity the same as prescribed in Doombera) instead of being placed by itself in a hole close by the tree. Picking of the new crop has already commenced in the lower districts and even as high as Rangalla; but the prospect does not point to a bumper return, nor even to one equal to last year's, although in some districts estates are well covered with fruit.—*Ceylon Observer.*

THE BRAZILLIAN COFFEE CROP.

The Brazillian coffee crop is, we hear, estimated at 3,500,000 bags, equivalent to cwts. 5,075,000. For the first four months of 1870, however, the shipments from Rio had shewn a great falling-off, not only as compared with the corresponding period in 1869, but on the average of many years, as the following figures will shew:—

Shipments in	1867.	1868.	1869.	1870.
,, January	176 644	220,001	190,899	217,970
,, February	142 287	161,691	235,004	119,680
,, March	189,976	131,923	244,502	128,973
,, April	213,710	189,303	272,575	89,516

Thus it will be seen that the exports for April, 1870, are less by more than one-half those of any year since 1866 and less than one-third of the exports for 1869. 100,000 bags are equal to about 125,000 cwts. *Ceylon Observer.*

Distribution of Coffee Crop Exported from Ceylon from 1st Oct. 1869 to 4th Augt., 1870.

Place.	*Plantation.*	*Native.*	*Total.*
London .. .	cwt. 763,152	64,228	827,380
Melbourne	11,426	1,428	12,854
Sydney....	1,174	...	1,174
Gibraltar.	5,207	.	5,207
Hongkong	23	.	23
Bombay	1	350	351
Calcutta		392	392
Boston.	156	2,388	2,544
New York ...	2,473	22,188	24,661
Havre .. .	12,372	10,128	22,500
Singapore .. .		141	141
Ningpo .. .	13	5	18
Sandy Hook for order.	1,028	7,500	8,528
Falmouth for order	1,396	3,931	5,327
Mauritius		448	448
Total cwts. .	798,421	113,127	911,548
Via the Suez Canal Port Said for order.	13,749	609	14,358
Port Said	1,264	. .	1,264
Trieste	7,934	2,281	10,215
Havre	2,535	1,603	4,138
London, via the Suez Canal.	22,294	...	22,294
Total cwts. .	846,197	117,630	963,827

Pruning Coffee Trees.

To the Editor of the Madras Mail.

Sir,—You published an article headed a "Want of Wynaad," some time ago in which the writer dwells upon the injury coffee speculation has suffered in public opinion, from the Bombay crisis and other causes. I fancy that another "Want" exists, which could easily be met, if prejudice did not deter planters, untrained in the old practical Ceylon school, from trying it—I allude to pruning. From my observations, I believe that systematic pruning doubles the annual return of crop. Rupees 8 per acre thus expended, and Rs 3-8 0 additional for handling out the young wood, is not a heavy item when the result gained is considered. Properties which unpruned in former years yielded 3½ cwts. per acre, have since the execution of this work, given from 7½ to 8 cwts; such facts are well known to all who have ventured on the experiment. Individuals are, however, to be found, whose views are probably original, and who tell you, that "they don't believe in scientific pruning," and further, that all that is requisite consists "in removing suckers and shoots growing in the centre;" when these opinions are held, by—shall we say hard-headed Scotchmen, who, aw, act in the aw capacity of aw "visiting agents," it is palpable that the returns will be meagre, proprietors dissatisfied, or shareholders clamorous for a dividend in vain. In your issue of the 20th instant, "Novice" wishes to know whether "coffee cultivated in the open gives a profit of more than Rs. 40 per acre?" If pruning and handling are carried on, under average circumstances of soil and climate in Wynaad, I believe that a profit of Rs. 100 per acre may be safely depended on. Shade does not appear to be suitable to coffee grown

on forest sods here, but in the low-lying bamboo estates, I hold that a partial shade of "Jack" would be beneficial. Sambur injure young jack trees a good deal, unless the latter are fenced in.

I have always observed coffee growing near jungle suffer from "leaf rot," and where the annual rain-fall is large, and not well distributed, perhaps a remedy might be found in thinning out the shade; I hold that the *density* of the latter chiefly affects coffee with leaf rot, and that surface drainage is not connected with the blight; I hope this question will be thoroughly ventilated before long.—Yours truly,

AN ADVOCATE FOR SCIENTIFIC PRUNING.

Wynaad, 26th July 1870.

PRUNING COFFEE TREES.

"Common Sense" who hails from Wynaad has favored us with the following:—

"Would you kindly allow me to make, in this instance, an exception to my usual mode of communication with the public, viz., writing directly, and in my own name. Most people have, from time to time, the benefit of my inspiration—Newspaper Editors, (witness your leaders) and Englishmen of almost all degrees, even coffee planters. Natives of India, and officers of the Department Public Works, I need hardly say, are honorable exceptions. What has roused me to this unusual course? It is the letter, that an individual of one of the above classes has written, and which has appeared in your issue of August 1st, signed, 'An Advocate for Scientific Pruning,' for it shews throughout such an utter absence of my principles, and forgetfulness of my teaching, that I have recourse to you as the medium through which he may be recalled to a better mind.

To begin with, What would the gentleman be at? He says he has doubled his crops by pruning. Surely this is a very bare statement. Has he awakened suddenly from a long sleep, and begun frantically to prune, having neglected it before, or has he discovered a new system which he is far too knowing to proclaim to his brother planters? His letter gives no clue to the mystery. But it does worse, it might lead a young planter to believe that prunnig *per se* has greater virtues than I can possibly credit it with. Now, on the contrary, my idea is that every properly-managed coffee estate should be annually pruned and thinned, to secure a regular succession of crops according to the capabilies of its soil and exposure. But the dogma laid down by this gentleman, that scientific pruning will double crops, is, although sufficiently specious, a pernicious doctrine to swallow unqualified. It is specious as it might actually happen in case of great previous neglect up to a certain point. It is pernicious for the following reason—pruning encourages the tree to new efforts at the same time that it relieves it of superfluous wood, and when judiciously done is a most beneficial part of coffee cultivation. But no planter must look to that alone to keep his crops up to the mark. Why encourage the tree to new efforts, if the soil will not bear the poor thing out in them, which it will infallibly cease to do unless the ground is kept in heart by the weeds being checked, and manure being applied to replace the waste the crops have caused? A fine appetite is a capital thing when there is lots to eat; but bitters are a mistake when there is nothing for dinner.

"The Scientific Pruner" seems to have considered none of these things. If by any change these ideas have not occurred to him before, let him now make some observations anew, on the condition of the estates of the various companies which have had "meagre returns," and he will always find, I think, that there are many other causes besides deficient pruning to account for their short-comings. Again, there are none of my clients for whom I have such a respect, or who retain such a large proportion of my teachings, as the hard-headed Scotchmen who have offended my scientific friend. Necessarily, therefore, I object to hear them slighted. But I will let it pass for once—as, looking down from my elevation over mankind I can see these very hard-headed Scotchmen, standing at the head of affairs in almost all the great coffee districts of the east, where their opinions are considered of most value on all subjects with reference to coffee cultivation, scientific pruning included. Such being the case, the bitterness of our "Scientific Pruner" is easily accounted for.

And now, as to the last paragraph, how about the leaf rot? Let us ventilate it; by all means, and the thing is done. The disease has vanished. It only prevails to any extent on estates close to the ghauts, which are shrouded for eight months of the year in almost continual mist, and, as the "Pruner" remarks, it is worse at the forest edges, being found there in estates further out from the ghauts although the body of the estate has none. The reason is evident. The forest stops the circulation of air.

As to the profits to be made from coffee in the open. They are so entirely contingent on the chances of wars, dyspeptic brokers, and general contingencies that they can hardly be fairly stated. But the coffee from a reasonably accessible place should cost the grower when it arrives in the curer's yard on the coast, a maximum of Rupees 360 per ton, and under favorable circumstances as low as Rupees 240. This presupposes all the estate in bearing, and a reasonable Wynaad crop say of from 5 to 8 cwt. per acre. With a parting caution, therefore, to my scientific friend, not to make his pruning knife too sharp, and to remember that the coffee tree has roots as well as branches. I will return to my more legitimate methods of mitigating the follies of the human race, hoping, however, that the world at large has not suffered from my pro-occupation.—*Madras Mail.*

PRUNING COFFEE TREES

Our Correspondent "Novice" has favored us with the following letter with reference to questions of paramount importance to Coffee Planters in this Presidency:—

Allow me a few words in reply to "An Advocate for Scientific Pruning" whose letter appears in your issue of the 2nd.

I suppose I expressed myself badly in my last if I gave your correspondent the idea that I wanted to know if coffee in the open will pay more than Rs. 40 per acre per annum.

What I intended to ask was, whether coffee in the open will return a higher per-centage of profit on the yearly outlay? Rs. 40 per acre being assumed to be the net profit per acre of coffee properly managed under shade, after returning the investor his outlay for working, and that working expense having been Rs. 50. I hold that the profits on coffee under shade in good hands will be 80 per cent. in good years. Now, supposing a man devotes half his profits to a sinking fund as a stand by for bad years, he still has a profit of 40 per cent. The bad years and good, taken together, may about balance each other, and it will be a very bad year indeed where the estates under shade do not pay their working expenses. In fact, results go to show that in Mysore, estates under decent shade, even in the worst years, gave a profit of from 15 to 20 per cent. Therefore, lumping the whole, and assuming the good and bad years to be equal in number, the profits of an estate under shade in Mysore ought to be 50 per cent. yearly. I ask, Does coffee in the open do better?

I have no copy of my former letter to you, but if my memory does not deceive me, I imagine I stated my belief to be that coffee under shade, *on the same extent of ground*, would not pay as well as in the open, but that a good man could look after about twice as much under shade as he can do in the open.

To return to your correspondent's letter: I am obliged to him for his idea regarding the rot of leaves, but cannot help thinking him wrong As is well known charcoal is by no means a heavy shade or dense, and still the rot takes place in coffee growing under it. On the estate of a neighbour of mine, some of which is under original forest, some under charcoal, and the remainder in small patches quite in the open, it may be noticed that the rot does not occur on the open portions. Now the reason these portions are in the open is probably that being on tolerably steep slopes, the young charcoal which would have sprung up as in other parts originally clean felled, were dug up in the first year or two the same as in the other parts, it having been originally intended to have the estate in the open, and from the land being steeper than the remainder, the charcoal seed was washed away before it got time to take root in after years. At any rate whatever the cause, there is no charcoal on those places, and I take it the roots of the original trees being decayed make a kind of subsoil drainage, and there is not rot; whereas in those portions under charcoal, the place of the original forest trees' roots have been taken by the roots of charcoal, and therefore have checked the damage. On the estate I refer to the rain-fall is probably as well distributed as any other in Mysore and amounts to about 100 inches a year.

Shade, I believe, would be worse than useless in most parts of Wynaad, for the simple reason that the climate is much more moist than that of Mysore; but, as your correspondent remarks, the bamboo country would not be injured by partial shade. However, I cannot agree with him about the jack. The quality of the jack shade is "denseness," and that is what your correspondent objects to in the last para. of his letter. Moreover, if he wants to see the effects of the jack shade, let him visit the "Caroline" estate at Culputty, South Wynaad, where there is, or used to be, an avenue of jack tree with coffee under them. It is true that that part of the country scarcely requires even partial shade; but assuming, it being bamboo land that partial shade would be a good thing, this avenue will demonstrate my assertion, that jack alone is far too dense. For my part I consider that any of the numerous family of Indian fig trees are far the best shade for coffee in those parts where shade is absolutely necessary, *i. e.*, for those who have cleared their forest and have to get up secondary shade. For those who have virgin forest to work on, of course the best plan is to cave it and thin it out to the required amount of shade.

And now, touching the ostensible reason of your correspondent writing to you, viz. pruning. Wynaad is not the only country where this most important part of a Planter's duty is sadly neglected, or performed in a manner decidedly opposed to the principles taught by Laborie and other authorities on the subject. Neither do I imagine, are those planters *untrained in the Ceylan school* the only ones who go in for the happy-go-lucky

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system, if, I may so call it, consisting, as A. S. P. says, of merely handling out the centres. In the early days of coffee planting in Mysore, pruning was a thing undreamt of for years, and the consequence was, made estates get into very bad order. But as the country became more known, and more people took to planting, this subject received a far greater amount of attention. It is not however those who have been trained in the Ceylon school who attend most to this branch of cultivation.

One very bad system which I have seen practised in Mysore is that of letting trees go on bearing as they may for three seasons, and then putting in men with knives to cut all secondary and tertiary wood off and even cutting back the primaries. This last neat little operation is popularly known as Parrot Polling, and for some years was the only system (?) of pruning known on some estates. The idea was that the trees had been allowed for so many years to grow as they liked, with the single exception of pulling off suckers, that the primaries were supposed to be so bark-bound that they would not throw new wood till they were cut back. After such a severe ordeal as this, the trees naturally threw a large amount of new wood, and had proper handling been carried out, say two or three times during the season following, I believe these trees might have been got round to respectable form in spite of the Parrot Polling. Most Planters are, now-a-days, in Mysore, alive to the necessity of pruning, but very few I imagine, consider handling afterwards of sufficient importance; whereas, I think, there can be no doubt the half the effect of good pruning is lost in many cases by a deficient system of handling.

There is another point with regard to pruning that I should like to have discussed. I have been told by Planters, that wood which has not borne, *although it may have blossomed, and the blossom have been burnt off, or in other words not matured*, should not be pruned off, as it will blossom again the next season. This I hold to be an entire fallacy. I consider that wood, which has blossomed but not set, ought to be cut off with the wood which has borne crop. Solitary instances may, I believe, be pointed out of a few berries coming upon an eye which blossomed, but did not set the previous season; but the remainder of the branch is generally bare, and only proves that the wood which held the abortive blossom should have been removed to make way for something more remunerative.

TEA.

Comparative Statement of the yield of Tea on the "Kurbia" Plantation

	1868.	1869.	1870.
Average for the month of	Srs.	Srs.	Srs.
March	140	402	394
April	1,913	5,117	1,614
May	1,553	3,967	7,921

P. S.—The out-turn for April 1870, would have been much greater had not the crop been partly destroyed by the severe hail storm of the 7th April 1870.

Comparative Statement of the yield of Tea on Mr. Thomas Stenhouse's Plantation.

	1868.	1869.	1870.
Average for the month of—	Srs.	Srs.	Srs.
March	107	367	399
April	1,020	1,939	987
May	573	2,911	1,636

P. S.—This Garden and Amboocah suffered the most in the district. After the storm, (which only lasted ½ an hour) *not* a single leaf was left; both old, and young were completely knocked off and destroyed. Picking then stopped for 3 weeks. After this period the leaf again made its appearance in such quantities, that it has been (with the utmost difficulty) got in, in time. From the appearance of the garden at the present moment, I am of opinion that we shall yet turn out a good crop.

Comparative Statement of the yield of Tea on the Aloobaurree Plantation.

	1868.	1869.	1870.
Average for the month of—	Srs.	Srs.	Srs.
June	61	52·15	11·30
Tea made to end of June	109·2	158·0	165·30

N. B.—Exclusive of red leaf.
—*Darjeeling News.*

A MODEL GARDEN.

To the Editor of the Darjeeling News.

MR. EDITOR,—"Traveller" is very officious in bringing my garden so prominently into notice; he has said too much and too little, and consequently has forced me into print; there is no occasion to mention my name for all will recognise the description of the garden. If "Traveller had" called upon me, I would have given him much more information and not left this and a great deal more to the surmises of the public. Of course all will say that it is a garden; garden cultivation &c. These trees are in a garden, but they have had little cultivation, the second weeding only being completed last week. I have taken the trouble to count the trees and measure the land they stand on. There are two patches, and some straggling trees; in all 489, standing on 1-11th of an acre—for easy calculation, say 500 trees standing on 1-10th of an acre. Nor are these trees large, one half of them are not larger than ordinary trees, and the others only the size of cabbages, therefore, if an acre was thus planted, there would be 5,000 trees to the acre. The 500 have given me, in two flushes, 16 lbs of tea, therefore an acre of 5,000 such trees, ought, to have given two maunds of tea in flushes: ergo, in the whole season, it should yield 4 maunds per acre. The third flush is well out, and very promising. "Traveller" appears to me rather bumptious and jumps too much to conclusions. I have always advocated Mr. McMeekin's style of plucking, or I may say the Java Planters' style, years before I heard of Mr. McMeekin, and it is with great pleasure I read of the emoluments now received by Mr. McMeekin for the superintendence of many gardens, and I will be the first to welcome his coming into these hills, to show us how to prune and pluck. Now that I have given the just meed of praise to one who has so well earned it, I turn again to the insufficiency of "Traveller's" letter, who, in his admiration of Mr. McMeekin, has quite forgotten that it is God who gives sunshine and rain, which of course must essentially affect all crops given by the earth in which tea is also to be numbered. From want of sun, necessarily I think, would follow: firstly, want of flavour; secondly, size and weight of flushes; thirdly, a longer period of time for the flush to arrive at maturity, so that in the season we may get only four flushes instead of five. Of course in the Hills, there is drainage, but in stiff clayey soils, at the foot of the Hills, the drainage is not so perfect, and these I believe will and do suffer from the heavy rains—in fact, in all soils where the natural drainage is not perfect. Now, I have, in three several parts of my Estate, about 20 acres suffering from like cause, the flush is *well out*, but very light coloured; or, in the Indigo planters' phrase, it would be, "*Peela-ho-gyee*," showing that there is stagnant water at the roots. I have not the least doubt that others suffer from the same cause. I am doing my best to bring these plants round by cultivation. As I am already on the subject of tea, I here give my opinion, that it is necessary to pay more attention to plucking than to weeding; for in other parts of my garden, where it has not been weeded since March, and the grass is overtopping the trees, and where I presume there is a natural drainage, the third flush is well out, and of the *proper* colour; therefore I am inclined to believe, that a small yield, is the result of a faulty system of plucking. Although this is my opinion yet I have said little to enable my friends to arrive at the same conclusion. Here follows the result of my experiments. For several years, in all my gardens, —orders have been given to pluck on Mr. McMeekin's style—and the question is, *was it carried out, and what was the result?* I have four gardens, in all of which the above system was strictly ordered to be carried out, say, A. B. C. D. under different Sirdars.

A—Gave, in the second, about 60 per cent. more than in the first flush.

B—Do., a little less than 50 per cent.

C—The second flush equalled the first.

D—The second flush was 30 per cent. less than the first.

Now here are valuable statistics, giving hopes of a very great increase in the yield over the old system, for in it the first flush is always the largest, and all the succeeding flushes less. The next thing done was to examine the trees, as to whether Mr. McMeekin's system had been carried out.

A. and B, were found to be properly plucked on that style.

C Not so well, only by the road, but far off trees plucked any how.

D. The same as with C.—With this garden, on account of the slopes being greater, there was no attention whatever paid to the proper plucking of the further parts of the garden, on the supposition that the planter himself would not go to examine the trees low down.

(D.) being the last garden plucked, the European superintendence was less; it being then given to effect a superior manufacture of the leaf, on the supposition that the people were by this time well trained to this system of plucking.

I now come to consider in what manner we can insure a proper method of plucking, a method that shall be both economical and efficient; and I propose that it should be done by making the people interested in the yield: to each sirdar or set of sirdars, a certain portion of the garden should be allotted: and he or they should be answerable for the yield—through the amount paid them as *Sirdaree*:—no Sirdar should be paid from the time of pruning till the result of the pruning by the amount of the first plucking should be known. No Sirdaree, from the time of plucking the first flush, should be paid till the result of the second flush is known; if the second flush is less than the first flush then the Sirdaree should be in proportion, less;—if *more*, then the Sirdaree should likewise be *proportionately more*, and the like payment of Sir-

daree for every succeeding flush: this I believe will be both economical and effectual, and, if as above, the increase is rateably 50 per cent more, the yield will be gratifying to both planter and proprietor.

If the planter will take the trouble to divide the garden into 35 equal divisions, not of land but of trees, that is a division, about equal to one day's work and have a strict account taken of the yield of each division, then he will be able to go at once to the spot, which has given the *smallest yield*, and discover the reason; if they are bad trees they should be replanted or cut down; if good trees, which have been ill treated, then the coolies, who have so maltreated the trees should be brought to book.

Last year 15½ trees gave me one lb. of tea. The Java planters' *lowest* calculation is that, 10 trees will give, during the season, one lb. of tea; if they do not, then, there must be "something wrong in the state of Denmark." I believe this and am acting upon it.

I quite agree with you, Mr. Editor, that it would be to the advantage of the planters that each should make a correct statement of his plantation, elevation, acreage, number of trees, aspect, nature of soil, outlay, system of cultivation, &c., &c.: so that by a true comparison we can arrive at that system, which will give the greatest amount of tea, with the least amount of expenditure. Take aspect, for instance—those estates that get the morning sun (and only those who have been up here this season can fully appreciate its real value) should do better than others. Ging, for instance, and some estates at Kurseong, get the morning sun; now mine, under the shadow of Sonadah, rarely gets it; I may say, never gets it: should the sun shine for an hour or so, the mist begins to rise, and rushes up the valley, consequently my estates are enveloped in mist, while all others are enjoying a glorious sun. Some planters, or proprietors might object to the above, on account of its publicity, but is there not a Planters' Club? Such statistics should be deposited in the archives, only for the perusal of the members. In Indigo each district has its peculiar system adapted to its soil, and climate, and there is but one way of growing Indigo in each district successfully. Bengal, Tirhoot, Shahabad, the North West, have each their system, which to violate, would ensure great loss. I believe it is the same thing with tea; and beg my fellow-planters will give some attention to the above, for, with most crops, there is but one system adapted for each climate: the same with sugar. One system for the West Indies, another for India.—Yours faithfully,

IMPROVEMENT.

GOVERNMENT TEA PLANTATIONS IN KUMAON DURING THE YEAR 1868-69.

Report by G. King, Esq., M.B., Officiating Superintendent, Botanical Gardens.

I have the honour to submit, for the information of the Hon'ble the Lieutenant-Governor, the following Report on the working of the Government Tea Plantations of Hawul Bagh and Ayar Tolie, in Kumaon, for the official year ending 31st March, 1869.

1. The results may be briefly summed up as follows:—There is an increase in the out-turn of manufactured tea of 1,269 pounds over that of last year; a diminution in working expenses of about Rs. 11,000; and all the tea of this year is green, whereas of last year's produce green tea formed only two-thirds, while in former years the proportion was still smaller.

2. *Manufacture of Tea.*—The actual amount of the tea manufactured in both plantations is 22,857 pounds, the details of which are given in Appendix I. of this Report. Although the cost of its manufacture is more than that of black tea, it finds a much more ready sale in the markets of Upper India, and therefore green tea only has been made. Owing to the weakness of the in-door establishment, and the amount of leaf to be manipulated, the teas of this season have been rather later than usual in being finished; but this, except as preventing the sale of the year's produce being effected before the termination of the official year, is a matter of minor consequence. The season's tea is now on its way from the factories in Kumaon to Saharunpore, and I hope soon after its arrival to be able to dispose of it in bulk, as already several probable purchasers have been enquiring about it.

3. *Expenses of Plantations.*—The details of the expenditure on the plantations being given in Appendix No. II., I need here refer only to the total. This is Rs. 14,566-8-7, being a little more than half that of last year. The saving has been effected by dispensing with the services of two European Overseers, and by largely reducing the establishment of mallees and coolies. The reductions were made by Government on the recommendation of Dr. Jameson, whose opinion it was that the establishments should be reduced to as low a point as possible. They are now just sufficient to keep the estates moderately clean.

4. *Tea Seed.*—There being now no demand for tea seed, no arrangements are made in either plantation for its supply.

5. *State of Tea Market.*—The market for black teas is extremely dull. As will be seen by the statement contained in Appendix III., the sum paid into the Treasuries at Dehra Doon and Almorah during the year on account of tea sales is very small. The extreme smallness is accounted for by the fact, that the price realized for the former season's teas being received just before the last Report was written, the sum appeared in it; while the produce of the past season, not yet having reached Saharunpore, is not yet sold. The stock of tea (*See* Appendix IV.) in the Godowns in Kumaon and Dehra Doon, and especially that of the inferior sorts, is considerable. Two special efforts which I made to get rid of a quantity of the latter have proved failures. A native was sent to Umballa during the recent Durbar, and to the late fair at Hurdwar, in the hope of his being able to dispose of some among the crowds there assembled; but he met with no success. Other modes of disposing of the inferior as well as of the finer sorts are now being, and shall be, tried as opportunities occur.

The Indian market for black tea is, however, limited. The European community after all does not consume a great deal, and as a rule, only of the finer sort; while the demand for cheap tea among natives is small, the taste for tea being not as yet general. For many and various reasons Indian teas, other than Assam-grown, have not yet got a footing in the English market. It is a debated question whether they are likely to do so, unless some new mode of introducing them into the London market be adopted. The Trans-Himalayan tea market, concerning the extent of which so much has been written of late, remains practically unopened to the Indian tea-grower. Only brick-tea, however, can be sold there. As yet the difficulties of transport are probably sufficient to prevent the conveyance of tea beyond the Snows. But though the roads were opened, the Indian tea-grower is hardly in a position to avail himself of it, as he has not hitherto been able to manufacture brick-tea which a Tibetan or Tartar will buy. The most that can be said of India-made brick-tea is that it is in the shape of bricks. In no other respect is it brick-tea. If it is the desire of Government to do more than has already been done for the tea interest in India, it appears to me that the institution of experiments towards the discovery of the process of manufacture of brick-tea, such as is used in Central Asia, is one of the most efficient forms that farther assistance could assume.

6. For the energetic way in which they have carried on their shares of the business of the plantations, I owe my acknowledgments to Mr. W. A. T. Dick, Assistant Superintendent, and to Baboo Bishumbhur Ghose, the head of the Office Establishment. Mr. Dick having obtained sick leave to England, Mr. Cecil Bagshawe has taken his place.

APPENDIX I.

Statement showing Green Teas manufactured in the Government Tea Factories at Hawul Bagh and Ayar Tolie, in Kumaon, during the year 1868-69.

			Hawul Bagh.	lbs.	oz.	lbs.	oz.	lbs. oz.
Green Teas.	Imperial Gunpowder	...	...	163	0			
	Fine Gunpowder	.	..	177	8			
	Young Hyson	.	...	3,203	0			
	Hyson ..	.	...	2,479	8			
						6,023	0	
	Hyson	. ...	..	...		6,332	0	
								12,355 0
			Ayar Tolie.					
	Imperial Gunpowder	..	.	360	0			
	Gunpowder ..		...	160	0			
	Young Hyson	.	..	2,920	0			
	Hyson	...	.	1,320	0			
						4,760	0	
	Hyson Skin	.	..	..		5,742	0	
								10,502 0
	Grand Total, Teas manufactured in 1868 ...							22,857 0

APPENDIX II.

Statement showing the amount expended in working the Government Tea Plantations in Kumaon during the year 1868-69.

	Hawul Bagh.	Ayar Tolie.	Contingencies.	Remarks.
Total, Rs.	5,547 15 9	5 855 7 2	2,563 1 8	13,966 8 7
Office Establishment, at Rs. 50 per mensem ...				600 0 0
Rupees ...				14,566 8 7

G. KING, M.B.,
Offg. Supdt., Botanical Gardens, N. W. P.

Office of the Supt. Botanical Gardens, N. W. P.: Dated Saharunpore, the 29th April, 1869.

Reply by Government to Officiating Superintendent, Botanical Gardens, dated 27th May, 1869.

I am directed to acknowledge the receipt of your letter No. 405, dated 29th ultimo, reporting on the working of the Tea Plantations of Hawul Bagh and Ayar Tolie for the year ending 31st March, 1869.

2. In reply, I am desired to communicate to you the thanks of the Lieutenant-Governor for your Report, which will be

published in the Selections from the Records of this Government.

3. His Honor has noticed with satisfaction the very favourable terms in which you acknowledge the services of the Assistant Superintendent, Mr. Dick, while in charge of the Plantations.

4. When a more favourable time arrives for obtaining an adequate price, the Government will be glad to part with the two remaining plantations, as it has done with the others, the work of the Government in inaugurating the experiment of tea-cultivation having been fully accomplished.

5. Meanwhile I am to observe that, if anything could be accomplished towards the introduction of the manufacture of real brick-tea, it would conduce largely to the advantage of the producers, and probably ensure to Indian trade a hold on the marts of Central Asia.

6. The Government of India will be asked to communicate on this subject with the Consulate in China, and the result will be communicated to you hereafter.

COST OF PREPARING TEA.

To the Editor of the Indian Economist.

SIR,—I see you have (in your issue of July 11) republished Dr. Jameson's (Superintendent, Botanical Gardens N. W. P.) letter, or report, to the Secretary to Government N. W. P. respecting tea cultivation, in the said N. W. P., the Dhoon and Punjab. Dr. Jameson has hitherto been rather notorious for making blunders, and for writing reports respecting tea cultivation, calculating profits, etc., etc., etc., *without taking the trouble to procure reliable information on which to base them.* In consequence of this propensity to which he is addicted (in common with certain other Bengal officials) various parties have at different times been put on various and sundry "wrong scents," and have taken for granted, what has afterwards turned out to be "a delusion and a snare."

One would suppose, that after the exposes connected with a certain Government report published, mainly under the Doctor's auspice, in 1856, the utter fallacies and vague assertions contained in which have been exploded over and over again by practical experience, he (the said Doctor) would have learnt (if not wisdom) at any rate caution; but such by his letter of April last does not seem to be the case.

I have therefore, as his lucubrations may happen to lead people astray a second time, taken pen in hand, in order to endeavour to point out his mistakes before they do mischief.

The first, with a vast show of energy he recommends us to be "up and doing" and to "forestall" the China teas in the "home market;" but he does not show (though he admits that this would entail extra labour, trouble and expense), that we should gain one single pice extra profit by so doing.

He then tells us a few facts, (respecting tea) which read like a copy of one of Thompson and Co.'s old circulars, every one of which has been a truism for the last six years *at least*. After this we are treated to a paragraph or two out of his report of 1856, respecting the amount of waste land available for tea cultivation in the Kohistan of the N. W. P. and Punjab, about as relevant to the question as the amount of land available in Central Africa, and just as likely, at present, to be taken up by any one winding up by asking, whether tea is a failure, or whether it is not? which he answers in the negative, "because it "has given employment to a large population, and enabled them "to stay at home and propagate their species." (sic.) He next discusses the Russian demand, gives a price list of teas from St. Petersburg, and observes that the question, is whether Indian tea, or rather at what price Indian tea can be grown which shall be equal to the ordinary good China black tea; of this he says, "he has no means of forming an opinion."

A few lines lower down, he seems to have altered his mind however on this point, as he affirms, "*That there is no doubt* that tea equal to the said Chinese black tea can be grown in the Himalayas at 8*d*. and 10*d*. per pound."

It would not be difficult to prove that the Doctor himself has never made any when in charge of the Government plantations under something like 2*rs*. 8*as*. per pound, but—let that pass.

It would be as well, however, next time, if he would take the trouble to ask some planter of experience what he *can* make tea for on his plantation and not evolve statements out of his own consciousness. I have been a planter myself for some 12 or 14 years, and am ready to offer a wager of Rs. 500, that not a planter in the N. W. P. or Punjab is making tea at the present moment, all expenses reckoned, under 1*s*. or eight annas per pound, and that one in five is making it at as low a figure; I mean that 1s. is *the minimum of cost without allowing a single pice for profit.*

Yet on this estimate, utterly false as I have shown, all the Doctor's elaborate calculations of profit and loss are based, in sending tea, as he proposes, via the Caspian, Amu, Daria, etc. to Russia!—a route which he admits to have the slight drawback of being overrun for some 500 miles by predatory hordes of Turcomen, who sell you into slavery if you happen to fall in with them.

Seriously, Mr. Editor, we have had enough of this fancy writing, these reports made to Secretaries who know about as much of the subject, as I do about the Esquimaux dialect. Why can't these gentlemen, enjoy their sinecures, and draw their pay in quiet instead of writing "letters" and "reports" of which we had enough, and which have cost us enough too, Lord knows, years ago. Why rip up old sores?

We have had reports and reports till we are quite sick of them. If reports are written, why not collect some reliable information first! There is plenty to be had.

As it is, every line of the "report" in question is either something we all knew before, or is a "mistake," to call it by no stronger term.—I remain, Sir, yours truly,

A PLANTER.

KANGRA TEA.

The following letter, with its annexures, is published for general information—the Hon'ble the Lieutenant-Governor considering it a most interesting and valuable communication, evincing the deep and continued interest taken by Major Edward Paske in the well-being of the Kangra Valley, and the prosperity of its planters. His Honor believes that to the latter the information will be especially valuable. The remark made by Messrs. Thompson and Co., that the Kangra leaf seems better adapted for making green teas than black, is of great importance, from the fact that the inhabitants of Central Asia and Tartary greatly prefer the green teas, and, indeed, refuse to purchase the black. The Lieutenant-Governor believes that the chief outlet for Kangra teas will eventually prove to be in that direction, and that the races of Central Asia will, ere very long, if their tastes be considered and provided for, become the chief consumers of Kangra teas; but he nevertheless agrees with Major Paske in thinking it of great importance that the London market should be also consulted and conciliated, and that experienced tea-tasters should be procured from thence as Major Paske advises.

From Major E. H. PASKE, *Bengal Staff Corps, to* T. H. THORNTON, ESQ., *Secretary to Government, Punjab and its Dependencies.*
—*Dated London, 4th April* 1870.

I have the honor to submit, for the information of the Punjab Government, and for communication to tea-planters in Kangra Valley, the following particulars relative to the position and prospects of Kangra teas in the London markets.

Since my return to England, I have availed myself of the advantage of residence in London to make frequent visits to the city, and enter into communication with brokers, dealers, and merchants engaged in the tea trade. I have distributed samples of Kangra teas in numerous quarters, and have circulated printed copies of the report I wrote upon tea cultivation. Not having myself embarked capital in tea speculations, and not being connected in any way with any one of the plantations, I have had the advantage of disinterested action, which has enabled me to prosecute my enquiries with greater freedom; and my object,—viz., that of developing a most important industry, and extending the export trade of a district of which I so long held administrative charge—appears to be well understood. I have met with much attention and civility, and I would here offer my acknowledgments to Messrs. Thompson of 38 Mincing Lane; and to Messrs. Absolem and Crocker, of Road Lane, for the attention they have shown me.

A portion only of the samples of teas that I purchased before leaving the Kangra District have as yet reached England; and these have been carefully examined by the two firms named above. On one occasion the examination took place in my presence. All the samples were carefully examined and tasted, and their virtues and defects pointed out before me. I had then an opportunity of observing what a long course of schooling has to be gone through, and how much practical experience has to be gained before any one can be considered a professional tea-taster, and venture to offer a trustworthy opinion upon the qualities, merits, and value of different teas.

The samples of teas examined before me were from three plantations named in the margin. The finest sample was declared to be the orange pekoe from the Bandla plantation, which was highly esteemed as very rich in flavour, and which was valued at about three shillings per lb., wholesale price. Next came the teas of the Kangra Valley Company, and then those of the Byjnath Plantation. It is fair to mention that the slight inferiority of the Byjnath Plantation tea was entirely owing to the fact that the samples I was able to produce had been over-fired in roasting. I invite the attention of the planters to the annexed copy of a letter marked (No. 1) from Messrs. Thompson to my address, reporting upon the quality and value of samples of the Byjnath Plantation teas. It will be seen that Messrs. Thompson lay great stress upon the importance of keeping up a high standard of fragrance and

1. Bandla Plantation; Captain Harrison, Manager.
2. Kangra Valley Plantation; Messrs. Lennox and Ballard, Managers.
3. Byjnath Plantation; Capt. Fitzgerald, Manager.

strength in teas—hitherto, in too many instances Kangra teas sent to the London market have been found thin and pale in water, with a burnt flavour, and a peculiar rawness. I may here mention that I have not confined the distribution of samples of Kangra teas to brokers and merchants connected with the Tea Trade, but have sent samples in many directions. Among the authorities at the India Office, His Grace the Duke of Argyll; Mr. Grant Duff, M. P., Under-Secretary of State for India; and Mr. Ross Mangles, Minister of Council, have all taken samples. A box containing a large number of samples has been forwarded through the Foreign Office to the British Ambassador at St. Petersburgh for distribution among merchants in that town.

From information I have now gained, I am inclined to believe that for some time there did exist a prejudice against, and a depreciation of, Indian teas generally, and of the Kangra teas in particular, in the London market. The Kangra teas were new, their flavour peculiar, and they were sent in very small quantities. Moreover, perhaps some of the planters did not adopt the most judicious means of introducing them into the home market. On this subject I lately addressed Messrs. Thompson in the following words :—

"From a recent conversation with a partner in a large house "in the city, I have an impression that in some quarters in the "city the Indian teas generally, and Kangra teas in particular, "are, if not depreciated, certainly not appreciated in the Lon-"don market. Among other things they are talked of as in-"significant in quantity,—the important fact that everything "has a beginning being lost sight of. When the war in Ameri-"ca broke out, and we lost our supplies of cotton from the "Southern States, what was the quantity of cotton shipped "from India? Something most insignificant a Mr. —— remark-"ed in regard to Kangra teas. What has India's export trade "in cotton now become? Something most important So it "will be in regard to Indian teas, if you in the trade in London "will acknowledge that everything has a beginning, and will "only encourage our planters to produce the supplies that you "will require soon enough, if much more spurious tea is brought "from China. I would remind you that attention is being "drawn to the advantages of shipping teas from China and "India direct over the Suez Canal to Russian ports in "the Black Sea without the intervention of the London "market, and thus there is a risk of your losing a considerable "portion of the Indian Tea Trade. You in London are becom-"ing alive to this risk, if what I read in certain London jour-"nals is correct. I think, then, it is your true policy to encour-"age the Indian planters more than you have done hitherto."

In reply to the above remarks, Mr. W P. Thompson, senior partner of the firm of Messrs. Thompson, addressed me a letter, dated 30th March, a copy of which I annex (marked No. 2), as it contains information to which I would draw the attention of our planters. Mr. Thompson appears to admit that for some time Indian teas were depreciated in the London market; but it is satisfactory to know that the prejudice does not now exist, and that the sellers, and not the buyers, have now the command of the market. I think our planters may well place confidence in Messrs. Thompson, in whom they will find friends ready to advance their interests, as identical with their own.

As the result of my enquiries, I am disposed to offer two suggestions for the consideration of the Kangra tea planters :—

1*st*.—That there should be more combined and associated action on the part of the planters; that they should combine and produce uniformly classes and descriptions of teas of that fragrance, strength, and flavour that will find favor in the London market; and that, instead of each plantation sending its shipment of teas to a separate broker or merchant, as heretofore, the planters should all send their shipments of teas to one and the same house in London. One reason why the Kangra teas do not get attention is, that they are received in such small quantities, and these quantities are the more insignificant when scattered among different houses. One merchant, after reading my Report on Tea Cultivation in Kangra, laid it on the table with the remark :—"The entire produce of all your Kangra plantations would not meet half a day's consumption of tea in London." If this remark may appear discouraging in one way, it is most encouraging in another —it shows what a vast demand there is for tea—and a demand steadily increasing. Indian teas are receiving the more attention at this time when it has been discovered that very large quantities of spurious teas have been shipped from China. As I said, all the planters should combine and employ one Agency in London, sending all their teas for the London market to this one house; so that the most may be made of the comparatively small quantities shipped for England. 100 chests of tea when sold through one large firm, will receive more attention than the same quantity sold through ten houses. A merchant after trying a sample of tea, if he approves of it, at once asks "What quantity of this tea can I secure? If only a very small quantity, returns from it is not worth attention." If the planters do think it desirable to combine and employ one Agency only in London, I do not think they could do better than enter into negotiation with Messrs. Thompson of 38, Mincing Lane.

2*nd*.—The second suggestion I have to offer is, that the planters should combine and secure the services of two or three professional tea-tasters, who have throughly learnt their business in London, and who, while mixing among the different plantations and watching the manufacture, would instruct as to the precise flavour, strength, and fragrance of teas required for the London market. To cultivate the tea plant is one thing; to manufacture precise qualities of tea is a different matter, and requiring different experience. The surest way for our planters to be able to manufacture the particular qualities of teas required for the London market, is to employ those who can instruct them as to what those qualities really are.

While I hold to the opinion, expressed in my Report on Tea Cultivation in Kangra, that our planters will find the local Indian and Central Asia markets the easiest and most profitable, I think it is a matter of great importance that they should push their way and secure a good footing in the London market, and it is in this view that I have offered the suggestions given in the last preceding para. Planters should not look only to their immediate annual return and profits, but they should do all in their power to improve and increase the market value of their estates; and this they can best effect by such steps as will ensure their teas finding favour in the London market. Kangra teas once in good favour, the demand for them will become so great that the cultivation must extend enormously, and the value of estates increased in the same proportion—a consideration not to be lost sight of, as the means the plantations may afford for giving employment to young men who, having acquired a knowledge of the tea trade in London, might be sent out to assist in the management of plantations in the Kangra Valley, where happily we have the advantage of an almost European climate. In these times when every profession in England is over-stocked, and young men have to seek employment in foreign service and in the colonies, many parents would pay largely for shares in tea plantations in so desirable a locality as the Kangra Valley, in the hope of securing employment and a future provision for their sons. Such are my reasons for advising planters to keep their teas well before, and do all they can to find favour in, the London market.

I take this opportunity of inviting the attention of our Kangra planters to the prospect of extensive tea trade direct between India and Russia. In my Report on Tea Cultivation in Kangra, written before the completion of the Suez Canal, I suggested that that canal, if successful, might be made a route for an important tea trade between Indian and Russian ports in the Black Sea. The successful completion of the Suez Canal, and information I have now gained in regard to the supply of tea for the Russian market, through the intervention of the London market, have led my mind to dwell once more upon the prospect of a tea trade between India and Russia, *viâ* the Suez Canal. On this subject I have recently written a brief paper showing the disadvantages attending the supply of tea for Russia through the London market, and the difficulties, risks, and delay that exist in the transport of teas to Russia by what is called the Overland Route from China; at the same time, I have pointed to the facilities afforded by the Suez Canal for a direct tea trade between India and Russia. A copy of this paper, marked Annexure 3, I append to this report. A copy has been submitted to the India Office, and has been forwarded with samples of Kangra teas through the Foreign Office by the Queen's Messenger to the British Ambassador at St. Petersburg. I am sure our planters should turn their attention to this prospect of tea trade with Russia, and endeavour to supply teas suitable for the Russian market. Mr. Thompson, in his last letter to my address, copy annexed, has given some information on the subject and to which I would draw attention.

In concluding this brief and hasty report, I would mention that during my residence in England I shall continue my enquiries in matters connected with the prospects and interests of our planters, and shall communicate through the Punjab Government any interesting information I may receive. I shall be happy to hear from any of the planters who might desire to obtain any special or particular information.

All letters and communications to be addressed to me at the Junior United Service Club, London, S. W.

ANNEXURE No. 1.

From MESSRS. W. J. and H. THOMPSON, *to* Major E. H. PASKE, *Bengal Staff Corps.—Dated* 38, *Mincing Lane, London*, 30*th March* 1870.

We have carefully examined the tea musters that you have sent us.

They are all well-made teas of the Kangra type, but have been much injured in the firing.

The leaf after infusion appears to be young, and of a good brown color, but much mixed with black leaf, the cause of the burnt flavor, which destroys any richness that the tea may have had.

The value of the Pekoe is 2*s.* 4*d.* per lb., but it has a leaf that would command 2*s.* 8*d.*, and that of the Pek Song is 1*s.* 10*d.* and 2*s.*, with leaf of the value of 2*s.* 3*d.*

The musters are much inferior to some belonging to the Nassau Company, that we sold in February and July 1868, which were fragrant and rich in the cup.

The value of Kangra teas, compared with those from Assam, will be ruled by *flavor alone.*

Judging from all the musters that we have seen, it seems clear that the North-West cannot produce tea of the fulness and strength of that grown in Assam and Cachar; but tea of higher fragrant quality can be made, such as, if up to the type of excellence, will equal in value that from Assam.

If, however, below this standard of high quality, the tea falls into a lower grade altogether, as, from its comparative want of strength, it loses its great value for mixing purposes, and will only rank with common tea.

The green teas from the Nort-West have also differed a good deal—some yellow and dusty, of ordinary grade; others in flavor almost equalling the China Moyunes, and if more carefully made would command a preference in the market, on account of the strength of the water. The water of green teas should be pale,—the opposite of that of black tea.

If, therefore, the planters can keep up a high standard, especially of fragrance, they need not fear competition with any other Indian teas; but in the majority of instances, the teas from the North-West have been of a class which is not esteemed in this market, being thin and pale in water, with a burnt flavor, and a peculiar rawness.

There have been some marked exceptions of high fragrant or peculiar fancy teas; but we speak of them as a whole; and it is for this reason (the absence of relative merit) that the North-West teas have not taken the rank expected by the owners.

The combination that you refer to in page 18 of your pamphlet had reference to the action of two principal buying brokers, at a time when Indian teas were not in such favour as they are now. This happily has all passed away with the increasing demand now existing among the various dealers; such action is rendered impossible; for the sellers, and not the buyers, have now the command of the position.

The future of Indian tea is secure: there will be demand equal to any increase in production, and at prices that will compensate the grower; but to secure these, the standard of quality must be kept up, both as regards fragrance and strength, with depth and fulness of water.

Indian teas differ most materially in this characteristic according to the locality where they are grown; but each has its peculiar excellence, which is fully appreciated.

On skill and management, however, all depends; for two gardens side by side may and do show widely opposite results, and a whole season's produce may be ruined by carelessness or ignorance in the tea-house

Annexure No. 2.

From Mr. W. J. Thompson, *to* Major E. H. Paske, *Bengal Staff Corps.—Dated* 38, *Mincing Lane,* 30*th March* 1870.

I beg to acknowledge the receipt of your favor of the 29th instant. I had written a report on your musters, which, had it been copied, your letter would have crossed. I now send it, that it may help us in our conversation when I shall have the pleasure of seeing you.

I should like to show you musters of Indian teas from various districts, so as to enable you for yourself to appreciate the differences:

I will see Mr.——, as you suggest. I know him well in business, as our firm has frequently large transactions with his. The opinion he would give you would be that of a practical wholesale dealer; his business is to supply the smaller trade, to do which he would buy the classes of tea that would suit them best on the cheapest terms he can. If tea comes to this market, he selects from it; if not, he turns to something else. I am not surprised at his opinion being adverse, his trade lying mainly in Scotland and Ireland, where even fine Kangra teas would not be esteemed; the strong heavy tea would alone sell. I do not suppose Mr. C. knows the different types of Kangra, as compared with teas from other parts of India, as such knowledge would be of no material value to him, the more so as the quantity from Kangra is so small. His opinion, however, is valuable, as proving to you what really is wanted in London, and what classes therefore are commercially the best.

As regards ourselves, as we act for the majority of planters throughout India, and as I have from the very conviction to which you refer, that some day I should reap a reward, made Indian tea a specialty from its commencement. I can perhaps place at your command as great a range of information as most, and, I think, prove to you from printed circulars during a series of years, that I have not been unmindful of planters' interests, but have fostered them as identical with my own. I have always had faith in the future of tea in India; and I believe that we have now passed the time of ignorance and folly, and that by the exercise of prudence and skill, the difficulties of tea culture will be mastered.

The drawbacks to the North-West Provinces I believe to be owing to climate, *want of strength*, and a *very small number of flushes*, as compared with an average of about 20 in Assam, and a consequently *small yield per acre.* Against these you must have cheaper labour. I think that, on the whole, the North-West will succeed better as a green tea-producing country than as a black, on account of the character of the leaf.

We have from time to time seen the produce of several of the gardens to which you refer, and shall be ready to make arrangements to take charge of the teas if your plan can be carried out. I shall also be able to assist in obtaining young men understanding the London market.

With respect to Russia, I have always been sanguine as to the introduction of Indian tea there; but hitherto all efforts have failed. I have sent musters through the most influential houses, but, except in one instance, have been met with sundry objections: the *general flavor*, though liked here, is not esteemed there. "*Pekoe ends*" (the characteristic of *fine tea*) lays it open to the risk of a charge of extra duty,—the quantities are too *small* to be worth attention, and the great variation in *taxes* is fatal. This latter objection in time can be got over, and I think that Kangra is as likely to take in Russia as any other class; but they are very particular, and require a peculiar fragrance in the flavour, like sweet luscious fruit.

If you will let me know when it would suit you to call I will try to make my time yours almost any afternoon.

Annexure No. 3.

In a report on tea cultivation in the Kangra district, I had the honor of submitting to the Punjab Government in the month of August 1869, and which was subsequently published by the Government, I remarked that it was not taking too sanguine a view to anticipate the day when Kangra teas forwarded by rail to Kurrachee or Bombay, and from thence shipped via Suez, could be conveyed through the canal, and on to ports in the Black Sea, at considerably smaller cost than is incurred in the transport of teas from China to Russia.

I now offer the following observations upon the question of the tea trade with Russia:—

Tea as a beverage has become most popular among all classes who have the means of obtaining it in Russia: there the consumption of tea is so extending and increasing, that tea has become one of the most important staples of the import trade of the country—the demand being only limited by the supply.

The Report on the Tea Trade of Russia, written in 1867 by Mr. Lumley, Her Majesty's Secretary of the Embassy at St. Petersburgh, which I regret I have not at hand for reference, contains a great deal of information on the subject of this trade.

At present China provides all the teas consumed within the limits of the Russian empire. These teas are conveyed by two routes—

1*st.*—The sea route from China to England, and from thence on transhipment to ports in the Baltic.

2*nd.*—The route termed the Overland Route—that is, partly by land, and partly by inland water carriage through countries bordering on provinces of Central Asia.

The first of these two routes provides for the transport of by far the greater portion of the teas conveyed to Russia. This route, while presenting many facilities and advantages, has drawbacks,—several months elapse after shipment before the teas reach Russia; and as they are usually purchased through London brokers and merchants, instead of direct from the China market, there is reason to believe that the choicest kinds are secured in London before provision is made for the requirements of Russia. Moreover, it is pretty certain that the Russian market is made to pay for the higher priced teas, the value of which could not be secured in England.

The second, or so-called Overland Route, presents many difficulties and drawbacks. A brief description of this route will tend to show the delays and risks that are met with on this line, and which, while so greatly increasing the cost, necessitate the sale of the teas at almost prohibitory prices in the Russian market.

The tea destined for the Russian market by the Overland Route is mostly collected in the Province Fukien, to the North-east of Canton, whence it is despatched by land and water carriage to Chuck Chan, and thence by coolies or porters over the mountains to Kin Chan. There it is loaded in small boats and conveyed for 40 versts (a verst being about three quarters of a mile) down a stream into the Chinturg, where it is re-loaded in larger boats. Passing the town of Hanguhau, the boats emerge into the Eastern Sea, and coasting along reach the river Kisiang, up which they proceed to Shanghai. Thence the tea is conveyed in still larger boats to Teintsin, a passage of about 15 days. Here it is again re-loaded in other vessels which follow the windings of the stream Barboe up the Trenchi, 22 versts from Pekin, in the space of 10 days. From this point the tea is transported on camels and in bullock-carts to the frontier fortress of Kalgan, a distance of 252 versts, and thence across the Steppee, a desert of Yobes, 1,282 versts, to Keachta. The transport from Fukien to Keachta occupies two or three months.

The distance from Keachta to Moscow is 4,450 miles, so that

altogether the tea has to be conveyed, partly by land and partly by water carriage, a distance of 7,921 miles before it reaches its market.

From Keachta are two routes—the winter and the summer routes to Nijni, Noogorod, and Moscow. But by either of these two routes it occupies five or six months in transit from Keachta. Thus a period of fully eight months is occupied in the transport of teas from Fukien, the province where produced, to the markets at Nijni, Noogorod, and Moscow.

Indian teas have not yet, I believe, found their way into Russia. But bearing in mind the very great and increasing demand for tea in that vast country, it seems an important matter for consideration whether efforts should not be made to introduce the Indian teas into the Russian market.

I have myself brought a considerable quantity of samples of Kangra teas to England for distribution, in view to endeavouring to make these teas better known in the London market. A portion of these samples I have put aside for despatch to Russia, if I can find the means of forwarding them and securing their distribution among merchants in that country.

I may here mention that a gentleman, a partner in one of the largest wholesale tea warehouses in the city, was kind enough to test the samples I have brought home, and he pronounced most of them to be of excellent quality, and such as would command high prices in the market. The samples were all examined and tasted by professional tasters in my presence last week, and I was thus able to secure a reliable opinion upon the qualities and value of the samples of teas from three of the best plantations in the Kangra Valley.

Some have suggested that Kangra teas might be conveyed through Koolloo and Lahoul *via* Lek to Yarkand, from thence to Tashkend and on to Petropaulooch,—a post on the confines of Western Siberia. But this route appears to present as many difficulties, and to be scarcely more practicable than the present Overland Route from the tea district of Fukien in China. My personal knowledge of a portion of this route, through the wild and the inhospitable tracts of Lahoul, assures me that this route will never be available for trade or traffic on a large scale. the scarcity of carriage and labour, the rigorous nature of the climate and the sterility of the country preclude it.

But it seems to me that on the opening of the Suez Canal, and in the facilities afforded by this channel for trade communication between countries in Europe and in Asia, we have the means of establishing a great tea trade direct between India and Russia without the intervention of the London market. The advantage of this route in the shortening of distance is patent to all.

The teas of Assam and the lower provinces of India, shipping at Calcutta, have to be conveyed across a wide expanse of ocean, a distance of nearly 13,000 miles, before they can reach the London market. The teas from the Himalayas, in the North-Western Provinces and the Punjaub, which up to the present time have been shipped at Calcutta, have followed the same ocean track.

But the completion of the missing link in the line of railway communication across Central India must now make Bombay the port of the North-Western Provinces and of the Punjab, though hereafter, when Railway communication is complete along the Indus Valley, Kurrachee must become the port of the Punjab.

While the distance from Bombay to England round the Cape is about 11,500 miles, the distance from Bombay *via* Suez to ports in the Black Sea is less than 4,000 miles.

Teas manufactured on plantations in the Kangra Valley are conveyed a distance of 120 miles on camels, or in carts, to the nearest railway station within 10 days; from thence they can now be transported in five or six days by the rail to the seaboard at Bombay; and from Bombay could be conveyed over the Suez Canal to the ports in the Black Sea in about three weeks: thus these teas could be delivered to the consumers in Russia within two months of their despatch from the plantation on which grown and manufactured.

That attention is being drawn to the advantages of the Suez Canal for the establishment of a tea trade between China or India and Russian ports in the Black Sea without the intervention of the London market is, I think, apparent from the following extract I have copied from a recent issue of a widely-circulated London journal:

"A large trade has long been transacted in Mincing Lane in "high-priced teas, which being too costly for the English market "are sent to Russia. Now, however, the teas will go direct "*via* the Suez Canal to Galatz and the Black Sea, and thus a "considerable amount of trade will be diverted from the Lon-"don market." (Sd.) EDWARD PASKE, *Major*

IPECACUANHA.

INTRODUCTION OF THE IPECACUANHA PLANT INTO INDIA.

The Duke of Argyll addressed the Governor-General on the 20th April as follows:—

I have considered in Council the despatch from your Excellency in Council, numbered 12, Public, and dated the 25th of January, urging upon me the importance of introducing the Ipecacuanha plant into India, and suggesting that Dr. Anderson, the Superintendent of the Botanical Gardens at Calcutta, now in this country, should be asked to submit proposals as to the best means for obtaining the object in view.

On the application of the Government of Bombay last year, I had already recognized the importance of introducing this valuable medicine; and the two plants received at Bombay having died, I had already taken steps for procuring others for transmission in July next.

I transmit to you the correspondence which has been held with Dr. Anderson on this subject; and I trust that, even should the other attempts fail, Dr. Anderson will still have a sufficient number of strong plants to send or to take back with him to India, to secure the introduction and establishment of the plant.

It seemed to me that an application through the diplomatic Agents of Her Majesty was not likely to be so sucessful as an application through commercial or scientific gentlemen. You will see from the accompanying memorandum by Mr. C. Markham, of which I transmit 15 copies, that he has written to Messrs Miers and Co., of Rio, to Mr. Bramah, and to Dr. Otho Wucherer, to obtain roots of the plant.

The accompanying correspondence with Dr. Cleghorn and Dr. Balfour will show you that I have also enlisted the kind assistance of the Royal Botanical Gardens at Edinburgh, besides the aid promised at Kew. I forward also herewith 70 copies of the memorandum on the propagation of the Ipecacuanha plant prepared by Mr. McNab of the Royal Botanical Gardens at Edinburgh. Dr. Christison and Dr. Balfour have likewise applied to Dr. Gunning, a medical practitioner at Rio, to assist them in obtaining plants and seeds.

I add to these documents the letters which have passed between Dr. Hooker and this office, on the supply of plants for Bombay.

You will learn from my despatch to that Government of this day's date, that the plants destined for them will be retained at Kew; and two healthy plants will be sent to them from the Botanical Gardens at Calcutta.

Copies of the above, with the enclosures referred to, have been transmitted to the Government of Bombay, which has directed that the Superintendent of the Botanical Gardens and the Secretary of the Agri-Horticultural Society be furnished with copies.

* * * * "Not a tree
A plant, a leaf, but contains
A folio volume —we may read, and read
And read again, and still find something new,
Something to please, and something to instruct
Even in the humble weed."

For a long period the genus of plants that yielded *Ipecacuanha* were unknown until by the persevering researches of one "Professor Protero" of "Coimbra," aided by a medical botanist, a resident of Brazil, named "Hernando Gomez;" they determined its Botanical character. No doubt the specific name "*Ipecacuanha*" was adopted as conveying the strongest description of the properties of the root. Signifying as it does in the native Brazilian language, "*Vomit root.*" The value of *Ipecacuanha* is one that cannot be reckoned by *£. s. d.* it being an almost perfect antidote for that terrible bane of mankind, dysentery—in tropical countries especially,—terrible indeed to those whom it afflicts; call it by whatever name you will, it is truly human misery intensified; and as this medicine has been found to be the best remedy, a little interest, if only a little, may be entertained as to what the plants are that yield such a valuable secretion by the use of which human suffering is alleviated and life preserved. The natural order "*Cinchonaceæ*" is probably one of the most comprehensive of what are known as flowering plants, it is divided into divisions and subdivisions; under one of the latter termed "*Psychotrida*" is placed "Ipecacuanha." The generic name of this plant is "*Cephaelis*," (Greek) signifying a head, in allusion to the form of the flower. Of the genus there are about 40 species, from which may be deducted 7 or 8, being herbaceous and comprising the medical group; the remainder being shrubs. "*C. Ipecacuanha*" is a low growing half herbaceous plant with creeping roots, a native of the Brazilian and "N. Granada" forests; the active principle is called "*emitine*" or "*emetin*" and is contained in the annulated or ringed roots. The root is composed of a central axis, which is termed the "meditulum," and an outer covering or rind in which the drug is concentrated. Of the annulated Ipecâcuanha there are said to be three kinds, viz., red, brown, and grey, or grey-white, the latter is called the greater annulated Ipecacuanha and is the only kind said to be shipped from Rio Janiero and is commonly called Brazilian or Lisbon Ipecacuanha. Of the three kinds the brown contains 16 per cent of emitine, the red 14 per cent., the contents of the grey do not appear to be given. It is evident that the active principle "emitine" is not confined to one race of plants, but appears to be widely diffused; 9 per cent. is yielded by "*Psychotria emetica*," and "*Richardsonia scabra*, the undulated or starchy Ipecacuanha yields 6 per cent. Besides the above there are many

other plants which yield this valuable product of which may be mentioned the roots of "*Ionidium Itubu*"—these are commonly sold as the true Ipecacuanha. and are considered in Pernambuco the very best remedy for dysentry. According to "Aublet" the roots of "*Bærhaavia, decumbens*" are emetic and called Ipecacuanha in "Guiana." Deslongchamps" states that the powdered roots of "*Euphorbia Gerardiana*" cause vomiting fully in doses of 18 or 20 grains. And the roots of *Euphorbia Ipecacuanha* are said by "Barton" to be equal to the true drug, and in some respects superior; Dr. Duncan of Edinburgh considers that "*Colotropii gigantea*" (the *Mudar* of Bengal and the *Vercum* of Madras) agrees medicinially in every respect with "Ipecacuanha" and from the ease by which it can be obtained might cause it ultimately to supersede the latter drug. The roots of "*Tylophora asthmatica*" are used in Coromandel as Ipecacuanha, "Dr. Roxburgh" found it answer the same purpose, and in which he is borne out by others. Dr. J. Anderson a Physician General at Madras, during a season that dysentry was an epidemic in the British Camp used the root with the greatest of success and confirmed the opinion of "Roxburgh." This is probably one of the most valuable indigenous medicines in India. Similar properties are also contained in *Sarcostemma glaucum*," the Ipecacuanha of "Venezuela." The wild Ipecacuanha of the West Indies is obtained from "*Asclepias cunassavicus*.' "Dr. O' Shaughnessy" has found by experiments that the leaves of an East Indian plant, "*Crinum Asiaticum*" were equal in effect to the best Ipecacuanha; indeed it would appear that a bountiful Nature has furnished mankind in no stinted manner with this useful medicine. It is also found to be present in "*Richardsonia rosea, Geoptrila reniformis, Spermacoce ferruginia*' and *Spermacoce poaya*."

—*Darjeeling News.* HORTUS.

INDIAN FIBRES.

(*Concluded from our number of July last.*)

Major-General Clarke writes:—"It may interest the Committee to hear that, in 1855-56, the Punjab Government, then administered by Sir John (now Lord) Lawrence, sanctioned an advance to the district officer of Goograwala (myself) of 1,500 rupees, for the purpose of experimenting on the growth of flax. The plan I pursued was to offer to the cultivators of forty villages, having different characters of soil, the average profit they would expect on two acres of wheat if they would undertake to sow linseed, cut and deliver the same to the native revenue collector's office. The result was, that of the produce two tons were despatched to England, of which nineteen bales, sold in Belfast, realised £63 6s. 4d., at prices varying from £35 to £45 per ton, and those sold at Dundee fetched £28 15s. 10.; total £92 2s. 2d., at £45 per ton. My own opinion was, that the district in which these experiments were conducted was not by any means the one in which the natives would be likely to take up such cultivation, although the experiment was not unsatisfactory, even as to profitable results. I am of opinion that there are several tracts, chiefly alluvial, to the east of Ungurabad in the Punjab, in which flax may be grown profitably; and indeed, in parts of the Scalkote district the flax is grown for fibre as much as for seed. I know no other district in which this is the case. The twine is called "toolee." I think it was in 1857 that, in a brief visit to Dundee, one of the gentlemen I met there told me that the twine I showed him, which I had in my pocket, and which was a bit of string that I had bought in the bazaar and brought home, was worth 4½d. per lb. I believe that the Government of Punjab experiments led to the establishment of flax works, conducted by Belfast men, and I have heard that many difficulties beset the enterprise. I can only say as to this, that wherever an article requiring mechanical skill in its preparation grows indigenously in India, it may be profitably dealt with by European supervision. As to how far the cultivation of flax may be extended I cannot state anything definite, but I think that there are several other fibre-yielding plants which will be much more grown than they have hitherto been. I suggest whether some of the vast, arid, sandy tracts in the Punjab might not be experimented on as to their fitness for growing "atscha" or esparto (the Spanish grass) for making paper. I believe that *Lloyd's Weekly News* is made from this fibre, of which the stock in Spain has declined, but of which Algeria yields a good supply."

The following is the correspondence alluded to by Dr. Archibald Campbell, regarding the Pooah fibre of Nipal and Sikim (*Bhæmeria nivea*) and the oodal (*Sterculia villosa*):—

Extract from Letter from Dr. Campbell to the Agricultural Society of Calcutta.

I have the pleasure to bring a new sort of hemp to the notice of the Society, on behalf of Sergeant Crutcher, who is a professional worker in leather, and uses it in his craft. The sergeant considers it equal to Russian hemp for shoe and saddlery work and purposes, if a demand should be made for it, to prepare and supply it to the Calcutta market. I shall shortly describe the plant, the method of preparing the hemp, with some other particulars, and will request of you to be so kind as to have it submitted to a comparative trial with the "sunn" and European hemps, and favour me with the result; also adding, if possible, the price it would fetch per maund in the Calcutta market.

Description of the Plant.—The plant from which the hemp is made is called "pooah" by the Parbuttias, "kienki" by the Lepchas, and "yenki" by the Limboos. It is like a nettle, and is one, probably, although I cannot determine the question. I have, however, the pleasure to submit herewith the leaves, seeds just formed, and a portion of the stem of the plant, from which the genus if not the species may be determined. It grows to the height of six to eight feet, and varies in the thickness of the stem from the size of a quill to that of the thumb. The leaf is serrated, of a dark-green colour above, silvery-white below, not hairy or stinging, and has a reddish pedicle of about three inches long. The seed forms in small currant-like clusters along the top of the plant and on alternate sides, about an inch apart; two small leaves spring from the stem at the centre of and above each cluster of seed.

Habitat.—The pooah is not cultivated, but grows wild and abundantly in the valleys throughout the mountains of Eastern Nipal and Sikim, at the foot of the hills skirting the Terai, to the elevation of 1,000 or 1,200 feet, and on the mountains up to 3,000 feet. It flourishes best in the hills at the same elevation at which the cotton is grown, but it does not, so far as I can learn, grow on the flat Terai, or open plain along the mountains. It is considered a hill plant, and not suited to the plains, or found in them. It does not grow in the forest, but is chiefly found in open clear places, and, in some situations, overruns the abandoned fields of the hill people, within the elevations which suit it. It is, I believe, a perennial, but of this I cannot speak positively, as I have not till now known the plant. It sheds its leaves in the winter, throws them out in April and May, and flowers and seeds in August and September, the exact period altering of necessity with the elevation.

When used.—It is cut down for use when the seed is formed. This is the case with the common flax in Europe. At this time the bark is most easily removed, and the produce is best. After the seed is ripe, it is not fit for use—at least it is deteriorated.

How prepared. As soon as the plant is cut, the bark or skin is removed. This is very easily done. It is then dried in the sun for a few days. When quite dry, it is boiled with wood ashes for four or five hours; when cold, it is beaten with a mallet on a flat stone, until it becomes rather pulpy, and all the woody portion of the bark has disappeared; then it is well washed in pure spring-water and spread out to dry After exposure for a day or two to the bright sun, it is ready for use. When the finest description of hemp is wanted, the stuff, after being boiled and beaten, is daubed over with wet clay, and spread out to dry. When thoroughly dry, the clay is rubbed and beaten out, when the hemp is ready for spinning into thread, which is done with the common distaff.

Uses.—The pooah is principally used for fishing-nets, for which it is admirably adapted, on account of its great strength of fibre, and its extraordinary power of long resisting the effects of water. It is also used for making game-bags, twine, and ropes. It is considered well adapted for making cloth, but it is not much used in this way—I am, &c.,

A. CAMPBELL.

Darjeeling, September 24th, 1847.

P. S.—The gigantic stinging nettle of the Nepaul and Sikhim hills is made into hemp, and used in making the cloth called "bangra";* the preparation is the same as the pooah. The bangra is harder and stiffer than the pooah, and not adapted to making cordage and nets.

In compliance with your request, I have forwarded to your address a packet of the pooah hemp, which will, I hope, enable you to have the experiment instituted as to its comparative merits. I have also sent you a parcel of the dried bark of the pooah, with which you may desire to try some other mode of preparation than that in use here.

Enclosed is a note from Sergeant Crutcher, on the expense of preparing the hemp, which shows that the process, in his hands, has been very expensive. He tells me, however, that he thinks it may be prepared for about 4 rupees per maund, if done on a large scale; this, of course, is still conjectural. The point to be first ascertained is the quality of the article. On this I hope again to learn the opinion of the Society.

A. CAMPBELL.

Darjeeling, October 30th, 1847.

SIR,—I beg to enclose an account of the expense incurred by me in manufacturing a small quantity of the pooah for the Society. I send, per bearer, the pooah manufactured, also a seer in the rough state, for them to try experiments on. The expense is including the seer not manufactured, Rs. 4-6-6.

C. M. CRUTCHER, Sergeant.

October 29th, 1847.

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* See "Notes on the Agriculture of Nipal," vol. iv., p. 173, "Transactions of the Agricultural Society of Calcutta," by Dr. A. Campbell.

Expense of manufacturing the pooah, 4½ seers only, cleaned from the stalk, cost 11 annas per seer..	Rs.	3	1 6
Expense of boiling the above, 2 men for two days, at 2 ans. 6 pies. each per diem ; also finishing the process.....	,,	0	10 0
Total	Rs.	3	11 6

Quantity manufactured from the above is two seers, at a cost, as above detailed, of Rs. 1-13-9. per seer ; the waste in manufacture is exactly five-ninths.

The reason this experiment is costly is this, the pooah was brought in by a coolie engaged on purpose, and not cultivated by myself ; also the process should be conducted on a large scale, as the same expense, incurred as above, would be sufficient for a maund.

Extract of a letter from Major Jenkins, dated Gowhatti, 24th Nov. 1847, on the Oodal (Sterculia villosa), a species of Nettle

The Oodal rope I sent you, not long ago, was a present from Capt. E. F. Smith, commanding at Sudiya. He thought it possible serviceable ropes might be made from this substance if better prepared. You may be aware it is the common rope used by all the elephant hunters when in the jungles. The tree is very common, and the rope is made most readily. The bark, or rather all the layers, can be stripped off from the bottom to the top of the tree with the greatest facility, and the pliable ropes may be made from the inner layers of bark whilst the outer yields coarse ropes. The rope is very strong and very lasting, wet doing it very little injury.

Report on the abovementioned Fibre and Rope, by Capt. A. Thompson.

An unexpected pressure of affairs has prevented me till now sending you the specimens of oodal rope and pooah hemp you sent me to experiment upon. I have now the pleasure of handing you the manufactured specimens, as also returning the communication of Dr. Campbell and Major Jenkins on the subject, together with some remarks on their value, and the uses to which I think them adapted.

First, the oodal. When well made, this rope is equal in strength to our best coir. But, in its present state, from having been made green, I suppose it is too stiff and inflexible for marine purposes. It resisted every attempt to separate the fibre or to dress it by hackling, and could only be useful, I think, for rafting timbers, bale lashings, stage ropes, and such like purposes, for which jute is now used, and the value of which is from 2½ to 3 rupees per maund. You will see by the specimen that has been re-manufactured, that the same rope when laid by machinery is three-quarters of an inch less in circumference than that sent by Major Jenkins ; consequently, a rope af three inches made by machinery is equal to one of four inches made by hand. I would further observe that, could the fibre be brought here in such a state of flexibility as to allow of its being dressed by the hackle and properly spun, the value would be very much enhanced, and, I have no doubt, it could be made into good rope for ship use. The line made of the bark of the oodal, you will observe, is much more flexible, and better adapted for ship use, but not so strong. It is very elastic, having stretched 16 inches in six feet. It sustained 1½ cwt. for two hours before it broke. Of the pooah I have to report more favourably. The substance resembles cotton-wool more than hemp, and is consequently better adapted, in my opinion, for sail-cloth, twine, and thread, than for rope. I send a specimen of the cloth made of it, as also a piece of line. The pooah, when properly dressed, is, I think, quite equal to the best European flax, and will produce better sail-cloth than any other substance I have seen in India. I observe, from Dr. Campbell's communication on this fibre, that mud is used in the preparation, which clogs it too much, and not only renders it difficult to dress and spin, but spoils the colour, as is evident by the sample of cloth made of it.

My superintendent, Mr. William Rownee, who understands the nature of these substances, tells me that, if potash were used in the preparation (which is invariably done with Russian hemp and flax), instead of clay or mud, the colour would be improved, the substance rendered easy to dress, and not liable to so much waste in manufacturing. The value of the pooah fibre here may be estimated from the following data :—To make one yard of sail-cloth, it requires 11 lb. 2oz. of fibre ; and the expense of dressing, spinning, and weaving it (with the rude apparatus now used by the natives), is 2 annas 6 pie, and I estimate the value of the cloth, when made, at six to seven annas per yard ; or, it might be easier understood thus :—

A maund of clean pooah will give 72 yards.....	Rs.	25
Less expense of manufacturing, say	,,	15
Leaving as the value of the fibre.....	,,	15

There are other incidental expenses that are not included here, but as near as I can at present estimate, I should say it is worth twelve rupees per maund. I would only further observe that, if properly prepared and dressed, I think the pooah capable of being converted into fibres much finer than either sail cloth or sewing twine.

OPIUM.

OPIUM TRADE.

To the Editor of the Pall Mall Gazette.

Sir,—It has been long known that the poppy has been and is cultivated largely in at least five Chinese provinces, and in the earlier edicts it was less to the use of opium than to the "oozing out" of the sycee silver in payment for the "foreign drug," that the objections were urged. It was and is notorious that many of the decrees against the importation of opium emanated from those who themselves consumed it. Employed in excess, there can be no doubt of its being deleterious and dangerous, but its mischiefs have been much exaggerated. I caused statistics to be prepared when I was Governor of Hong-Kong, and it was shown that there were fewer deaths among the 60,000 natives who smoked opium, than among the 600 Europeans addicted to drinking. Among forty of my own dependents and servants, there was only one who used the drug to excess—nor let it be forgotten that opium has, to a very large extent, banished intoxicating liquors, formerly much used in China. The drunkard is led to commit every sort of violence ; the effects of opium are much less injurious—they who smoke it are delivered over to delicious though delirious dreams, but the community suffers little from these excesses. I believe no legislation will prevent an indulgence which may be called national, and were Indian opium prohibited and its supply checked, the vacuum would be soon filled up from other quarters. Any increase upon the heavy duties now levied in China, will but give greater encouragement to smuggling, especially along the extended coast and amid the many islands of the China Sea, and the almost universal corruption of the Custom-house officers.—I am &c.,

May 11, 1870. JOHN BOWRING.

FOREST CONSERVANCY.

FOREST DEPARTMENT.—A SUCCESS.

SIR,—I cannot pass by your quotation from the *Madras Mail* entitled, "Forestry a Failure," without endeavouring to show up what any one who is acquainted with the history of forestry in Europe must know to be egregiously in error. The facts of European forestry show that a large outlay of money is necessary for a period of between 60 and 100 years, in order to produce forests, but that, eventually, they pay very well, and France and Germany once exhausted of timber are now supplied with fuel at nearly as cheap a rate as coal, besides exporting enormous quantities of deals to all the world. Some in fact are now in use as sleepers on the Indian railways. The true place of the forests is emphatically *not* under *revenue*. Forestry has for its object the *production of timber to supply the demand* and not revenue which properly comes from taxes. The average proportion under forest in Germany is about 1·15 acres per head of population, and a good acre produces 5,000 cubic feet of timber. The rate in the Central Provinces, a fair specimen of India, is perhaps three acres per man, a good acre bearing at the outside 500 cubic feet ; but the forests are mostly cleared of all good timber and are not likely, without the most careful conservation, to reproduce it Scientific forestry, like agriculture, is based on a system of rotation and a proper provision, for reproduction of the crop is the very existence of the system. To dismiss the trained forest establishment and appoint a forester in each district under the civil authority, would indeed, as the writer in the *Madras Mail* says, produce a fine income with little outlay, but the forests would, like the goose with the golden eggs, soon be out of existence. It would be precisely as sensible to appoint an agricultural labourer to look after a farm with orders to cut the unripe corn and sell it for straw and dismiss your steward because he wanted money to sow the next crops. If the writer had any idea of how successful both in the timber producing and paying point of view systematic forestry has proved in France and Germany after one and a half to two centuries' trial, I am sure he would not have propounded such opinions, condemning without facts a well-established institution. Before it is possible that there can be any result from conservation in India, the full period for the growth of the trees must elapse, *i. e.*, 80 to 100 years. Till then, if the forest department pays its expenses it will have done exceedingly well. I hope that by publishing this you will let forestry have justice in your liberal columns.

THOS. WINGFIELD WEBBER,
Asst. Conservator of Forests, Hoshungabad, C. P.

FOREST TRAINING SCHOOL.

The Conservator of Forests having proposed to establish a Forest Training School for the Madras Presidency, Government referred the matter to the Board of Revenue for observations. The Board remark that Major Beddome points out the great disadvantages which attend every effort to establish a system of

forest conservancy, owing to the want of superintendents possessing any knowledge of the first principles of forestry. It was at one time proposed to open a Training School at Nellumboor Teak Plantations, but Major Beddome does not now advocate that plan. He shows that at Nellumboor (the planting being confined to teak) no general knowledge of arboriculture could be obtained there, and points out that, as the country is feverish and the people inhospitable, considerable expense would have to be incurred in the erection of dwelling houses, etc., for the pupils. Major Beddome, in preference, recommends that a school for a limited number of pupils should be opened under the charge of the Conservator at Ootacamund, where he shows that pupils would have the advantage of studying planting in tropical, sub-tropical, and alpine regions, and would be in a position to acquire more varied information in forestry than at any other place.

The question of establishing a Training School at the expense of the Jungle Conservancy Funds was raised in 1867, and referred to the Collectors of districts for their opinions. The Collectors were divided in their opinions—some considering that no measure of the kind was required for their districts, while others foresaw considerable advantages in the proposed scheme. They also differed as to the class of men to be employed—some Collectors proposing to train intelligent men of the overseer class, whilst others would have been content with subordinates on 7 rupees a month. The general question of jungle conservancy having been at the same time brought forward and referred to the districts for report, all action was stayed as regards the Training School, pending the receipt of the reports from the different districts on the measures of protection which the several Collectors proposed to adopt.

From these reports it appears that conservancy has been carried into practice, and reserves for firewood formed to a greater or less extent in all districts. The measures adopted in various districts differ, of course, according to the varying circumstances of the country to be treated, but a beginning has been everywhere made. It is not necessary in this place to review in detail the proceedings in each district, but the Board are satisfied that the time has now come for gradually introducing a more systematic treatment of the jungles under conservation, and with this view they strongly advocate the establishment of a Training School at Ootacamund as suggested by Major Beddome.

The Board have conferred with Major Beddome on the subject, and agree with him in thinking that for the present a limited number of pupils of the overseer-class should be entertained. Major Beddome considers that a course of training of from four to six months would be sufficient to fit intelligent young men for employment under Collectors. A class consisting of five individuals, of whom three should be Natives, would be sufficient at first, and the Board consider that an allowance of 40 rupees a month each for the former and 20 for the latter would suffice. As these men become duly qualified, they might be sent to the districts and be re-placed by others. Their salaries while training would be fairly chargeable to Local Funds, and the cost should be distributed rateably over all the districts. The Board consider that this will be preferable to charging the salary of individual pupils to particular districts. Each district will in its turn be supplied with overseers from this class, and may therefore be fairly called on to contribute to its general cost.

The Board are also of opinion that it is highly desireable that the superior officers of the department, before entering on their duties in districts, should undergo a course of training at Ootacamund, the expense being of course borne by the Imperial Forest Revenue: with this view, if possible, one or two supernumerary officers should be appointed. The proposal of Major Beddome to establish a Museum for the department also commends itself as sure to be of the greatest aid to students of arboriculture, and the Board recommend that funds be allotted whenever available for the purpose.

Pending the passing of a new Forest Law, it woul be premature to discuss the future organization of the department, but the Board consider that the first step towards improvement in forest management will be to provide the means of training an efficient body of men to carry the law into effect whenever it may be passed.

The Government have ordered the matter to lie over until the proposals for the re-organization of the Forest Department are disposed of.

HIMALAYAN FORESTS.—NO. II.

In a former notice *(Vide Supplement to Indian Economiest for June* 10, *Vol.* 1, *p.* 193.) we pointed out a method by which the extensive forests on the banks of the Sutlej could be easily and successfully made a source of considerable income to the Forest Department. We attempted to show that after the clearance of a large number of big trees, care ought to be taken lest the forests should be ruined. If our suggestions were adopted and the sowing and planting in open tracts carried into effect, in a very few years many of the trees would attain to those dimensions which would enable the department to recommence operations periodically. This point should never be left out of sight. And in order to effect this purpose efficiently, we again urge the strong necessity that exists for having good paths in, about, and between the forests to bring them within easy access of the officials. One path in particular running from Nachar through all the forests at an elevation between the place occupied by the present bungalow there and the new Deodar plantation in the eastern forest, is especially required. It would prove of considerable benefit to those who had to visit Panwi, Dippi, Kusthall and all those forests whose position at present is inaccessible to the inspector owing to the steepness of the precipices. Zig-zags should always be made leading down to the river's edge from some point in each forest to enable inspection to be carried on as to whether the logs have gone into the river or not. The present mule-road should be extended from Kilba to Bursari, (a place beyond Sangla on the river Buspa, a tributary of the Sutlej) in one direction, and in the other to the Teelong forests with a bridge across the Sutlej at some convenient point between Rispa and Riba.

This road should then be continued to the Jangi forests. A branch road sloping up gradually and proceeding through the centres of the Karchain, Mehar, Barung and Janglin forests, and again joining the main road at some point in the neighbourhood of Purai, would prove of the greatest service in affording an opportunity of opening out the resources of the above-named forests.

Considering the great profit that might be derived from such an undertaking it is not too much to say that about eight thousand rupees should be sanctioned for this important purpose, disregarding even the fact that without such a road as indicated, personal superintendence on part of the officers of the Forest Department would be attended with great danger from present inaccessibility of the locality. The money spent on such a work ought never under any circumstances to be considered as wasted, for if it served for no other purpose, the Government in the long run would be the gainer by opening up the country and benefiting the inhabitants. The charge in itself at best is only required for a few years, as the roads once completed would require merely to be kept up.

As regards further expenditure not obviously necessary, yet highly advantageous, it will be worth while mentioning that an annual sum should be granted for building groynes or spurs in the river Buspa to confine and deepen its channel, and also for blasting the large boulders that are found in its bed both in the gorge and especially below the village Chassoo. Nor would an allowance of Rs. 2,000 a year be thrown away on work of the latter description in the Sutlej commencing with the worst portions of the river. Compared with the great damage to the timber which now takes place from this cause, the sum to be given is certainly not too much. It will further be required to construct a good foot-path along the river bank, crossing and recrossing as might be deemed expedient to avoid those worst portions of the mural rocks which are frequently to be met with near the river bank. Such a work, enabling the officers in charge to expedite the logs in their progress to the plains, would not require more than an annual sum of Rs. 1,000.

After the trees have been cut down, the next important work is to transport them in parts down to the river. Hence care must be taken to have all the necessary slides, timber roads, &c. required for extracting the logs from the forest as perfect as possible. Rs. 15,000 at least should be annually sanctioned for these purposes in order to derive full benefit from obtaining long and sound logs, since both these qualities are great desiderata in timber employed for building houses.

The places where the forests grow are remote from the centres of courts of justice, and it is therefore difficult in cases of dispute between the employer and the employed to detect and punish the guilty. It will be easily understood that an officer in charge of a forest cannot without the greatest loss and inconvenience send a native accused of any crime to Simla, a distance of about 200 miles; and in case of coolies being defrauded of their pay and perquisites by the head of their gangs, it is next to impossible for the wronged person to obtain redress. It was not long ago that a European almost lost his life in a brutal assault made by the savage hill-men in those parts, without being able to bring afterwards the perpetrators to justice. The Deputy Conservator of the Sutlej Division has certainly obtained the powers of a magistrate, but we would suggest, limited as they are, they should be greatly extended in order that the whole line of the country lying on both sides of the Sutlej and its tributaries might benefit by the change. In addition to all, cases connected with timber, he should have special powers in the Bussahir territory as far as the frontier to settle all differences between travellers and inhabitants. All appeals from his decision ought to be referred directly to the Agent of the Governor General or Commissioner of Division. The Deputy Commissioner at Simla and others

have already too much on their hands to render it advisible to increase their work. The Assistant Commissioner at Pullhan should also have powers of a magistrate in all cases relating to timber, with right of appeal from him to the Deputy Conservator, and thence as before suggested.

But to return to the actual operations. Experience shows that it is a mistake to saw up timber into scantlings in forests. Such a proceeding doubles the cost of sawing, and it adds considerably to the cost of provisions to maintain the sawyers, since ninety per cent. of them must be brought from the plains and elsewhere. Next, bringing the kurries on carts to the river (for to drag them along on the ground decreases their dimensions from friction,) is far more expensive than taking down entire logs, and considerable loss occurs in their progress down the Sutlej where they get knocked and battered about and become broken and waterworn.

In some of the khuds of more than ordinary level, strong dams might be employed to deepen the water sufficiently to float the logs down to the Sutlej: in section this would have the appearance of a gignatic staircase; but perhaps it will be found preferable to construct roads about 12 feet wide at a gradient of about one in forty, starting from the water's edge and leading to the remotest parts of the forest. A few feet above it in each of the natural slides check-walls might be built where logs brought down from the upper portions of the forest could be collected. From these walls the logs should be put on trucks running on a wooden tramway; check-gear being used to prevent their attaining too great a speed on their downward course, and bullocks employed to draw them back again.

Next to the felling and launching operations the most serious thought ought to be given to the proper establishment of timber depôts. Considering the large quantity of wood used at Simla, Sabbatoo, Dugshai and Kussowli, one depôt should be fixed at Suni, about 12 miles from Simla. A small tramway constructed by degrees, would eventually prove of great service in connecting this depôt with the selling points, and be an expeditious and cheap method of transit. It is scarcely necessary to add that the great depôt and final place for catching the timber should be at Phillour, being nearest to the rail and therefore within easy reach of the largest towns of the Punjab. Parcels of timber could thus be conveyed to Jullundhur, Umritsur and Lahore on the one side, and in the other to Umballa, Saharumpore, Meerut, Delhi and Agra. Now that a railway is projected from the latter place to Bombay we cannot be wrong in saying that good and cheap timber delivered on that line will prove as profitable to the Forest Department and to the State Railway.

Considering Phillour as the chief storeyard, it will be advisable not to let the timber accumulate too much lest loss should be incurred from rotting, but by quick sales to aim at small, not excessive, profits. A saw-mill at that place would yield a good return upon its outlay, and a landing wharf connected with the railway by a siding would be a great saving of expense in getting the logs to their station

Our suggestions are very simple indeed; aiming at effecting a large and sure income to the Forest Department when it assumes operations next year. But should the Government wish to derive full benefit from the resources of these splendid forests, another 3000 trees might be annually felled in the Pandra Bis district opposite Nachar, Tarenda and Serahan. The difficulties there are no worse than in Kunawur, and the out-turn would be equally good, yielding under an energetic man after allowing a lakh of rupees for annual expenditure, a surplus of a couple of lakhs every year.

It is needless to add that to carry out the work under notice a good establishment is the prime requisite. Unless efficient European supervision is sanctioned the work will never succeed. To this effect it would be most necessary to appoint a special Conservator for the forests we have before mentioned; and as for the staff of assistants, all that need be said is, that it should be sufficient. If the Governor General has a mind to increase the revenues of the country, here is an opportunity. With assiduity and care the Himalayan forests will at no distant period be more profitable than the deleterious poppy fields of the plains.—*Indian Public Opinion.*

THE MARKETS.

LONDON, 11*th August*, 1870.

COFFEE.—At public sale 40 casks of Plantation Ceylon were bought in, but afterwards sold at 65*s.* to 67*s*, being the full value of 1,400 bags. Native Ceylon catalogued, part was sold previously, and the remainder at and after the auctions small to bold pale, 40*s.* to 49*s.*; peaberry, 48*s.* to 48*s.* 6*d.* 300 packages of Wynaad Plantation, part sold—triage, 52*s.* to 54*s.*; middling to good middling colory, 63*s.* to 65*s.*; peaberry, 75*s.* to 75*s.* 6*d.* Yesterday 1,000 bags native Ceylon sold—small, 40*s.* 6*d.*; good ordinary, 46*s*; bold, 50*s.*; peaberry, 50*s.* The *Civilian* says that enormous, and probably unprecedented, shipments of coffee to France have been made during the past few days, with a view to escape the increased Customs' duty which will soon be levied under the war budget.

TEA.—Messrs. W. J. and H. Thompson state:—"Since the settled alteration of conditions of sale a moderate business has been transacted, but without any alteration in prices. Foochow Congous—siftings and dust continue unchanged, broken leaf has been sold at 8*d.* to 9*d.*, and inferior common at 9*d.* to 10*d.* per lb.; an inquiry has existed for common to good common at 10½*d.* to 11½*d.*, and for fair at 1*s.* per lb., but only a limited business has been transacted. Black leaf congous—common may still be quoted at 10½*d.* to 11*d.*, and good common to fair at 11½*d.* to 1*s.* 0½*d.* per lb., which prices do not show any improvement. The public sales of 7,000 packages Indian growth were commenced on Aug. 9, and are progressing flatly at 1*d.* to 2*d.* per lb. decline. Privately, new monings are selling slowly at 1*s.* 9*d.* to 2*s.* 6*d.* per lb. The *Erl King*, steamer, 1,804 tons, is the first steamer in from China with the new season teas. She left Hango on June 4, along with the *Diomed* steamer, both taking the Suez Canal route. The *Erl King* arrived in the river on Aug. 5, and commenced discharging her cargo in the London Docks next morning. The *Diomed* arrived at Gravesend on Aug. 6.

RICE.—Quiet. Privately 4,000 bags low Rangoon have been sold at 8*s.* 6*d.*; and afloat a cargo of 620 tons Bassein, arrived off the coast, at 9*s.* 7½*d.* per cwt. Continental terms. At auction, to-day, 1,680 bags fair Rangoon, new crop, were placed at 9*s.* 6*d.* per cwt. 10,500 bags Siam were bought in.—*Overland Mail, Aug.* 11.

INDIGO.—Cannot be sold in London unless at a ruinous loss on the cost; and if the war continues matters will go from bad to worse; add to this the present prospects of a good out-turn for the year, and it will be seen that the state of things is by no means satisfactory either for the planter or the shipper; in fact, if the war lasts for many months more, the losses to both interests are likely to be serious. The crop of the year is estimated at from 100,000 to 110,000 Factory maunds.—*Toulmin & Co., August* 20.

(BY WILLIAM MORAN & Co.)

CALCUTTA, 26*th August*, 1870.

INDIGO.—The crop of 1868-69, with an estimate of 1869-70. It will be observed that last year's crop has exceeded our estimate of the 12th August 1869 by about 15,000 maunds, in explanation of which discrepancy we beg to remark that it is accounted for by a great excess over former years in the proportion of Indigo (chiefly *Gaud*) made by *Natives* in the *Doab*. With regard to this part of the crop we have no means of obtaining information beforehand, and in making our estimate, we can only put the native production down at their usual relative figure compared with the quantity expected to be made by Europeans. The difference between the result of the outturn of *Lower Bengal, Tirhoot, Chumparun, Chuprah*, and the *Benares* districts, from our estimate of August last, was only about 3,000 maunds in 60,000, while the excess over the estimate of the *Doab* outturn as explained was about 12,000 maunds.

There remain in stock in Calcutta about 5,800 maunds, comprising about 4,500 maunds (say 1,200 chests) of Native *Oudes*, nearly all of ordinary and low *Gaud* descriptions, and about 500 maunds Native *Rungpore*; the rest being odds and ends of all descriptions purchased at auction to be re-manufactured, and a few low Figs.

Our accounts from the Indigo districts vary a great deal. Heavy rain has fallen in parts of *Tirhoot* and *Chumparun*, too much in some places, and is causing the leaves of the plant to turn yellow, whilst in the higher lands it is of great benefit to the *Khoonties*. In other places more rain would be be acceptable. In *Chuprah* all is progressing satisfactorily.

From the *Benares* districts we have several letters from Planters on whose opinion we could confidently rely, but who are at present very averse to expressing any as to the out-turn of these districts. There *Issauee* sowings have suffered so much by excessive rain and a consequent unconquerable crop of weeds springing up and choking the plant, that little or nothing can be expected from them unless under the influence of a few weeks of fine weather. The *Khoontie* crop (last year's plant) will turn out more than last season apparently, and we are inclined to think the whole out-turn may be a little over that of last season

We have great doubts as to the probable out-turn of the *Doab* after our experience of last season; but being assured by many of our native friends that the manufacture of *Gaud* Indigo will be on a reduced scale this year, and as they cannot but see from the stock lying here unsaleable, that the making of such Indigo must result in a heavy loss, we have estimated that division of the crop at a few thousand maunds less than it yielded last year. So far as the European factories are concerned, which represent about a fourth only of the production of the *Doab*, there is not likely to be much, if any, falling off from last year's quantity.

	Crop of 1868-69.			*Estimated Crop of* 1869-70.
Dacca, Furreedpore and Mymensingh. Fy. Mds.	1,245	...	...	2,050
Jessore ,,	4,233	...	...	3,450
Kishnaghur & Nuddea ,,	2,076	...	...	4,275
Midnapore ,,	1,635	..	...	1,000
Burdwan ,,	1,045	.	...	1,300
Moorshedabad ,,	1,029	...	...	2,280
Rajshye and Bogra	427	..	...	1,120
Maldah, Deauleah & Pubna	977	...		1,300
Bhagulpore ..	2,080	...	...	2,550
Monghyr ..	595	...	...	1,025
Purneah .	1,958	...	...	3,150
Native (incl. Rungpore)	3,266	..	..	3,500
Lower Bengal.	20,566	...	...	27,000 to 27,000
Tirhoot ...	11,080	Tirhoot ...	18,500	
Chumparum	7,126	Chumparun	9,000	
Chuprah	4,001	Chuprah	8,500	
	27,207			36,000 to 36,000
Benares .	17,776			18,000 to 20,000
Doab	30,670			25,000 to 28,000
Total Fy. Mds.	91,119			1,06,000 to 1,11,000

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A. H. BLECHYNDEN,
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Bombay, April 1870.

THE

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, SATURDAY 15TH OCTOBER, 1870. [No. 3.

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IMPROVED YIELD OF COTTON.

THERE are symptoms here and there in India, of an improvement being about to take place in the yield of cotton by Indian soil which, if it become general, will place the material well-being of the country upon a sure and lasting basis. We noticed in a late issue, the extraordinary out-turn of the staple upon some of the Governmental farms established by Lord Mayo. At the last meeting of the *Agri-Horticultural Society* of Calcutta, the Secretary read the following letter from Mr. J. J. Fraser, of Gopalpore Factory, Jaunpore :

"I have forwarded to your address a parcel containing one pound of cleaned cotton. It was raised by myself from Hingunghat seed, supplied by the Collector. I departed from the suggestion made by the Cotton Commissioner, and cultivated under a system of transplanting. I sowed broad-cast before the rains, and when the plant was about eight inches high, I transplanted at a distance of 4 feet, the rows also being that distance apart. I need scarcely add that after the rains, the field was frequently hoed and watered. The result has been good, and better I fancy than any grown under the ordinary system. The produce has been 280 lbs. per Jaunpore bigga, or 376 lbs per acre; and this of clean cotton such as I sent you."

A yield of this order is new in India altogether. The cotton is declared to be "silky, clean, and of good staple," and such as would sell readily in Liverpool at prices approximating to the value of "Middling Orleans." The average Indian yield of clean cotton has hitherto been 35 to 70 lbs. per acre. No lands of greater productive powers than those already under cultivation in America exist in that country, and the yield would seem to be declining, although a produce of 500 lbs. per acre under high cultivation and where the seed is carefully selected, is not we are told unfrequent, and some counties return an average of 300 lbs. per acre The yield of American soil generally in the last season was as follows :

North Carolina	115 lbs.	per acre.
South Carolina	123 ,,	,,
Georgia	150 ,,	,,
Florida	152 ,,	,,
Alabama	176 ,,	,,
Mississippi	201 ,,	,,
Louisiana	296 ,,	,,
Texas	275 ,,	,,
Arkansas	251 ,,	,,
Tennessee	160 ,,	,,

When it is remembered that this yield is obtained only by the same means—artificial fertilization—adopted upon our own model farms, we begin to hope that India after all, may yet compete successfully with America in the production of the staple. At all events, we can hardly attach too much importance to the efforts being made in this direction. If *they* fail, we may give the matter up in despair If they succeed, how terrible a reflection will the fact be upon the character of past experiments in the country which have cost the treasury not far short of a million sterling.

YIELD OF RICE AND WHEAT.

CENTRAL PROVINCES.

SINCE our last issue, we have received the Administration Report of the Central Provinces for the last year. "The first "five or six months of 1869-70," says the Commissioner, "were a "time of bitter suffering and privation to the labouring classes." The rains of 1868-69 failed all over the Provinces. The autumn crop (*khureef*) of 1868, and the spring crop (*rubbee*) of 1869 were alike failures, and the distress of the people seems to have been very great from April to October, when the khureef of 1869 resulted in a bountiful harvest. The effects of the drought, we are told, had been very remarkable :—"Tanks dried up ; "forest trees withered ; rivers shrank to puny streams ; wild "buffaloes died of thirst in the jungles ; and if native report "may be credited, the very snakes perished in large numbers "from the intense dryness and heat. Even the abundant rains "of 1869 scarcely sufficed to restore the balance of nature, for "in the last cold weather it was noticed that the rivers still "flowed with something less than their accustomed volume, "and that the tanks had not been completely replenished." The Commissioner remarks that the experience of the last two seasons has thrown much light on the question of the food reserves of the country ; and we shall therefore look with interest for the Famine Report which Mr. Morris promises, in which the subject is to be discussed at length. The report before us simply states, that the grain stores in the provinces proved to be much greater than was expected, and that while the food reserves of the Nerbudda valley "held out well, those of Chutteesghur seemed quite inexhaustible." The report is accompanied with a tabular account as usual of the average produce of the land per acre during the year. This is now the third of these annual statements, and it is desirable, we think, to compare it with those of the previous two years. The staple grains of the Provinces are rice, wheat, and a coarse grain called *kodo*. The area under cultivation with each respectively, during the last three years was as follows :

	1867-68	1868-69	1869-70
Rice.....	2,532,328 acres.	2,899,230 acres.	2,731,135 acres.
Wheat.....	3,313,677 ,,	3,126,493 ,,	3,287,765 ,,
Kodu*.....	4,197,516 ,,	4,604,869 ,,	4,707,192 ,,

* *Including other inferior grains.*

The average yield per acre is declared to have been as follows :

Yield of Rice per Acre.

	1867-68. [*Famine year.*]	1868-69.	1869-70.
Nagpore	332 lbs.	180 lbs.	324 lbs. per acre.
Bhundara	694 ,,	270 ,,	540 ,,
Chandah	800 ,,	300 ,,	500 ,,
Wurdah	201 ,,	40 ,,	267 ,,
Balaghat	460 ,,	277 ,,	372 ,,
Jubbulpore	560 ,,	12 ,,	245 ,,
Saugor	435 ,,	50 ,,	385 ,,
Dumah	180 ,,	24 ,,	800 ,,
Mandlah	982 ,,	420 ,,	650 ,,
Seonee	649 ,,	220 ,,	846 ,,
Hoshungabad	432 ,,	132 ,,	250 ,,
Baitool	242 ,,	152 ,,	256 ,,
Chindwara	700 ,,	246 ,,	265 ,,
Nursingpore	320 ,,	20 ,,	100 ,,
Nimar	720 ,,	720 ,,	1000 ,,
Raopore	880 ,,	240 ,,	240 ,,
Bilaspore	880 ,,	80 ,,	516 ,,
Up-Godavery	624 ,,	232 ,,	1228 ,,

We presume, that these figures are intended to represent the yield of *cleaned* rice, as it is impossible to suppose that a yield of this order can mean paddy or rice unhusked. Looking at the figures carefully, it is not possible to attach any value to them as a record of facts. They are of importance only as *first steps* towards something better It is impossible that they should represent the real return of the cultivation of rice in India. We are afraid we must say the same of the returns of the yield of *wheat*, which are as follows :

	1867 68.	1868-69. [*Famine Year.*]	1869-70
Nagpore	235 lbs.	130 lbs	138 lbs. per acre.
Bhundara	349 ,,	330 ,,	324 ,,
Chandah	250 ,,	200 ,,	200 ,,
Wurdah	182 ,,	167 ,,	117 ,,
Balaghat	460 ,,	215 ,,	252 ,,
Jubbulpore	400 ,,	148 ,,	126 ,,
Saugor	380 ,,	480 ,,	400 ,,
Dumoh	160 ,,	400 ,,	320 ,,
Mundlah	684 ,,	300 ,,	472 ,,
Seonee	409 ,,	370 ,,	501 ,,
Hoshungabad	840 ,,	540 ,,	318 ,,
Baitool	221 ,,	302 ,,	318 ,,
Chindwara	400 ,,	307 ,,	320 ,,
Nursingpore	404 ,,	350 ,,	301 ,,
Nimar	640 ,,	640 ,,	500 ,,
Raopore	560 ,,	320 ,,	320 ,,
Bilaspore	560 ,,	420 ,,	400 ,,
Up-Godavery	250 ,,	670 ,,	678 ,,

We should be sorry to say one word likely to discourage the efforts of the Government of the Central Provinces, so healthfully directed in the preparation of these returns, but this is now the third year in which they have been presented to us in a shape that precludes the possibility of our accepting them as a record of facts. Who can possibly believe that the cultivation of wheat throughout the Nagpore district during the last three years, in drought and rains alike, has given but a yield of 130 lbs., 138 lbs., and 235 lbs. per acre each year respectively? No one can believe it. It is hardly the amount of the seed thrown upon the land. We have brought the three years' returns together in this shape, to point out that the yield in the *famine year* is returned in some cases at a considerably higher figure than the yield of the years immediately before and after it Thus the Upper Godavery districts show a yield of 670 lbs. per acre in the year of utter drought, against a yield of 250 lbs., only when there was no drought at all. The yield of Saugor again is said to have been 480 lbs. in the year of famine, against 380 lbs. in the year of plenty. As first steps towards what we want, we receive these tables thankfully, and it is surely unpardonable that while the minor governments of the country are thus moving in the preparation of such returns, the older Governments of Bombay, Madras, and the North-West are doing nothing to enlighten our ignorance as to the real condition of the country. In view of the uncertainty which these returns reveal as to the agriculture of the Central Provinces, is it not madness to talk with Sir Richard Temple of settling the land revenue in perpetuity! Why we have not as much exact information upon the subject, as would justify us in so settling the bazaar duties of a village. And yet upon such returns as we have just given, the land revenue of the Central Provinces has been fixed for a generation of years to come at six or seven annas per acre!

THE PUNJAB YIELD.

The following figures are taken from the Administration Reports of the Punjab and other provinces for 1868-69 :

Average produce per Acre.

	Rice.	*Wheat.*	*Jouree*	*Goor.*
Punjab	650 lbs.	631 lbs.	549 lbs.	1,353 lbs.
Oudh	649 ,,	878 ,,	644 ,,	816 ,,
Central Provinces	217 ,,	351 ,,	316 ,,	536 ,,
Mysore	1,577 ,,	758 ,,	636 ,,	1,788 ,,

We have shewn above how manifestly erroneous are the returns from the Central Provinces, and we shall now make room for the candid and valuable remarks with which the Punjab returns are qualified in the Financial Commissioner's report .

"The figures in this return are but an approximation, and perhaps only a remote one, to the truth. It is extremely difficult to obtain accurate information from natives as to the rents they receive or pay, and still more so as to the yield of their lands. It was feared last year that this information could not be given in such a way as to be of any practical value, and the result has shown that these misgivings were not unfounded. The return is full of discrepancies. Further enquiry might lead to some of these being explained, but as this is the first time the statement has been attempted it will be better to direct the attention of officers to the necessity for greater accuracy in the next annual statement, and in the meantime the figures may be taken for what they are worth. Lands adapted for sugar-cane and tobacco usually pay the highest rent, not only on account of the remunerative nature of these crops, but on the account of the superior soil and high cultivation they require. Rice is also a remunerative crop, but requires much water. Hence it is chiefly grown in villages near the canals, and as land so situated is exceptionally valuable, the rent rate for rice lands will be found to be high as compared with other grain crops. Wheat is a crop grown almost universally, and the rates for it may be taken as samples of the rent for good land in all districts. The highest rent rates, and the yield per acre for wheat, are as follows :

	Rent per acre.	*Yield of wheat.*
Delhi	Rs. 7 0 0	880 lbs. per acre
Kurnal	,, 6 0 0	320 ,, ,,
Loodiana	,, 7 4 0	1,066 ,, ,,
Jullundhur	,, 5 8 0	880 ,, ,,
Sealkote	,, 10 6 0	800 ,, ,,
Goordaspore	,, 16 0 0	1,066 ,, ,,
Mooltan	,, 7 6 0	736 ,, ,,

"The yield in Kurnal is exceptionally low, and is probably incorrect, but from the other entries it would appear that the yield is from 800 to 1,000 lbs per acre But it is difficult to understand why the rent is so much higher in Goordaspore and Sealkote than elsewhere. The lowest rent rates are found in the following districts :—

	Rent per acre.	*Yield of wheat.*	*Population*
Hissar	Rs. 1 3 0	477 lbs. per acre	.137
Sirsa	,, 1 5 0	615 ,, ,,	68
Umritsur	,, 1 12 0	580 ,, ,,	532
Ferozepore	,, 1 9 0	594 ,, ,,	204
Rawul Pindee	,, 1 8 0	640 ,, ,,	115
Jhelum	,, 1 9 0	640 ,, ,,	128
Goojrat	,, 1 1 0	640 ,, ,,	345
Kohat	,, 1 1 6	502 ,, ,,	51
Huzara	,, 1 8 0	640 ,, ,,	122

"Now in the districts in which the highest rent rates prevail, there is some similarity. They are either, like Delhi, Goodaspore, and Mooltan, under the influence of canals; or, like Loodiana, Jullundhur, and Sealkote, they are populous and cultivated. But the districts in which the lowest rates are shown present the most varying characteristics. No one would expect to find the prosperous districts of Umritsur in the same class as the arid and thinly inhabited districts of Hissar, Sirsa, and Kohat. In the district of Hooshyarpore, which is one of the richest and most populous in the Punjab, the rent rate for wheat is given at Rs. 2-8-0 per acre, and the yield at only 380 lbs, which is almost the lowest estimate in the whole list.

"The yield of sugar per acre is given at 78 lbs. in Hooshyarpore, where it is largely grown. In most other districts the yield is stated at from 1,000 to 2,000 lbs.

"The average yield of cotton per acre for the whole province is stated at 2 13 lbs. But the distinction between cleaned and uncleaned cotton has not uniformly been kept in view. It has on former occasions been ascertained that the average yield of clean cotton is a little below a maund or 80 lbs. per acre. These remarks will suffice to show how much need there is for improvement in the preparation of these returns, and how hopeless it is to expect perfect accuracy at present."

In spite of their manifest inaccuracy, the returns are laying the foundation of exact knowledge. They are but the boulders thrown into the gulf to find bottom for the future building to rest upon. By and bye, we shall see it arise in fair and exact proportions from the deep.

CAROLINA RICE.

IMPORTANT SUCCESS IN BENGAL.

A two years' experiment of Carolina rice growing has been made in the Soonderbuns with complete success. Five maunds were planted in 1867, and, in spite of the seed being old, and unsuitable land having in the first instance been selected, a sufficiently promising result was obtained to tempt a second experiment.

The paddy grows to about four feet high, and, if properly managed, is ready for cutting about a month before the Patna variety. It is the general impression that high levels should be selected for the purpose, but the impression is a wrong one, for it has now been established that low wet lands answer best. The seed is first steeped, and when the ground has become thoroughly soft and soaked, it is sown broad cast, with a portion laid out in nurseries as a reserve. On the young blade reaching a proper height the field is carefully gone over, the crop thinned where it has fallen too thick, and any blank spaces which may appear are filled up with shoots from the nursery. It is a curious fact that Carolina paddy in the Soonderbuns throws out an after crop, so that when the first harvest of ears has been cut, a new growth succeeds and keeps the plant green and alive. During the second year's experiment particular attention was paid to this circumstance, and notwithstanding that the land had meanwhile hardened and dried, the Carolina plants threw out fresh ears and continued in full bloom. It seemed as if there would be a good second yield, but the grain did not form well owing to the drought, and the after-crop proved small and sparse. The first crop is much stronger, however, than the ordinary Patna paddy. The bullocks were unable to tread out the grain in the usual manner, and the ear had to be regularly threshed by coolies.

The second year thirty-three acres were put down under the "imported rice." In spite of two cyclones, which had blown over the granary and partially rotted the seed, and notwithstanding the subsequent difficulty experienced in getting the injured grain to germinate, a heavy crop was obtained. The yield amounted to between twelve and thirteen maunds a beegah, or about 27 cwt. an acre. The usual quantity of Patna rice per acre in Lower Bengal varies from six to ten maunds per beegah, or from 14 to 22 cwt. per acre. But in addition to the larger yield of the Carolina plant, it fetches from three times to four times the price of Patna paddy: thus, last year, the quotations in England rose from nine to sixteen shillings per cwt. for best Bengal white rice, and thirty-seven shillings for Carolina. Assuming, therefore, the yield of Bengal rice at the high average of 21 cwt. per acre, and twelve shillings a cwt. the crop from an acre would sell for only £12-12; while an acre of Carolina in the Soonderbuns, yielding 27 cwt. would bring in £49-19.

We shall watch the future of Carolina rice growing in Bengal with interest, and we think that the province owes much to Mr. Swinhoe, and the other English land-holders, who have conducted the experiment. It should not be forgotten that the fine cereal, now known as the large or pig-grained Carolina rice, is a recent variety even in America. It was only discovered in South Carolina in 1838. Two fields were planted in 1839, and another half acre in 1840; four hundred acres were put under it in 1843. In 1843 it commanded a higher price than the finest of the old sorts sold in the same market; and since then whole estates have been covered with it. It was not only very fine, but it proved unusually productive; fields which had formerly yielded thirty-three bushels per acre of the old sorts producing seventy-three bushels of the new variety. There seems reason to believe that it is this lucrative species which has now been introduced into the Bengal Soonderbuns.—*Pioneer.*

LETTERS TO THE EDITOR.

A CORRECTION.

To the Editor of the "Agricultural Gazette of India."

Sir,—In your note on a letter addressed by me to the Agri-Horticultural Society on the subject of potato-cultivation, you have mistaken the figures regarding *manure* for figures regarding *produce*. The letter states that "the ground is loaded with *manure*, the amount per acre is often from 300 to 400 bullock loads." The bullock loads have reference to manure not potatoes. The amount of produce per beegah is not uncommonly 80 maunds, equal to 140 maunds per acre or about 15,200 lbs., very near the Irish yield, 14,500 lbs. In answer to your question whether lime has been tried as manure, I have never heard of its having been used by natives. It has lately been recommended by a member of the Agri-Horticultural Society as you will see by reference to the last proceedings of the Society.—Yours faithfully,

E. Buck,
Settlement Officer, Furrackabad.

PRODUCE PER ACRE; AND THE COURT OF WARDS.

To the Editor of the "Agricultural Gazette of India."

Dear Sir,—I have read with much interest the article upon the "Agriculture of India" in the July number of your journal. The subject is one of so much interest and importance, that perhaps you will allow me to point out what appear to me, to be mistakes in it, and also to offer a few remarks on the subject generally, in the hope that others more competent to do justice to it may be induced to take part in the discussion.

In a country like India, there are no Statistics of more vital importance to the Government, than those relating to Agriculture, and yet there are none so generally incorrect and unreliable, because they appear to have been collected spasmodically and chiefly by those officials least likely to give correct information. Though a settlement officer myself, I believe there are no officials whose reports on the productive capabilities of the soil should be received with greater caution, for the simple reason, that there are none whom the natives try so systematically to deceive, and naturally so, as successful deceit means a light assessment for 30 years. It is a well ascertained fact, that, as soon as it is known that a settlement is about to commence, every agriculturist in the district sets to work to reduce the yield of his land and so shew inferior capabilities. There is nothing easier than to do this; the cultivator has only to cease manuring for a year or two, refrain from the ordinary rotation of crops, put less seed than ordinary into the ground, and give 2 waterings instead of 3 or 4 and the yield falls a half at once; and yet, how is a settlement officer to guard himself against all this? The utmost he can do, is, to select a field here, and a field there for experiment, and if the yield agrees either with his preconceived notions, or, with what he is told by his subordinates or draws from some cultivator whom he meets by chance in his morning rides, he goes on his way rejoicing, and wrapping himself in the firm belief that he at least has solved the problem and has at length obtained really trustworthy statistics, he sets forth in his report all his exertions and experiments, and believing firmly the correctness of his results, he succeeds in imparting to his readers his own earnest belief, and the returns are given forth to the world stamped with the authority of Government. And yet, after all, they are the result of a simple leap in the dark, the chances against their correctness being at least 100 to 1. Take as an instance the Settlement Officers of the Central Provinces. They were all able men, many of them exceptionally so, and yet they induced the Government to believe that seed sown in admittedly fertile soil, yielded but a four-fold return. Why that yield would not pay for the labour necessary to production of any crop at all; and in support of this, I give you the results of several years inquiry in different districts into the cost of producing one acre of wheat. I do not say that my figures are perfectly correct, but I do not assert that they are considerably near the mark, that the work could not be done for

less if the labourers are to live, and that where I have made a mistake I have erred on the side of a low estimate rather than a high one. I would mention that all the items of expense (except irrigation) have to be paid for in the grain actually produced, the cost of irrigation being disbursed before the field is cut, is paid for in either money or some description of grain at the time available. The estimate given is therefore of my own working out.

	Lbs.
Seed 128 lbs. *plus* ¼ more added for interest .	160
Ploughing and weeding	... 220
Irrigation	.. 100
Cutting and carrying	... 70
Watch and ward	. 20
Village servants, carpenters and blacksmith, &c. . .	13
Total cost lbs	583

Now if the seed yield but a four-fold return how is this expenditure to be met, the total out-turn being 128 lbs. ×4=512 lbs. We have here a dead loss of 71 lbs.; but, it may be urged that in a part of the country so highly favoured as the Central Provinces, irrigation is not required, but this will not help much, for after deducting 100 lbs. cost of irrigation there remain 483 lbs. required to meet actually necessary expenses, leaving to the cultivator but 29 lbs. with which to pay his rent and support his family And so it comes to this, that either the 3,125,193 acres of wheat in the Central Provinces are cultivated at a loss, or, the Settlement Officers have been utterly deceived. I prefer to believe the latter, for I know how often I have been deceived myself, and how, only now after some years of diligent inquiry, I am beginning to get an insight into the truth.

Test the returns given by the old North-West Settlement Officers in the same way, and tho' far from being so completely wrong as those given for the Central Provinces, they are all under the mark. My own impression is, that, in real practice, the great Akbar's estimate is after all the correct one. But let me put you right as to this estimate. The Settlement Officer of Oonao in his report gives it as follows—1st class 18 maunds, 2nd class 12 maunds, 3rd class 8 35-10 per *bigah*; but you appear to have read it *here*, and in Captain Harvey Tuckett's produce statement, the same error occurs, the real fact being that Akbar's bigah is but 5-8th of an acre, and therefore his estimate per acre is as follows.

1st	class land	28·	32 =	2,272
2nd	do do	19·	8 =	1,528
3rd	do do	14·	8 =	1,128
Average	...	20·	29 =	1,629

This agrees very closely with the returns for England in the present day of high farming, and is not very far from the result of the experiments made by the European Zemindar at Muthra. Further, I think you are in error as to the kind of soil classed by Akbar as 1st, 2nd, and 3rd. Except in some peculiar situations, wheat, not artificially irrigated, is quite an anomaly and practically unknown. So I am disposed to think that Akbar instead of taking *irrigated* and *dry* soils as his basis of classification, used the conventional soils,—1st class being highly manured lands near the Village site, 2nd class moderately manured land about the middle of the village, and 3rd unmanured, or, very slightly manured lands on the outer boundaries, or, in other words, lands highly, moderately, and poorly farmed.

Now taking Akbar's average estimate of 1,629 lbs. per acre, it will be seen that the necessary expenses attendant on the cultivation of the crop, forms but a moderate percentage of the total out-turn.

	lbs.
Produce	1,629
Cost of production	583
Balance	1,046
Zemindar's share of rent	523
Balance to cultivator	522

Or at the rate wheat was selling in the spring—Rs. 10-8. This, on a farm of 6 or 7 acres, the average in the Upper Provinces, would well repay the labor, risk, and anxiety attendant on the cultivation of the holding, and if the cultivator held at a money rate, he might make a rupee or so more, but a lower out-turn would never pay, and we may be quite sure, that, unless wheat were a profitable crop it would never be grown to the extent it is. No one will work at a loss, it is not to be expected they should, and yet if the majority of Government officers are to be believed, the Indian cultivator simply grows wheat either at a loss, or at best, a nominal profit to themselves for the benefit of their wealthier neighbours. This I never can or will believe. If any further corroboration of my views of the productiveness of the soil is necessary, I may mention that a friend of mine in a recently settled district required some young barley for a valuable horse; he sent round through all the adjacent villages, offering at the rate of Rs. 32 per acre for a field of it, and could meet with no acceptance of his offer.

But it may be asked, if the agency of the picked officers of Government is not to be relied on, by and through whom can reliable agricultural statistics be collected? The answer is —by the agency of the Court of Wards. For the last 50 years the Government in almost every district has held often for long series of years, the direct control of large estates, to the good and proper management of which an accurate knowledge of the productive capabilities of the soil under all conditions is an absolute essential, and yet I am not aware of a single continuous effort ever having been made to solve the problem under discussion. Isolated, disjointed, spasmodic efforts are useless. Agricultural statistics to be of any use, must be obtained by persistent and continuous efforts through a series of years,—yet Government has steadily neglected the only agency at its command which could collect reliable data. Had Government instead of calling upon overworked Collectors, who have to work through still more heavily oppressed Tehsildars to file up elaborate statements, organised proper establishments for the management of of the Court of Wards estate and obliged the managers to take the capability of the soil as the basis on which to settle the rents of their tenants, as every intelligent landowner does, and at the same time insisted upon these results being properly tabulated year by year, by this time we should have obtained a series of statistics as reliable as those obtained for England, and Settlement officers instead of being left to grope in the dark for materials with which to check their money rates, would have had a sure and incontrovertible basis to work upon; but as it is, we know, at this date, no more of the real yield of the lands of India than we did on the day we came into the country. I am perfectly convinced that were the real yield of the land known to Government Officers, the Revenue of the Upper Provinces could be easily increased by 25 per cent. beyond what any Settlement Officer in his present state of ignorance would venture to assess it at, and the increase in the Central Provinces would save us from an Income Tax. But under these circumstances some limit would have to be put to the demands of the Zemindars upon their tenants; even now I can see we are coming to this, and the only fair way to legislate between the two, is to take the productive powers of the soil as the basis of calculation and apportion a fair share to each.

As regards your deduction that the land of India is not as productive as it is supposed to be, I can only point to Akbar's figures, and ask how, if soil so rudely farmed, can yield such returns, any one can say its productive powers are small? With high farming I believe that the soil of India will yield an incredible out-turn, but if the cultivators are rackrented to utter ruin, the farming will fall off, and these fair Provinces which ought to be a garden will be turned into a desert.

But I must bring this long letter to a close apologising for the space I have occupied. My only object is, to get this subject so full of interest to us all, discussed fairly and fully, and, if possible induce the authorities to use the right agency in collecting Agricultural Statistics.

I enclose my card, and remain, Your's truly,

A SETTLEMENT OFFICER.

EDITORIAL NOTES.

A CONTEMPORARY tells us that the Mysore Agricultural and Horticultural Society intend to attempt the introduction of the true cochineal insect into this country. Until lately Brazil and Mexico have supplied Europe with all the dye it required, but the demand is increasing so rapidly, that the culture of the cochineal is largely carried on at Madeira and the Canary Isles, where it is proving so remunerative that other branches of field produce are suffering, the cultivation of food plants being neglected. The true cochineal (*grana fida*) has never had a fair trial in India. There are several indigenous species of the insect, and as any kind of cactus, the food of the cochineal, will grow in this country, there seems, says the *Pioneer*, to be no reason for predicting anything but success for the new enterprise.

THE following weighty words were addressed a few months ago by the United States Commissioner of Agriculture, to the Planters assembled at the Exhibition in Georgia, towards the close of last season :

"To secure a longer, finer, and evener staple is entirely prac-
"ticable. It however, can only be accomplished by observing
"the great law of reproduction on which all improvement
"in animal and vegetable species is founded. The key to this
"progress exists in a single word—'pedigree'

"Select a plant producing abundantly a superior fibre; plant
"its seed in a genial and well-cultivated soil; select again and
"again from its progeny the finest and the best, discarding all
"else, and few years will elapse ere marked results will prove
"the great utility and exceeding profit of the effort. I would
"also commend to each individual planter the necessity of a
"constant regard to this principle of selection *in the planting*
"*of every crop* he may attempt to cultivate."

IF we may accept the statements made at a recent agricultural dinner at Harleston, says the *Economist*, "a serious check to, if not a decline in, the husbandry of Norfolk has occurred, and is likely to continue and increase. The causes alleged are the old story. Game preserving, insecurity of tenures, defective management of the estates by landholders; in short, all those obstacles to advancement in husbandry and to success in farming business, which justify the common saying amongst farmers that the great encumbrance on land is the landlord."

"There are extensive estates but partially developed for want of improvements, and on these very estates are these tenants asking to undertake these very improvements, if they were but allowed to do so." The cold shadow of the landlord blights English husbandry to this day. What would not English farming accomplish under such a system as the 30 years' leases of India! It would *double* the yield of the English harvest within 10 years.

IT is cause of surprise, we think, that the cultivation of the *potato* has commanded so little attention in this country, and we are glad to see that Lieutenant Pogson is persevering in his experiments therewith. He writes to the Agri-Horticultural Society of Calcutta :

"I have tried the German method of potato-planting, and find that a single potato planted entire has thrown out stems and branches which actually take up 20 square feet of soil. The growth east and west being five feet, and north and south clear four feet,—the flower branch is 3 inches over 4 feet, but I do not count this—and as the plant is in full flower and will yet grow for the next 30 days, it is pretty conclusive that the German farmers are right, and the English wrong.

"My next potato experiment is also of importance. On the 9th July I put down a large potato (crop of 1869) which germinated, and was in leaf on the 25th July; since then its growth has been very vigorous (present height 18 inches,) the flower buds having formed on the 23rd of August, and, as far as I can judge, the roots will be ready for digging up, with the main crop, which was sown in March. If the return is good, an opium or onion crop might safely precede the potato crop in the hills, and in gardens early vegetables of all kinds might form the first crop, and potatoes the next"

A MR. WILLIAM DICKENSON, who farms some portion of the New Forest under lease from the Crown, has addressed a letter to the *Mark Lane Express* in which he points out that there are 60,000 acres of land in the forest capable of growing the finest corn and root crops while, under existing management, they yield in all to the crown but £1,700 a year. Judging from his own experience, Mr. Dickenson believes that these 60,000 acres would be farmed in all probability as follows :

"20,000 acres might be in pasture, 10,000 in wheat, 10,000
"in barley, 10,000 in oats, and 10,000 in roots. Ten thousand
"acres in wheat, 3 qrs. to the acre, would be 30,000 qrs.;
"10,000 acres in barley, 5 qrs. to the acre. would be 50,000 qrs.;
"10,000 acres of oats, 7 qrs to the acre, would be 70,000 qrs.;
"10,000 acres of roots, 25 tons to the acre, would be 250,000
"tons; 20,000 acres of pasture for sheep, &c, produce—to be
"added by a more competent judge than I am. One sheep an
"acre for the roots and one sheep an acre for the pasture would
"produce annually 30,000 sheep."

If Mr. Dickenson is right, these 60,000 acres of land are worth two to three millions sterling. It certainly seems a frightful waste of resources in a country in which the pressure upon the means of life is so great as our own, to allow this vast area of culturable land to lie waste. Mr. Dickinson's own, farming on the very same lands produces, we are told, heavy crops of the finest grain and the finest roots, "while growing grass, 2ft 9in. high, was shown at the fat cattle show at Christmas, dug up from the open field." The land, says Mr. Dickenson, "wants nothing but simple honest farming by resident farmers." We take these particulars from the English *Economist*

THE Rev. W B Keer of Bombay who has lately been ravelling in Cutch, sends the following interesting note of the native drill to a Bombay paper: "The native drill, is a most interesting and simple implement, and does its work in some soils with much more efficiency, or with less injury to them, than the best English patent corn, or seed drill could do. This latter implement with its heavy iron and steel coulters partly cuts into, and slides over the soil, leaving a smooth-plastered bottom to the little furrow into which the seeds fall, from the back of the coulter, the upper part of which leans forward. The circulation of the water and penetration of the roots are thus both hindered. While by the native drill, which consists of a simple wooden cross like the letter T., into the cross arm of which from three to five wooden coulters are set with the points (which are sometimes tipped with iron) sloping forwards, and the upper part backward, the soil is lifted up, instead of being plastered down. The seed is then dropped through hollow bamboos fixed into the coulters, and passing upwards about three feet where they meet, and are fastened together and surmounted by a small round box, or, in some cases a large hollowed nut into which the seed is put a handful at a time from a bag carried by the drillman himself, who regulates the quantity by his practised judgment. The long arm serves as the beam to which the yoke is fixed for the cattle to draw from. The regularity with which some of the fields were thus sown with this simple implement, would astonish some of our British scientific and practical agriculturists. Cotton, gram or pulse, bajri, and joar, as well as in some places wheat and several other seed and corn crops are thus sown. The light kind of cultivator, only the drill without its bamboos and coulters, or even a plain stick, is then drawn transversely after the drill, and the seed is lightly and efficiently buried. The same implement, or one very similar, is used to clean and weed the growing crop, an iron hoe being fixed between each of two of the wooden coulters, and one or two oxen duly muzzled, draw the hoe between the ridges, which are then finished by hand weeding. No doubt much improvement might be effected on these primitive methods and implements,

but not by at once introducing European ones, as it is difficult if not impossible to repair them."

M. MANTEGAZZA has lately communicated to the Institute of Lombardy the results of certain investigations he has been making into "the therapeutical value of flowers and their essences" which are capable, he has discovered, of generating *ozone* in considerable quantities. The *Imparziale* of May 16th, gives the principal results of his investigations which are said to be as follows :

"The essences of mint, turpentine, cloves, lavender, bergamotte, anise, juniper, lemon, fennel, nutmegs, cajeput, thyme, and cherry-laurel, when placed in contact with oxygen in bright sunlight, develop a very large quantity of ozone—equalling, if not surpassing, in this respect the power of phosphorus, electricity, or the decomposition of permanganate of potash. The oxidation of these essences, indeed, seems to be one of the most convenient modes of obtaining ozone, since, even when in very minute quantity, they are capable of ozonising large volumes of oxygen, whilst their action is very persistent and continuous. In the greater number of cases, it is not sufficient merely to expose the essences to the diffused light of day, but they require, to effect the change, the direct light of the sun. Little or no action occurs in darkness; though it was observed that, when it had been commenced by exposure to the sun's rays, it was continued when the essence was placed in darkness. The quantity of the essence required must be extremely small, since it was found that, even when the vessel which had contained it had been washed out with alcohol and thoroughly dried, a certain amount —though of course only a relatively small proportion—of air could be ozonised, provided a faint odour of the perfume was still perceptible. The essences that developed the largest quantity of ozone were those of the cherry-laurel, the palmarosa (of which we cannot find the English name), cloves, lavender, mint, lemon, fennel, and bergamotte; those producing it in less quantity were anise, nutmeg, cajeput, and thyme. Camphor, notwithstanding its strong odour, was found to be inferior to all the floral essences mentioned above. Even when dissolved in alcohol the essences have a certain ozonising power, as was shown by the action of eau-de-cologne and the ordinary toilet perfumes. The flowers of the narcissus, hyacinth, mignonette, heliotrope, lily-of-the-valley, and others possessing fragrance, are capable of developing much ozone in closed vessels under sunlight; whilst those of less perfume produce a smaller quantity, and those that are odourless produce none.

"The Professor considers that the results of these experiments enable him to recommend with considerable confidence the cultivation of highly odorous flowers to those who live in marshy districts and in places exposed to miasmatic animal exhalations. The inhabitants of such places should surround their houses with a girdle of aromatic plants adapted to the various soils, climate, and period of the year. The utility of the perfumes employed by the physicians of the olden time during their attendance upon infectious cases thus receives its scientific demonstration, and is, in fact, pointed out by Prof. Mantegazza himself, who, however, observes that, in order to obtain the fullest advantage, the perfume should have been exposed previously to the direct rays of the sun. He concludes by recommending the proprietors of rice-fields to allow their labourers, during the period of picking the rice, to carry round their necks a little sponge impregnated with some aromatic essence."

AGRICULTURAL STOCK.

IMPROVED BREEDING.—BENGAL.

We see from the *National Paper* that some Bengalees have in contemplation the establishment of a company for the rearing of an improved class of cattle. We do not know whether the undertaking is a commercial or a purely philanthropic one, but we presume the former. In any case, however, it is a most laudable project, and deserves encouragement. We fear, however, that the conditions of agriculture, and to some extent the general economic conditions of Bengal, are likely to be fatal to the extension of any benefit that may be realised by the proposed association.

The deterioration of the cattle of Bengal does not arise from careless breeding alone, though this cause would of itself be sufficient to produce it, but is connected to a great extent with the means possessed by the people of caring and feeding them. One cause alone would even under much more favorable conditions than those prevailing neutralise all attempt to improve the catttle of the country, viz, insufficiency of good pasture. The native system of agriculture does not take into account the wants of cattle in this respect. A few acres of land may be left in each village as common grazing ground, and during a considerable portion of the year this is made to supply the wants of the entire cattle of the community, the average of land per head seldom being a fourth of what it should be to keep the animals in good condition. After the crops are cut they are somewhat better off, being allowed to stray over all the fields and pick up what they can; but at the best the food they thus obtain is absurdly insufficient. In countries like England, where cattle are considered worth feeding as highly as they can be fed with advantage to themselves, and sometimes even more highly, every farmer reserves a certain proportion of his land, commonly one-third, for grazing purposes, and even upon this land he lays out money that it may be covered with the richest grasses. But besides this a considerable proportion of his green crops, such as turnips and mangel-wurzel which occupy perhaps another third of his land, are intended specially for the consumption of his cattle. It is only by such means as these that the best beasts can be bred; and it is by these same means that he finds he can also get the most out of his land, whether directly in the force of crops, or indirectly in that of dairy produce. Whether this system, or one approaching it, can be adopted in Bengal or not, may be doubtful, but there is no room for doubt that, if it cannot, the people generally can never expect to possess superior breeds of cattle, whatever a company, or individuals, who can afford to make special arrangements for the purpose, may do.

The grand question, of course, is whether it would pay the native cultivator generally to adopt such a system; and in considering this question it must be kept in mind that there is not the same unlimited market for dairy produce and butcher's meat in India that there is in England.

Such a system would at least quadruple the yield of milk throughout India. There would be a market for four times the quantity of milk now produced, in the form of ghee, or in any other form at remunerative prices. Of any large increase in the demand for butcher's meat we see no probability. Still, without going into the entire question, we incline to the belief that a modification of the English system would pay, if individual farms were larger. The task of bringing about the necessary changes is, however, far beyond the powers of a company such as that now projected. At the same time we should hail its establishment as a beginning in the right direction.—*Indian Daily Ex-*

CULTIVATION OF FODDER.

No one can, for a moment, doubt that, by applying certain means to the end desirous of being achieved, India, from the diversity of her climate and soil, is capable of yielding most of the varied products and growths of other countries, and, certainly, in the way of cattle food, the staple of which we must consider to be grass. It has been fully demonstrated that, even the mother-country herself, cannot boast of richer grass growths more nutritious, and in every shape suitable to the feeding of cattle, than the Eastern dependency possesses in the resources of its soil, were ordinary exertion and trouble, and a small outlay expended, in each instance, where the greatest scarcity of grass growth exists. In a tropical country like India, where a great extent of its area is yearly visited by rain, and, even then, at long intervals between each casual fall, the grass which springs up at the season of these periodical showers, is stunted in growth, through the speedy hardening of soil; the powerful rays of the sun dry it up, and convert it into the appearance of a species of short scrubby fibre, rather than what our preconceived notions would lead us to suppose was meadow grass. On this scanty supply of wretched food, the miserable herds of cattle which roam the jungles, and, eventually supply our market with beef, manage to pick up a precarious living, which often barely sustains life in their attenuated frames. The only means by which vegetation can be brought forth from the arid soil, in the absence of regular rain-falls, is, as a matter of course, by way of irrigation. It not unfrequently happens that, whenever the subject of irrigation is brought on the tapis for discussion, comment, or otherwise, the ideas of people (and those too of an enlightened class), at once revert to such works as the stupendous constructions to be seen on the Jumna and Baree Doab Canals; and, being cognizant of the immense expense incurred on these gigantic undertakings, at once come to the conclusion that spread of irrigational works in India, is too serious an undertaking to be en-

tered on, other than under the auspices and the command of the wealth of an empire. Nothing can be more fallacious than to suppose irrigational works cannot be carried out out on a limited scale, which will in their results, yield as large a pecuniary return, and be as great a benefit, in proportion to their comparative extent, as those extensive works whose completion and existence have changed the face of whole provinces of the empire. The native cultivator is so wedded to old ideas, and prejudice so greatly in favor of old modes, which must, of necessity, soon become obsolete, whether he likes it or not, that it becomes a matter almost of impossibility to impress upon him, that this or the other improved mode of conducting his affairs, is either the most profitable, economical or convenient. Irrigation by private means, whenever practicable, would not only immensely benefit the district, but would speedily recoup the small landowner, or stock farmer, the small outlay which would be entailed on him at the outset, and eventually, be a continual source of profit and advantage to him in his capacity as a tiller of the soil —*Sind News.*

PRESENT CONDITION OF AGRICULTURE IN IRELAND.*

By William R. Robertson, M. R. C. A., Government Experimental Farm, Madras.

In accordance with the wishes of your committee, I have much pleasure in offering a few general observations on the present condition of Agriculture in Ireland; these observations will necessarily be of a very general nature —the subject is too comprehensive, and embraces interest of too momentous a charater, to be considered in one, or even a dozen addresses.

In this country (England) most erroneous views are held regarding the climate of Ireland; the common belief is, that the rainfall is so heavy, that nothing but grass can profitably be cultivated. I believe, on the contrary, that the climate of Ireland is well suited for the profitable cultivation of nearly every agricultural crop grown in England or Scotland. There are districts in Ireland where the rainfall is so heavy, the cereal crops cannot profitably be cultivated; but, have we not similar districts on this side of the Channel? Because in Westmoreland, with its 45 inches of annual rain, wheat cannot be profitably cultivated, are we to condemn the climate of England, as only suited to the system of agriculture practised in Westmoreland? Too long have these absurd notions prevailed regarding the climate of Ireland; no one can estimate the injury the country has sustained, from the prevalence of these mistaken ideas. During my residence in Ireland, I registered daily observations of the rain-guage, hygrometer, barometer, and thermometer, and I have recently had opportunities of looking over meteorological registrations made in nearly all parts of Ireland; I have seen crops growing in the most northern portions of the country; in the most southern parts of Cork and Kerry; in the west, in Limrick and Clare; in the midland and in the eastern counties; and I most emphatically assert that the climate of Ireland is not blamable for the backward condition of Irish Agriculture. True, at one or two Irish meteorological stations, the rain-guage registers a large annual rainfall. On the extreme coast of Kerry I was shown a register, which recorded an annual fall of more than 50 inches per annum. All, however, who are acquainted with the contour of Kerry, and its geographical position, will allow that these registrations were made under circumstances of a most exceptional character, and that the results obtained can only be of local value. I had the opportunity of examining a Register made in the city of Cork; this register had been kept for a long period; the average annual rainfall for the past seventeen years did not exceed 35 inches. These registrations were also made under circumstances of an exceptional nature. In the district round Belfast, the annual rainfall is about 33 inches, whilst in the midland counties, and around Dublin, I do not think the average annual fall exceeds 27 inches. However, I attach a little value to the information, what the total annual rainfall in a district amounts to; I hold it to be of far greater importance to know in what manner the rainfall—whether in slight, but frequent showers, or in heavy, but less frequent showers. I believe, in a district where the rainfall does not exceed 30 inches per annum, that agricultural operations may be more retarded and interfered with, than in another district where the annual rainfall exceeds 40 inches.

The area of Ireland is 20,319,924 acres; in 1866 it was divided as follows:—

	Acres.
Under crops	5,519,678
— grass	10,002,058
— fallow	28,060
— woods and plantations	327,346
— bog and waste land ...	4,442,782

In 1841 the population of Ireland was 8,196,597 persons, or about 251 persons per square mile; in 1861 the population was only 5,798,967, or 178 per square mile. Between the 1st of May, 1851, and the 30th of December, 1866, 1,630,723 persons emigrated from Ireland. In 1864 there was 601,771 agricultural holdings in Ireland, nearly one-half of which, or 300,000 were below fifteen acres in extent. The following are the details:—

	Number of Holdings.
Not exceeding one acre	48,653
One to five acres	82,037
Five to fifteen acres	176,368
Fifteen to thirty acres	136,678
Above thirty acres	158,135
Total Holdings...	601,771

Between 1841 and 1861 the number of holdings not exceeding fifteen acres declined 55 per cent., while those above fifteen acres increased 133 per cent.; between 1841 and 1861 the farms from fifteen to thirty acres have nearly doubled in number, and in the same period the farms above thirty acres have increased from 43,625 to 157,833. Though there is still far too many small farms in Ireland, yet, as the foregoing figures prove, their number is gradually being reduced. It will be a happy day for Ireland when the farms below thirty acres in extent are reduced to, at the most, one tenth their present number. I am not here to discuss whether large or small farms are best suited to the requirements of Ireland, but I cannot refrain from observing that, in my opinion at any rate, the very backward condition of Irish Agriculture is to be attributed to the excessive number of small holdings. I am certainly acquainted with districts where the occupants of these small farms are intelligent and industrious, and manage to make both ends meet, but over the greatest portion of Ireland, these small farmers occupy a most unfortunate position; they live in most wretched dwellings, and their plots of land are miserably cultivated. There is an immense difference in the management of the small farms of the north and of the south of Ireland. I am personally acquainted with many small farmers resident in Ulster, who cultivate their land in a most creditable manner, and who grow crops that would not shame the large farmers of this country. We generally associate high farming with small farms and spade culture, but I can assure you, gentlemen, that you may travel over thousands of acres of arable land in Ireland without seeing a single instance of high cultivation. True, spade cultivation will enable a farmer to obtain the maximum results from his farm, but it is equally true *that the very worst farmed districts of Ireland are those districts where only the spade is used in cultivating the ground.* I recently saw a town land containing 400 statute acres, on which there was not a single plough. This land was held by about 60 tenants, not one of whom owned a vehicle of greater dignity than a barrow—the manure to the land, and the produce from the land, all being conveyed in baskets on the backs of women. The land is held on a long lease, at about 5*s.* per acre. The farming on this town-land was the worst I ever witnessed; indeed I may say, almost without exception, the worst farmed districts in Ireland, are those where the land is held under long leases, at low rents; the longer the lease the more the land is divided; the lower the rent, the less does the occupant seem to feel the necessity for industry.

In different parts of Ireland, more particularly in the midland counties, you meet with farms more adapted to the requirements of modern agriculture, in the hands of men fully competent to turn them to the best advantage; however, the greatest number of these larger-sized farms are in the hands of landowners, as Home Farms. In this country, Home Farms have little effect on the agriculture of a district; but in Ireland, they have a mission to perform—in many instances great good has resulted from the establishment of Home Farms in backward districts. I often had the pleasure of finding implements of the most modern construction, not kept as novelties, but in regular use, in the hands of highly eulogistic owners, in districts into which they were very unlikely to have found their way, except through the agency of the Home Farm. Though the neighbouring farmers tear to pieces the practice on the Home Farm, they always find something to adopt, some new idea to carry out,—even the mistakes on the Home Farm are valuable to them as beacons of warning. It is greatly to be regretted that so many Irish landowners are putting their Home Farms into grass. True, in many instances, the returns from these farms is not large; but many of the operations carried out on them are of an experimental nature, and not paying in themselves, though the information obtained, is of immense value to the farmers of the district, and must result ultimately, in the increase of the estate rent-roll. There are districts where the surrounding practice is so good, there is no longer need for the Home Farm; but over the greatest portion of Ireland, the agricultural practice is yet in an embryo state.

It is customary for the tenant in Ireland to erect all the buildings required for the economical working of his land. On a few large holdings, and on Home Farms, I have seen good buildings; but on the greatest portions of Irish farms, the condition of the buildings is most unsatisfactory. On many Home Farms the

* A Paper read before the Newcastle-upon-Tyne Farmers' Club, 1867.

buildings are of a vary pretentious character, but are ill arranged ; little forethought has been exercised in their construction ; operations carried on at them must make a much greater demand on time and labour than should have been necessary. In the north, the buildings generally consist of a residence, containing three or four rooms ; and three or four outhouses, consisting of cattle byre, cart shed, pig sty, &c. These erections are generally thatched with straw ; the walls being washed with lime on the outside, give a rather pleasing appearance to these otherwise rude erections. In the south-west, a single erection frequently answers all the purposes of farm buildings. I have frequently seen a single building sheltering the farmer and family, with all his live and dead stock. These buildings are most unsubstantially constructed. I have seen hundreds of small farms in the south-west, on which the whole of the buildings were not worth £10. In many instances the walls consist of mud and stones, and the roof is formed of thatch, frequently unceiled within ; the floor generally is composed of clay. I saw several of these cabins without either windows or chimnies. *Political agitators have made a good deal of capital out of the fact, that the Irish farmer generally erects his own buildings ; but they have always observed a discreet silence as to the value of these buildings.* The worst farm buildings I saw in Ireland were erected on holdings held at a few shillings per acre, on a perpetuity lease ; and some of the neatest and best constructed buildings I had the pleasure of examining, were erected on farms held on a yearly tenancy. It is extraordinary, though it is nevertheless the fact, that in districts where long leases are common, the buildings are greatly inferior to the buildings in districts where leases are seldom given, and never for a longer period than twenty-one years. I know many farms situated in different parts of Ireland, held on a year-to-year tenure, on which the buildings have cost the tenant from £150 to £200 ; several of these farms do not exceed thirty acres in extent. Now, I am not here to express any opinion on the wisdom of laying out capital in the permanent works on farms held on a yearly tenancy ; I only wish to make you acquainted with the facts as they exist. Of course a farm is of little value, unless there are buildings on it, for the residence of the tenant, and for the manufacture of the farm produce into marketable commodities In this country the landlord provides these buildings, no farm being considered complete without them ; the interest on the sum spent on their erection forming part of the rent of the farm, This is undoubtedly the most satisfactory plan, where the farms are sufficiently large to bear the expenditure In Ireland, however, as I have already informed you, 300,000 farms are below fifteen acres in extent ; on these small holdings it is quite impossible to erect the necessary buildings ; nothing of a suitable character could be erected under £150, -the interest on this sum would amount to, in many instances, a sum equal to the present rent of the farm.

The greatest portion of the land under cultivation in Ireland is enclosed ; the fields are very small ; no inconsiderable proportion of Ireland is wasted by useless fences and ditches. I am acquainted with large districts, in which you will scarcely see a field of more than five acres in extent I recently saw a map of a district, containing 540 acres, which is divided into 230 fields.

The agricultural labourer is hardly paid in most parts of Ireland. Over the greatest portion of the south, he receives about 7s. per week ; in the north he is paid 8s. or 9s. per week, and sometimes has a free cottage in addition ; in the south-west, the wages seldom exceed 6s. per week—in this part of Ireland a great deal of the work is done by occasional labourers, or squatters ; these men generally obtain 6d. per day, and their food, "sour milk and potatoes," when working for the farmers ; but this employment is very irregular ; they are often unemployed for two or three weeks together during winter.

A large amount of capital has been invested in Ireland during the past twenty years, on permanent agricultural improvements. Under the Land Improvement Act, the Board of Works has advanced nearly two millions for drainage, &c. Under the superintendence of the Board, 250,000 acres of land have been thoroughly drained, at an average cost of £5 2s. 6d. per acre. A very large area has been drained by private enterprise, many landlords having laid out large sums on drainage works.

Legislation has recently done much to place the agriculture of Ireland on a sure footing. Under the Land Improvement Loan Act, Limited, owners can obtain money for the improvement of their estates, for draining or subsoiling, for making farm roads, or erecting farm buildings. These works are carried out by the owner of the land, under the superintendence of an Inspector of the Board of Works. The loan is repaid at the rate of £6 10s. per cent. per annum, over twenty-two years. This loan takes precedence over all prior charges on the land, with the exception of tithe rent charge, quit rent, and head-rent.

Another Act, entitled the Landed Property Improvement Act, of 1860, employs private enterprise and capital, under certain conditions. The limited owner may employ his own capital to improve his estate, and charge his successor his fair proportion of the cost of the improvement. Before he commences any improvement under this Act, he must first apply for and obtain the sanction of a judge of the Landed Estates Court. The sum expended under the Act, is made into an annuity, at £7, 2s. per cent. for twenty-five years. All improvements made under this Act must be maintained, or the subsequent owner will be entitled to damages. The second part of the Act secures to the tenant, under certain conditions, the value of any improvement he may make on the landlord's property ; he must, however, obtain the landlord's sanction for carrying out the improvements. He is either remunerated from the landlord by continuance of occupation for twenty-five years ; or by an annuity charged on the land for the same period ; this annuity, at £7, 2s. per cent., repays capital and interest in this period. The works described under tenants' improvements, are draining, subsoiling, irrigation works, reclamation of bog and waste land, making of farm roads, and the erection and repair of farm-houses, buildings, &c.

Customs of the country, have considerable force in Ireland. If a tenant, after sowing his land, receives notice to quit, he is entitled to remove the whole of his crop, as emblements. Under other circumstances, the way-going crop is divided ; in Munster and Connaught two-thirds, and in Leinster seven-eighths of the crop being given to the out-going tenant, the remainder going to the landlord or incoming tenant. In some districts the landlord or incoming tenant is bound to pay the outgoing tenant for any ground he has manured, but which has not been cropped. In the North of Ireland a very extensive system of Tenant Right prevails—it is known as the Ulster Tenant Right. It is supposed to have originated in the reign of James I., at the time of the importation of a large number of Scotch and English into Ulster. This custom, although unrecognized by law, operates with considerable force over the whole of the northern counties. There is in this custom nothing analogous to the Tenant Right of this country. I have known £20 and even £30 per acre thus given, for the mere possession of land, without even the protection of a lease, the land in many instances being in the most impoverished condition. It is very common to give ten or fifteen years' purchase for tenant right in County Down. The outgoing tenant generally advertises the land, and sells by public auction to the highest bidder, often without even consulting the landlord : on some estates this is prohibited, and outgoing tenants are not allowed to accept more than five or ten years' purchase for their tenant right. This custom operates in a most injurious manner on the capital of the incoming tenant—he often has to borrow the purchase money, and enters the farm not only without capital, but often burdened with a heavy debt. True, the landlord or his agent can to some extent influence this state of things for good ; but even with the greatest care, it has been found impossible to prevent incoming tenants, giving often twice as much for possession of the land, as the Office Regulations allow.

Last year the cropping of Ireland was as follows :—

	Acres.	*Average yield per Acre.*
Wheat	300,474	13·3 Cwts.
Oats	1,697,648	12·3 do.
[illegible]	150,538	14·9 do.
Bere or Rye	9,992	14·8 do.
Beans and Pease	14,781	10·4 do.
Potatoes	1,050,419	3·6 Tons.
Turnips	317,121	9·9 do.
Mangold	20,218	13·3 do.
Cabbage	36,446	10·4 do.
Carrots, &c.	26,791	
Vetches	30,096	
Flax	263,659	25·2 Stones.
Meadow and Clover... ...	1,600,495	1·8 Tons.
	5,519,678	

Per centage proportion of each kind of corn crop to total of corn crops in—

	Ireland.	*Scotland.*	*England.*
Wheat ...	13·8	8·1	42·7
Barley or Bere	7·0	15·6	25·4
Oats ...	78·1	73·5	20·8
Rye ...	·4	·5	·7
Beans ...	·6	2.1	6·7
	·1	·2	4·2
	100·0	100·0	100·0

Per centage proportion of each kind of green crop to total of green crop in—

	Ireland.	*Scotland.*	*England.*
Potatoes...	70·9	21·6	11·3
Turnips and Swedes	21·4	72·2	58·2
Mangold...	1·4	·1	9·2
Carrots	·2	·2	·6
Cabbages, Kohl Rabi—Rape..	3·4	·8	5·8
Vetches, Lucerne, &c. ...	2·7	5 1	14·9
	100 0	100·0	100·0

Since 1860, the area under cultivation has decreased from 5,970,139 to 5,519,670 acres ; nearly half a million acres of land has been removed from cultivation—I may almost say, abandoned to nature—during the past six years. We are informed that Wheat cannot be profitably cultivated in Ireland, owing to the humid nature of the climate. From the statistical tables of

1865, I select the following from the returns from Kerry, Cork, Londonderry, and Donegal, which counties, from their geographical position, have a large annual rainfall :—

	Cwts.	Bushel, 62lbs.
Kerry, average per statute acre	14·6	26·37
Cork, do . ..	14·5	26·19
Londonderry, do . ..	16·3	29·44
Donegal, do	14·4	26·01

The average return for these four counties is 11·95 cwts., or 27 bushels of 62 lbs. Mr. Caird averages the produce of the Wheat crop in England at 26½ bushels per acre. It is quite evident, therefore, that the climate of Ireland is not blamable for the small area under the wheat crop.

I need not occupy your time by alluding further to the cereal crops—the foregoing tables speak for themselves. It is very much to be regretted that the area under green crops has been so much reduced during the past few years in Ireland; the decrease last year was upwards of 20,000 acres. Unless these crops are more largely cultivated, the area under cereal crops must be considerably reduced.

As to the superior character of Irish grass lands, I must confess I am sceptical; excepting in the midland counties, I saw very little grass land that would equal the grass lands in many of the southern counties of England. There are thousands of acres of land in Ireland under grass, a disgrace to the agriculture of the country; the land would have been better left in its uncultivated virgin state, as be in its present condition. It is yet to be discovered in Ireland, what, even in this country, is to many an unknown truth, that grass requires almost as much attention as arable land. During last year 200,000 acres of arable land were laid down under grass.

In 1866 the live stock of Ireland consisted of the following animals :—555,449 horses, 171,706 asses, 3,712,923 head of cattle of all ages, 4,270,027 sheep, 1,493,532 pigs, 186,536 goats, and 10,744,422 head of poultry of all kinds. Since 1861, horses have been reduced in number fully 80,000, while cattle have increased upwards of 100,000 head; and sheep nearly 620,000 head. I need not trouble you with any detailed account of the live stock of Ireland; the farmers in this part of England are too well acquainted with Irish stock, to need any information from me. I will only remark, that Irish stock has vastly improved during the past twenty years, and that I have no doubt but that the various agencies now at work will result in th establishment of herds and flocks in Ireland unsurpassed i Her Majesty's dominions.

I must now bring my observations to a close ; I have tres passed already too far on your patience—the importance of th subject must be my excuse. I would only add, in conclusion that if I have succeeded in removing any wrong impression fro your minds regarding Irish Agriculture, I shall feel well repai for any little trouble I have had in preparing this address.

IRRIGATION IN REUNION.

(*From the French.*)

The theory of irrigation is intimately connected with that o drainage; because, if the proper distribution of water to the soil is an essential element for developing vegetation, its re maining there too long, its stagnation, becomes hurtful to th plant, and may cause its destruction; but the soil of our islan is found to be drained naturally by reason of its physical formation and inclination. We may therefore leave this second part of the question, and give our attention to the first.

The circulation of water in cultivated soils not only contributes to the activity of vegetation by the access of humidity, but also to their fertility, and in the long run improves them. "The division of the soil into particles, between which the air can circulate, and the pores of which may imbibe both air and water, such is the essential condition for the accomplishment of the phenomena of vegetation, and it may be added that the nourishment of the plant is prepared by the reaction of the oxygen of the air on the organic matters of the earth. In the chemical effects which may be produced by drainage and irrigation, the air acts on the various substances contained in the soil, and especially its oxygen combining with the organic matters, produces carbonic acid, and in consequence disintegrates and dissolves the calcareous substances, decomposes the phosphates, peroxide of iron, &c., &c., and as a necessary consequence, the earth crumbles and acquires the porosity needful for vegetation. When fresh rains fall unexpectedly, or irrigation is practised, the water drives out the air previously introduced, modified air having lost its oxygen, which consequently is renewed, to the great benefit of vegetation. In short, water has the property of dissolving the two chief elements of the atmosphere, oxygen and nitrogen, but because there is more oxygen to be dissolved than nitrogen, this oxygen produces an eminently useful effect on vegetation. Fact is here in accord with theory." The properties of the water also exercise a great influence on vegetation. "Water contains always in solution, in its mineral state, oxygen, carbonic acid, ammonia, nitric acid, organic compounds and mineral salts, which exercise an energetic action on vegetation, and furnish plants with the food which they require."

Wishing to report of the composition of the waters of our river, which are generally used for irrigation, we have submitted to analysis some of the sedimentary deposit from the river Pluies, collected in our steam boilers, with the following result : —A noticeable quantity of carbonic acid combined with lime and magnesia, a considerable proportion of iron, of silica, and of alumina and soda.

In short, the deposit analyzed may be represented by the following bodies : —silica alumina, lime, magnesia, soda, iron, chloride, carbonic acid, oxygen, and hydrogen.

The small quantity of deposit submitted to the chemist did not permit of the determination of the proportions of each ; but according to the reactions observed, lime, iron, and magnesia entered largely into its composition.

This analysis, it may be said, represents very nearly the composition of the waters of all our rivers, as they take their rise in a common centre. The presence of lime is especially valuable for our low lands, which contain little or none. Irrigation then may enrich lands with substances in which they are deficient. This last consideration, and others above mentioned, will then explain how in certain localities of our island the lands submitted to irrigation have been cultivated for years without fallowing, always giving excellent crops, without losing their fertility in any appreciable degree. * * *

Sources of the Supply of Water, &c.

The water which is to be used for irrigation, may be obtained from natural sources, rivers, brooks, and ravines, or artificially from wells.

But little water flows in our rivers, generally, after the period of the great rains of winter. In the dry season, the time when irrigation is most needed, the supply of water fails, and the beds of our torrents become completely dried up. But under the permeable sand and pebbles, of which the river beds are composed, there often flow streams of water of considerable volume, which are never exhausted. Not penetrating the lower strata, the water filters gradually, and goes silently to the coast into the waves of the sea. These waters might be utilized, by opening trenches in the mass of sand and gravel on the most favourable parts of our rivers, to their full breadth, and by filling up these trenches with impermeable pudding from the solid bottom : the waters, unable any longer to escape, would rise to the surface and might be turned into canals. The pudding in question might, according to the importance of the work, be made with clay mixed with pebbles, and carefully stamped down ; or with hydraulic concrete, composed of the volcanic ashes and lime which the country furnishes in abundance. The above applies chiefly to the brook and ravines, which are real torrents in the rainy season, but the beds of which are quite dry in summer.

There is another method of increasing the volume of water wasted during the low water of our rivers. It consists in establishing large dams in the most narrow and embanked parts of their beds, thus forming immense reservoirs, which store up for use during the dry season the superabundance of water which falls during the rainy season. But these immense works raise the grand problem which should be previously solved, and which is beyond our province (that of their cost). Meanwhile, because of its importance, your commission expresses the opinion that this question should be brought before the notice of the government. Springs of water may also be a precious addition to the supply for irrigating purposes. We do not mean merely springs which rise above the surface of the ground, but those which may readily be brought to light by works easily executed.

Waters which rarely appear above the surface, may be found in abundance under our feet. It is sufficient to glance at the configuration of our island, to have an idea of the quantity of water which might be obtained and stored in reservoirs. Unfortunately the waters rapidly penetrate the permeable surface of our soil, following at variable depths the lower beds, and flow, like the waters of our rivers, unseen, to the sea coast, without having been utilized to the profit of our agriculture.

With an attentive study of our lands, and the peculiarities of our ravines, by practising the boring which the new system of tubular pumps renders feasible, it is possible to find out the locality of subterranean sheets of water, and by opening trenches perpendicular to the slopes, until the veins of water are met with, it would be easy to conduct it to the surface. In many localities of our island, especially on the lowland plains near the coast, sheets of water are met with at very slight depths, a few yards at most. Wells dug at slight expense, with barrels within them, would supply great volumes of water, which might be raised by horse-power, by windmills, or, still better, by powerful steam engines.

When the supply canal is to be constructed on an incline of difficult access, we do not hesitate to advise the use of Iron canals of this kind which are made at moderate prices, the thickness of the metal varying from ⅛ to ¼ of an inch, according to the capacity of the canal. The stability required may be ensured by corner pieces.

These canals last a long time if preserved now and then with a coat of paint or tar. In the case in point they are less expensive than masonry. The chief supply canal should traverse the ground to be irrigated through its whole extent; for distributing the water several kinds of conduits are needful—1st, those which receive the water from the supply canals and conduct it to; 2nd, the trenches which empty the water into furrows, and whence, lastly, it is distributed over the fields to be irrigated. * * *

In conclusion, what we have said on the advantages of irrigation applied to our agriculture will merely confirm the opinions you have already formed on the ability it confers of planting and obtaining crops at the most favourable periods, of carrying into the soil at any time the manures which may be needed, and lastly, of the great economy of manual labour which it enables us to exercise in our agriculture

As an immediate consequence of irrigation the return of our crops will be increased, but this increase does not permit of actual estimate It will naturally vary with the differences of the climate, soil, and mode of culture. If in dry regions, where for want of water the growth of crops is ordinarily impossible, all the produce of the soil may be attributed to irrigation, we may also say that its application will not be without influence even in humid localities As we already explained, periodical watering not only favours vegetation by furnishing the plant with the requisite degree of moisture, it also acts chemically on the soil by carrying to it new principles and favouring the transformation of its constituent elements Lastly, it is worthy of remark that those localities of our island submitted to irrigation have been able to struggle with advantage against all the scourges of which the influence has been so fatal to our colonial agriculture.—*Extract from the Report of the Commission of the Chamber of Agriculture of the Island of Reunion, on Irrigation applied to Colonial Agriculture.*

MISCELLANEA.

The Government of India has been making enquiries relative to the effect of the cultivation of the sunflower plant in neutralising the injurious effect of marshy exhalations. A despatch was addressed in December last to the Secretary of State for India, requesting him to obtain, through the Foreign Office, any information France and Holland might be able to afford. Lord Lyons, Ambassador at Paris, was accordingly instructed to make enquiry on the subject of a treatise respecting the cultivation of sunflower said to have been presented to the Société Thérapeutique of Paris by M Martin M Ollivier caused enquiries to be made, but with no good result, as among all the works on this subject submitted to the Société there was none found written by M. Martin. At the Hague, enquiries were only just more successful in eliciting information. M. Limburg could find little but hearsay on the subject. He only knew that the plant had been sown in the Netherlands for the object stated. Their officers in the East were, however, to be asked to state what their experience was. The Minister of the Interior enabled M. Limburg to amplify his answer, by adding that since the reclamation of the Lac de Haarlem, no one had any occasion to fear intermittent fever, if he only took care to plant "colza" on the dry land, or wild plants such as the "Cineraref palustris."—*Times of India*

IRRIGATION BY WIND POWER.

Read the following letter from Mr. H. A Harris of the Bengal Marine, dated 12th August.

"On the 20th of July, I addressed the Bengal Government, on the subject of irrigation by wind power, and on the 6th of August a few remarks of mine on the subject appeared in the *Indian Daily News*, which you have no doubt seen. I now beg to offer to any member of the Society, who feels an interest in this method of irrigation, a small wind-mill pump complete, well suited for a gentleman's garden, and in good working order, on the following conditions:—

"1*st*.—The pump will be put up by me free of all charge.

"2*nd*.—A good situation open to all winds must be found.

"3*rd*.—That if it works satisfactorily, the recipient will aid me introducing them to the province of Orissa and other parts of India, for which I am convinced they are well adapted.

Dimensions of Pump and of Model.

Stroke, about 6 inches.
Diameter pump, 3¼ inches.
Diameter of sails nearly 8 feet, *i. e.*, each sail 4 feet.
Lift, about 12 feet.
Number of sails, 4.

"Should my offer be thought worthy of notice, a reply will oblige. The present model is best adapted for a well, but could be placed over a tank if necessary.

Agreed—To introduce the above letter in this day's proceedings, with the view of inviting a response to the offer of Mr. Harris from any one interested in the subject.—*Agri-Horticultural Society.*

Official Gazette.

CALCUTTA, 15TH OCTOBER 1870.

AGRICULTURAL EXHIBITION.—FURREEDPORE.

Report on the Exhibition for 1870.

1*st*.—The first Agricultural Exhibition took place in the year 1864, and since then the exhibition has been held year after year with varying success. Some years ago it was almost feared that it would cease to be held, but owing to the energy, especially of Baboo Bhugwan Chunder Bose, those evil times were tided over, and during the last year or so the exhibition has gradually gone on increasing in size, in the amount of the sums subscribed to it, and in the area over which its influence extends. The following figures will show this in part:—

Amount subscribed.

	Rs.	as.	p.
Year 1868	887	0	0
1869	1,023	15	0
1870	1,200	0	0

2*nd*.—This year agriculturists came with samples of rice and other products from distances, indeed from all parts of the district, thus proving that the exhibition is gaining notoriety, and that the people of the district are getting confidence in its stability. A few (too few) of the landowners attended during the exhibition week. The account given to me of the reason of more of this class not taking interest in the matter was the want of due publication of the programme to them. This will be rectified in future by a copy of the committee's proceedings and of the programme being sent to each influential landowner, so that they may not in future plead ignorance of the *exhibition*, its *character*, and *object*.

3*rd*. The chief point to be noticed in the present exhibition is the large number of various sorts of rice brought for exhibition from all parts of the district, the eagerness of the exhibitors, and the interest displayed by the spectators. The exhibition of sugarcane, molasses, vegetables, was regarded with a certain amount of interest, which was chiefly shewn by the exhibitors and their friends, but on the days (for the committee had to give two days to this instead of one as put down in the programe) on which the rice were exhibited, the people flocked in numbers to look on, and displayed a really lively interest in the matter. This is a very significant fact, and in future exhibitions a large portion of the best prizes should be set aside for the encouragement of the exhibition of all *sorts* of rice of the best quality. There should be a prize for each class of rice, the prize to be awarded to the best exhibited in that *class*; because certain parts of the district are more especially adapted to the different classes, and it should be the object of the committee to encourage agriculturists *in all parts of the district* to compete with one another for the production of the best sort of rice produced *in their part of the country*. notice this, because it seems hitherto to have been the custom to award prizes only to what are considered by connoisseurs to be the best sorts of rice. For instance, the connoisseurs say this is a very good rice *of its kind*, but the *kind* is inferior and therefore no prize can be awarded to it. On this principle no judges could in England award any prize to apples or pears unless these were all Ratisbone pippins or Jargonelles.

4*th*.—That there was a falling off in the exhibition of certain products, such as pulses, sugarcane, &c., is attributable to two causes—*viz*., the cyclones of May and June, and the inundations of October last. As to the cyclones, it is well known what damage they were likely to cause to agriculturists in general. They were sufficiently spoken of at the time, so as not to require much special mention in this report. As to the latter cause, in the very latter end of October there was a rise in the Pudma (Ganges), which of course caused a corresponding rise in the khals and "bheels" all over the district; these again overflowed their banks and inundated the whole country, and this inundation did not dry off till the end of November. This was disastrous to many of the peas and pulses which are sown in Kartick or October. We may say, if it had not been for these very exceptional calamities, the out-turn of all crops would have been generally as excellent as that of the rice, and the exhibition would have excelled in all its departments those of previous years.

5*th*.—As was to be expected in a Bengal district, chief among the show of live stock were draught oxen and milch cows. The former especially should be noticed, such cattle being principally used for the plough. The ploughing match was also well contested by eleven competitors, to six of whom prizes were awarded.

6*th*.—The sanitary arrangements of the fair were carried out notwithstanding that the people at first seemed inclined to resist any such innovation. Trenches were dug on the banks of

the Dhole lake, and mothers appointed to see that the earth was properly applied according to the dry-earth system. Dr. Bose, the civil surgeon, personally superintended the matter, and all the arrangements were successfully carried out. No cases of cholera or any other epidemic occurred during the fair, though it was estimated that it was attended by some thousands of people.

7th.—There were the usual amusements in the way of athletic sports, races of all sorts, and native singing and dancing These sports and amusements are necessary to attract spectators, who again serve to animate and encourage the exhibitors and traders who set up shops during the continuance of the exhibition. If bands of music and other attractions are found necessary in Europe, how much more so is something of this sort necessary in this country?

8th.—The greatest credit is due to the committee, especially to Dr. Bose, Baboo Neelkant Seekdar, Gunga Narain Chowdry Modhoosoodun Chowdry, Bepin Behari Sirkar; and that the whole exhibition was a success, is very much due to the unceasing exertions, energy, and ability displayed by the honorary secretaries, Baboos Chundra Mohun Roy and Bhubun Mohun Raha.

9th.—Pursuant to notice, the annual agricultural exhibition was opened to the public on the 1st January 1870. The following is a brief narrative of each successive day's proceedings during the eight days the exhibition lasted this year:—

1st January.—This was the day fixed for a show of vegetables, foreign and native. The show in this department was not quite equal, to former ones, owing, it is said, to the cyclones of May and June 1869. The show of European vegetables was averagely good, but not so the native. The people neglected their garden products to look after more important cultivations injured by the cyclones.

The evening was spent in amusements, such as sack and ghurrah races, pole climbing. During the night there we native nautches and a display of fireworks. The exhibition room was very tastefully fitted up with hanging lamps and other decorations, and formed a good native ball-room.

10th. 2nd January.—This was Sunday. As previously notified in the programme, nothing was done this day.

11th. 3rd January.—There was a show of vegetables and manufactures, such as sugarcane of various kinds, molassess and sugar of different sorts, cocoanuts, castor-oil seed and oil, arrowroot, ghee of different sorts, butter and cream, &c., &c. Considerable improvement was apparent as compared with former years. There were some foot races and other athletic sports in the afternoon, for which the winners got prizes.

12th. 4th January.—This day was fixed for the exhibition of rice. Early in the morning swarms of people literally poured into the exhibition ground with various samples of rice in baskets full. Numerous spectators also pressed in exhibiting the very great interest people have in the cultivation of this the staple produce of the country. Need we say that the cultivation of rice engrosses the attention of the people *en masse*. The object of the exhibition therefore has been, we are perfectly convinced, realized as far this department of agriculture is concerned. The undoubtedly great interest which every body, both exhibitors and spectators, took in this day's exhibition was very remarkable. Various specimens of amun and aus rice were exhibited, and the competition was so keen that the whole day and part of the night passed in selecting merely a number of the best sorts of the amun exhibited, for more careful examination on the day following. Of the amun rice there were 270 exhibitors and 49 species; of aus, 141 exhibitors and 28 species.

Neither games nor any other amusement could be held this evening, as the committee's time was fully engrossed in the selection of the best species of amun paddy only. The exhibitors of the aus paddy were desired to come next morning.

13th. 5th January.—This day the whole of the morning was occupied in selecting the best kinds of the aus crop rice, and prizes were settled for both aus and amun. Specimens of different cereals and rubbie crops were also exhibited. These specimens were, however, not very good owing to the rise of the river so late as in October, which destroyed the crops altogether. In the evening there was a nautch at night, both *khemtra* and *jatra*, the latter being a curious medley of Hindoo tragedy, comedy, and theology, partly recited in verse and partly in prose dialogue.

14th 6th January.—This day live stock was exhibited—milch cows, plough bullocks, country-bred bulls, poultry, sheep, goats, &c. agricultural implements, cotton-cleaning machines, &c., were also exhited. Some of the milch cows were fine animals, producing five seers of milk daily The show of pairs of draught bullocks was also good, some of the pairs being really fine animals. The poultry show for some cause or other was not good this year.

Date as above. The pony races were held this afternoon. Nearly 20 were entered. Several heats had to be run before three prizes could be awarded. There were also other games and other athletic sports. Native dancing and singing during the night.

14th. 7th January.—This day there wasa ploughing match; eleven competitors appeared. The competition was keen and vigorous, and several prizes were awarded.

In the evening there were wrestling, high jump, broad jump, and similar games and other athletic sports.

15th. 8th January.—This was the last day of exhibition. A meeting of the members of the committee was held in the afternoon at the mela bungalow, and the business of the day was opened by a speech from the chairman, Mr. N. S. Alexander. The distribution of prizes to successful competitors, of whom there were about 280 persons present, besides a vast concourse of spectators followed, and the proceedings were brought to a close at 6 o'clock P.M., when the meeting was dissolved with thanks to the chair.

At night there was a grand display of fireworks. Thus concluded the exhibition.

N. S. ALEXANDER,
President of the Furreedpore
Agricultural Exhibition Committee.

No. 1948.

TO THE COMMISSIONER OF DACCA

Fort William, the 5th July 1870.

SIR,—With reference to your letter No. 172 dated the 16th ultimo, with enclosures from the Collector of Furreedpore, submitting a copy of the printed report of the results of the agricultural exhibition held in January last in his district, I am directed to inform you that the Lieutenant-Governor has been pleased to sanction the grant of Rs. 250 towards the expenses of the next fair, on the understanding that the amount sanctioned will be spent in prizes to exhibitors and not on amusements. The Accountant-General will be requested to adjust the charge.

I am also to convey to you an expression of the Lieutenant-Governor's gratification at the success of the last exhibition.

H. S. BEADON.
Offg. Under-Secy. to the Govt. of Bengal.

The Foresters' Gazette.

CALCUTTA, 15TH OCTOBER, 1870.

To the Editor of the Agricultural Gazette of India

Sir,—I cannot pass by your quotation from the *Madras Mail* entitled, "Forestry a Failure," without endeavouring to show up what any one who is acquainted with the history of forestry in Europe must know to be egregiously in error. The facts of European forestry show what a large outlay of money is necessary for a period of between 60 and 100 years, in order to produce forests, but that, eventually, they pay very well, and France and Germany once exhausted of timber are now supplied with fuel at nearly as cheap a rate as coal, besides exporting enormous quantities of deals to all the world. Some in fact are now in use as sleepers on the Indian railways. The true place of the forests is emphatically *not* under *revenue*. Forestry has for its object the *production of timber to supply the demand*, and not revenue which properly comes from taxes. The average proportion under forest in Germany is about 1·15 acre per head of population, and a good acre produce 5,000 cubic feet of timber. The rate in the Central Provinces, a fair specimen of India, is perhaps three acres per man, a good acre bearing at the outside 500, cubic feet; but the forests are mostly cleared of all good timber and are not likely, without the most careful conservation, to reproduce it. Scientific forestry, like agriculture, is based on a system of rotation and a proper provision, for reproduction of the crop is the very existence of the system. To dismiss the trained forest establishment and appoint a forester in each district under the civil authority, would indeed, as the writer in the *Madras Mail* says, produce a fine income with little outlay, but the forests would, like the goose with the golden eggs, soon be out of existence. It would be precisely as sensible to appoint an agricultural labourer to look after a farm with orders to cut the unripe corn and sell it for straw and dismiss your steward because he wanted money to sow the next crops. If the writer had any idea of how sucessful both in the timber producing and paying point of view systematic forestry has proved in France and Germany after one and a half to two centuries' trial, I am sure he would not have propounded such opinions, condemning without facts, a well established institution. Before it is possible that there can be any result from conservation in India, the full period for the growth of the trees must elapse, *i. e.*, 80 to 100 years. Till then, if the forest department pays its expenses it will have done exceedingly well. I hope that by publishing this you will let forestry have justice in your column.

THOS. WINGFIELD WEBBER,
Asst. Conservator of Forests, Hoshungabad, C. P

THE AILANTUS AS A TIMBER TREE.

Both in France and America this tree is gaining ground in the estimation of practical men. Experiments made in France show the wood to have less density than that of the oak, and greater than that of the elm, while it is superior to either of the two in elasticity and tenacity. Ailantus planks have been exposed to the weather for 27 years, without shelter or paint, and the wood is still perfectly preserved. The wood is useful for agricultural implements, and it neither warps nor cracks. It saws readily, and afterwards acquires great hardness under exposure to the air. The ailantus grows so freely in this country that it ought not to be a difficult matter to ascertain whether its timber is as serviceable here as it is said to be across the water.—*American Agriculturist.*

BHAGEERUTTEE VALLEY FORESTS

To Colonel C. J. Hodgson, R. E.,
Secretary to Government, N. W. P., P. W. D
Dated Camp, the 7th November, 1869.

The Conservator has the honour to submit herewith the Map and Valuation Surveys of the Bhageeruttee Forests, which have been prepared by Mr. Grant during the past season. They will give the Government a very accurate idea of these valuable though distant forests, and carry with them the most favourable impression of the zeal and ability with which Mr. Grant has carried out his work in these difficult and distant mountains, to which the Conservator would desire to solicit the favourable attention of Government. The forests of the Jadh Gunga (which joins the Bhageeruttee from Neelung about 8 miles below Gungootree) are not included in this Report, and will be surveyed another year.

GENERAL DESCRIPTION.

Just above the point where the Bhageeruttee cuts through the snowy range is situated the village of Jhala. Between this point and Gungootree the valley lies nearly due east and west. It is about 17 miles in length between these points, and this portion of the valley contains the Deodar Forest. Deodar extends for about 2½ miles above Gungootree, but it is generally stunted. The Cheer (*Pinus excelsa*) extends eight miles higher up the valley above Gungootree, and the birch is found in patches up to within half a mile of the glacier. The surveys were only carried up as far as Gungootree.

Agreeably to my directions, Mr. Grant divided the forests into convenient blocks, bounded by natural features—the several blocks of forests being called by the names of the *gads* or streams which bound them to the east. The upper survey line was carried along the edge of the forest below the snow; valuation lines, two chains in breadth, were then taken through the forest as far as possible. These are all indicated in the map. The trees were carefully counted along the lines, distinguishing the sound from the unsound, and averages were then struck for the whole block from the number counted along each survey line, as per its average.

A description of each block in succession, commencing from the east along the north bank of the river, and returning up the south bank from the west, will now be given.

Gungootree Block.—This block extends from the junction of the jadh Gunga with the Bhageeruttee up to the Gungootree Temple. It is a narrow strip of forest containing somewhat less than 500 acres. The rocks are granite, the hill sides excessively steep, and the river runs nearly the whole distance between perpendicular cliffs from 200 to 500 feet in height below the forest.

Some of the finest trees in the whole forest are in this block, and several were measured of 16 feet girth and upwards, and from 100 to 200 feet in height. Those, however, to the east are somewhat stunted and broken, but they are no doubt of great age—the two trees above the temple being supposed to be even 1,500 years old. Above the Jadh Gunga, there is a close forest of young trees springing up in the old cultivation, and generally the proportion of young trees in this portion of the forest is good, as will be seen by a comparison of the number of 3rd and 4th class to mature trees. This forest has not been much injured by avalanches, but the damage from fire and barking of trees in former times has been considerable. There is a fair quantity of *Pinus excelsa* mixed with the deodar, but no other trees. This block has not been worked, except to a very small extent by Mr. Wilson.

Neelung Block.—extends from the Jadh Gunga or Neelung River westwards as far as the Goomgoom River. The characteristics are generally the same as those of the last block. It contains some very fine forests, and a very fair show of young trees in portions of it. But it has suffered terribly from avalanches; and where they have fallen, the forest is utterly destroyed. It is a convenient forest to work, and will yield much good timber.

Goomgoom Block.—The valley here becomes more open and the forest closer. The trees are generally not of such large size; but a vast proportion have been burnt and killed for the cultivation of the Mukwa people in former years. Though not included in the estimate of the forest, they will yield a quantity of timber for sleepers, independent of the living forest.

Hirseel Block has been heavily worked by Mr. Wilson in the past years, while great number of trees were destroyed before his time for cultivation. There is, however, a good deal of timber left available for use.

SOUTH SIDE OF THE RIVER.

Tailguree Block.—The same remarks will apply as to the Hirsee Block. There is a fine forest of *Excelsa* and silver-fir mixed with and above the deodar in this block.

Sartee Block.—The older trees have been generally felled in this block, but there is still a good amount of fine timber (deodar and cheer), while a fine young forest of young deodar and cheer is now coming on. Above the deodar there is a fine forest of silver-fir (*Webbiana*)—the trees being of enormous size; but they are of great age and generally unsound. Some portions of this block have been dreadfully injured by fire, and numerous fine trees have been destroyed for the temporary cultivation of the Daralee village. The deodar forest west of Daralee is, however, as fine as any I have seen almost anywhere.

Doodoogad Block.—This large block of forest contains a vast quantity of fine timber. The average of the surveys shows about 25,000 first-class trees, but this is certainly well within the real number. The forest has been considerably worked heretofore in certain parts, but not all over, and it has been much devastated by avalanches. The young forest is particularly good in portions of this block.

Dinargad Block.—The mountains here are exceedingly precipitious, and the forest very inaccessible. They may, however, be got at in almost every part by light wire-rope bridges across the river from the north side. While an immense amount of valuable timber is available, if only it can be put into the river without being broken to pieces over the precipices. The number of trees shown in the statement is certainly well within the number which exist in the forest.

Kidar Ganga Block.—This forest is opposite to the Gungootree Temple. The trees are generally stunted, the aspect being cold and enjoying but little sun. Nevertheless, in many places fair young forests may be seen coming on, and on examination it seems better than could be expected in such a situation.

GENERAL CONDITION OF THE FORESTS AT PRESENT.

It must be confessed that these forests bear a very desolate appearance on first looking at them, and if their true value be not carefully gone into. The ravages committed by the cultivators in the western portion of the valley, where thousands upon thousands of dead trees—all killed by fire—disfigure the hill-side in every direction, are barely equalled by the destruction committed by avalanches higher up the valley. Here, in the Neelung, Dinargad, and Doopoogad Blocks, huge lanes may be seen swept clean down the hill-side by avalanches, the whole place strewed right and left with the *debris* of trees, hurled down and broken in pieces, from small saplings up to trees of 12 and 15 feet in girth, in one common destruction. Then, again, the forests having been worked formerly on no regular system, the whole place is strewed with loppings and tops of trees, and half-decayed logs. Added to this, from the height of the mountains the sun disappears entirely from the valley by half-past one or two o'clock in the afternoon, and does not rise till half-past eight in the morning—the frost being exceedingly severe, while cutting winds blow all day long, and snow in this month (November) lies far down the side of the mountain. All this is against natural reproduction, and makes one wonder how such fine trees have ever been produced as are seen here.

The rate of growth, however, is no doubt very slow. Although there are exceptions, and specimens of very good growth may be found in the valley, yet, after examining many trees, the Conservator considers that *eight rings per inch* may be taken as a fair average of the rate growth in these forests, or about 200 years for a tree of two feet in diameter. Many stumps showing an age of upwards of 400 and 500 years have been counted by the Conservator, and one containing about 420 rings measured under 4 feet. In the Hirseed Block one stump was counted of 7 feet diameter, with only 320 rings, and the rate very much varies according to difference of situation; and this happens also where trees are within a short distance of each other in the same block.

PROPOSED IMPROVEMENT AND PLAN OF WORKING.

It is very remarkable that where the forest has been cut down by avalanches, in no case can any young tree be seen coming up again; the ground becomes covered with scrub-jungle, and the forest disappears.

As a large amount of timber must be taken from these forests during the next few years, it becomes important to consider the best plan of working them. After carefully considering the matter, the Conservator feels convinced that the plan of felling in lines, leaving intermediate lines of trees between, will not do

here. The shelter of older trees is absolutely necessary to let the young ones take root and obtain shelter in this bitter climate. Indeed, the action of nature with regard to the avalanches, which, as it were, fell regular, lines of trees through the forest seem to show us that such a plan would never answer, as the forest never springs up again in such places. He believes that the best plan will be to take as many of the sound first-class trees out of the forest as it will probably bear without denuding the ground or depriving the young trees of shelter, and then *shut it up absolutely*—not allowing any workman to enter it. For the present, felling will be confined to the four western blocks, and to certain limited portions of those blocks which it may be convenient to work. Moreover, every effort will be made to utilize as many of the dead trees, which exist in great numbers in these four blocks, for sleepers. Many of them are perfectly sound, and the timber seems excellent, and of course thoroughly seasoned.

As regards what may be called putting these forests into order, collecting and burning the *debris*, and such like, the Conservator really does not see where he can even begin with profit. To make any perceptible change in this point of view would entail a vast amount of money and much labour, which is difficult to procure. He believes that as regards the future we must insist in clearing up the work as we go on, and little by little remedy the past in the forests in which we may be working.

In the meanwhile, every pains will be taken to keep the present work straight and as it should be. The villagers are no longer allowed to burn the forests for cultivation or to bark the trees. There is very little sheep-grazing, especially in the upper part of the valley, as the sheep are all constantly employed in journeys to Thibet. Even with all the drawbacks that exist, Government may rest assured that the rent they pay to the Rajah of Tehree for his forests (of which these are only a small portion), even if supplemented by the cost of the Bhageerutee Valley Road, is well laid out, and that they ought to get a handsome return in the shape of timber for their money.

Proposals for the work of preparing the sleepers required for the Delhi Railway are submitted in a separate document.

CONCLUDING REMARKS.

In this Report the Conservator has endeavoured to give a general idea of the condition of the forests, apart from figures, which are contained in the table which is appended, and which gives a carefully compiled statement of the contents of the different blocks of forest at a glance. This seems the most useful way of showing it; and, indeed, from this table the condition of each block of forest can be better told than in the Report. It should be remarked that only first-class cheer trees are counted.

In conclusion, he would add a few words on the forests of the Jadh Gunga or Neelung River, on the condition of the Bhageeruttee for floating, and on the progress of the road during the past year.

As regards the forests of the Neelung Valley, which will be surveyed if possible next season. The deodar extends for about twelve miles up the valley, and contains some very fine trees; but there is very little appearance of young forest. The terribly cold winds which tear up and down this valley must, it is supposed, carry away the seed from place to place and prevent it germinating. Nevertheless, a considerable amount of mature timber may be taken from the valley.

In the upper portion towards Neelung, the pencil-cedar (*Jumpenus excelsa*) is found in considerable abundance; but it has been much cut for fuel by the Tartars, who come to the valley with their sheep; and but few trees of any size exist. Neelung is about 10,000 feet above the sea, and it grows close up to it.

FLOATING IN THE BHAGEERUTTEE.

There will be difficulties in regard to this matter which did not strike the Conservator when he made his hurried journey up the valley last year at this time. The upper portion of the gorge is so bad that sleepers could not be floated through it (as he hoped) in the cold weather; in the floods they would be dashed to pieces. Below the gorge, the river, it is believed, presents no difficulties; but perhaps it will be better to launch the logs in the floods, when they will be carried through the gorge, and then they can be cut into sleepers where they are stranded below the gorge, or in the Doon, if they get so far.

The Conservator believes that it would not take very much to improve the bed of the river for floating to such an extent that sleepers might easily be floated with safety in the cold weather through the gorge; but without a survey of the river, he does not like to speak positively on this point. Such a survey will be made whenever Mr. O'Callaghan has leisure to attend to it, and then some calculation may be entered into as to the cost of opening the river in the gorge. Perhaps the best plan would be to spend a small sum (say a couple of thousand rupees) every year in blasting away the worst impediments. Below the gorge there is certainly nothing worse in the river than there is between Augustmoonee and the Doon, whence we know that sleepers were floated last March and April with ease and safety.

The Planters' Gazette.

CALCUTTA 15TH OCTOBER, 1870.

THE ESTATES.

THE Coffee Planters of the Neilgherry Hills have had an interview with the Madras Governor at Ootacamund upon the subject of their grievances. Their demands seem to have been very moderate, the chief of them being a reduction of the assessment on forest land from two rupees to one rupee per acre. Upon the whole, coffee planting has proved a disastrous speculation for the Europeans engaged in it. It is now clear, that neither tea nor coffee is the magnificent investment which they were once supposed to be, and that the waste lands of India had better have been left *waste* in so far as the planter himself is concerned. The coffee planter of Southern India, however, is under a disadvantage from which the tea planter of the North is exempt. For the former is weighted with a perpetual land tax of two rupees per acre, while the latter enjoys an immunity from all land tax whatever. The coffee planter can redeem this land tax only by a payment to Government of £4 an acre, in addition to the amount he has already paid at public sale for the land. The tea planter pays considerably less for the land in the first instance than the coffee planter, and in the second has no land tax to pay. Now these invidious differences between the rules for the sales of land in Bengal and Madras are plainly indefensible. *Why* should the coffee planter be required to pay an annual tax upon his land, when the tea planter pays none on his? It is only in the Madras Presidency that this condition attaches to the purchase of Waste Lands. In every other part of India, the land is free from all tax whatever. We have never concealed our own conviction of the improvidence of those sales, but it is now clear that in so far as the *hill* wastes of the country are concerned, their reclamation is an enterprise of the utmost doubtful order, and that if the State attaches any importance to its success, it is necessary to shew the most consideration for the private interests engaged therein. We are sorry, therefore, to learn, that Lord Napier held out no hope to the planters of the Neilgherries of a reduction in the assessment. In view of the ruin which the enterprise has proved to the many, we think that Government at the very least should have suspended the levy of the assessment altogether for some years, until coffee planting has passed out of the region of experiment and has become a manifest success, or plain failure. You cannot put this assessment in any light whatever, that will shew it to be just. If the coffee planter is engaged in an enterprise destined eventually to succeed, it will be time enough to tax him when it *has* succeeded. If the experiment is destined to fail, then are you simply confiscating the hard-earned fruits of his industry, by adding the weight of this tax to the losses he is already encountering. The editor of this journal is personally interested in this enterprise, and has sunk a considerable fortune therein. Is it just in these circumstances to reduce him to the alternative of abandoning his property, or continuing to pay a heavy *fine*—for that is what it comes to—for the privilege of trying to win back what he has lost? We care not who Lord Napier's advisers may have been, the counsel they have given him is essentially *unjust*, and that ought to be enough to secure its rejection. The State cannot reduce the cultivator to the alternative of paying the tax, or abandoning the land in which his property has been sunk, without injustice and dishonor. Coffee has been so miserable a business for all engaged in it, that all taxation thereof should be suspended. It is the requirement of plain justice to suspend it, just as we exempt from the income tax the merchant who has made no gains. You might as reasonably make the merchant pay income tax upon the outgoings of his establishment in periods of loss and disaster, as compel the coffee planter to pay this land tax of 2 rupees per acre, when he is getting no return for the

capital he has sunk in the land. The tax becomes simply a tax upon capital, the very worst form of tax perhaps we can impose in a country where capital is so scarce as it is here. We are tempted to ask, will the world ever see wise, and unselfish, and enlightened rule set up therein! The Planters should go up to Lord Napier again, and press His Lardship to regard the equities of the case. The temporary embarrassment of the treasury must not be allowed to commit the State to what is manifestly unjust.

CINCHONA.

CINCHONA CULTIVATION IN JAVA.

The reports of both the Government and private plantations of Cinchona in Java for the second quarter of the present year are most favourable. The demand for both cuttings and seeds from the Government plantations have largely increased, showing that private plantations were being extended, and the Government is now beginnig to realise the benefits of its own exertions by the sale of the bark in Europe. The first experimental shipment of 400 kilos was sold in small parcels at the rate of three francs per kilo. In July 900 kilos were shipped; 1,000 kilos more are ready for shipment, and 2,000 kilos more are expectd to be collected and shipped before the end of the year. The Indian Government must now bestir itself to realise the profit of its plantations, which were commenced as soon as those in Java.—*Englishman.*

CINCHONA IN WYNAAD.

In June last the Conservator of Forests recommended to the Madras Government that the cultivation of the cinchona tree in the Wynaad should be extended, if it were considered that the area now under cultivation on the Neilgherries was insufficient He also intimated that a large plantatian of cinchona, in the neighbourhood of Manantoddy, would be a great benefit to the surrounding coffee districts, not only in the Wynaad, but in Coorg also, where fever is very prevalent. It seems that fine sites are available, both on bamboo and forest land. We are sorry to observe that the Government considers it undesirable to form any such plantations in the Wynaad. It only remains for the planters themselves, if they regard it as a useful and profitable speculation, to take up that which the Government, certainly not without reason, consider to be beyond the sphere of their operations. We should be very glad to hear that some of our Wynaad friends had determined to form such a plantation on a large scale. Cinchona cultivation must certainly be profitable.

Darjeeling News, 30th July 1870.

We have been favored with a copy of the report, to 30th June 1870, of the Poomong estate, the property of the Darjeeling Cinchona Association.

We glean the following figures and facts from the tabular statements. Area of estimate 6,000 acres, area planted out 542 acres. It must not be supposed that only 542 acres of land are under plant, but that there are 542 acres of trees. The land used up in getting 542 acres of trees would be about 800 acres; as rocks and slopy places abound on which it would not answer to plant out young trees. It appears that there were 661,350 young trees planted out and 229,347 in nurseries; the remainder were stock plants, and about 300,000 seedlings &c., making a grand total of 1,204,203.

The tallest measured tree was 19ft. one inch in height. In October next, there will be 114 acres ready for the knife, which, judging by last year's crop, will yield at the rate of 3½ maunds per acre, or about 400 maunds of red bark, which at Rs. 100 per maund will give Rs. 40,000. Every year the crops will go on doubling, while the expenses will be nearly stationary. We sincerely congratulate the two lucky owners of this fine property. If none but the brave deserve the fair, then none but the plucky and wise deserve success. If we could get rich without risk there would be no beggars left in the world. These somewhat trite phrases are forced out by the circumstances of this Association—in former times it has had many proprietors, but funds being abundant, or funds failing—only two remain to gather in the harvest. The gardon has had the same good Manager from its commencement, only the proprietary body has been changed and absorbed.

[*Company proposed at Darjeeling in* 1868.]

(PROSPECTUS.)

It is proposed to form a Company at Darjeeling, for the purpose of cultivating Cinchona on a large scale.

In the Neilgherries, where the experiment was first tried in India, the result, as is well known, has been very satisfactory; but it is not yet so generally known, that in British Sikhim, par excellence, has the natural home of the cinchona been found. The experience of some years has now however proved, that here the cinchonas are more easily propagated, are more hardy, and grow faster, and are richer in the alkaloids, as a comparison of the Official reports, published respectively at Ootacamund, and Darjeeling, places beyond all cavil.

The experience that has been acquired in Darjeeling goes to prove, that it is by conducting operations on a large scale, that cultivation can be most economically and most profitably carried on. It is in planting out the first two, or three hundred acres, that the chief expenditure is incurred—thereafter, with the assistance derived from such a nucleus, a very moderate amount of capital will suffice, in two or three years, to plant out a magnificent block of two or three thousand acres, yielding a revenue which it might seem absurdly sanguine to name, even after making the very fullest allowance for the tremendous fall expected hereafter, in the market value of the bark.

The Company, which it is now proposed to form, would start under several very marked advantages. It would be the *first in the field*, and, in this district, would have little to fear from competition. It may be reasonably expected, that, according to precedent, the Government would immediately desist from extending its cultivation; and it may be said that, *with one exception*, there are no private gardens; some 3, or 4, tea planters have laid out a few acres of plants on their estates, but as the best of their land is already occupied by tea, it is improbable that they will be able to add much to this cultivation. The best security for the proposed company, against rivalry of any formidable character, is to be found in the fact, that *no other Company* could here be brought into a position to pay a dividend in less than 4 years. Except by the premature sacrifice of the trees, no return of bark can be obtained in the third year, beyond the cuttings made in thinning the plantation; and from this source the profits would be but small; further, *no other Company* could here be started, in a position to plant out more than a few acres *the first year*, therefore, its dividend even in the *fifth year* could be at best but trifling.

To intending subscribers, and all *bona fide* enquirers, the fullest information will be given, and calculations laid open, to enable them to form their own judgment of the real character of this scheme. In this circular it is sufficient to state, that the capital of the Company will be Rs. 3,50,000 in one hundred rupees shares, of which 2,500 are now offered for subscription. A provisional agreement has been made for the purchase of Poomong (the garden above referred to) for Rs. 2,50,000, of which the vendors will accept one lakh in paid up shares. It is calculated that the working capital remaining (one lakh) will amply suffice to meet *all expenditure up* to December 1871, commencing from the 1st January 1869, when Poomong will be delivered over thoroughly cleaned. Delivery will soon after this be obtained of 550 acres, of excellent land, within easy distance of Poomong, and in the course of the year it is believed, that a considerable portion of it may be planted out; but on this point it is impossible to say more, than that it appears perfectly feasible to complete the whole by the end of September 1871 at latest.* On Poomong there are already 263 acres planted out—excluding all rock, and portions in any way unsuitable, and from the stock of cuttings, and seedlings, on hand, the cultivation can be made up to 350 acres, at the commencement of the next planting season,—nearly the whole being Succirubra. The entire resources of Poomong, with large quantities of stock, plants, glass, &c., will thereupon become available for planting out the 2,000 acres of new land.

Poomong will thus in fact become a vast nursery for filling up, by the least expensive mode, and in the shortest time, the remaining block, but its own productiveness will in no way be effected thereby. The calculation can be shown, to be based on the most moderate estimate of the returns of bark, avoiding premature sacrifices of the trees. In October 1869 only so much bark will be cut, as will accrue from the necessary thinning of the trees. The value is set down about Rs. 5,000 which would be placed to reserve. In October 1870, the cuttings would still be sparingly made, but would be to the value of more than Rs. 30,000 which, with the sum at reserve, would yield a dividend of 10 per cent. on the whole capital. In 1871, the bark still sparingly cut, would be of the value of Rs. 90,000, in 1872, of about Rs. 120,000, and in 1873, about Rs. 150,000, which last sum may be taken, as the permanent net revenue, which the 350 acres would therefore yield. In 1873, a portion of the new block would yield a return, and thereafter the yearly profits on the whole estate would be enormous.

The undersigned will be happy to give any further information that may be desired.

The shares will be allotted according to the priority of appli-

* This was a fallacy, only 542 acres planted by the end of the rains and another 108 acres may be done, and beyond this we shall not proceed I think. The land makes no loss as its rents derived from cultivations, pay. The No. of shares were never taken up, and all the proprietors of Poomong were gradually bought out by Mr. Lloyd and Col. Angus, in whose hands it is now. There has been a fair amount of progress since this was printed.

cation with remittance in full, or the receipt of any of the Calcutta Banks, stating that the money has been lodged to the credit of the Darjeeling Cinchona Company, Limited.

WILLIAM, LLOYD, Banker

Darjeeling, 20th October 1868.

COFFEE.

COFFEE IN PORTO RICO.

Coffee in Porto Rico is thus reported on by the British Consul:—"The crop of coffee fell short of those of 1867 and 1868, but these were very exceptionally good years, and a continuance could not have been expected; the future promises well, persons ignorant of coffee planting and without capital had possessed themselves of some of the estates, and by their reckless proceedings greatly injured them and themselves, but these men have now been brought out, and it is to be hoped that the crops will improve.

A mercantile gentleman favours us with the prices of native coffee in London from 1850 to 1859, taken from his note-book:—

	s. d.	s. d.
1850	51-6	to 58
1851... .	37-6	to 46
1852 ...	38	to 48
1853 . . .	15 6	to 48
1854 .	42	to 50
1855... .	44-6	to 52
1856	53	
1857	53	to 66 6
1858	40	to 56
1859 . .	40	to 63-6

Can any other gentleman now add those from 1860 onwards so as to complete our list?—*Ceylon Paper.*

As our commercial year draws near its close, it becomes evident that although the quantity of plantation coffee shipped will be far in excess of the export of this kind in any previous year, yet in consequence of a falling-off of nearly fifty per cent. in native, the round million of cwts. for both kinds will not be exceeded to any material extent. The exports of plantation to 25th August were cwts. 854,608, more than 100,000 over the quantity to the corresponding period last season. Native only reached cwts. 125,600 against 216,672. The aggregate total is cwts. 969,615, an increase of somewhat over cwts. 20,000. In the five weeks to 30th September we may fairly expect the figures to be increased as follows:—

Plantation	cwts	875,000
Native		130,000
Total .	... ,,	1,005,000

Almost exactly the same as last season, with the difference of so much larger a proportion of plantation. So with cinnamon, the figures will not be much under those for last season, only that the proportion of better kinds is larger by lbs. 129,000. In cocoanut oil there will be a large increase; in coir a moderate decrease, and a decrease of cwts. 80,000 in plumbago.—*Ceylon Observer.*

The latest news from Brazil:—"Santos advices bring news of immense damage done to the young coffee trees and to the unripe berries by the severe frosts which have lately prevailed. Many planters are said to have been completely ruined, one of them, as an instance, having had as many as 150,000 trees killed, and the loss is variously estimated up to as much as Rs. 3,000,000." [About £300,000.—Ed. *C. O.*] Our producers, too, are now unburdened even by the 2½ per cent. [rather 2 per cent.] duty which was imposed for railway purposes. What would our friends say to the duty being raised to *thirteen per cent.* just as a great calamity had overtaken them? But that is what has been done in Santos. On 1st July the export duty on coffee from Santos was raised to 13 per cent.—that is more than one-eighth of the whole value of the product!

The latest market reports from Rio and Santos, more than confirm what we recently stated as to the great falling-off in shipments of coffee from Brazil. We quote as follows:—

"RIO DE JANEIRO, JUNE 25.

Coffee: The supply from the interior having continued upon a very limited scale, our dealers have been unable to maintain their prices, notwithstanding that the demand has been moderate, as well as for Europe, as for the United States. The receipts are estimated to have averaged only 3,300 bags per day for the past fortnight, nor can we expect any great increase in our supply for some weeks, as the planters are obliged to devote their attention almost exclusively to the picking and saving of the new crop, while our short winter days, with their mists, give but few hours of sun to the dryeries in the deep valleys where they are mostly located. We beg to call attention to the fact that with the first six months of the year near its close, the total shipment of coffee from this port to the United States and Europe barely reaches 750,000 bags, while their wants are estimated for the same period at fully 1,200,000 bags. It will hence be seen that the whole shipment to Europe and the United States was barely sufficient to meet the consumption of the latter country. Sales for the month under review are 134,000 bags, say 79,000 bags for the United States, 35,600 for the Channel and North of Europe, 10,200 for the Mediterranean, 45,000 for the Cape of Good Hope, and 4,700 for other ports.—*Ceylon Observer.*

FRENCH LEGISLATION ON COFFEE, &c.

In the report published by M. Chesnelong, Deputy to the Corps Legislatif, upon the French general budget of 1871, there are many subjects referred to which are of great interest and importance to the continental grocers, and which may be of some interest to the trade upon this side of the Channel. First, alluding to the impost on coffee, M. Chesnelong speaks rather lugubriously. He is evidently of opinion that it was not a very advisable step to reduce the impost upon this article in 1860, and that the hopes indulged in, that a necessary result therefrom would be an increase of consumption, have not had a practical realisation. He also states, that the measure has been without influence upon the price of coffee, and that the treasury has experienced a loss without having had the gratification of seeing any profit to the consumer. Observations of this tendency are exhibited all through M. Chesnelong's report, and are written *a propos* of an amendment presented by M. Cochery, having for object the raising again of the duties upon coffee, cocoa, and tea. Although the consumption of coffee has, from 1860 to 1869, increased from thirty millions to fifty millions of kilogrammes, [from lbs. 72,000,000 to lbs. 120,000,000; Ed. *C. O.*] M. Chesnelong is of opinion that this progression ought to have equally taken place with the old duty, and the treasury would have been enabled to have received twenty-five millions more of the duty of 1fr. 14c per kilogramme instead of 50c. [this is at the rate of about ½d. per lb., which has been increased with reference to the war to 1½d. Ed. *C. O.*] had been maintained.

It is hardly satisfactory to see this tendency on the part of the Corps Legislatif relatively to fiscal and economic reforms, the accomplishment of which is so necessary. Not only is it perceptible with regard to coffee, it is the same with sugar. M. Ancel, however, has argued on a different basis. He says, to lower the duty on coffee, with the view of increasing its consumption, would also give the consumption of sugar a new stimulus, inasmuch as the use of a kilogramme of coffee necessitates the use of from three to four kilogrammes of sugar. He further predicts, that these two reforms are destined to mutually advance each other. It is well known, he says, that coffee possesses hygienic and nutritive properties, which make it highly desirable that the labouring classes should use it, as much as possible, as a substitute for strong liquors For this, as well as for numerous other circumstances, it is greatly to be wished that a measure like this should become law, which would almost of necessity render the usage of the commodity much less costly and far more general. This, however, does not appear to suit M. Chesnelong, and now he says the ancient duty should not subsist, and the treasury would be the richer by twenty-five millions of francs!

The amendment proposed by M. Cochery, and before referred to, is to the effect that from the 1st January 1871, the impost upon coffee into France should be at the rate of seventy centimes per kilogramme; cocoa at the rate of forty centimes per kilogramme; tea at the rate of one franc per kilogramme; and the excess of the receipts thus produced to be applied to the reduction of the impost upon drinks. According to the report, this amendment raises three questions; is it desirable, as proposed, to increase the duties upon coffee, cocoa, and tea? Supposing the affirmative, what would be the new tariff? And what is the impost which ought to profit by a reduction consequent upon the augmentation of resources which would be produced in the budget by the contemplated measure? These questions, M. Chesnelong states, have been of too great an importance to admit of a precipitate decision. They have not, therefore, been able to accept the amendment, but have called to it particularly the attention of the Government. The report states, however, as an illustration, that upon coffee the duty up to 1859 was 1f. 14c. per kilogramme; from 1860 it has been reduced to fifty centimes. In 1859 this duty returned to the treasury about thirty-one millions for an importation of thirty millions of kilogrammes; in 1869 the production of the duty was only twenty-six millions, and the quantities entered were increased to fifty millions of kilogrammes. It was proposed to attain, by the reduction of the duty, two excellent objects; on the one hand, to favour, by a cheap market, an increased consumption; and on the other hand, to recover for the treasury any loss that had been sustained by such reduction through this development

M. Chesnelong, speaking from his point of view, argues that these hopes have failed; but with reference to the public good, can it then be truly said, and satisfactorily proved, that the result is a failure? We think not, having a decided opinion that all omissions of taxation, which directly and necessarily influence the immediate welfare of the great mass of the people, and which are practically felt by the public in the consumption of such essential articles as coffee, tea, cocoa, and sugar, cannot possibly be a failure, but are emphatically a benefit. In respect to the article of sugar, of the great continental importance of which nothing need here be said, we never admired the action of French legislation.—*Grocer, July* 23.

COFFEE IN CEYLON.

DIMBOOLA: THE AGRA PATENAS.

From the Editor of the "Observer."

Dimboola, 6th August, 1870.

The Agra lots will be 50 miles from Peradenia by road, 20 of which lot us hope will be soon superseded by a railway. Five miles extra distance on a road means about 4½ or 5d. additional per cwt. on the carriage of coffee, but what is this to the additional cost where no cart roads exist? "The grub" (larva of a moth, I believe,) is a great enemy to planting operations in Dimboola, as much as 50 per cent. of the young plants being sometimes destroyed soon after being put into the holes. For a small space round the stem, just under-ground, the bark is eaten off and the plant withers and dies. To meet such contingencies some planters put two plants in each hole. Plants are rarely attacked after they are one year old, and very curiously, plants in a nursery are never attacked. I suppose the philosophy of it is that the moth lays her eggs in the soft rich soil of the holes in preference. My experienced guide tells me that the lots adjoining the Patena are sure to be specially haunted by grubs. This must be taken into account as well as the absence of streams in many of the lots. And this reminds me of a curious peculiarity in such small streams as do run down into the Patenas. "Where on earth is the water?" was the question I asked, and the reply was that it was under the earth. "Do you not hear it?" and as we listened there was a sound of gurgling from 3 to 5 feet under the carpet of vegetation, live and dead, on which we stood and which was elastic to our tread.

Here as elsewhere in Dimboola patches of low swampy land occur between the knolls. The soil will have to be well drained where wet, and well manured where dry. Nothing can be finer than the young estates in this region, and with facilities for manuring (each ton of manure up meaning two tons of coffee down,) I see no reason why an average yield of 10 cwts. an acre should not ultimately be sustained in Dimboola. Of course the distance will tell against Agra lots, and there is no question that their great attractions are the lovely scenery and the fine climate. Land adjoining them has done well, and so the hope will be that these lots, though by no means superior or equal to land behind them and under the Elbedde rock, will also be fairly well as coffee yielders. As sites for beautiful and healthy homes they cannot be surpassed. After a generation spent in Ceylon I am, for the first time, in a position to buy a lot, if I am allowed to get one at, or at a moderate advance on the upset prices. But for the four good lots there will, I suspect, be severe competition. Planters in the neighbourhood are determined to have one or two lots, and I heard a moneyed man from Colombo declare that he would give £5 an acre for the best lot. This best lot, beyond all question, is 5,126 on the plan. [I am giving all the information within my reach as fully as if I had no interest in the matter.] It has a good "lay of land," good eastern aspect (towards the Patenas and Newera Ella,) and has a nice piece of Patena running into it. No. 5,127 has some fine hollows in it and adjoins Tillicoultry, to which the road is to be extended! No. 5,125 has a fine "lay of land" and fine aspect, most of it. Some of it is rather high. No. 5,124, forest rather straggling with the Elbedde Patena running through it and soil rather gravelly, but if gentlemen with large means are determined to have the three first-named lots and will not give me a chance for any of them, I shall be contented with this one. The remaining three lots must be left to eccentric speculators. No. 5,130 is entirely patena, very lovely with the eclat of the Prince's hut, would be useful for cottages and cattle grazing. Nos. 5,128 and 5,129 are entirely or almost destitute of water, they are high and have not the right aspect. So much for the Agra Patena lots. We may add, in confidence, that adjoining them six lots have been surveyed and will doubtless soon be advertised. They range from 163 to 278 acres and aggregate 1,600 acres. We repeat, therefore, that those who do not succeed in obtaining an Agra Patena lot need not despair. There is more land yet to be had in the neighbourhood.

The rate per acre was so high in the case of the purchase of Lethenty Estate, Dimboola, announced by us on Thursday, that we were staggered even while announcing the intelligence as it reached us. We took the acreage from the advertisement in our columns; but the matter has now been explained to us by Mr. Skene by the fact that he advertised only half his estate for sale intending to retain the other portion himself; but Mr. C. J. Scott's offer of £4,500 for the whole induced him to change his mind. The correct extent is therefore as follows:—53 acres of coffee one year old; 156 planted this year and 79 acres jungle—total 288 acres. It is still a handsome price, averaging £30 an acre for the coffee one year old, full £16 per acre for the 156 acres planted this year, and say £4 per acre for the remainder.—We hear of a fine property in Oodapusilawa being also likely to change hands at a sum which indicates anything but want of faith in coffee.

THE AGRA PATENA LOTS.

That there should have been such keen competition at yesterday's land sale at Kandy and such high prices realized in the face of the disturbing influences of war, is a strong proof of the confidence which planters, who ought to be the best judges, feel in the future of coffee in Ceylon. No doubt the great success of the estates already opened in Dimboola did much to promote confidence and competition. In our extra issue to town subscribers yesterday an error occurred which converted the aggregate sum for the seven lots into £5,135 instead of £4,135, which latter was the correct figure and the figure given to the telegraph office at Kandy. The detailed results of the sale, which was largely attended by planters and others, may be interesting to our readers:—

Lots.	Description.	Acreage.	Amount.	Per acre.			Purchasers.
5124	Nearly all forest	264	£900	£3	8	2	G. H. D. Elphinstone.
5125	Do	227	810	3	11	4	R. B. Lawrance
5126	One third patena	235	830	3	16	4	J. F. Paterson.
5127	Nearly all forest	217	710	3	5	5	Do
5128	One third patena:—high	183	360	1	18	3	H. S. Saunders.
5129	More than two thirds patena	193	235	1	9	6	A. Stevenson.
5130	Entirely patena with Duke's hut	189	190	1	0	1	G. H. D. Elphinstone. and R. B. Lawrance.
	Total	1,516	4,135	£2	14	6	

It will be seen that the average for the whole was £2 14s. 6d. per acre, but the two comparatively inferior lots and that composed wholly of patena reduced the average. The average for the four superior lots was no less than £3 9s. 9d.

COFFEE IN THE LONDON MARKET IN 1848.

A planting correspondent furnishes us with the following annual report issued by a large dealer in Coffee in London in 1848. The review and the anticipations are curious, as shewing the great change which has come over the trade, but the figures before us quite bear out the statement of the London broker who had sold Ceylon Native Coffee at 108*s.* and 28*s.* per cwt. during his career. Can any of our mercantile friends conveniently furnish us with the quotations necessary to bring the price-list embodied in the following circular down, to the present day:—

Copy of Circular issued by Moore & Co, of 34 Lime Street, London:

6th November, 1848.

Gentlemen,—The imports of Coffee for the year 1848 being brought to a close, we beg as usual to present you with a brief statement of the position of the market, and of our opinion as to its probable tendency for the coming year.

Ceylon has again been the principal, almost the only source of supply for Home consumption. Berbice and Demerara, formerly the chief places of export to this country, send now little

or nothing; the quantity from Jamaica, which was more recently the place from whence we were supplied, has dwindled down to one-sixth part of what it was twenty years since; while the imports from our other West India Islands, Dominica, Trinidad, &c., have ceased altogether. All deficiencies, however, have been more than made up by the great increase of growth in Ceylon, since the produce of that island has been admitted at the low rate of duty. The growth of Ceylon in 1830 was about 22,000 bags; in 1847 180,312 bags.

Our consumption has gradually been increasing for many years, and yet prices have been continually receding: the following list for the last ten years shews such a continued and rapid decline as perhaps, for so long a time, and to such an extent, no other article has ever experienced. The price of good ordinary or native Ceylon, which, in a great measure, determines the value of other descriptions was—

		S.	
On the 1st November	1839	101	per cwt. in Bond.
Same time in	1840	80	,,
,,	1841	67	,,
,,	1842	62	,,
,,	1843	60	,,
,,	1844	51	,,
,,	1845	45	,,
,,	1846	39	,,
,,	1847	33	,,
,,	1848	27-6	,,

The consumption during the period increasing from 26,832,268 lbs. in 1839 to quite 40,000,000 lbs. in 1848.

It requires no gift of prophecy to say there must be an end of this at some time, and that the extreme prices of 1848 are as unlikely to last as were the opposite extremes of 1839. As might have been expected, exorbitant rates caused in Ceylon, (when land was abundant and cheap) an enormous increase of growth, the ruin of very many of the parties engaged, as the recent accounts from that island too well testify.

For the first time since 1829, the exporters buy all descriptions of coffee in common with the Home Trade, and the price of coffee generally in the English market is now the world's price, and not a price caused by protection. This puts us on a firm footing; how long large import and heavy stocks may keep prices down to the present low ebb, time alone will show; but this much is certain, any decided fluctuation must be towards higher prices. Various causes have combined to produce present rates, and all seem to have completed their effect; such being our opinion we are buying very heavily; and the market being absolutely glutted by the heavy arrivals from Ceylon, we select parcels which we know to be the right sort, and which we hope to be allowed to prove to you. The present stock of Ceylon in this country is—

In London	142,192 bags.
All other Ports	2,700 ,,

Our last Circular, October 1847, contained the following:—"We ground our pretensions on a constant and *sole* attention to, and thorough knowledge of the article, proper means to buy at all time for *cash*, and an anxious desire to inspire confidence by proving that our friend's interest is never tampered with."

Our friends have decided as to whether we spoke correctly, and the result is a very extensive and widely extending trade, which of all things is the best stimulus to exertion.—*Ceylon Observer.*

BRAZIL: THE WAR AND THE COFFEE ENTERPRISE.

It seems difficult to obtain reliable information regarding the great South American empire in which we in Ceylon feel so deep an interest, as beyond all compare the chief source of coffee production. Recent accounts were of a glowing character. War had ceased and a career of prosperity was opening up for Brazil and for immigrants to its shores. That is the "flattering tale" which "hope" seems to have told. Having listened to the poetical accents of hope, let us now give heed to the more prosaic utterances of Hunt. This gentleman has been for many years British Consul at Rio de Janeiro, and the following is the substance of his latest published reports. We quote from the *European Mail*:—

"The reason why Brazil, with all its magnificent resources is so imperfectly developed, is partially explained in a report just published, of Mr. Hunt, the British Consul at Rio de Janeiro. Brazil is a purely agricultural country of wonderful fertility, but the Consul discourages the idea of European immigration into it. Quoting Mr. Buckle, the historian of civilization, he says, 'that the forces of nature are so formidable, that man cannot make head against them or rally against their accumulated pressure. The progress of agriculture is stopped by impassable forests, and the harvests are destroyed by innumerable insects. The mountains are too high to scale—the rivers too wide to bridge.' The land is principally in the hands of large holders, who cultivate but a small portion of it. The export and import duties are excessively high. A planter with an unembarrassed estate is as rare as a merchant who has acquired money in trade. Since the date of the final suppression of the slave trade in 1851, the labour has diminished at the rate of 7,000 negroes a year. None of the settlements of European immigrants have proved successful, with the exception of one or two German colonies established in Ria Grande. In opposition to the glowing terms in which Brazil has been recommended as a field for immigrants, the Consul says that a subscription is now in course of collection from the British residents, to enable a considerable number of their fellow subjects to return to their own country. The North American citizen has not been more successful than the British subject in finding an opening for his industry in Brazil. There is no real security for human life, and, in consequence of the light punishment inflicted, assassination has come to be regarded as a venial offence. The Chinese are better fitted to prosper in Brazil—their patience makes them efficient, and their economy cheap labourers. Brazil will shortly find herself the only Christian slave-owning country in the world; but the liberation of her slaves to-lay would amount exactly to the destruction of her present agricultural system, with a very slender prospect of its early reconstruction on another basis. A liberated slave's notion of freedom is the privilege of total abstinence from anything like systematic labour, and the country is favourable for squatting purposes. Striking the average of different estimates, the number of slaves in Brazil is about two millions. The reduction in the number of slaves is seen in the decreased sugar crops. In 1862-63, the gross produce was 145,000 tons; in 1867-68, it had fallen to 124,000 tons. The debt of Brazil amounts to sixty millions sterling."

It will thus be seen that, whatever may be the disadvantages of Ceylon as a coffee-growing country, our island is certainly more favoured than her great rival in every possible respect except large expanses of superior soil. Here life and prosperity are secure and the existence of our chief agricultural enterprise is not dependent on the contingencies—involving a possible insurrection—of the wicked and rotten system of slave labour. Mr. Hunt notices the falling-off in the sugar crops as evidence of the decrease of the slave labour available. But then there has been in the years ending 1868-69, an enormous expansion of coffee production. The official figures for the trade of Brazil for 1867-68 and 1868-69 and for its great staple exports for the year 1863-64 to 1867-68 are published in the *Anglo-Brazilian Times* of June 4th. For convenience we take the reis at the average rate of 2s. and we find that the value of the import trade of the empire had risen from fourteen millions sterling in 1867-68 to £16,699,000 in 1868-69. The exports had also increased from £18,557,000 to £20,686,000. The united value of the import and export trade for 1868-69 it will be seen was £37,385,000. If the reis is taken at the usual average of 2s 3d. instead of 2s., of course the value must be raised in proportion. The population, of Brazil is about six millions against our two-and-a-half millions, a large proportion in Brazil being European in origin and habits. For the staple exports the values are given only to the end of 1867-68, the returns for 1868-69 being still incomplete for some of the Provinces. The production of cotton had risen from 1,350,465 arrobas (the arroba being somewhat over 32½lb.) in 1863-64 to 3,386,601 arrobas in 1867-68. This is an enormous increase in production, but the reduction in value is more than in proportion. While 2,899,004 arrobas were valued at 46,917,400 reis in 1865-66, the larger quantity of 3,386,601 in 1867-68 was valued at less than half: 22,970,765 reis against 46,917,400. Such a fall in value if the figures are correct, can scarcely fail to check the advance of cotton cultivation. The official figures for sugar scarcely bear out Mr. Hunt's conclusion. The crop for the first year of the period under review was 8,016,127 arrobas; it rose to 9,158,065 in 1865-66 and was as high as 8,719,023 in 1867-68. The average for the five years is 8,308,801 arrobas, 300,000 in excess of the figure for the first year of the period. If, therefore, these figures are correct, Mr. Hunt must be wrong. There may have been a great falling off in 1868-69, but he writes of a gradual decrease. But whether sugar is stationary or declining the increase in coffee has been truly enormous. In the five years the crops almost doubled! In six years the exports of coffee from Brazil may really be taken as having doubled, the figures, reduced to cwt. and £ being as follows. [The figures for 1868-69 are not official, but we believe they are fairly correct.]

1863-64	Cwts.	2,362,444	£ 5,413,088
1864-65		3,119,868	,, 6,414,455
1865-66		2,869,743	,, 6,115,605
1866-67		3,766 074	,, 6,978,255
1867-68	,,	4,199,513	,, 8,363,315
1868-69	,,	4,360,513	,, 9,000,000

Brazil having thus produced 4½ millions of cwt. of coffee in 1868-69, the question is as to the probabilities in favour or against a continuance of this rate: an increase or a diminution. Looking at the figures before us, we have reason, judging by analogy, to expect a large falling off. Indeed the actual figures are conclusive. In the first five months of 1870 the exports of Rio had been only 949,000 cwt. against 1,461,000 corresponding period of 1869. This is a falling off of no less than 512,000 cwt., and if the same rate of decrease continues, the total export from Rio in 1870 (calendar year,) will be only 2,283,000 cwts. as against 3,206,000 in 1869, a decrease not far short of 1 million cwts., or equal to almost the entire crop from Ceylon. In-

creased exports from Santos could scarcely affect this deficiency. The exports from Rio for 1869-70 (June 1869 to May 1870) were :

Cwts.	2,745,000
Add for Santos &c, .	700,000
Total for 1869 70, cwts.	3,445,000

We should not be surprised to see the figures sink to 3 millions in 1870-71, a quantity of which the United States will alone absorb the greater portion. Of 195,000 sacks exported from Rio in May this year, no less than 127,000 went direct to the United States. Our reasons for expecting a further reaction will be found in a comparison of the following figures. From less than 3 millions of cwts. in 1859-60 the exports of coffee from Brazil rose suddenly in 1860-61 to 4,218,000 ; but sunk in 1861-62 to 2,852,000, in 1862-63 to 2,527,000 ; and in 1863-64 to 2,362,000. Then came the rise culminating in 1868-69 in 4,360,000. From this there has been a fall in 1869-70 to 3,445,000 (or less according to what the actual figures may be for Santos). Looking at the figures above quoted for the years 1860-61 to 1863-64, we submit that it is reasonable to expect a further considerable decrease now.

DOOMBERA, *June*, 21*st* 1870.

We had a magnificent blossom out on the 8th of April which literally covered our fields "like a mantle snow," another small one towards the end of the month, and to crown all, another good blossom on the 14th of this month ; this latter was our usual May blossom, kept on the trees, though dry weather in both February and March we had blossom, making in all five good blossoms, the best part of them set, and the fruit is now swelling out under the genial influence of the June rains. Granted favourable weather, we shall pick the heaviest crop the district has seen for years ; even now, late as it is, it is premature to put a figure on the crop. We must wait a while and see the effects of the rains. After such a severe season of drought, what comes on, and what falls off, after the manner of Doombera, when the berry is a little larger (some of it is very little bigger than good sized pins heads !) we shall be in a better position to judge of our prospects.

Manuring is being extensively carried out. Cattle manure we go in for largely, as we are specially favored! for both the number of stock we can keep on our beautiful pasture lands, and the facilities we have of carting such a bulky article to almost any part of our estates, it is consequently a very cheap manure with us —Sombreorom, Australian special, (composed of bones principally,) bones, and composts made in Colombo, are the principal artificial manures used ; poonac we dare not use, owing to the number of wild pigs, which nightly roam through the plantations. This work is now nearly completed, the rains having set in, handling has commenced, and as it is necessary to get over it in the shortest possible time, all hands are put to it. The next season afterwards, causes the trees to throw out a superabundance of young wood ; this work is therefore done again in August and completed just before the September picking. This latter handling requires good supervision, (as a matter of course both do,) as on the judicious taking off, and leaving on, the young wood, next season's crop mainly depends. Estates during the late spell of dry weather, were, as regards weeding, as clean as it is possible to get them in Doombera. The rains will now puzzle both managers and contractors to keep them in anything like decent appearance. This is a state of affairs we are not very particular about. The rains make both coffee and weeds to grow, and as we cannot exist without moisture, for the benefit of the former we do not much without detriment to either.

Coolies, generally speaking, very healthy. I lost by death a new man from the cost a few days ago. The kangany said it was cholera. I ascribe it to the man having a huge feast of green jack. He was taken off *very suddenly*. Two other men were similarly attacked, but got over it. Last year I lost a man from the same effects, and it was well-known to the coolies, he killed himself by a surfeit of jack. Coolies are very much tempted by the superabundance of this fruit, to eat it indiscriminately, both fruit and stones, and very often so unripe as to be unfit for food. What wonder if they suffer from their foolishness, and it is impossible to check them. The old hands warn them against it, and the manager forbids them to pluck the unripe fruit, but steal they will, and if they escape death, the subsequent bowel attack at last impresses on their memory the old adage—experience teaches fools. We are now having nice gentle showers, not the heavy rain I see falling all around on the hills. The trees are picking up and are already assuming the dark green luxuriant appearance peculiar to high cultivated coffee, and as this takes place, so our hopes rise, and we begin to think we have at last turned the corner of that problematical lane, and that bumper crops are to be the exception, as formerly they were the rule in Doombera.—*Ceylon Observer*

PLANTING IN WYNAAD.

The memorandum which we print below so entirely speaks for itself, we need do no more than commend it to the attention of captitalists. Here is an example of a judicious, laborious and well-qualified person, who has laid out forty-five thousand rupees, and has realized eighteen per cent. per annum on his money. It is evident that guided by his experience, it would be perfectly possible for others to improve considerably on this. We are greatly obliged to the friend who has favored us with this memorandum ; since facts, stated in this way, speak more forcibly than words.

PARTICULARS OF A COFFEE ESTATE, SITUATED IN SOUTH-EAST WYNAAD.

Sixty acres under cultivation ; with pucka buildings, machinery, and about thirty head of cattle. This Estate was first commenced in the year 1862, by the Proprietor, who has had a long experience in Coffee.

Planted in 1862	10 acres.
,, in 1863	20 ,,
,, in 1865	20 ,,
,, in 1868	10 ,,
Total	60 acres.

The yield from this estate has been as follows :

In 1864-65	2 tons	from the 10 acres.	
In 1865-66	8 ,,	,,	30 ,,
In 1866-67	12 ,,	,,	30 ,,
In 1867-68	18 ,,	,,	50 ,,
In 1868 69	20 ,,	,,	50 ,,
In 1869 70	20 ,,	,,	50 ,,
In 1870-71 (*estimated at*)	30 ,,	,,	60 ,,
	110 tons		

At Rs. 500, will be Rs. 55,000. This estate has cost the proprietor about Rs. 45,000, for these eight years. It is now valued at about Rs. 35,000, at the lowest. If a person going into coffee purchases a property like the above for Rs. 35,000, he will, after deducting the expense for the year, (say about Rs. 8,000 for working the estate highly, and picking a crop of thirty tons) get a profit of about Rs. 7,000, valuing the coffee at Rs. 25 per cwt. down at the coast. This will give the purchaser about 18 per cent. per annum interest for the Rs. 35,000 laid out by him. This estate has about 300 acres of land altogether, of which only 60 is cultivated, as mentioned before.

A plantation of the same extent, &c., &c., as the above would pay better and sooner, if the whole sixty acres had been opened out at one time In that case sixty acres would yield, viz,

Virgin crop as the	3rd year		7 tons
2nd ,,	4th ,,		15 ,,
3rd ,,	5th ,,		20 ,,
4th ,,	6th ,,		20 ,,
5th ,,	7th ,,		25 ,,
6th ,,	8th ,,		25 ,,
7th ,,	9th ,,		30 ,,

which would be Rs. 71,000, valuing at Rs. 25 per *cwt.* Coast price. A coffee estate can be managed in a more economical way, that is, by not erecting pucka buildings until the 3rd year. The land selected for coffee, should always have a good aspect, and be situated under a mountain, with an even lay, facing the north-west, and well sheltered from the south-west. The soil should be well examined, and also the locality where the ground lies, and the kind of jungle, &c., &c. The proprietor of the estate mentioned, has been for upwards of 23 years in Wynaad, and his estates have always paid him —*South of India Observer.*

The Ceylon Planters are going ahead. The *Ceylon Observer* of the 12th instant says.—"So pressing is the exigency in Ouvah that the Happootella Planters are about to meet for the purpose of subscribing to lay down a trial section of the form of wooden railway, described in a letter from Hungary which we recently extracted from the *London Times*. It is proposed to lay down a trial section of at least one mile in length, on a spot (to be decided on at the meeting) contiguous to some estate, so that in the event of its succeeding the subscribers to the experiment may be reimbursed the amount of their subscription, by the sale of the line to the said Estate. The projectors state in their Circular that

"The experience of the past season with reference to the difficulty in procuring transport for the coffee crop has given rise to serious consideration as to the future. This fact applies not only to this district, but to others more favorably situated, and to some even within a few miles of the Kandy Railway Station.—The importance of the subject is proved by the fact of the number of schemes which have been projected to mitigate in some manner the present state of things ; none of which however have has yet come to anything, and this fact has not only deterred cartmen from continuing in the trade, but it has made the few who remain more independent as they see the various schemes to supplant them fail. Among the various means of transport proposed are Traction Engines, Horse Waggons, &c., and foremost of all the Wire Tramway ;

but as it is now proposed to take this Wire Way through the Hackgalla Gap and Dimbulla; it is self-evident that this district would be entirely debarred from any benefit to be derived therefrom, as in the first instance, a road from the top of the Pass to Wilson's Bungalow would be required, and in the second the Dimbulla Estates would take precedence of us. However this may be settled, it is doubtful whether the new Wire Way will be carried out, but should it be, it is equally uncertain as to the length of time it will take to mature and complete it; as one of the London Committee writes on 17th June, 'The Tramway is still in abeyance; we have had trials at Brighton but not conclusive ones.' At this stage of affairs a new discovery has been made in Hungary of a cheap and easily constructed Railway; which is considered to be easy of application to the ordinary cart roads of Ceylon, and the cost of construction so cheap that it would amount to less than that of metalling a roadway for ordinary cart traffic; in addition to which the yearly upkeep would be a mere trifle.' We do not know that the Wynaad Planters are in want of a wire-way or a tram-way, but the pluck evinced by their insular contemporaries will perhaps induce them to put more of their own shoulder to the wheel in obtaining an easy and ready mode of transit for their crops to the ports of shipment."

Another "spirit of enterprize" on the part of Ceylon Planters is exhibited in the following extract, to which we would call attention:

"Imported Manures—In the single month of August the value of bone manure entered at Colombo was £4,781, other manures, classed as guano, £403, and poonac £1,788, total £6,973, almost £7,000. We suppose a good deal of the poonac is used to feed cattle, but even so it is perhaps correctly classed. In any case the trade in fertilizing substances is rapidly expanding and will become still greater as the railway is extended so as to enable the planters of Dimboola and Dickoya to do full justice to their coffee culture." How much do Wynaad planters spend upon manures for fertilizing their estates per annum? Does it amount to the monthly outlay in Ceylon? If more, what is the annual expenditure? Manuring, from all we have heard, is not popular in Wynaad. Would Ceylon Planters go to the monthly expense of £7,000 if no benefit was derivable from it?—*Neilgherry Excelsior.*

TEA.

LAND AT DARJEELING.

Of late the revenue authorities have been throwing obstacles in the way of people wishing to hold land on freehold tenure in this district. In the *Terai*, this obstruction has existed all along, and there is at present no such thing as *lakhiraj* or freehold, in the low lands.

In the *Terai*, the later settlements have been on 30 year leases; the first 5 years being rent free and the remaining 25 years at 6 annas per acre annual rent. Nothing could be fairer, and no one grumbles at these *terai* 30 year leases.

In the hill territory of the district, all the leases of waste land made during the past four years, have been for 30 years; the first 5 being at an annual rent of 3 annas per acre, and the remainder of the term of 6 annas per acre, the same as for the rich flat land of the *terai*. This is too high a rate for the poor soil of the hills, and can never be paid by the ordinary cultivator.

Some of the land is also held on ten year leases at 8 annas per acre. The leaseholders under this tenure have the privilege of commuting their holdings into freehold by paying 10 rupees per acre.

There have been a good many blocks of so-called hill waste lands, bought at auction at an upset price at 2½ rupees per acre. In former days it was thought fair to compete at these auctions, and after a good deal of spirited bidding, large blocks have been knocked down at as high a figure as rupees 45 per acre. Those days are gone now, and of late it has not been considered fair to bid against a man, who had applied for a bit of land, and he has invariably got it at the upset price of 2½ rupees per acre, which, with various charges for survey, boundary marks, registry fees, stamps and advertisements would bring the cost of the land up to about 3 rupees per acre.

Now, however, the available lands are all appropriated under some holding or other, and the value ought to rise, if it ever will.

The 30 year leases have in many instances been obtained by men of straw who rack-rent for 3 or 4 years and then throw the lands back on the Government; what should the revenue authorities do with these lapsed leaseholds? The ordinary procedure is to sell for the arrears, and if no one buys the lease, it becomes *khas*, that is to say, it is farmed by the collector himself.

Darjeeling is likely to overtake Assam and Cachar as a tea producing district. The tea of this district, in its fineness and delicacy of flavour, beats the other districts out of the field. As regards strength, it must as a rule lose the palm: though our *terai* teas are said to be quite as strong as those of Assam.

This small district will yield next year a crop of 240,000 lbs. equal in value to a quarter of a million sterling.

The annual increase may be safely put down at 6,000 maunds per annum. The gross weight, including boxes, lead and nails or hoop iron binding, amounts to about one-third more. So when the railway reaches the foot of the hills from Kooshtea, the tea planters can give it a gross weight of nearly 60,000 maunds of tea to take down to Calcutta.

Twenty years hence, most of the valleys in this district will have become tea gardens. But at present it is fair to count that for every two maunds of tea produced, a coolie receives 60 rupees per annum in wages. The wages would amount to 9 lakhs of rupees, half of which would be spent on imported food and clothes. The remaining population of the district must spend an equal amount Directly a railway approaches completion, the greater portion of the European troops in Bengal will be massed in our hills, and a large town would spring up immediately in the neighbourhood of the cantonment. The *terai* would then very soon become a second Dehra Dhoon. —*Darjeeling News.*

ASSAM.

A friend writing from Luckimpore, remarks:—

"Last month was a bad one for tea—all rain and no sun, but August I am happy to say, gives promise of more favorable weather. I hope soon to read a reply to the query I propounded the other day in your paper about cutting and sifting the leaf in process of manufacture. This and a great many other questions might be discussed by ourselves and the Cacharians with profit to both. There is much to be learnt about tea in the manufacture of it; indeed, contrasted with what we hope to attain in quantity, &c., we have scarcely got beyond the preliminary stages. If we don't boil and eat the leaves as our ancestors did before they discovered how to brew, I have every reason to suppose that science will enlighten us greatly as to manufacture and use by and bye. Producer and consumer have both their tasks to get up, before any one can dare limit enquiry on the score of our having as much information as we want; for, in tea as well as in the manufacture of any other produce, that man is generally successful who is never too old or too proud to live and learn.—*Dacca News, Aug.* 1870

CACHAR.

A friend writing from Cachar says:—"Cachar is, I fear, not about to make a fortune out of its gardens, and in this direction I am sorry to learn that Assam is scarcely in a more favourable position, financially considered. Fourteen gardens for sale on account of arrears, so says rumour, is not a lively state of affairs to contemplate. Success up here is, strangely as the statement may read, exceptional. If we take into account the length of time which must elapse before capital invested in tea cultivation can return anything like a respectable dividend, the problem will prove itself. Let us take for instance the case of, say a man at present in comparatively needy circumstances, who, when tea was to pay 20 *per cent.*—I speak of 7 or 8 years ago—put in half the hard savings of a life into some company with an alluring prospectus; what has he received back as an equivalent? A report from year to year, garnished with needless repetitions and reiterated hopes of a revival of a good time that has passed, never, I fear, to return! The beginning of this season promised marvellous results at its close—gigantic efforts have unceasingly been made to push prices upwards, but to what avail? Little or nothing has been achieved to encourage the hopes of planters, and the reason of this is obvious. Every improvement has to be initiated by large outlays for the purchase of implements and the increase of labour; and this at a time when Calcutta sales have averaged less than one rupee per pound, and nothing short of sixteen annas can possibly compensate those shareholders who have for years past received no more substantial return for their invested capital than a nominal dividend—on paper. You will naturally ask the cause; for this I must refer you to an enquiry into the working expenditure of our gardens If correctly informed, you will hear the same story repeated everywhere—small improvement in manufacture at large cost.—*Id*

TO THE SHAREHOLDERS OF THE DEHRA DHOON TEA COMPANY, LIMITED.

Gentlemen,—Most of us, if not all, have, I imagine, received the report of the directors submitted at the 13th ordinary general meeting of shareholders held at the Company's office on the 26th February last. That report is satisfactory in *some* respects, but as a whole, plainly shows that under existing circumstances we can *never* hope for a dividend in any shape. Notwithstanding the "very satisfactory increase" in season 1869 over past seasons, viz: 84,809 lbs. on the out-turn of 1867

and 58,347 lbs. of 1868, we are as far off as ever from the long expected dividend. A reference to the "revenue account" of the Company which accompanies the directors' report gives the following:—

Expenditure on crop of 1869, ...	Rs. 1,02,302-1-1
Revenue—amount of land revenue realised, 4,735-6-2	
Tea sold 81,025 lbs., ... 63,772-6 6	78,507,-12-8
Dependencies—40,209 lbs. which seeing it consists chiefly of low qualities (vide directors' report) I put down at an average of 8 annas per lb, ...	20,104-8-0
A total of	Rs. 98,612-4-5
is arrived at as total revenue, or a deficiency on cost of	3,689-12-5
	Rs. 102,302-1-1

If with such a " " very satisfactory increase" we have such a melancholy result, there must be something rotten in the state of Denmark. In the expenditure will be found a sum of Rs. 24,564-8-6 on account of interest, and to this point I wish particularly to draw your attention. It is self-evident that until the debt which hangs over the Company is wiped off and the annual item of interest thereby expunged from our accounts, the Company cannot prosper. The question is, how is the debt to be paid? Having been a great deal in the Doon and being pretty well acquainted with the immense tract of land which comprises the Dehrah Doon Tea Company's estate, I feel competent to offer a few remarks, which I earnestly beg you to think over. We are *bona fide* a "Tea Company" and as such ought to confine ourselves to the "cultivation and manufacture of tea." The estate comprises some thousands of acres of land, of which only about 600 acres are occupied with tea. The rest consists of arable land (some of which is under cultivation), very valuable forests and a large tract of waste land. I feel confident, and my remarks are from a personal acquaintance with the property, that a very large sum of money would be speedily realized by disposing of the surplus land which we do not require, and by the sale of the valuable sál timber which would find a ready market. This would enable us easily to clear off the debt of the Company, and with so able a manager as Mr. Minto at the helm, we may, once clear of all financial difficulties, reasonably expect a dividend. It must be most disheartening to our manager to find his exertions result in no benefit to the shareholders. Let the entire acreage not required for tea and the timber, be at once disposed of, reserving only what is necessary for fuel. Then, and not till then, we may hope to see our fine estate pay. The last para: but one of the report plainly tells us that unless we come forward and take up the Company's debentures we cannot be extricated from the financial difficulties which press upon us; in other words, without any prospect whatever of obtaining a return for the large sum of money we have already invested, we must throw a few more thousands into the wheel. To benefit whom? Certainly not the shareholders. Gentlemen, let us shake off the apathy which seems to pervade all joint-stock companies and insist upon being heard, unless we wish to see our fine estate swamped and our money benefit others. We have a page devoted to "Resolutions" in the report herein alluded to. What are those resolutions?

1st.—That the directors' report and accounts for 1869 be received and adopted.

2nd.—That the present directors be re-elected for the ensuing year.

3rd.—That Mr. G. Lucas Kemp be appointed auditor.

Now by whom were these resolutions proposed and seconded? By three gentlemen who seem to have constituted the "meeting"—Messrs Grob, Shearin and Cable.

Mr. Grob proposes No. 1.
Mr. Shearin seconds it.
Mr. Shearin proposes No. 2.
Mr. Grob seconds it.
Mr. Cable proposes No. 3.
Mr. Grob seconds it.

I feel confident fully one half of the shareholders are as ignorant of the affairs of the Company as it is possible to be, and possibly thoroughly disgusted with tea, but let me assure you, Gentlemen, we have an estate worth looking after, and let me beg of you to join with me in agitating matters.

—*Delhi Gazette.* A SHAREHOLDER.

RUKTEE TEA AND COTTON ASSOCIATION.

Prospectus.

The Estate.—The undersigned has secured 1,169 acres of land between the road and the Ruktee stream near Adulpore, at a cost of Rs. 7,066, also 118 acres to complete the block, called Nikreebaree and Maleebhita, at a cost of Rs. 1,062. This makes a total area of 1,287 acres of good land, costing, exclusive of stamps &c., a total of Rs. 8,128. This can be repaid to the undersigned as follows:—the Rs. 1,062 at once—and the Rs. 7,066 by quarterly instalments.

The season being somewhat advanced it is not likely that more than 125 acres can be planted this season, but every endeavour will be made to push it, and the end of 1870 will be made the most of to get in the balance of a total area under tea of 400 acres—30 maunds of seed from Assam will cost Rs. 1,000 say, the rest of the seed will be got in the district at a low rate, the land will have to be paid for during the 1st year.

To be worked by a Private Company.—The undersigned proposes to take several partners, no share to be less than (1-16) one anna say. Payments of calls to be made quarterly commencing from 1st December 1869, to Lloyd's Bank, Darjeeling: a partnership deed to be executed between Mr. Lloyd and each member of the Association.

Management.—Mr. Lloyd to have charge of the general business of the Estate, charging Rs. 50 monthly for his time, trouble and responsibility. The garden would be in charge of a Manager as usual, who would hold at least one anna share in it

Yield of Tea.—1st year nothing, 2nd year ¾ md. per acre, 3rd year 2½ mds. per acre, 4th year 4 mds., 5th year 5 mds. The first year's expenditure would be for 13 months, up to end of December 1870, afterwards 12 months regularly.

Time.	Expenditure.	Receipts.	Balance.	Remarks.
1st year, to end of 1870	28,000	..	28,000	
2nd ,, 1871	45,000	2,585	70,415	Tea taken at 55 Rs. per maund.
3rd ,, 1872	36,000	22,825	83,590	
4th ,, 1873	50,000	65,450	68,140	
5th ,, 1874	60,000	94,875	33,265	After 5th year, Expenditure 66,000 annually and receipts Rs. 110,000, or an annual profit of Rs. 44,000 Rs.

General—Difficulties arise when partners don't pay regularly; it should be understood that 18 per cent. will be charged on arrears. If a partner becomes a permanent defaulter (*i. e.*) in arrears to the extent of 1,000 Rs per anna share, his share will be thrown into the common stock, the remaining members paying up the arrears pro-rata, and his share will be forfeited.

Amount of calls to be paid in Darjeeling free of exchange.

WILLIAM LLOYD

Darjeeling, 27th Nov. 1869.

NOTE.—All the shares in this association have been taken up principally by *employés* on Hill tea gardens, for whose benefit it was got up.

COOLIES IN CACHAR.

To the Editor of the Indian Daily News.

Sir,—Will you allow me, through the medium of your paper, to call the attention of the authorities to one of the greatest evils existing in Cachar, and which is fraught with very serious consequences to the health of our imported labour? Should you look over the returns of the Protector of Immigrants, you would find seven-eights of the death attributed to either cholera, diarrhœa, or dysentery! These diseases are supposed to be caused by the insalubrious climate of this district. But I am prepared to prove that these fatal complaints amongst our coolies are originated by the abuse of a fermented liquor which they have been allowed to manufacture for themselves. There is not a single garden where the coolies do not distil a kind of arrack—a most unwholesome stuff As a rule, no cooly considers that he has sufficiently partaken of the cup until he gets drunk; and this liquor being a washy stuff made of rice, jungle bark, and molasses, little stronger than beer, he goes on drinking a gallon of it before it has the desired effect. One of my own men was brought to me, suffering from severe diarrhœa; and on my questioning him, he confessed that the night previous he had drunk the contents of one earthen pot full, about two gallons of this liquor. The man was put under medical treatment, but died; and my native doctor reported him "dead of cholera." It is a most infernal stuff, and the abuse of it carries off yearly many good men, especially of the jungly race. By putting a stop to the manufacture of this drug, the Bengal Government would do more to improve the health of the Cachar coolies than by all their laws and regulations. Our coolies need stimulants; this is an undeniable fact: the climate is debilitating. When a cooly has been at work for several hours under a heavy rain, he comes home at night chilled to the bones, and certainly requires stimulants. I am sorry to say that in our days of economy and retrenchment, very few gardens are allowed rum for the coolies. This little favour seems to be going out of fashion, and the consequence is that they manufacture for themselves a drug which brings on diarrhœa and cholera. I think that every garden should supply their labourers with one glass of rum free, when they are kept working in the rain. Calcutta secretaries of tea companies should not be stingy on that point; it is a bad policy to ignore the comforts of their coolies. They have no idea how an occasional glass of rum keeps a cooly healthy and contented; they have no idea

what a blessing it is to him when wet and chilled, and how hard he will work to deserve it when promised one! I am one of those who take great interest in tea; and I believe that its ultimate success is closely linked with a better treatment of our labour. The expense of constantly importing fresh batches of coolies is a very heavy item in our expenditure, and I am afraid that the day is not very far distant when the supply must cease. Have you ever compiled the number of deaths at the gardens since tea has been cultivated? You would be painfully astounded. It behoves every planter to redeem the past, and to give to the health and welfare of their men their most particular attention. The gardens have now become much healthier; and with still more care and prudence, the mortality might be considerably reduced. Government officials, on their part, should do their duty, and be more cautious when passing the men from the depôts. It is a great shame that they should send so many sickly people to die in the tea-districts. The antecedents of the cooly should also be enquired into; it is ridiculous to send a man to hoe our lands, who, all his life, has been accustomed to play the fiddle. Within the last year, I have received amongst my imported coolies one man in the last stage of consumption, since dead; two women in debility, who have never yet done a single day work, but have been in hospital from the time they landed at the garden; one man with asthma, which he had for the last ten years, and has since died; one man with paralysis; and one woman a walking skeleton. It is very inhuman, to say the least of it, to allow such people to leave the depôts to come and die at our gardens. There must surely be a screw loose somewhere, or these men could never have been passed.—Yours, &c.,

A Planter.

FIBRES.

MANUFACTURE OF ALOE FIBRE IN DHARWAR.

Letter from Dr. M. M. Mackenzie, the Superintendent Dharwar Jail; to the Chief Secretary to Government, Revenue Department, Bombay, dated 7th September 1870.

With reference to resolution of Government No 4165, dated 29 August, Revenue Department, forwarding copy of Dr. F. Watson's report on "Aloe Profoliata," I have the honour to acknowledge receipt of the same, and permit me to offer to Government a few remarks on the subject.

Taking the low rate of £27 per ton for the fibre given by the Dundee Chamber of Commerce, and calculating the total out turn of the Dharwar Jail up to date at 2 tons 3 cwt. 3 qrs 13 lbs, the selling price in Dundee would leave us a profit after all deductions of £19 3d, or 47 per cent

The following table will fully illustrate it:—

Aloe Fibre.

	Ton.	cwt.	qr.	lbs.
Total quantity manufactured in Jail	2	3	3	13

	Rs.	a.	p.
(Value) money return to the Jail, or prisoners' labor	302	1	2
Profit to Jail (the same as above)	302	1	2

	£.	s.	d.
Value in England at £27 per ton	59	4	4
Deduct—			
Probable carriage to Carwar . £ 2 10 per ton.			
,, ,, Carwar to Bombay. 1 5 ,,			
Freight Overland .. .. 6 5 ,,			
£ 10 0 0			
(Labor) Cost price at Dharwar Jail... ... ... , 30 4 1	30	4	1
Nett profit in England, after deducting all costs, or at 47½ per cent	£19	0	3

I feel sure that the above will recommend the fibre to the attention of exporters, although it is very evident that the Dundee Chamber have priced it at far too low a figure.

The specimens of fibre presented by me to Government were never intended to represent them in their thoroughly clean state, but merely as showing what even prisoners could do with it; with ordinary care it can certainly be cleansed thoroughly, but for the ordinary purposes of matting, further care is not required.

Over cotton and such other products, the cultivation and preparation of the aloe has the following great advantages, which I would beg most respectfully to press upon the attention of His Excellency the Governor in Council, for I do not believe that they are taken so fully into account as they ought to be, and yet they are most important ones in carrying out the cultivation.

1st. Rapidity and certainty of growth in all soils however poor.

2nd. Once planted it requires no care or attention, but will go on yielding leaves from the same stock for an unlimited number of years.

3rd. Its almost total independence of water supply.

4th. Its cleanliness and thorough defence as a hedge, boundary marks, railway defences, &c.

5th. While a part of the lateral leaves only is used, the plant still remains as an effective defence, and improves in growth.

6th. The cutting and preparation of the fibre can be carried out by men, women, or children in their spare intervals of labour.

7th. Lastly, its superiority in actual straining powers over that of all other fibres, as shown in my previous communication.

Taking all these points into consideration, and not counting even its remunerative rate, I believe the article will recommend itself to the consideration of all intended growers.

Since my last report to Government, No. 202, dated 15th August, on account of an order from the Collector for the cutting of all hedges around private compounds, an enormous addition of fibre will be collected, and when thoroughly cleaned and weighed, I shall have the honour to report as to the quantity.

CHINA GRASS.

Read a letter from Mr. James Montgomery, of the Ram Bagh, Kangra, in reference to the culture and preparation of China Grass (*Bælsmeria nivea.*) Mr. Montgomery intimates that having observed from recent reports of proceedings of the inability of the society to meet requisitions for this plant, he will be glad to supply any number of roots at certain rates. The plants are of the genuine Chinese variety, reared by him from imported seed. The stems average 7 feet in height, many reaching 9 to 10 feet. Mr. Montgomery encloses a specimen of fibre from freshly cut stems, which possesses good length, great strength, and a much whiter color than the fibre obtained from the Rheea of Assam.

In a subsequent communication, Mr. Montgomery writes at greater length, of which the following are extracts:—

"In reply to your queries, I have the pleasure to inform you that my plantation has been stocked from the produce of seed obtained with great difficulty, from China, in March 1864.

"The plants produce seed freely here, which would doubtless germinate readily, as shown by the number of self-sown plants that spring up every year in the vicinity of my cultivation; but I have increased my stock by planting divisions of the roots, which is a certain and quicker method of obtaining strong plants. Moreover, to save seed, the spring shoots must be left untouched until the seed has ripened in autumn, thus losing at least three cuttings. The plant cut down this month will throw up a crop of new stems in a few weeks, which, if allowed, will flower freely, but not perfect the seed. I have not seen the Assam variety (*Rheea*) growing, but have received many specimens of fibre stated to have been obtained from it. All were more or less tan-colored; none so white as that I have separated from my plants. The specimens I sent you have been hurriedly prepared by hand. I have not yet been able to employ machinery.

"I entered on this enterprise in 1863, and had scarcely obtained a site for operations than the extensive commercial failures in England ruined my supporters, before even the machinery and appliances ordered had been despatched, I was thus thrown entirely on my resources, and have with the greatest difficulty, maintained the plantation up to the present time, throwing away the produce from want of means to utilize it. It is possible that Government may purchase it; if not, then I shall probably have to abandon it, and sell or rent the land for the common cultivation of the district

"Any information regarding China grass that my experience enables me to give, I shall be happy to afford you."—*Agri-Horticultural Society.*

RHEEA OR CHINA GRASS

The Government of India is now anxious to introduce the Rheea plant into this country, and has published in several *Gazettes* an official notification to that effect. The Rheea plant, *Boehmeria tenacissima*, was introduced in the Southern States of America by M. Roezl in 1867. At that time the high price of cotton, and the entire disarrangement of the system of its cultivation, led men to hope that something might be found which would prove, in however humble a degree, a substitute for the great commercial staple. This rheea plant, or "China grass," as it is sometimes termed, is a variety of the nettle. The New Orleans planters, after giving it a hasty trial, were so impressed with the beauty and extraordinary lustre of the fibre, that they entered into the new enterprise with the greatest enthusiasm. Small cuttings from roots were sold at a dollar, and hurried changes were made in the preparation of land and in the construction of machinery to suit the new plant. The fabrics made from this China grass were remarkable for their brilliancy, and the seed yielded a large return of plant per acre; but the great drawback was the difficulty of treating the fibre owing to its extreme brittleness,—a difficulty which has not been entirely

overcome to the present day. The want of proper machinery for the separation of the fibre from the bark is still felt to be a great obstacle to the development of this new industry; and the Government of India has accordingly offered a reward of five thousand pounds sterling for the system of machinery which will best answer the requirements of the case. M. Roezl, the introducer of the plant to America, has invented a machine, which is said to have fulfilled the conditions in the fullest manner. This machine is minutely described in the *Gazette of India* for March 26th.

The Department of Agriculture has been very successful in the experiments made under its immediate supervision. The seeds, which were imported from Paris in 1868, and consisted of the two varieties *Boehmeria tenacissima* and *Boehmeria candicans*, "germinated readily in every instance." The seeds are small and require a very slight covering; and on this account protection from the rays of the sun and from excessive moisture, is somewhat necessary.

In a report made by Mr. Wilson of the Jamaica Botanic Garden to the Colonial Secretary, it is stated that the plant is suffrticicose, the shoots dying to the crown of the stool when the seed ripens, and being rapidly succeeded by others; and also that the luxuriance of its growth is extreme, as much so, indeed, as that of most of the rank-growing weeds in Jamaica. The soil for China grass should be rich and porous, the climate warm and moist, the altitude not exceeding 3,000 feet. Mr. Wilson mentions his having received a sample of this fibre from London some years ago, the marketable value of which was 2*s.* 6*d.* per pound or £280 per ton, this sample had been cleaned in London from raw material produced in India.

Hitherto China grass has not been successfully used alone; the warp is generally cotton and the woof China grass, or *vice versa*. We were glad to see from the *Gazette* that "a chemical process of treating the fibre has resulted in producing, in combination with cotton, an article resembling the best mohair, a stiff, strong and cool texture, silky and beautiful.

It may interest some of our readers to know that the average cost of the British imports of rheea grass in 1867 was scarcely 19 cents per pound, and that the imports for that year amounted to £65,208. The fibre itself has at times commanded prices of sixty, eighty, and even as much as one hundred and twenty pounds per ton, but these exorbitant prices were owing to the great amount of manual labour which had to be expended in separating the fibre from the bark. When the plant is cultivated and prepared in a more systematic way, and with the aid of suitable machinery, the manufacturer will find the prices so low as to meet his own views with regard to the sale of the prepared material. It was stated in the notification of the Home office, as one of the requirements of the machinery for which a prize was to be given, that it should be capable of producing "a ton of fibre of a quality which shall average in value not less than £50 per ton in the English market, at a total cost, all processes of manufacture, and allowance for wear and tear included, of not more than £15 per ton."—*Delhi Gazette.*

TOBACCO.

EXOTIC TOBACCO IN BURDWAN

Submitted the following communications in respect to the tobacco, of which samples were placed on the table:—

From the Officiating Collector of Burdwan, dated 2nd August 1870.

"In forwarding herewith copy of a letter from the Maharajah of Burdwan to the address of my predecessor, No. 60, of the 23rd May last, together with a quantity of tobacco, weighing 6¾ seers, raised by him from the James River Virginia seed, supplied by Government, I have the honor to request that you will be good enough to favor me with the opinion of the Society as to the result of this experimental cultivation of the American seed."

From H. H. the Maharajah of Burdwan, to the Officiating Collector of Burdwan.

"With reference to your letter No. 253, dated 6th September 1869, I have the honor to state that the James River Virginia tobacco seeds, you kindly placed at my disposal, having been very small in quantity, I thought it convenient to see how they would vegetate in my Dilkoosh Garden

"I learn from the report submitted to me by the Superintendent of the garden, that the seeds were first sown in pots filled with leaf-mould and the top covered over with sand, and that they germinated, according to the estimate, from 75 to 80 per cent.

"These seedling were transferred in a bed prepared to receive them, and allowed to remain there, until they had given out from five to six leaves each. Thence they were transplanted in October last, and cultivated in the mode in which tobacco is grown in this country, in a plot of ordinary garden soil, with copiously mixed up vegetable and horse dung manure in equal quantities Due care was of course taken of them as they went on growing, and the leaves cured in the usual way. The ground cultivated was 12 to 24 feet.

"The whole quantity of tobacco, weighing 6 seers and 14 chittacks, is herewith sent.

"I shall feel much obliged by your sending these to the Agricultural and Horticultural Society at Calcutta, and obtaining their opinion as to how far this experiment has been a successful one.

"In the event of the experiment proving hopeful, I have a mind to have some more of this American tobacco seed for trying, on an extensive scale, how they will grow in my zemindaries in Midnapore and Cuttack."

Dr. Tonnerre kindly agreed to examine and report on this tobacco.

In connection with the above, the secretary submitted a communication from the Secretary to the Government of the North-Western Provinces, forwarding, by desire of the Lieutenant-Governor, reports from the Superintendent of the Botanic Gardens, North-Western Provinces and from the Collectors of Saharunpore, Meerut, Agra, Cawnpore, and Furruckabad, on the experimental cultivation of American James River Virginia tobacco during the year 1869:—"These experiments, though conducted by officers who were sure to give them a fair trial have not, on the whole, proved successful.—*Agri-Horticultural Societys Proceedings.*

Read the following report by Dr. C. Fabre Tonnerre on the sample of tobacco raised in the Dilkoosh Garden of the Maharajah of Burdwan, from James River Virginia seed, which was presented at the last meeting:—

"I have the honor to report for the information of the Society, that I consider the tobacco submitted by the Maharajah of Burdwan as a most superior article, and in my opinion equal to the best Brazil tobacco. It is excellent for smoking purposes. I have prepared a portion of it like the American tobacco, and the two samples, accompanying this report, are equal to the best Cavendish tobacco imported from America. Very good cigars could also be manufactured from the leaves. In its present state it would realise from ten to twelve rupees per maund in the bazaar; but if the leaves were better prepared, the tobacco would command a high price in the markets of Continental Europe. I am of opinion that sufficient care has not been bestowed either upon the cultivation or the process of gathering and drying of the leaves, most of which appear to have been plucked in an unripe state.

"To obtain a good produce, the ripe leaves ought to be gathered on a dry day between the hours of 10 A. M. to 5 P. M. No leaves ought to be plucked unless they show a yellow tinge, approaching to brown or Sienna color. The delicate leaves of the upper portion of the plant can be gathered when of a light yellow color, but on no account ought green leaves to be plucked, as invariably they give a bitter flavor to smoking tobacco

"The tobacco leaves ought to be dried upon machans under the shelter of a roof made of hoogla or some other light material, and freely ventilated.

"The process suggested by me for curing the leaves is so simple, that it can be adopted by the poorest ryots without much expense. In fact, it would more than repay them for the trouble.

"The reason for saying that sufficient care has not been bestowed upon the cultivation of the tobacco, are that the leaves are not as broad as they ought to be, and that the ribs coarser than those of Virginia tobacco cultivated either in South America or in Europe.

"The soil of Bengal appears to be most suitable for the cultivation of finer kinds of tobacco than those exhibited at the Alipore Agricultural Show."

Resolved—That a copy of this report, and a portion of the manufactured article be forwarded to the Collector of Burdwan for submission to the Maharajah.

Read also the following letter from Mr. D. Bruce of Gowhatty, Assam, respecting the sample of tobacco alluded to under the head of contributions:—

"I have pleasure now to report on the result of the experimental cultivation of the Virginia and Havannah seeds sent by you. The seeds were sown immediately on receipt, which was about the end of January, and the young plants transplanted about the beginning of March. They throve remarkably well, the Virginia rivalling the Rungpore in size, but unfortunately, from the time that the leaves showed indications of ripening, we had such heavy showers of rain, that the land got deluged and the plants destroyed, except a few Havannah that had early ripened. A few leaves as sample I will send by the next steamer that leaves this place. As I have been unable to keep any seeds, owing to the adverse circumstance spoken of, I hope you will be able to send me a supply and early, otherwise it would not be worthy trial in a climate like Assam where the rainy season commences earlier than in Bengal. I don't think you will find the tobacco of the desired strength and flavor; but considering that it was raised during the rainy season, it must be admitted to be a fair sample, with a promise of being better if sown in the

proper season, and no adventitious cause occurring to prevent it."

Dr. Tonnerre reports as follows on this tobacco :—

"The second or Assam sample submitted for examination, seems to be well cultivated ; the leaves are well cured and dried, but they are coarser than the leaves of the Virginia tobacco cultivated in Europe. I found it deficient in flavour ; this defect is no doubt owing to climatic influences which, it appears, were most unfavourable, after the plants had acquired a certain growth. I would suggest, should Mr. Bruce continue to cultivate the same tobacco, that he send the Society a large quantity so as to enable me to ascertain its value in the market, and also to have a certain portion manufactured in Calcutta. Nobody at present can prudently commit himself to fix any price on the tobacco, owing to the smallness of the sample, which consists apparently of fifteen picked leaves.—*Id.*

SUGAR.

CULTIVATION OF SUGAR IN INDIA.

It is alleged by persons who have always some objection to offer to every suggestion for the improvement of India, and the augmentation of her powers of production, first, that India cannot grow more sugar than is required for her own consumption, and, secondly, that England can obtain her sugars cheaper in other markets. Both objections are met by the first, that India not only grows sugar enough for her own consumption, as proved, but that she does export the article, while that it can be exported at a profit is shown by the quantity sent to England, amounting in 1869 to 5,837 tons for the port of Liverpool, and to 63,564 for the port of London, besides what goes to Bristol and the Clyde, which is however not much.

That England does not derive supplies equivalent to her requirements from her own possessions, is shown by the fact that she imports enormous quantities from foreign countries, including France, who gives her no less than five millions of pounds per annum A reduction of duty always means enlarged consumption, and it may reasonably be assumed that that enlarged consumption will amount to about the percentage of duty remitted, or some sixteen per cent. The consumption of sugar in England (that is Great Britain and Ireland) amounted to in 1869 to 194,589 tons, or 435,879,360 pounds, equal to something under twenty pounds per annum for every man woman, and child. Now, an increased consumption of some sixteen per cent. likely to follow the reduction, means upwards of thirty thousand tons, or twenty millions of pounds, which is after all only three pounds per inhabitant more than the consumption of 1869. But it is nevertheless a great increase, representing so much more cultivation, so much more shipping, so much more trade, and so much more profit.

We should like to know why steps should not be taken for enlarging sugar cultivation in India, to the extent of enabling her to come in for a considerable share of this increase to which as a British possession she is reasonably entitled ? The Government has done much for the increase and improvement of cotton cultivation and for its export by the most rapid and cheapest means available. Why not devote a little attention to another produce, and more especially to sugar, now that such an improving market is opening out in the West ?

Would it be bad policy to sell the lands of the Baree Doab, where millions of culturable acres are uncultivated, at a low figure, on the condition that sugar shall form the staple cultivation once in three years ? The extension of the Baree Doab Canal will afford an ample supply of water down the whole of this fertile tract. We have no hesitation in asserting that five thousand tons of sugar could thus be secured for export in so short a time that those who may be willing to adopt the suggestion would themselves be astonished at its success, or, if the Government do not in the short-sighted policy they have adopted in modification of the great scheme projected by Lord Canning, wish to sell the land in fee simple, let them lease it on such terms for, say, thirty years, as would amount to a virtual sale for a generation at least. Had Lord Canning's views been carried out in their integrity, this same Baree Doab, instead of being still a dreary and unproductive waste, would be verging at the present moment, from Lahore downwards, on the rich condition of Umritsur and Goordaspore.

It may be objected to this that cultivators are not to be had for these lands. We are quite sure, however, that were estates of two, three and four thousand acres, created on the conditions we proposed, the purchasers or lessees would have no difficulty in finding thousands of tillers of the land in the at present over-populated districts of Goordaspore, Sealkote and Jullunder. Let Mr. Robert Egerton see to this, and we entertain small doubts that a man of Lord Mayo's astuteness will not be slow in adopting any practical proposal submitted to him.—*Delhi Gazette.*

CARDAMOM.

CARDAMOM CULTIVATION.

It has been the intention of the Dewan of Travancore to extend the cultivation of Cardamoms in that State, and with this object, Sir Madava Row has lately created the office of Superintendent of the Cardamom hills. The production of this article in Travancore and Cochin is at present comparatively limited. In former times, cardamoms formed one of the chief exports from this coast, but the trade has gradually dwindled into insignificance. The Travancore Sircar do not realize more than three lacs of rupees annually from the sale of cardamoms, and the revenue to the Cochin Government from this source is still smaller. The arrangements which Sir Madava Row has already made for the conservancy of the Cardamom Hills will, it is hoped, tend to increase the supply of the spice in Travancore The cultivation of cardamoms must certainly be a profitable investment, when the price in the English market of the spice, is excessively high. It has been observed that "a cardamom jungle is a mine of wealth to its possessor," and the observation still remains true. We have not as yet seen any report on the intended operations of the Superintendent of the Cardamom Hills, but as cardamom plants spring spontaneously from the soil, without the necessity of sowing seeds or laying down cuttings, much will not be required from him Many of us are perhaps aware that in other places where the cardamom grows, its cultivation has not been attended with much trouble. In Coorg, its production has hitherto greatly depended on the "processes of nature." We observe in the report of Mr. Ludlow, that in the Coorg forests, "a spot is selected as likely to produce cardamoms, and a party of coolies is sent in February or March to prepare a garden, i e., make a clearing. They cut away the scrub, the brushwood and the small trees, and proceed carefully to fell the large ones. As soon as the rains begin, young cardamom plants shoot up on all sides of the clearing, but especially near the stem and roots of the fallen trees." In a year, the plants will be a foot in height with eight or ten leaves. They attain the height of four feet in about three years, when they yield the first crop which is, however, a very light one. The heaviest crops are obtained from the fifth year. We are told that, when the plants begin to look sickly, which they generally do after the next seven years, "large jungle trees are felled right across them, which will have their stems and racemes killed by the fall, but from the rhizomes, fresh stems will shoot, and the plants grow with increased vigour for eight years, when the same process of renovation will have to be gone through again." The process of picking is carried on in September or October, and the crop, after being picked, is dried in the sun. It will be thus seen that a cardamom jungle can never become exhausted, and that the cultivator has not to contend with the great difficulties which the cultivation of other articles produces. If carefully worked, there can never be a failure of crops, and if some attention be paid in saving the crops from their natural enemies, such as grub, squirrels, &c., he can count upon a handsome return every season. It has been shown that a garden of 484 square yards in area will yield annually an average of 40 seers of *green* cardamoms, equal to 10 seers in weight when dry. In an acre of ground, four such gardens could be made, and the yield will therefore be about 40 seers of dry cardamoms, which, it is estimated, would fetch nearly £13 in the English market. The cost of production may be reckoned to be 4 rupees an acre, and the cost of collecting, preparing the crops, and weeding the gardens, would not be above that amount in addition. We consider that the system of growing the cardamons is capable of great improvement, and whatever faith we may place on the phenomenon of its spontaneous growth, we are inclined to think that it would be desirable to attend to the rearing of the plants in a better manner than is done in Coorg. There can be no doubt that by irrigation, a systematic planting and manuring, the yield of cardamoms would be ten-fold and would bring an immense revenue to the cultivator. We are certain that it would be profitable to invest capital in the cultivation of cardamoms in Travancore, where the soil is so admirably adapted to the growth of cardamom plants and where cheap labour is obtainable. That the cardamom trade is remunerative, is a patent fact, and it is to be hoped that the endeavours of the Travancore Sircar to increase the production of the spice would be followed by similar endeavours on the part of the Cochin Sircar.—*Cochin Argus.*

IPECACUANHA.

Everything connected with the introduction of new plants into Ootacamund, is of interest ; even when the subject is so sickly as that of the Ipecacuanha. From the paper which we reprint below, it appears that there is no hope of growing this

plant on the Hills, but it is possible that it may succeed at Nellambur. We can hardly expect every experiment to be successful: everything should be tried.

THE IPECACUANHA.

Proceedings of the Madras Government, Revenue Department, 13th September, 1870.

Read the following letter from J. W. Brooks, Esq., Commissioner of the Neilgherries, to the Acting Secretary to Government, Revenue Department, dated Ootacamund, 4th August 1870, No. 38 :—

Reference to Proceedings of Government, dated 8th June 1870, and Order thereon, No. 845, directing me to furnish the information called for in paragraph 3 of Secretary of State's despatch of 20th April 1870, No. 11, regarding certain Ipecacuanha plants, also to Proceedings of Government, dated 18th July 1870, and Order thereon, No. 1,103, forwarding a letter from Mr. Broughton, the Government Quinologist, with an enclosure to be embodied with Mr. McIvor's report on the Ipecacuanha plants.

2. Mr. McIvor's report, herewith forwarded, states that three Ipecacuanha plants have been introduced into this Presidency, viz., one by Mr. Broughton in April, 1866, and two by Mr. McIvor in December 1867.

These three plants were brought to the Ootacamund Botanical Gardens, and have been increased to thirteen by the root-cutting process described in Mr. McNab's pamphlet.

3. The plants have made unsatisfactory growth at this elevation.*

4. Three of the plants were taken to Nellumbur † by Mr. Broughton in January last, and arrived in good condition.

The Assistant Conservator of Forests at Nellumbur took charge of the plants and hand-watered them daily during the dry season.

In March one of the plants died, and the other two are said to have produced flowers, which dropped off as soon as blown, so that the seed was lost. Since the rains set in the two plants are said to have very much improved.

5. Of the ten plants remaining in the Ootacamund gardens three were sent to Devi Shola, where Messrs. Money, Wauchope and Co. have a large cinchona plantation, about ten or twelve miles to the south of Ootacamund, and at a somewhat lower elevation. The plants there also "remain stunted and are of unsatisfactory growth."

6. Mr. McIvor thinks the climate of Malabar and the damp slopes of Wynaad may be better suited to the plant than the Neilgherries, and he intends trying three of the plants on the lower‡ slopes of the Government Neddivuttum Cinchona Plantation and three on the eastern slopes of the Neilgherries, where the rainfall may be fifty or sixty inches.

From W. G. McIvor, Esq., Superintendent, Government Cinchona Plantations, to the Commissioner of the Neilgherries, dated, Ootacamund, 25th July 1870, No. 198.

With reference to the order of Government of 8th June, 1870, No. 845, and your letter, No. 145, of the 27th instant, I have the honour to state, with reference to paragraph 3 of the despatch from the Right Honourable the Secretary of State for India, under date 20th April 1870, No, 11, that only three Ipecacuanha plants were introduced to these gardens, viz., one brought out by Mr. Broughton from Kew and received here in April 1866, and two plants brought out by me in December 1867. We have increased these plants to thirteen in number by root-cuttings as described by Mr. McNab in the pamphlet referred to in the Secretary of State's despatch.

2. As this climate is too cold for the successful growth of the ipecacuanha, some plants were sent to Devi Shola, where they remain stunted and of unsatisfactory growth. Three plants were sent to Nellumbur in January last, and there they seem to be thriving well. The climate of Malabar and the damp slopes of the Wynaad Hills appear to be much better suited for the cultivation of Ipecacuanha than the Neilgherries.

3. We have still seven plants in the gardens here; these plants continue to make very unsatisfactory growth, and I have, therefore, resolved to plant out three plants on the lower and damp slopes of the Neddivuttum plantations, and three plants on the warm slopes of the eastern side of the hills.

4. All the localities where the plants have hitherto been tried on the Neilgherries appear to have been too high and too cold.

ORDER THEREON.—The Government approve the measures which Mr. McIvor proposes to take for preserving the still existing ipecacuanha plants by changing their site. In the event of the Burliar garden becoming the property of Government the plant should be tried there.

2. The results of the ipecacuanha cultivation in this Presidency will be reported to the Secretary of State

* Ootacamund, between 7,000 and 8,000 feet high; average rainfall, about 45 or 50 inches; mean temperature, about 60° F.

† In Malabar about 100 and 500 feet above sea level; rainfall between 80 and 90 inches.

‡ Perhaps 3 000 or 4,000 feet above sea level and 100 inches rainfall

MARKET REPORT.

THE INDIGO OUTTURN.

CALCUTTA, 20TH SEPTEMBER.

Planters in *Tirhoot*, *Chumparun*, and *Chupra* are much disappointed with their second cuttings, which, in consequence of continued unfavorable weather, are yielding wretchedly. At present fine weather prevails, but it comes too late to do much good. In the *Benares* districts the plant from *Assares* sowings has produced almost nothing in consequence of constant rain and in some places innundation by the rivers. The country moreover being in such a state, it is most difficult to get plant to the vats, and the yield from it in its drenched state, with many of its leaves turned yellow, is very unsatisfactory. In the *Doab* too much rain is also complained of, and it now seems very probable that the crop will not exceed, even if it reach 1,00,000 maunds.

CALCUTTA, 27TH SEPTEMBER.

The few letters which have come to hand since the date of our last issue, are of the same tenor. The second cuttings in *Tirhoot*, *Chumparun* and *Chupra* are likely to produce far less in proportion to the first, than we believe they have ever been known to do, but in the absence of corrected estimates we are at present unable to state what the falling off in the out-turns of these districts will be. From the *North West Provinces* the letters report no improvement, and we are confirmed in the opinion that the crop will probably fall short of 1,00,000 mds.

Exports of Indigo from 1st November, 1869, to 26th November, 1870 :—

	Chests.	Mds.	S.	Ch.
To Great Britain	12,828	48,991	11	6
,, Havre and Bordeaux	3,113	11,756	14	14
,, Marseilles	1,781	6,420	18	5
,, Foreign Europe.....	1,528	5,044	9	11
,, America.....	1,700	6,106	26	0
,, Gulphs	1,659	6,587	27	5
Total.....	22,610	86,806		

Wm. Morgan & Co.'s Circular.

INDIAN TEA.

CALCUTTA, 20TH SEPTEMBER.

Only two Auctions have been held since departure of the last Mail, 1,644 chests having been offered, a portion of which were disposed of privately before the sale. The teas were principally Assam and of desirable quality, and prices paid were accordingly good, the competition being very brisk for all teas with strength. No great quantity of tea is likely to be sold till after the Doorgah Poonjah holidays.—*Toulmin & Co.'s Circular.*

LONDON MARKET, 10TH SEPT. 1870.

COFFEE.—The tone of the market is decidedly firm. Of the parcels offered on Tuesday, Plantation kinds sold at previous prices, except medium kinds, for which easier rates were accepted. 960 casks, 100 barrels, and 520 bags Plantation Ceylon chiefly sold—triage, &c., 40*s.* to 51*s.*; small to bold grey, 54*s.* to 67*s.*; ditto colory, 57*s.* to 77*s.*; peaberry, 72*s.* 6*d.* to 79*s.*; 360 cases Wynaad, all sold—colory, 67*s.* to 79*s.* 6*d.*; peaberry, 81*s.* 6*d.*; 20 packages Jamaica, at 47*s.* to 48*s.*; and one-half of 820 bags washed Rio, middling to fine colory, 56*s.* to 67*s.* 6*d.*; 250 packages of Mocha withdrawn. Yesterday the parcels offered were mostly sold at the valuations. 70 packages of Plantation Ceylon—triage, 43*s.* to 45*s.*; small to good colory, 56*s.* 6*d.* to 75*s.*; peaberry, 76*s.* to 79*s.* 320 packages of Neilgherry triage, 48*s.* to 58*s.* 6*d.*; small to bold, 59*s.* 6*d.* to 80*s.*; peabery, 79*s.* 6*d.* to 80*s.* Of 1,000 bags washed Rio offered, 700 bags sold ordinary to good colory, 53*s.* 6*d.* to 66*s.*; and 3,300 bags of Costa Rica, low middling to good, 52*s.* 6*d.* to 65*s.* 6*d.*

TEA.—A sale of 1,800 packages was held yesterday; 1,280 packages found buyers, all bein "without reserve." About 1,000 chests new season's black-leaf Congou, ex steamer *Craigforth*, were sold. Two breaks marked "Souchong" brought the low price of 1*s.* 6½*d.* per lb; but a chop at 1*s.* 5½*d.* to 1*s.* 5¾*d.* per lb. realised about previous rates. Packages offered :—Congou, 667; Pouchong, 480; Soughong, 103; Hyson, 224; Young Hyson, 78; Imperial 228; Presents, 20 : total, 1,800 packages. The deliveries in London, estimated for the week ended September 5, were 1,560,777 lb., which is a decrease of 44,373 lb. compared with the previous statement.

RICE.—The market is without animation and sales on the spot have been limited, including 2,000 bags Askoolie at 10*s* 3*d* and 2,500 bags ditto at 9*s* 10½*d* per cwt. ex ship. The cargoes of Arracan, &c., arriving are not offering for sale at any reduction in price.

IMPORTS AND DELIVERIES of RICE to Aug. 27, with Stocks on hand.

		1870	1869	1868	1867
Imports	tons	33,940	53,900	46,290	4,700
Deliveries	..	46,100	41,600	30,140	22,540
Stock	..	37,610	44,900	26,720	4,950

—*Overland Mail.*

STATEMENT.

Of Imports, Exports, and Home Consumption of Coffee, in the 35 weeks ending Aug. 27, 1870, showing the Stock on Aug. 27, compared with the corresponding period of 1869.

PORT OF LONDON COFFEE.

	Imported.		Exported.		Home consumption.		Stock.	
	1869	1870	1869	1870	1869	1870	1869	1870
	tons	tons	tons	tons	tons	tons	tons	tons
West India	918	3109	218	858	457	1107	449	1497
Ceylon	2529	24630	16964	18018	7629	7632	11852	12891
East India	6819	3181	3738	2350	2556	2587	4429	2519
Mocha	253	200	84	73	114	137	165	147
Brazil	8253	3303	5409	4026	573	516	4368	905
Other Foreign	4279	4604	2001	1457	1168	1147	2472	3870
Total....	18814	39027	28404	27682	12497	13146	23795	21829

MESSRS. SHAIKH KASIM & CO.,

TENT MAKERS,

FUTTEHGURH.

WHO received a certificate from H. M. Mackenzie, Esq., Commissary of Ordnance, Futtehgurh, on the 11th November 1867.

Respectfully beg to inform the public, that they make tents of every size and description to order, of best materials, handsome shape, and good workmanship, at very reasonable prices, in support of which they have obtained a highly recommendatory testimonial from the above gentleman.

They beg also to announce that they have a large stock of tent materials always in hand to execute all orders promptly and with much care and attention Brass eyelets will be supplied in lieu of leather ones in every tent; also ventilators will be made in under fly of Large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, punkhs, gunny-bags, pegs and mallets, as follows:—

No	1, 20 feet by 18 feet	.. ..	.. Rs. 825
,,	2, 28 do. by 16 do.	.. ..	.. ,, 690
,,	3, 24 do. by 14 do.	.. ..	.. ,, 625

II.—Single-poled tents of 4 cloths throughout and 4 feet verandahs, complete as above, viz:—

No.	4, 20 feet square,	.. ..	.. Rs. 640
,,	5, 18 do.	.. ..	.. ,, 540
,,	6, 16 do	.. ..	.. ,, 475
,,	7, 14 do	.. ..	.. ,, 420

III.—Hill tents, double fly and single kanats of 4 cloths, complete as above, viz:—

No.	8, 14 feet square, with 2 saibans, 3 cloths 5½ feet high,			..	Rs 270
,,	9, 12	do	do.	do.	,, 225
,,	10, 10	do	do.	do	,, 19
,,	11, 8	do	do.	do	,, 17

IV.—Swiss Cottage tents, double fly and circular saibans, the rear one being closed by 6 feet kanats to form a dressing room of 4 cloths throughout, complete as above, viz:—

No	12, 14 feet square,	.. ..	.. Rs 37
,,	13, 12 do.	... .	... ,, 34
,,	14, 10 do.	... .	.. ,, 28

V.—Swiss Cottage tents, double fly and circular verandah, and 3 feet saibans, the rear one being closed by 4 feet kanats to form a bath room, 4 cloths throughout as above, viz:—

No	15, 14 feet square,	.. ..	.. Rs. 29
,,	16, 12 do.	. .. .	.. ,, 24
,,	17, 10 do	.. ..	,, 20
,,	18, 8 do	.. . .	.. ,, 17

VI.—Routies of 4 cloths in fly and 4 cloths, in 6 feet kanats, complete as above viz:—

No	19, 16 feet by 14 feet,	Rs
	20, 14 do by 12 do	
,,	21, 12 do by square,	

VII.—Sleeping pals for gentlemen, of 4 cloths, including chintz, and with 4 feet kanats, wooden poles, complete as above, viz:—

No	22, 12 feet square,	.. ..	Rs
,,	23, 10 do	.. ..	,,
,,	24, 8 do	.. ..	,,

VIII.—Bechoba tents of 4 cloths in fly and kanats, complete with durries, &

No	25, 12 feet square,	.. ..	.. Rs
,,	26, 10 do	... .	... ,,
,,	27, 8 do.	... ...	... ,,

IX.—Shameanahs of 4 cloths in fly and kanats, 7 feet high, with 5 feet curtains, hanging from above, of 3 cloths, complete with 8 wooden poles, as above, viz:—

No.	28, 24 feet square,	.. ..	.. Rs 4
,,	29, 18 do	.. ..	.. ,, 32
,,	30, 16 do	... ...	.. ,, 290

X.—Sepoy pals of 3 cloths, with bamboo poles:—

No.	31, 16 feet by 15 feet,	.. ..	Rs.
	32, 14 do by 12 do. servants' pals	do .	
	33, 12 by 10 do	do do .	
	34, 10 do by 8 do	do do. .	

NECESSARY TENTS.

No.	35, 5 feet square,	... .	.. Rs.
,,	36, 4 feet square,	.. ..	.. ,,

XI.—Swiss Cottage tents for hills, double fly and circular saibans of 4 feet, the rear one being closed by 4½ feet kanats to form a bath-room, and two bathrooms will be two sides, the upper fly 3 cloths, under fly 2 cloths, complete with wooden poles, as above, viz:—

No.	37, 12 feet square	.. ..	.. Rs. 250
,,	38, 10 do.	.. ..	.. ,, 210
,,	39, 8 do.	.. ..	.. ,, 185

XII.—Mess tents, three-poled, of 4 cloths throughout and 4 feet verandahs, complete, with glass shades with 4 branches with a brass clasp and two punkhas, complete as above, viz.:—

No. 40,	40 feet by 20 feet, ...	.. Rs. 1,500
,, 41,	32 do. by 16 do. of two-poled do. do. with one punkha..	1,250
,, 42,	Bath-room, 6 feet square, with top for single-poled tent, without durries	38
,, 43,	Zanana kanat, 3 cloths, 7 feet high, 72 feet long, in two pieces	72
,, 44,	Shuterinjee of best materials, per square yard, (14) fourteen	

TERMS.—Two-thirds the price of the tent in advance, the remainder on delivery. Risk and cost of transport to be borne by purchasers, as also any charges for discounting their cheques and hoondies. No orders will meet with prompt attention without a remittance mentioned as above.

Apply to

MESSRS. SHAIKH KASIM & Co.,
Tent Makers, Futtehgurh.

The Ravages of White Ants.

completely prevented by the Preservative Composition patented by Major Forbes, R.A., Executive Engineer, D. P. W.

This is the only effectual process yet invented for protection against White Ants, it also arrests decay in woodwork whether sheltered or exposed.

The dry ingredients, packed in tins, containing 25 lbs. each, can be obtained from the undersigned; this quantity, mixed with a due proportion of oil, will form a paint sufficient to prime 1,000 superficial feet. Price per tin, Rs. 5.

Sole Agents,
BURN & Co.,
7, Hastings Street.

HOWRAH STEAM SAW MILLS.

The undersigned having erected extensive Steam Saw Mills, with vertical and circular saws, are prepared to execute every description of Woodwork on a large scale. Rates can be obtained at our Howrah Iron Works, or at the Offices, Hastings Street.

BURN & Co.,
Iron Founders and Mechanical Engineers

Calcutta, January 1870.

HOWRAH IRON WORKS.—WROUGHT IRON BRIDGES,

Oil Presses, Pug Mills.
Gearing and Shafting,
Filatures, Iron Steamers, and Barges, Ships' Capstans and Windlasses, Portable, Stationary, and Marine Engines, Hydraulic Presses, High and Low-pressure Boilers, Tanks, Gasholders, Railway, Mining, and Contractors' Plant; Turn-Tables, Crossings, and improved jointed Levers for Switches, Road Rollers, Cranes, Winches, Traversers, &c., &c., manufactured.

Having a very extensive Foundry, the undersigned are in a position to execute orders for all kinds of Castings with great despatch.

Head Office, 7, Hastings Street, Calcutta.

BURN & Co.

DURBAR TENTS & CAMP EQUIPAGE

OF EVERY DESCRIPTION,

MADE TO ORDER AT THE

FUTTEHGURH ORPHAN ASYLUM TENT MANUFACTURING COMPANY, LIMITED, OF EXCELLENT CUT, BEST MATERIALS PROCURABLE, AND HANDSOME WORKMANSHIP.

ESTABLISHED IN 1838.

INCORPORATED AND REGISTERED IN 1866.

PRIZE and MEDAL by N. W. PROVINCES' EXHIBITION held at AGRA, during FEBRUARY, 1867.

FIRST PRIZE AND MEDAL BY BROACH EXHIBITION IN BOMBAY, HELD DURING DECEMBER 1868, WITH CERTIFICATES OF MERIT.

Printed Price Lists will be forwarded on application to

MESSRS. PREM MASIH & Co.,
Managing Directors.

A revised List of Tents, with their reduced prices, made by

MESSRS. MOULA BUKSH & Co.,

TENT MAKERS,

FUTTEHGURH,

WHO received the following certificates, one from R.C. Oldfield, Esq., Collector, Furruckabad, on the 20th October 1863, and another as follows.

Messrs. MOULA BUKSH & Co,
Futtehgurh.

I have much pleasure in stating that the tent you made for me has given satisfaction as regards materials, tent and workmanship.

J. E. KIN, Surgeon.
37th Regiment.

Shahjehanpoor, 1st February 1870

Have the honor to inform the public in general, that in their manufactory the best materials are supplied, and brass eyelets are supplied in lieu of leather ones Ventilators will be made in large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, punkahs, gunny bags, pegs, and mallets as follows:—

No. 1.	30 feet by 18 feet	..Rs 810	No. 3.—21 feet by 14 do. ..Rs. 620
,, 2.—28	do. by 16 do.	.. ,, 690	

II.—Single-poled tents of 4 cloths throughout, and 4 feet verandahs, complete as above:—

No	4.—20 feet square ..	..Rs. 640	No. 7.—16 feet square	..Rs. 420
,,	5.—18 do. ..	.. ,, 540	8.—12 do.	.. ,, 390
,,	6.—16 do ..	.. ,, 475		

III.—Hill-tents, double fly and single kanat of 4 cloths, with 2 outriggers of 3 cloths, complete as above:—

No.	9.—14 feet square ..	..Rs. 270	No. 11.—10 feet square .. ..Rs. 200
,,	10.—12 do. ..	.. ,, 225	

IV.—Swiss Cottage tents of 4 cloths throughout, double fly and circular saibans, the rear one being closed by 6 feet kanat to form a dressing-room, complete as above:—

No.	12.—14 feet square ..	..Rs. 380	No. 13.—12 feet square .. ..Rs. 340

V.—Swiss Cottage tents of 4 cloths throughout, double fly and circular verandah and 3 feet saibans, the rear one being closed by 4 feet kanat to form a bathing-room, complete as above:—

No.	14.—14 feet square ..	..Rs. 290	No. 16.—10 feet square . ..Rs. 200
,,	15.—12 do. ..	.. ,, 240	

VI.—Routies of 4 cloths, in fly and in kanat, complete as above:—

No.	17.—16 feet by 14 feet	..Rs. 225	No. 19.—12 feet square .. .Rs. 190
,,	18.—14 do. by 12 do.	.. ,, 200	

VII.—Bechoba tents of 4 cloths fly and kanats, complete as above:—

No.	20.—12 feet square ..	..Rs. 150	No. 21.—10 feet square .. .Rs. 140

VIII.—Shameanahs of 4 cloths in fly and kanat, 7 feet high, with 5 feet curtains from above, of 3 cloths, and eight wooden poles, complete as above:—

No	22.—24 feet square ..	..Rs. 480	No. 24.—16 feet square .. ..Rs. 290
,,	23.—18 do. ..	.. ,, 320	

IX.—Sleeping-pals for gentlemen of 4 cloths, including chintz and 4 feet kanat, wooden poles, complete as above:—

No.	25.—12 feet square ..	..Rs. 110	No. 27.—10 feet by 8 feet.. ..Rs.
,,	26.—10 do do. ..	.. ,, 90	

X.—Sepoy pals of 3 cloths, with bamboo poles—

No.	28.—16 feet by 15 feet	Rs. 60
,,	29.—14 do. by 12 do. servants' pals	50
,,	30.—12 feet by 10 do servants' pals	45

XI.—Miscellaneous.

No.	31.—Necessary tents 5 feet square	Rs.	33
,,	32.—Ditto do 4 do		27
,,	33.—Bathing room, 6 do with top for single-poled tents, without durries	,,	38
,,	34.—Saibans for 12 feet hill tents	,,	18
,,	35.—Shuterinjee per yard Rs. 1.		
,,	36.—Mess-tents of three poles complete, with glass shade, brass clasp, punkha &c., of 4 cloths throughout, 40 feet by 20 feet	,,	1,500

TERMS.—Two-thirds of the prices must accompany the order to meet prompt attention, the remainder on delivery. Risks and any discount charged in casting the cheques, &c., to be levied on purchasers. All orders will be executed without the least delay.

Apply to

MOULA BUKSH & Co.,
Tent-Makers, Futtehgurh.

CHARTERED MERCANTILE BANK OF INDIA, LONDON AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies

Circular Notes and *Letters of Credit* are also granted for the use of Travellers in the *East*, on the *Continent* and to *Europe* overland

The Bank purchases Bills and grants Drafts payable in Calcutta Madras, Cocanada, Ceylon, Hongkong Foochowfoo, Shanghai, Hankow, Singapore Penang, Mauritius, and Yokohama

INTEREST ALLOWED

On Deposit Accounts payable on demand Interest will be credited half yearly on 30th June and 31st December at the rate of two per cent per annum on the daily balance, not exceeding one Lac Rupees

ON FIXED DEPOSITS

12 months	5 per cent
3 do ..	3 ,

All letters should be addressed and Hoondies made payable to the Chartered Mercantile Bank

ORIENTAL BANK CORPORATION.

Bombay Agency.

EXCHANGE

THE CORPORATION grant Drafts on London on Demand and at from one day to six months sight and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope

No Draft at six months' sight is granted for a sum under £50 Sums under £20 are only drawn for on Demand

COMMISSION

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent, and on the collection of Bills one per cent and Postage

The Corporation take charge of Government Paper Shares in the Bank of Bombay, and other local Stocks free of all charges and will draw Interest and Dividends on the same as they fall due on the following terms

If to be remitted through the Corporation	Without charge
If to be paid in India a Commission will be charged of	¼ per cent
On delivering Securities out of safe custody	¼ do
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869

NATIONAL BANK OF INDIA, LIMITED

BOMBAY BRANCH

CURRENT DEPOSIT ACCOUNTS

The Bank opens Current Deposit Accounts and allows Interest at the rate of 2 per cent per annum on Customers' daily balances, from Rs 500 up to Rs 100,000

FIXED DEPOSITS

The Bank receives money on Fixed Deposit, and allows Interest thereon as follows:—

On Deposits subject to 6 months' notice of withdrawal		4 per cent
Do	12	6 ,

EXCHANGE

The Bank negotiates and collects Bills payable in London Calcutta Madras and Hongkong It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors,
JAMES WINDHAM Manager

Bombay 20th August 1870.

NEW BANK OF BOMBAY,—*(Limited)*

RATES

DISCOUNT

On Government Bills	6 per cent
On Private Bills and Notes	8 do
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do

INTEREST

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do
On do do do Goods or Shipping documents for Goods	8 do
On Cash Credits on Security of Government Paper, Bullion or Railway Shares subject to a Commission of ¼ per cent on the amount of Credit	do

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts

Bombay, 15th July 1869

LLOYD'S BANK,

DARJEELING.

Fixed Deposits—Interest is allowed on deposits of Rs 100 and upwards on the following terms —

On sums lodged for	3 months certain	3 per cent	per annum.
Do.	12 do	7	do
Do	2 years certain	8	do

Interest is allowed at 2 per cent per annum on floating deposits or Current Accounts, when the balances exceed 500 Rupees

There are many who have a dread of speculation, and yet who desire a *fair* rate of interest than is obtainable from investments in Government paper and Railway scrip or from fixed deposits in Joint Stock Commercial Banks Remittances can be made by cheques on any part of the world

Interest paid half yearly in India or London

A B L WEBB,
Manager.

Darjeeling, Northern Bengal, 1st August 1870

ADDIS'S PATENT CART AND WHEEL.

These Wheels are constructed to suit the purposes of railway carriages, lorries, carts Waggons, and every other description of vehicles

The wheels are formed of open segments of iron or steel, which, when bolted together form a skeleton-wheel to the periphery of which the ordinary wooden felloe is fixed with bolts going through the tyre, the tyres also being in segments

The advantages over the old style of wheel are that they last longer, run easier and are unaffected by temperature of climate, obviating the shrinking which occurs to tires and spokes in the case of ordinary wheels

The segmentary tyres can also be renewed by any ordinary workman or cart-driver.

F. KLINGELHOEFER,
Sole Agent for the above,
TANNA.

Tanna Iron Works.

ADDIS'S IRON PERMANENT WAY FOR RAILWAYS.

The advantage of Addis's Permanent Way in addition to its cheapness and durability, consists in its being a longitudinal Sleeper Road; it combines the office of sleeper and fish-plate, and thus enables chairs, spikes and trenails to be dispensed with The parts being fewer, in cases of shipment to foreign countries, is of great importance in saving of freight, as well as for facility of close packing of carriage over long land distances,

It has also great advantage in simplicity of laying, and cheapness in maintenance The staff needed for this purpose may be limited, and no special or previous knowledge is required

For plans, specifications, price lists, and all other information, apply to the undersigned.

F KLINGELHOEFER.
Sole Agent for the above.

Tanna Iron Works *TANNA*

MOORLEE DHUR, A RELATIVE OF RAO JOTEE PERSHAD & Co.,

Tent Manufacturers, Futtehgurh.

A revised List of the prices of tents, &c, made at the manufactory of Moorlee Dhur and Co

Double poled tents of 4 cloths throughout and 4 feet verandahs, complete with carpets, chicks, purdahs gunny bags, pins and mallets as follows —

No	1 32 feet by 20 feet	Rs	1 02
„	2 30 do by 18 1	„	90
„	3 28 do by 16 do	„	81
„	4 26 do by 16 do	„	76
„	5, 24 do by 14 do.	„	61

Single pole tents of 4 cloths throughout and 4 feet complete as above viz

No	6 0 feet square,	Rs	67
„	7 18 do ditto, ..	„	64
„	8 16 do ditto,	„	57
„	9 14 do ditto, .	„	51
„	10 13 do ditto, .	„	43
„	11 12 do ditto,	„	40

Hill tents of 4 cloths, in kanat and toy and in suebans 3 cloths, and complete as above, viz —

No	12 14 feet square with 2 suebans,	Rs	310
„	13 13 do ditto do 2 ditto,	„	270
„	14 12 do ditto do 2 ditto,	„	270

Routies of 5 cloths in top and 4 cloths in kanats complete as above, viz —

No	15 16 feet and 14 feet,	Rs	270
„	16 16 do do 12 do,	„	2
„	17 14 do do 12 do,	„	21
„	18 12 square	„	200

Swiss cottage tents double fly and circular suebans all the four enclosed with kanats to form rooms 4 cloths through out with carpets

No	19 16 feet square,	Rs	720
„	20 14 do ditto,	„	450
„	21 14 do ditto,	„	450
„	22 13 do ditto,	„	400
„	23 12 do ditto, .	„	400

Sleeping pals, 5 cloths, chintz lining and wooden poles, with one carpet, 4 others in kanats, complete.

No	24, 12 feet square,	.. Rs.	120
„	25, 10 do by 14 feet,	. „	110
„	26 10 do square,	. „	95
„	27 sepoys pals, 15 by 16 ft (4 cls.)		75
	28 ditto 14 by 12 ft (3 do)		5
„	29, lascar pals, 18 by 16 ft (3 do.)		8

Shamianas

No	30, 40 feet square of 4 cloth in fies and 12 feet high, with kanats complete as above, being 10 wooden poles,	Rs	800
„	31, 24 feet 8 wooden poles, with kanats	„	500
„	32 20 feet 8 ditto ditto ditto,	„	410
„	33, 12 „ square,	„	270

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34,	8 by 12, for one horse ..	„	60
35,	Necessary tents, .	„	2
36	ditto small ..	„	20
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38,	Division curtain and kanat will be charged for agreeably to size of tents,	„	32
39,	Glazed tins with boxes for packing each, ..	„	22
40,	Bathing tents 6 feet and 10 feet (3 cloths) .	„	32 8
41	Bents for tents, per boot,		20
42,	Shutrungas of best material per square yard 11 annas		

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Prospectus.

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Sixty acres are in tea, planted 4' by 2' so as not to lose altogether the cold season of 1869-70

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It is a very fine lay of land and is quite worth 17 its per acre, on an average.

Management—Payments of calls to be made quarterly or monthly to Lloyd's Bank, Darjeeling, Mr Lloyd to be Agent, charging sixty Rupees monthly for his time, trouble and responsibility The garden to be in charge of an experienced manager who would have to hold at least one anna share in it.

Yield of tea and estimate of outlay and profit—From sure data already obtained from similar or somewhat inferior soil in the neighbourhood, the yield of tea may be taken at ½ md per acre the 2nd year, 3rd year 2½ mds, 4th year 4 mds, 5th year and afterwards at least 5 mds per acre. During the cold weather of 1869-70 only 60 acres were planted out in the following season 240 acres and the year after that 200 acres or as much as the funds economically used, will admit of. The land would have to be paid for during the 1st year by quarterly instalments, with interest at six per cent per annum on the unpaid quarterly balances The price of the tea has been taken at the moderate figure of 65 Rs. per maund, but ordinary *terai* has hitherto sold at an average of 14 annas per lb.

It is now proposed, as being the most practicable arrangement, that there be 16 one anna shares and that any one may take one, or more of these anna shares, and pay Rs 250 per anna share monthly, or if he prefers it Rs 600 quarterly, in advance and that the most be made of this money

The project is not intended for large capitalists but for the savings of poorer men with salaries Mr Lloyd is prepared if necessary to take ½ of the shares.

He is already in similar associations in the terai and he started this last one to utilise this fine block of waste land. The terai gardens are all doing remarkably well If present circumstances continue, and there is no reason to anticipate any change whatever, this garden will pay 40 per cent. per annum.

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WILLIAM LLOYD.

Darjeeling, 1st August 1870.

Printed for the Proprietor by JAMES PEARSE, at the *Oriental Press*, Bombay. Published by WYMAN & Co., Calcutta.—Oct. 15th, 1870.

THE

SUPPLEMENT TO
THE INDIAN ECONOMIST

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE

VOL. II.] CALCUTTA, TUESDAY 15TH NOVEMBER, 1870. [No. 4.

Advertisements.

PRIZE OF £5000.

Fort William,—the 11th January 1870.

THE GOVERNOR GENERAL IN COUNCIL is pleased to direct the publication of the following advertisement :—

ADVERTISEMENT.

1.—The Government of India, after communication with various Agricultural and Horticultural Societies in India, and with persons interested in the subject, has arrived at the conclusion that the only real obstacle to the development of an extensive trade in the fibre of Rheea or China-grass is the want of suitable machinery for separating the fibre and bark from the stem and the fibre from the bark, the cost of effecting such separation by manual labour being great.

2.—The demand for the fibre is now large, and no doubt might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown.

3.—The requirements of the case appear to be some machinery or process capable of producing, with the aid of animal, water, or steam-power, a ton of fibre of a quality which shall average in value not less than £50 per ton in the English market, at a total cost, all processes of manufacture and allowance for wear and tear included, of not more than £15 per ton. The said processes are to be understood to include all the operations performed after the cutting and transport of the plant to the place of manufacture, to the completion of the manufacture of fibre of the quality above described. The machinery must be simple, strong, durable, and cheap, and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation.

4.—To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offers a prize £5,000 for the machine and process that best fulfils all the requirements named above.

5.—Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named.

6.—Arrangements will be made by the Government of India for the supply of carefully dried stems, and specimens of fibre separated from the bark, but subjected to no other process, to mechanical firms and others desirous of competing, on application to the secretary to the Government of India in the Home Department.

7.—All machinery, &c., must be brought by the competitors at their own charge to a locality which will be notified hereafter, probably in the North-Western Provinces or the Punjab, and there worked under the supervision of their own representatives for a sufficient time to enable the judges appointed by Government to determine whether all the conditions named have been complied with. The prize machine is to be transferred, if required, to Government at 5 per cent. above cost price; the patent right in any such machinery to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of 5 per cent. on the cost price of all machines manufactured under the patent during its currency.

8.—One year from the date of this advertisement will be allowed for the preparation of the machines and their transport to the locality named for the competition, and the trials will then be made and the decision of the judges announced. If no invention of sufficient merit is received in the above-named period to obtain the prize offered, the Government will continue to allow machines to be tendered for trial till the end of two years from the same date after which, or on award of the prize, the offers herein made will be withdrawn.

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Metcalfe Hall; Calcutta, 16th March 1870.

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THE

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, TUESDAY 15TH NOVEMBER, 1870. [No. 4.

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THE NEW DEPARTMENT OF AGRICULTURE.

[*From the Overland Mail*]

It may be some weeks yet before we shall be made acquainted, by direct official announcement, with the arrangements for the new Indian Department of Revenue, Agriculture, and Commerce; but we are in a position to place before our readers the general design which, as regards its main features, has been determined upon by the Governor-General in Council, and cordially approved by the Secretary of State for India in Council. There are, naturally, some points in the organisation of the department in which the Duke of ARGYLL and Earl MAYO differ, but in all probability the despatch sent to India, as we understand, at the end of last month, will produce a rejoinder settling these minor details, and supplying estimates for the department. Until the actual estimates are given and concurred in by the Home Government, no formal step can of course be taken in the establishment of the department, but we have reason to believe the Duke of ARGYLL has distinctly hinted that it might with great advantage be entrusted to Mr. RIVETT CARNAC, who has shown himself to be not only an excellent cotton commissioner in the Central Provinces and the Berars, but competent to deal with general matters of Indian agriculture. To these subjects he has, in fact, given as much, if not more, attention than any other official in India, and we have already indirectly expressed our hope that he would receive the appointment. As the question of outlay will necessarily stand uppermost in the minds of all who turn to a consideration of this change in Indian administration, we may as well state at the outset that it is in contemplation to remove from the several departments already undertaking, as a kind of extraneous work, some of the duties which will fall to this department, such assistants as will be released from engagements in their present posts by the change. The head of the new department, if he be Mr. Carnac, will continue his present duties. In fact, to him it will be simply an enlargement of his field of labour. With more comprehensive responsibilities, he will require one or two specially qualified deputies, but the additional outlay in staff will not be large, and the application of the projects of the department will, as heretofore, rest with the district collectors. While new enterprises are of course contemplated, still, as the votes for them will come before Council, possibly by a system of reference through the Finance Minister, and as, at the same time, "creating business" in this new department is to be very particularly guarded against, there need be no great anxiety on this head, and increase of revenue must ultimately follow whatever improvements in agriculture are effected.

It will be borne in mind that in the establishment of the department no new principle is involved. The Government of India has hitherto undertaken the guardianship of agriculture, warranted by its peculiarly intimate relations with the owners and occupiers of land. But it has done so in a makeshift sort of way. The revenue boards and commissioners, and the superior and subordinate governments, have all taken an indirect part in the supervision, but there has been no system. No less than four different departments have a finger in the pie. In Bengal, the North-Western Provinces, Madras, and Bombay, the Home Secretariat deals with Land Revenue questions; but in the Central Provinces, the Punjab, Oude, and the Berars, they fall to the FOREIGN SECRETARY; matters connected with Miscellaneous Revenue fall to the Financial Department, and Forest and Fisheries to the Public Works Department. The inconvenience of this seems to have been seriously felt in India. What has been every body's business has been to some extent nobody's; and thus, as we have recently pointed out in articles upon this subject there has been very little progress in the management of land in many districts, while it is often questioned if we have done governmentally all we might in the cultivation of cotton, the breakfast requisites, or even opium. There is then, without a doubt, good reason for bringing into one focus the supervision of Agriculture. Revenue and Commerce are so closely allied to the land and its produce, that they cannot be separated, but it will be a difficult matter to define what absolutely shall come under the control of the new department; and, if we are rightly informed, this has yet to be finally decided. That the management of the land revenues, of all that concerns forest, fisheries and minerals, should come into this department is taken for granted; also opium cultivation and salt manufacture, though the farmer is already under special official direction, and the manufacture of the latter has ceased in Bengal. Opium cultivation is not incapable of improvement, and in the North-West, Government is associating itself more directly with the production of salt. What to do with the Customs' revenue appears to have puzzled the authorities in India and at home, but all things considered we believe it is deemed advisable to bring them under the new department. Were these left to another department, the Government might, by one hand, be encouraging the production of an article, and by the other repressing the trade by supporting Exchequer exactions. It is not, in contemplation to make any alteration in regard to Abkarry, Stamp, and Income Tax management, which may very well remain with the Finance Secretariat.

We have thus indicated the probable scope of the new department. A word or two will suffice upon its constitution. Some favour seems to have been shown in India to the appointment of a Director-General of Agriculture and Commerce under the control of the Home Secretary In fact this, with a view to meet the objection of some members of Council in India, has been recommended, but the Duke of ARGYLL does not recognise the possibility of the department working well unless entirely free from nominal dependence on some superior officer. The wisdom of such a view must be recognised, and all that will have to be done will be very distinctly to map out the duties of the new department as apart from those of the Finance Depart-

ment, while it is thought the Finance Minister should, at least, have the position of representative of the department in Council. He will not be very likely to interfere with agricultural schemes so long as they do not cripple the Exchequer, and at the same time, his direct association with the department will prevent any antagonism between the two branches of agriculture and finance.

Our space does not admit of our doing more than giving an outline of what we believe to be designed concerning this new department. It commends itself in every way to our good opinion, and it speaks for the enterprise of the Government, that in such times of war alarms and financial unhappiness it should boldly take in hand this measure. It has something of the sound of turning the sword into a ploughshare, and the spear into a pruning hook. We believe it will be productive of blessings to the country and advantage to the Exchequer.

AGRICULTURAL STATISTICS OF OUDH.

The land revenue is undergoing re-adjustment for thirty years in a large portion of Upper India, and we cannot too often reiterate that the first step towards a fair and intelligent assessment, is the knowledge of the real yield of the land, the cost of production, and the proportion which the rent paid by the cultivator bears to the total out-turn.

Now, when we examine the returns devoted to Agriculture, none appear to us so carelessly prepared, and so heedlessly passed by the revising officers. It really looks as though the majority of officials, unable to appreciate the value of these statistics, regarded them as an intolerable piece of humbug, and while unable to resist altogether the cry for statistics, determined to make them as valueless as possible.

In a recent issue, we shewed the unreliable character of the statistics of the Central Provinces, and we now propose to examine those issued for the year ending 30th September 1869, by the Oudh Government. We indulge the hope that the attention of the Financial Commissioner may be drawn to the subject, and that in the forthcoming report some explanation may be vouchsafed of the discrepancies observable in that before us.

We have selected Oudh, as being in everyway diametrically opposite to the Central Provinces. There the population is sparse, in Oudh it is dense: there irrigation is wanting, in Oudh it is abundant and freely used; in the Central Provinces low farming prevails, in Oudh the highest farming known in India.

In Statement No. 31, the rates of rent and produce are given;

Rice, average rent ...	Rs.	4	12	9	average produce	649½ lbs.
Wheat ,, ...	,,	7	4	11	,,	878½ ,,
Superior grains ...	,,	4	0	3	,,	644 ,,

According to this return, with the highest farming known in Upper India, rice yields but 6½, wheat but 7, and inferior grains but 8 fold the amount sown. This is simply incredible. The cost of production alone would swallow up so much of the yield, that the balance would not enable the cultivator to pay his rent and live. From the Oudh census report, we observe that there is one male agriculturist to every 3·7 acres of land, and on the average 1 female and 1 child to every male; so that from this 3·7 acres, the cultivator has to pay his rent, and support himself and family.

Assuming then that the land is cultivated with food grains, according to the figures in Statement 29, 60 per cent.—2·2 acres would be under inferior grain; 23 per cent. = 0·9 would be under wheat and 17 p. c. = 0·6 under rice, giving a total yield as follows:

Rice	389 lbs.	deduct expenses say	⅓	remainder	315 lbs.
Wheat	790 ,,	,,	⅓	,,	527 ,,
Other grains.	1,416 ,,	,,	⅓	,,	1,087 ,,
Total...	2,595 lbs.			Total	1,929 lbs.

The result of these calculations is, that after deducting expenses there remain 1,029 lbs. to the cultivator to pay his rent and support himself and family. The rent which he would have to pay, and the amount of grain absorbed thereby, even at the present high prices would be as follows:

Rice.....lbs.	2	14	1	Produce required to pay this ...	80 lbs.
Wheat..... ,,	6	10	6	,, ...	187 ,,
Other grains. ,,	8	13	6	,, ...	320 ,,
				Total...	587 lbs.

leaving but 1,342 lbs. grain available for the support of the cultivator and his family. Taking this at 5 lbs. per diem, (the very smallest quantity on which three persons can live) we have a requirement of 1,825 lbs. against 1,342 lbs. There must be something wrong here. It is quite impossible that agriculture should flourish, if the cultivator cannot get enough to fill his stomach.

If further evidence were required of the untrustworthiness of the figures in these statements, we direct attention to the curious differences observable in neighbouring districts. In Seetapore the rent for sugar land is Rs. 19-10-3, and the out-turn is said to be 247 lbs. At the rate said to prevail in the district, (table 32) the value of this would be Rs. 13-14-9, the conclusion being that the cultivation of 18,620 acres of sugar cane (table 29) is carried on at a dead loss of Rs. 5-11-6 for rent alone. Compare this, on the other hand, with the adjoining district of Kheri. Here the rent is but Rs. 6-10-8 per acre, while the out-turn is said to be 1,640 lbs. giving a value of Rs. 92 per acre. No wonder, if this be the case, that 41,065 acres are under this crop!

Again, look at wheat; ranging the districts in order of area let us compare the asserted yield and rent paid in one district with that of another.

	District	*Rent*	*Produce*	
Percentage of land under wheat to total cultivated.	13. Pertabgurgh	Rs. 7 0	625 lbs.	4·9
	38. Hurdui ...	,, 6 11	824 ,,	6·4
	33. Barabank ...	,, 8 1	1,184 ,,	9·2
	30. Roy Bareilly	0	1,520	12·0
	23. Sitapur ...	8 8	635½	5·0
	Sultanpur ...	,, 8 0 0	900	7·0
	Gondah ...	,, 5 0 0	400	3·1
	21. Oonao ...	,, 8 4 0	1,086	8·5
	18. Fyzabad ...	,, 7 4 3	777	6·0
	18 Lucknow ...	,, 8 2 0	839	6·6
	16. Kheri ...	,, 3 14 8	735	5·9
	5 Baraitch ...	,, 6 6 6	1,017	8·0

Times ①

Now can anything be more incomprehensible than this table? Pertabgurh with nearly half its cultivated area under wheat, gives a yield of only five times the seed, whilst its next door neighbour, Roy Bareilly gives a yield 2½ times greater. Seetapur with a rental of Rs 8-8-4 per acre, returns a fifth lower yield than Kheri, where the rents are less than half. The densely populated district of Fyzabad yields one-third less than the sparsely peopled district of Baraitch; whilst Gondah with nearly double the population of Baraitch yields, 5·8 less out-turn.

In the same manner, we could go through every column of these tables and point out irreconcilable differences, the out-turn of rice and inferior grains being even worse than in wheat, but to what end? We should weary our readers, and we have already proved that the figures in these tables are unworthy of credit. The collection of trustworthy agricultural statistics involves much trouble and labour, but if the Financial Commissioner of Oudh would pay some attention to the matter, and insist upon his subordinates giving their personal supervision to their preparation, and require them to give reasons for their figures whenever glaring discrepancies are observed, in a few years the tables would become of real value. At present they are useless, and simply throw discredit upon the office from which they are issued.

AGRICULTURE OF SINDH.

THE total cultivable area of land in the Sindh Collectorates, and the average yield of produce per acre are as follows:

Kurrachee Collectorate. .... Acres 1,308,278 culturable.
.... ,, 304,319 cultivated.

Average yield per acre.

Rice	451 lbs.	(902 lbs. Paddy.)
Toel	162 ,,	
Jowaree	656	
Bajeree	656	
Barley	328	
Wheat ..	574	
Mustard .	164	
Moong .	492	
Sugar-cane	2,460	
Cotton .	164	(cleaned.)
Cotton ..	492	(with seed.)

We are indebted for this return to Major W. R. Lambert, Collector of Kurrachee. The soil of the collectorate seems to be of a poor description, greatly inferior to that of the upper part of the province. The return discloses, however, the curious fact, that the yield of clean cotton per acre in Lower Sindh is nearly three times as much as the average yield of Indian soil in general.

For the Shikarpore returns, we are indebted to Captain W. A. Gillespie, the Collector of that district. They are as follows

Shikarpoor Collectorate . . .. Acres 2,046,830 culturable.
. . . . ,, 850,646 cultivated.

Average yield per acre.

Wheat	820 to 1148 lbs.	
Barley	820 ,, 1148 ,,	
Mustard seed... ..	450 ,,	
Gram	492 ,,	
Bajeree .	1230	
Jowaree ...	1558	
Rice	1230	(? clean.)
Sugar cane (good)...	1640	
Teel	328	
Flax ... . ,,	820	

Captain Gillispie does not tell us whether the yield of rice is unhusked (paddy) or clean. The area of Khyrpore on the opposite bank of the river, the territory of His Highness Mee Ali Moorad, is 3,91,052 acres, nearly the whole of which seems to be cultivated. In 1867, there were 118,756 acres under actual cultivation which, allowing for two fallows makes the total area of cultivation 356,268 acres out of 391,052. The statistics are :

Khyrpore	Total area	3,944,836 acres (chiefly desert)
	Cultivable	391,052

The average yield per acre of the crops grown in Khyrpore is almost the same, Captain Gillespie tells us, as in Shikarpore

For such statistics as we have concerning the Frontier districts we are indebted to Sir Henry Green, Political Superintendent on the Frontier. Tehy are as follows:

FRONTIER DISTRICTS UPPER SINDH.

Culturable Land .. .. 1,125,552 acres.
Under cultivation ... . 286,612 ,,

Yield per acre.

Cotton ... *clean* .	82 lbs.	(246 lbs. seed.)
Jowaree, Bajera and Dhana	1,476 ,,	
Gram	1,312 ,,	
Rice (husked)	656 ,,	
Paddy (rice unhusked	1,106	
Teel, Mustard seed	410	
Tobacco	738	
Barley	738	
Wheat	984	
Vegetables ...	820	
Indigo ..	82	

We are indebted to Major F. Phillips, the Collector of Hydrabad, for the statistics of that collectorate :

Hydrabad Collectorate ... 2,188,097 acres culturable.
575,390 ,, cultivated.

Yield per acre.

Jowaree .	1,148 lbs.	(2,000 lbs. straw)
Rice	1,312 to 1,476	(1,200 ,,)
Wheat..	902 to 984	(800 ,,)
(Flooded land)	738	(800 ,, boosa)
Bajeree	1,066	(1,500 ,, straw)
Sugarcane	2,400	(goor)
Cotton (cleaned ...	80	
Seed ...	240	

In this case, we are told, that the yield of rice is unhusked, and the quantity is certainly very small. It is a good feature of this return, that Major Phillips gives us not only the yield of grain, but of *kurbee* or straw ; and in the case of wheat of *boosa* as well as grain. The Political Superintendent of Thurr and Parkur is unable to give the average yield of produce in his districts, but supplies us with the following statement of the total area of cultivable land, and the acreage under actual cultivation :

Thurr and Parkur.....Total culturable land ... 666,323 Acres.
Under cultivation in 1866-67 .. 213,164 ,,

The acreage devoted to each crop respectively is as follows

Jowaree	Acres	9,707
Bajeree	,,	139,694
Wheat	,,	16,650
Rice	,,	16,104
Cotton	,,	1,220
Tobacco	,,	5
Til and Jamta	,,	12,961
Miscellaneous	,,	16,820

Of this acreage, the greater part (147,737 acres) was cultivation in the desert, 65,427 acres only being in the Narra and Putt Lands. Lieutenant Mayhew deserves our thanks for this return, and we should be glad to see the others supplemented by information of the same nature. It is very much to the credit of the Kurrachee Chamber of Commerce, through which these statistics are made available to us, that it should have engaged in these researches. Might not the other Chambers of Commerce imitate the example with good effect ?

YIELD OF COTTON IN SINDH.

WE have noticed above, the exceptionally large yield of Cotton in the Kurrachee Collectorate. The similarity in point of climate, formation, and mode of irrigation between the deltas of Egypt and Sindh has frequently been remarked upon, but while the Egyptian yield is exceedingly heavy, all that we can say of the Sindh yield is that it is heavy for India. The cultivators themselves, we are told, consider the soil of Middle and Upper Sindh extending on both sides of the river from Kotree upwards, as the best cotton land in the province. We have now before us an account of the average yield per acre in the Hydrabad and Meerpore talookas of the Hydrabad Collectorate during the 3 years 1854 to 1857 :

	1854-5.	1855-6.	1856-7.
Hyderabad talooka...	159 lbs	160 lbs.	154 lbs. per acre.
Meerpore ,, ...	110 ,,	224 ,,	149 ,, ,,

We have here an average yield, three years running, of 160 lbs. the acre. Cotton is, we believe, a *khureef* crop in Sindh as elsewhere, but instead of depending upon the rain-fall, it is watered by the flooding of the Indus. An average of 160 lbs. per acre comes somewhat near the general American average which is ollows .

N. Carolina	145 lbs.	
S. Carolina ..	123 ,,	
Georgia	150 ,,	Average 151 lbs.
Florida ...	152 ,,	per acre.
Alabama	176 ,,	
Tennesse	180 ,,	
Mississippi ...	... 201 lbs.	
Louisiana	296 ,,	Average 256 lbs
Texas ...	275 ,,	per acr.
Arkansas	251 ,,	

The Sindh yield in the talookas named, thus actually exceeds the yield in America except upon the best soils, while artificial fertilization is resorted to, we believe, on all. A yield of 160 lbs. an acre, if we could attain it generally in India, means so far as man can see, enduring prosperity for the country.

At present, the yield is terribly below this even in Western India :

Ahmedabad	43 lbs. per acre.	
Kaira ...	80	
Broach	73	
Surat ...	. 92	
Khandeish . . .	. 52	
Sattara	. . 40	
Ahmednuggur ...	.. 60	
Sholapoor	40	
Kholapoor	. 94	
Dharwar	.. 45 ,,	(Native cotton.)
.. .	70 ,,	(New Orleans)
Belgaum	. 30 ,,	(Native.)
... .	... 60 ,,	(New Orleans.)

The average yield of Western India generally, according to Mr. Cassel's researches is 63 lbs. per acre.

According to Colonel Monier Williams' Memoir, five-sixths of the soil of the Broach zillah consist of the *kala bhow* or black cotton soil of India ; and the produce in the Jumboosear pergunnah of clean cotton per acre in his time (1828) was 128 lbs. In 1844, Dr Burn who had charge of the Broach experimental farm, estimated the yield to be 83 lbs. per acre under the most careful cultivation, and 55 lbs. only under ordinary circumstances. Mr. Davies, the Collector, reduced these estimates to 54 lbs. per acre respectively for the seasons 1843 to 1846-47. Mr. Cassels in his elaborate work gives four estimates of 80 lbs., 108 lbs., 80 lbs. and 70 lbs. respectively. It is clearly a grand reproach to us that after all these years of research and experimentaling, we are as ignorant as ever of the real fact. If we strike a mean between these conflicting estimates, we have an average return of 77 lbs. per acre as the yield of the great cotton field of Guzerat

AGRICULTURAL STATISTICS OF MADRAS.

In his Report on the Famine of 1866, Mr. Dalyell, Secretary of the Board of Revenue, remarks that, most unfortunately, although there are in Madras probably better means of obtaining accurate information as to area, population, and food supply than in most other countries, little or nothing has been done in this direction during the last sixty years. A few attempts at numbering the population have been made, but they have been very imperfectly carried out, and only very rough calculations of area are obtainable. Again, though the cultivation of every ryotwary village is inspected once a month, at least by a Government officer, there are no reliable condensed returns giving the extent of land under each crop, and little or nothing is known, with accuracy, of the zemindary estates, whether as to area, cultivation, or population. The broad facts however remain, that the population in ordinary years has subsisted without difficulty on the produce raised, and that the extent of land under cultivation in those portions of the Presidency held on ryotwary tenure, had risen from about ten million acres in 1855, to sixteen million acres in 1865. In 1867-68 the area under cultivation increased by 353,286 acres. The total area of the Presidency is estimated at 124,277 square miles, being thus more extensive than Great Britain and Ireland, and about the same size as the kingdom of Prussia down to 1866. There are no details as to the extent of land cultivated and waste in about one-fourth of this area, but it is known that of the remaining three-fourths, one-third is under cultivation, and supposing the proportion of the waste to cultivated land to be the same throughout the Presidency, a very rough approximation to the total cultivation of the Presidency may be arrived at. It may be estimated to be about 28 millions of acres.

Ryotwary lands	16	million acres (actual)
Inam lands	4¼	million acres (actual.)
Zemindary lands	5¼	million acres (estimated.)
Malabar and Canara	2¼	million acres (estimated.)

In the Ryotwary, or Government lands of other districts, the land tax is fixed on each field in regard to its extent and quality, but in Malabar and Canara the tax is upon the holding.

"The available returns show, that of the 20¼ million cultivated acres of Ryotwary and Inam, or rent-free lands of which there are details, a little less than one-fifth is irrigated and supposing the estimated cultivation of the whole presidency to be divided in the same proportion, there would be about 5½ million acres of irrigated land, and 22½ million acres of unirrigated land, under crop. The proportion of the irrigated land applied to the production of any crop but rice, is so limited, that it may be assumed that the whole quantity of this description of land is under that crop, without seriously affecting the calculations about to be made, and it may perhaps be similarly assumed, that of the 22½ millions of unirrigated acres, at least 15 million acres are devoted to producing other food grains. No complete returns are available showing the extent even of the Ryotwary lands devoted to each description of unirrigated crop, except in regard to Cotton and Indigo—

Years.	Indigo.	Cotton.	Years.	Indigo.	Cotton.
	Acres.	Acres.		Acres.	Acres.
1861-62.....	173,436	1,020,184	1865-66	151,542	1,516,076
1862-63.....	203,131	1,309,234	1866-67	..	1,375,425
1863-64.....	163,665	1,766,312	(11 months).	...	...
1864-65.....	128,140	1,747,501	1867-68	...	1,462,432

These products have never ye toccupied so much as 2 million acres, and if 5½ million acres are allowed as being cultivated with oil-seeds and other products not used as food, it will probably be beyond the mark, so that it may fairly be estimated that, on the average, 15 million acres of dry land are devoted to the production of food grains, and that 5½ million acres of wet land are used for the same purpose. The Revenue Settlement Department, after elaborate inquiries and experiments extending over the last ten years, estimate the produce of an acre of the best rice land to be from 1,080 Madras measures (about 30 cwt.) in the southern districts, to 1,200 measures (about 33 cwt.) in Godavery and Kurnool, and the produce of the worst rice land to vary from about 300 measures (about 8 cwt.) in the former districts, to 533 measures (about 14 cwt.) in the latter. Probably, therefore, 20 cwt. of paddy, (rice in the husk) or 10 cwt. of cleaned rice, may be fairly taken as a good average of the productive powers of the 5½ million acres of irrigated land, and 190 measures, or about 5 cwt. may similarly be taken as the productive power of the 'dry' land, whether it be devoted to the growth of raggy, cumboo, cholum, or any other of the numerous unirrigated crops which are used as food by the lower classes. One acre of wet land will thus produce as much food as two acres, of dry land. The rough estimate of the annual production of the country, in food grains, would thus be 55 million cwt. of rice and 75 million cwt. of dry grain. Excluding the considerable import of inferior grain, by land, (into Canara from Mysore for example) the average excess of the exports of food grain over the imports, during the five years ending 30th April 1866, was about one million cwt. per annum, of which about three quarters of a million may be taken to be rice, and a quarter of a million inferior grains. There would thus be left for the consumption of the people 54¼ million cwt. of rice, and 74¾ million cwt. of dry grain, or 129 million cwt. in all. By the census taken in 1850-51, the population of the Presidency was estimated at about 22 millions. The census of 1856-57 gave it as about 23 millions, excluding the district of North Canara, (now transferred to Bombay,) and the census of 1861-62, at about 24½ millions. In all these estimates, the population of the town of Madras is taken as 720,000, which is probably about 270,000 beyond the mark. Supposing, however, that the population has averaged 25 millions during the last 5 years, there has been an annual supply of 129 million cwt. of grain for their support, or more than 5 cwt. for each person, being more than 1½ lbs. per diem, whereas, a family of five can subsist upon 7 lbs. per day without difficulty, and three acres of superior land, supposing one acre to be irrigated, or four acres of unirrigated land, would support such a family for a year." We are persuaded that Mr. Dalyell is wrong in this last estimate, but we owe him many thanks for his very interesting statistics.

EDITORIAL NOTES.

The Hingunghat cotton seed sown in the Punjab seems to have been a failure. It was sown we are told in a large number of plots in all parts of the province during the season 1869 The experiment was for the most part a failure. The plant is apparently not so hardy as the indigenous cotton, and exhibits a tendency to run to leaf and wood. Under the most favourable circumstances, the yield was less than that of the common cotton of the country. Upon the whole, the prospects of cotton cultivation in the Punjab are believed to be encouraging. It is extending in the districts best suited for it.

A local contemporary hears that the Cotton Commissioner has solicited the Government of India to move the Secretary of State to send out six more European gardeners on the same conditions of service, and on the same salary as those on which others have been entertained. Out of these six gardeners, two are to be posted in the N. W. Provinces, one in the province of Oude, another in the territories of His Highness the Maharaja of Putialla, who is willing to encourage the cultivation of cotton in some of his estates, and two are to be kept in reserve in the Botanical Garden in Bengal, with a view to relieve any of these officers in cases of emergency or sickness, on the ground that the services of practical gardener of this nature required, are not available in this country.

Our expectations regarding the Forest Establishment of Madras are just beginning to be realized. The actual receipt and charges for the year 1869-70 were Rs. 495,789 and Rs

286,691 respectively, shewing a clear gain of Rs. 209,091. The result for the current year will, it is hoped, show a similiar, if not a better, state of things. The estimates for 1871-72 stand thus :

Receipts	Rs.	4,95,250
Charges	,,	3,75,000
Profit	,,	4,20,250

The apparent decrease, when compared with 1869-70, is owing, first to the extreme caution of conservancy officers in under-estimating receipts and over-estimating charges ; and secondly, to large reserves and provision for extensive plantations to meet future demands for Railway fuel.—*Athenæum.*

THE *Pioneer* notices that Mr. George Campbell, has been lecturing lately on the duties of the Government of India and of the merchants of England in promoting production in India. Among other things he pointed out that it was a fallacy to represent native farmers and landlords as too conservative to improve. He believed that all that was required was to show them the means of raising better crops In his opinion it was the duty of the Collector to promote agricultural improvement in his district and of Government merely to facilitate the traffic. Adverting to the subject of competitive examinations, Mr. Campbell deplored the dis-establishment of Haileybury for the service, mentioning in particular the lamentable deficiency in common arithmetic displayed by the present generation of Civil Servants. They should be trained, he thought, for executive work, and should acquire some knowledge of agriculture the development of which was an object of such urgent importance to the country. Mr. Campbell will undoubtedly throw in the great weight of his opinion in favour of an agricultural department, and if such a *bureau* is really to come into existence, it would undoubtedly prove of value that the Secretary to the Agricultural Department should have some knowledge of agriculture."

"AN opinion, "says Colonel Haly," has been expressed to the effect that all the results of high scientific farming are, substantially, already attained by nature in fertile tropical lands, by the joint action of the sun of the torrid zone and moisture But that this is not the case the example of the pine-apple may show. In its wild state, in its native regions, it is unquestionably a delicious and noble fruit ; but how greatly superior to the wild pine, finely as it may grow, is the cultivated Indian fruit, or the magnificent product of a well-managed English hot-house. This is a thing familiar enough in England. Precisely elucidating the same idea, though resting on hearsay information, but which I have no reason to doubt, is a circumstance regarding the orange, related by a traveller, who, at Rio Janeiro, became acquainted with a wealthy Brazilian, and was taken by him to see his garden. Among the other fruit-trees were orange-trees, so highly cultivated and carefully tended as to produce a fruit immeasurably superior to any other ever tasted by him elsewhere, and so incomparably more exquisite, that he felt he had never, so to speak, enjoyed the flavour of an orange before. These two examples of the native produce of tropical and semi-tropical climes are, I think, pretty conclusive on the point as to what may be done by European science in improving Asiatic plants, and cultivation in India generally."

WE cannot help thinking, says the *Pioneer*, that Indian villagers are under some kind of delusion that cattle are in themselves wealth, without reference to their use. At this season of the year, when the most familiar sight is a herd of cattle browsing on the grass, and under every group of trees, each accompanied by the never-failing companion, the assiduous bird, *Pastor*, a passer-by cannot fail to be astonished at the number of unserviceable animals he sees grazing around him. Undersized oxen that are of no sort of use for the plough ; old cows that are mere frame-works of bones, guiltless of milk and long past toil ; and numbers of unwieldy buffaloes who are stupid and slow for draught, and whose cows yield a very inferior article for the dairy. Then, too, it must be remembered that a dead ox is of no value to the ordinary peasant. He cannot eat him, he will not skin him, he knows not that hoofs make glue, and horns combs ; and his only wish is to throw the carcase somewhere where the *chumars* or the *pariah* dogs may easily get hold of it. Altogether it seems to us that there is a large element of the national shiftlessness in cattle-keeping, and that many of the small farmers would only be able to assign custom, or village reputation, as a reason for the retention of so many animals they do not want, and which are neither ornamental nor useful.

THE yield of cotton per acre in the Punjab during the last season is officially declared to have been as follows :

Jullundhur	99 lbs. per acre.	
Peshawur	96	
Umbalah	93	
Derajat	91	Average 68 per lbs. per acre.
Umritsor	72	
Mooltan	57	
Rawul Pindee	49	
Lahore	45	
Delhi	44	
Hissar	41	

In the previous year (season 1868-69) the highest average yield was in the Derajat where it reached 96 lbs per acre. The lowest was again in Hissar, where it averaged 40 lbs. only, and very little more in Mooltan and Lahore. The Punjab yield generally may be estimated, we think at an average about 70 lbs. per acre. The yield in the North West Provinces seems to have averaged 46 lbs. per acre in 1867-68 ; 49 lbs. in 1868-69, and in the last season 40 lbs only. In Egypt, we are told, hat the yield is 500 lbs per acre, but this can hardly be the average.

EUROPEAN AGRICULTURE.

SMALL FARMING.—BELGIUM.

IN the recently-published number of the "Journal of the Royal Agricultural Society" there is a report on the agriculture of Belgium, by Dr. A Voelcker and Mr. H. M. Jenkins, which amongst numerous points of much interest points to the power and defects of "La petite culture." Its power, by the exertion of merely manual labour, to reclaim infertile land and produce considerable crops and its defect in the absence of continuous progression seem to be equally apparent. Like most other modes of cultivation, it is mainly dependent on soil, climate, and the social habits of the community, and can scarcely be promoted in uncongenial localities, nor usefully suppressed where nature and man alike concur in its favour. In mountainous and very rugged districts of this country (English) we suspect the value of petite culture has been too much overlooked, but to the greater part of England and Scotland we believe it to be wholly inapplicable.

The reporters thus refer to the reclamation of sandy heaths in Flanders:—"The autumn before the land is brought into cultivation the heath is cut, and preferably used during the winter as litter for stock ; otherwise it is left to rot on the compost heap. While the weather permits, the land is dug with the long Flemish spade to the depth of about two feet, the top layer being completely buried, and about 15 inches to the two lower beds mixed and brought to the surface. The cost of this operation ranges from 5*l.* to 6*l.* per acre up to a much larger amount, but it bears no proportion to the thereby increased value of the land ; for the rental immediately after reclamation may be placed at 30s per acre, while the land was previously worthless for farming purposes ....What now prevails in Flanders—what has excited the admiration of agricultural travellers for the last half century—is unquestionably the result of incessant labour combined with marvellous frugality." But the small size of the farms no less than the reclamation of the sandy heath contribute to the reputation of Flemish farming. There was this striking peculiarity, "that the farms were exceptionally small, and that this once barren district produced the largest crops, and sustained in apparent comfort and independence the densest agricultural population in Europe. But while in the interval, English agriculture has made enormous strides, the farming of Flanders has remained stationaryt; and it is now as accurately described in the old books as in was in the last generation, in the days when they were written."

Under a bad tenure, and where a farm of 20 acres is accounted large, this light sandy land lets at from 48*s.* to 60*s.* per acre. Where small farms, say from 5 acres, are mixed with larger farms ranging up to 50 or 60 acres, rents range from 28*s.* to 45*s.* per acre, the small farms being most highly rented from there being most demand for them, Much effort is made to

store manure, and close buildings are used for the purpose under the notion of preventing the escape of fertilising properties—a notion now found to have no scientific foundation.

The great object of the small farmer is to grow first as much as possible for his own consumption and next what will sell. His industry is great and his thrift something prodigious. That an English workman, even a farm workman, with the same amount of frugality could live as well (or better) as the Flemish small farmer is certain.—*Economist, 27th August.*

JUTE AND INDIGO.

Ten years ago European enterprise in Lower Bengal lay gasping beneath the blows of Act X. of 1859. The Calcutta papers drew a handsome income from advertisements of indigo factories for sale. The great districts of Nuddea and Dacca seemed ruined. English gentlemen who had been worth lakhs in 1857 were bankrupts in 1860. They had committed no fault; they had lived exactly as their predecessors had lived, but somehow the value had gone out of their estates, and their day had departed for ever. The end of a great enterprise had come. At the present day, the Presidency division is studded with its melancholy remains. Dilapidated, grass-grown rows of vats, blackened and unroofed factories, once resonant with jovial laughs and the abodes of hospitable Englishmen, strike the traveller with a feeling of neglect and decay in Dacca, in Furreedpore, in Nuddea, in Pubna, and Jessore. The glory of indigo has departed. But in the same districts, and particularly in the districts to the eastward, a new industry has sprung up. Down the Jamuna and the Padma the banks are lined with tall green stems, that seem to grow out of the water, and which certainly grow where no other crop will. But it is on the Megna and the rivers of Mymensingh, Sylhet, and Eastern Bengal Proper that jute is seen in perfection. Here it grows to the height of fourteen feet, shooting up as fast as the water rises, and rising to sixteen feet rather than succumb to the floods. The difficulties which led to the ruin of indigo are unknown in the cultivation of jute. Natives can grow it themselves; no complicated manufacture involves European supervision or interference. The peasant cuts it, steeps it in the river, washes out the fibre and sells it at the nearest market, without a single *saheb* appearing on the scene. Again, although a most exhausting crop, even more exhausting than indigo, yet it grows on land subject to inundation, and the river deposits more fresh soil than the crop, (although every particle of it—fibre, stalks and all—are sold off the land) can consume. This year hundreds of thousands of acres of *water* and river land are under jute, and the crop, after various perils, has turned out a bumper. New jute markets and little centres of European activity are developing. The truth is that English enterprise in Bengal, instead of being ruined by the downfall of indigo, has merely been diverted into a new channel.—*Calcutta Paper.*

RICE.

(*Proceedings, Agri-Horticultural Society.*)

Submitted the following remarks from Lieut. J. F. Pogson :—

"I do not see the *Field* newspaper, but the subjoined extract therefrom, which appears in the *Delhi Gazette* of the 25th August is deserving of attention :

"'The Chinese assert that the rice imported from other countries, where manure is not employed, is so inferior to their own in food-giving properties, that three bowls of it are required to satisfy a hungry appetite against one of the home-grown variety. In Japan, however, the soil is so superior to that of China, that the rice produced in it is not liked by the Chinese on account of its extreme richness.' Further on it is stated—'The yield is said to be sixty bushels of rice per acre,' i. e. China rice.

"That the rice of China contains more gluten than Indian or American rice is quite possible, and that the rice of Japan contains more than that of China, is proved by the fact of its 'extreme richness.' The best Carolina and Patna rice only contain 7½ per cent. of gluten and three-fourths per cent. of fat, and as the nourishing powers of cereal, depend on their richness or gluten, and fat, the rice of Japan must contain both in excess, to be condemned on account of its richness.

"There is no accounting for taste, and as the Japanese have for ages thriven on the very rice condemned by the Chinese, I suspect the glutinous nature of the Japan rice is what is objected to. But be that as it may, it is quite clear that the Japanese possess a very superior description of rice, and that the Chinese have a variety far superior to ours. Under these circumstances, I would venture to suggest for the Society's consideration that it would be advisable to give both kinds a trial in India. The land being reclaimed from the salt-water lake, would be a very good site for the experiment, and the sale of the produce as acclimatized seed would yield a no small income to the town of Calcutta. My experiment plot of Carolina rice is flourishing, 43 inches being the highest growth, and 33 the lowest No signs as yet of the ears of rice, but they cannot be far off

"You sent me two kinds of *Lall Sag*; the real or red kind has maintained its usual growth, but the other kind varies in height from 32 to 63 inches, and is laden with seed. The leaf of this *sag*, when cooked, gives a pale pink color to rice, and is not near so palatable as the true '*Lall Sag*.' It is, I think, of value for its seed, which *Paharees* say they could make into flour, and eat as they do the '*Bathie*.' Goats and rabbits eat the leaves greedily, and the porcupines enjoy the thick juicy stems; these are from three to five inches in circumference, six inches from the ground.

"As this *sag* has grown so well in very poor rocky soil, and has not suffered from either the drought, or subsequent heavy rains, its value as cattle-food becomes apparent, and as such I would recommend it to all residents in hill-stations who keep cows, goats, and rabbits. The seed, no doubt, will answer for fowls and pigeons.

COCHINEAL.

(*Agri-Horticultural Society's Proceedings.*)

The subject that next came before the meeting had reference to Cochineal, in the shape of a letter from the Honorary Secretary of the Mysore Agricultural and Horticultural Society, who writes as follows :—

"Should there be in the Government Gardens or Horticultual Gardens any plants of the true Mexican Cochineal Cactus, *Opuntia Cochinillefera* and *Opuntia Tuna*, or kinds so called, may I ask you to send some plants in a Wardian case by the next steamer from Calcutta to my address, care of Messrs. Binny and Co., Madras. There is a cactus in the Bangalore Government Gardens called the *O. Cochinillefera*, but I have my doubts of its being the correct kind, and comparison with your specimens will be useful, and also to have your variety to grow. I purpose again trying to introduce the true *Grana fina* cochineal insect-cultivation here.

"If any more recent attempts at true cochineal culture have been made in your part of India since those mentioned by Dr. Royle in his work, the 'Productive Resources of India,' page 57, could you give me a guide as to where I may find the record? It appears that the experiments made nearly 100 years ago failed, because the wrong insect was introduced, and probably also the wrong kind of cactus. A gentleman recently introduced the true insects, but he had no cactus food for them after their arrival here, and they died. He did not know of the cactus in the Bangalore Government Gardens that I have alluded to, and so the chance of trying that cactus was lost."

The Secretary mentioned he had been able to meet the request of Colonel Boddam, through the kind assistance of Mr Scott, the Curator of the Royal Botanic Garden, who had supplied him with cuttings of what he considers the true *Opuntia Cochinillefera* and *Tuna*. He (the Secretary) had also referred Colonel Boddam to the sixth volume of Transactions, shewing what the Society had attempted towards the introduction of the domesticated cochineal insect (*Grana fina*) since the publication of Dr. Royle's work.

The Secretary next read a communication from, the Secretary to the Chief Commissioner of Mysore forwarding copy of a letter from the Honorary Secretary, Mysore Agricultural and Horticultural Society, and enquiring if any attempts had been made to introduce the growth of cochineal in the Bengal Presidency.

It was agreed that Colonel Boddam's remarks be introduced in the Proceedings of this day's Meeting. They are accordingly inserted as follows :—

"I have the honor to request you will submit the following to Colonel Meade in view to enquiring whether any attempts have been made to introduce the growth of cochineal in this Province (Mysore.)

"It is not generally known that of late a great increase in demand for the article has arisen.

"Brazil and Mexico have always supplied Great Britain with large quantities, but of late years cochineal has been largely cultivated in Madeira and the Canary Isles, and during the past year many new plantations of cochineal have been established in Teneriffe and the neighbouring isles, in all of which the cultivation is proving most remunerative, a large amount of capital being thus employed. So great indeed is the demand in Europe for this valuable dye, and so large the profits derived from it, that every available piece of land on the islands is being laid under cactus cultivation for production of cochineal. So much so, that every other branch of field produce is suffering; even the cultivation of good plants both for human consumption and for cattle is being neglected, the temptation of realizing such large returns from cochineal crops causing landholders

to neglect proper care of the soil suitable for growing other plants.

"Several species of Opuntia (Cactus) serve as food for the cochineal insect, though *Opuntia Cochinillefera* and *Opuntia Tuna* are the most commonly used. There are several varieties of cochineal insect, an inferior kind, abounding in Bengal, but the cochineal of commerce is the '*Grana fina*' of South America, and I cannot learn whether it has been ever imported or had a fair trial. The question occurs to me whether any part of the Mysore province would do for cochineal culture. Any kind of cactus, I believe, would grow here, and a great many of the Flora, &c., of Brazil and Mexico, do well at Bangalore. We have also marked the regular seasons."

In reference to the above letter of Colonel Boddam the Secretary remarked that though the wild species, *Grana sylve* , abounded in various districts of Bengal, no attempts had been made, of which he was aware, to improve it by careful culture and judicious management. This wild insect has been found, by ordinary culture, to yield a color equal in brightness to the domesticated Mexican species, or *Grana fina*, but it does not yield more than one-third of the coloring matter. As several attempts to introduce the *Grana fina* into Bengal had failed, owing to unsuitability of climate, efforts might now be directed towards improving our own indigenous sort. From correspondence which was published by the Society twenty years ago, certain portions of the N. W. P. and the Punjab would appear to offer a fair field both for the improvement of the indigenous kind, and for the introduction of the Mexican variety. The experiments of the late Dr. Dempster on the wild cochineal of Upper India and the Punjab, and the observations thereon of of Drs. Falconer and McClelland, which are recorded in the seventh and ninth volumes of the Journal, will be found alike instructive and interesting.

CHINA GRASS.

(*Agri-Horticultural Society's Proceeding*)

Read the following extract of a letter from Mr. James Montgomery, of the Ram Bag, Kangra, in continuation of the remarks submitted at the last meeting:—

"I have much pleasure in acknowledging your favor of the 25th ultimo, and am glad to find that you consider the China-grass fibre, prepared by me, to be of good quality. In a letter from a dealer in England, of 21st July, I am informed that my fibre, is £20 per ton better than any then in the market.

"I cannot at present send you any seed. My plant has been cut twice this year, and I am now cutting it the third time. A few old clumps have, however, been left, and should they ripen any seed in October, it shall be saved for you. I enclose a few 1868 seeds, but these are now useless. I have noticed that very dry seasons are favorable to perfecting the seed. Last year was an exception alone in this respect, and the plants were loaded with seed. This year has been the reverse, 72 inches of rain having fallen since 14th June.

"Full-grown leaves on my plants measures 12″+17″, I have often endeavoured to dry specimens, but cannot preserve them in their natural color, the upper surface invariably turning more or less black; so sending you leaves would not be of much use. I have posted for you a piece of root, and if you will have it planted in your garden, it will, in a very short time, enable you to examine the fresh leaf. That the "*Rheea*," and "*Dœhmeria nivea*" are of the same species, there can be no doubt; but whether direct comparison would show a difference sufficient to authorise their being considered distinct varieties, I am not in a position to judge. There are two varieties found in the hills in this vicinity, which, when growing, and at a short distance, I can scarcely distinguish from my own; yet close examination shows marked differences between the three.

"It is very probable that most, if not all the specimens sent to you from the Punjab, were obtained from me. So far as I can ascertain, until I introduced the plant in 1863, few in Upper India had seen either it, or its fibre. Since then I have supplied roots to the Lahore and Saharunpore Gadens, and to a number of private individuals. No fibre has yet been shown me superior or even equal to my own, nor has any reached England. I am now preparing a quantity for transmission to England, and will send you a fair sample from the bale for your own inspection and that of your meetings. Should a better specimen be sent you, I shall esteem it a favor if you will send me a small portion."

The seeds referred to in the above letter are bad, but the root is sound, and Mr. Scott, who has kindly undertaken to raise it, reports that it is pushing out shoots vigorously. Though the plants (Rheea) flower annually in the Botanic Garden in the hot season, they never produce a single seed. The introduction of this root from Kangra will enable a careful examination to be made hereafter between the Rheea and this other stock which, Mr. Montgomery reports having raised from seed imported in 1864 from China direct.

The following further information regarding China Grass has recently been received from the Agricultural Bureau at Washington.

Messrs. Wade & Son, manufacturers, of Broadford, England, who forwarded the specimens of manufactured China Grass to the Museum of the Department of Agriculture of the United States of America in 1865, wrote recently as follows, to the Hon'ble Horace Capron, relative to the status of the manufacture:—

"We have pleasure in acknowledging the receipt of your communication of the 25th August, and shall be glad to give you any information now, or at any time, on the question of Ramie or China Grass.

"1*st*.—The machinery employed in manufacturing China Grass has been greatly improved during the last few years, but, owing to the limited supply of raw material, the manufacture of this fibre has not yet been very much extended.

"2*nd*.—Respecting the prospect for future demand, it is our opinion that, with a large and regular supply of raw material at a moderate price, say about £25 to £45 per ton in Liverpool, this article would in the course of time be a staple fibre in English manufacturing, taking to some extent the place of cotton, wool, or silk (with both the latter articles, we may, say it can often be advantageously mixed).

"3*rd*.—The amount of grass imported into this country varies considerably. During the last twelve months little has come forward, and the market is entirely cleared; there is now a demand for it at £70 per ton, but no great quantity could be consumed at this price. During the past year we have had many inquiries from the United States (some of them of a very enthusiatic nature) regarding ramie, &c., to all of which we have replied by sending samples and giving the best *bona fide* information in our power

"We may say that we consider your planters are injuring their interests by the manner in which they are getting up fibre. It is well known that China Grass when cut and dried has an outer bark on it, which the Chinese remove by hand; now, as this would be impossible in the States, it must be taken off by machinery, and in this state exported to England.

"The next process, probably the most important in the manufacture, that of discharging the gum, is one that has taken a great many years to develop, the manner in which it is done making the grass either valuable or almost worthless. The object to be kept in view in discharging, is to retain the strength, elasticity, color, and lustre of the grass, and the samples of ramie we have had sent from the States are all spoiled in discharging, being made tender, many of them almost rotten, a bad color, and entirely without lustre; therefore we see no success in the exportation of ramie but in the rough state with simply the bark taken from it.

"We are preparing, as requested, a small case of samples which will be ready in about six weeks, and shall be forwarded without delay."

C. F. Dennet, of Boulogne, France, writes concerning a new process for separating gum and gluten from the fibre, and for bleaching it without danger or injury from chemicals. He also says there is a new machine for spinning and twisting threads and yarns, of which the spindles are worked by conical and friction, instead of bands and drums running with small power and great speed, and twisting a uniform and perfect thread. He reports the scarcity of ramie fibre, referring to one mill fitted up expressly for the purpose of working China Grass, which is unemployed for want of material, and gives the opinion of a lace manufacturer that if ramie can be treated to retain its strength, softness, purity, and brilliancy of color, it will find a ready sale.

The *Petite Press* of Paris, under date of July 31 of the present year thus presents the history and utilization of *L'Ortie de la Chine*, or white nettle of China:—

"In the Su Chuen there is a great commerce made in cloth called hia-pon, which is made from several varieties of nettle, but principally from Urtica nivia, a white nettle; this herbaceous plant, which flourishes in a damp soil, resembles greatly our hemp, and gives a brilliant whiteness, and is of great strength; they use it to make summer clothes, bed curtains, handkerchiefs, sacks for grain and ropes. There is no textile material in existence to be compared with white nettle (L Ortie blanche) or China Grass, as the Americans call it, for the fineness and firmness of its fibres and their strength. It has been imported into France where it has become perfectly acclimatized through the pains taken by Father Voisin, Missionary of China, who was the first to understand its importance, which is so great that the Society of Acclimatization gives a prize for these fibres. Those who occupy themselves with this matter have only to take the Chinese for models to know how to draw from the nettle tissues as fine as cambric. But the Chinese have nothing to teach as to twisting; they have remained stationary, and are still pursuing the same old system, perhaps dating from the dynasty Tchang or Tcheon.

"The seeds are small and easily transplanted The method of preparing this plant is very simple. As soon as it is cut down, it is passed through a crusher, to separate the fibres and pulverize a portion of the gummy matter, after which it is soaked

in water to purge it from the residue of gum; then re-passed into the crusher, and finally plunged into a bleaching bath, whence once a day, it is sent to the manufactory. Now that the utility of the plant is proved, why not introduce it into California where the other varieties of nettles grow abundantly in a wild state? The farmers exhaust their soil in growing one kind of grain, when they might give the soil rest by producing other products, which would prove more profitable. Cultivation of the nettle would bring them a certain return more uniform and advantageous, because they would gather three crops each season, and the influence of weather would not affect it. Acclimation of this plant would prove a new branch of industry in California."

The Honourable Mr. Capron adds—

"Absurd statements, by interested and ignorant parties touching the botany and practical value of these plant are publicly made, and the public mind has been greatly mystified. As to the demand for the fibre, all depends upon its condition It must be very small for worthless samples manipulated by some of the machines and processes employed. It may be very large if the fibre can be easily and perfectly separated from the wood and its own bark at slight expense. The business of *propagating* plants has been very lucrative, but no one is known to have made a fortune by producing the fibre, nor will such a case be reported, until inventive genius and mechancial or chemical skill has perfected its proper and *cheap* preparation. It would be well to extend its *culture* slowly, till this result is more nearly attained than at present. The Department of Agriculture has investigated this subject carefully, has disseminated seeds and plants, and encouraged the experiment of its culture, and would stimulate invention and effort to a successful issue, and at the same time shield the unsuspecting from losses through th greed of gain."

(Signed) HARRY RIVETT-CARNAC,
Cotton Commissioner.
August 1870.

Official Gazette.

CALCUTTA, 15TH NOVEMBER 1870.

COTTON.

THE COTTON CROP IN WESTERN INDIA.

SOUTHERN MAHRATTA DISTRICTS.—The last report received from Mr. Shearer is dated 15th instant, and relates to the Talooka of Koosegul. In this district, the cotton plants suffered much from the excessive rain in the beginning of the present month, the continued moist weather causing them to shed their under foliage, besides producing blight to some extent Since the return of favorable weather, the cultivators have been busy, sowing wheat and grain, the cotton plants being meanwhile left unattended to, although the necessity of surface-stirring is very apparent in the dirty condition of the fields The cultivators have the satisfaction of finding that the recent continued rain, though too much for the cotton crop, has helped forward the jowaree, which is rather late With regard to the progress of his experiment in this district, Mr Shearer writes as follows :— "The imported New Orleans has suffered slightly from the rains, but more so from caterpillar and weevil, the latter insect having the peculiar habit of eating the foliage by night, and covering itself by day in the ground. The most forward plants are now two feet high and are remarkably healthy, where they have escaped the above causes of injury. I must not omit to state however, that these plants are sheltered and have had the benefit of village manure. Later sowings have lost their underfoliage, but with a continuance of favorable weather, the plants will soon furnish themselves with fresh leaves. Acclimatized New Orleans, grown from selected seed, is similar to the above, though perhaps not quite so strong. Dharwar indigenous, early sown, is now from 9 to 18 inches in height, and very healthy, shewing no signs of having suffered from the late rains. Later sowings of this variety promise to improve now with the fair weather. Plants from imported Broach seed are looking very healthy. So also are those from the latter sowings of two years' acclimatized Broach seed, considering the unfavorable weather we have just had. Imported Egyptian has been growing freely up to the present time, both from the early and late sowings. The same variety acclimatized is not so strong or healthy. Sea Island, both imported and acclimatized, is thin and sickly-looking."

GUZERAT.

A report dated 24th instant has just been received from Mr. Stormont in reference to the districts of Broach and Surat. "The condition of the general cotton crop here" he states "has much improved since the date of my last letter. The plants now average in height from 1 to 3 feet. The more advanced (early sown) fields have a bushy, mature appearance, and are already profusely covered with flowers. We may therefore expect a portion at least of the crop very early, provided no cloudy or cold weather sets in to interfere with the ripening process, and cause the pods to drop off, as was the case in the Broach district last year. The exotics with which only a few small plots were sown are very much cut up. Even in this light land, they are very poor, thus confirming what was said of them last year, namely, that they are not suitable for cultivation in this part of the country. With regard to the extent of land under cotton this year, I am unable to speak precisely. I think however that it will be found to be the same as last year. I gather this from conversation with the growers themselves who do not seem to have put more of their land under cotton than their ordinary rotation required.

A good deal of the grass land lying north of the railway line near the Panolee station has been dug up and sown with cotton. This at present looks somewhat stunted, but even should it not yield more than half an ordinary crop the first year, the return will be very considerable. The rain-fall here has been ample, but the weather during the last week was so very hot and dry, that crops on light, open land, began to shew symptoms of distress. The temprature has now settled down to a maximum of 90°, with heavy night dews and an occasional slight shower, which gives everything a very promising appearance

At this early stage, it is impossible to state, with even tolerable certainty, what the out-turn of the cotton crop may be. Its present appearance however is all that could be desired; and we can only hope that nothing will come in the way to disappoint the expectations now formed regarding it.

KHANDEISH.

For this Collectorate, Mr. Wilkinson has submitted the following report, dated the 24th instant: "From the 10th to the 21st instant very little rain fell, and that was confined apparently to the North-West districts, up to the latter date, owing to the lack of rain. In August and September, the temperature during the month had been exceedingly hot and dry, and calculated to bring the crop rapidly to maturity. Last week there was a transient lowering of the temperature which seemed to herald the approach of the cold weather. Unfortunately it was only the precursor of more rain, which commenced falling on the 22nd.

"The weather is now precisely what it was during the latter week of October last year, and in consequence of the forward state of the crop, the first instalment being ready in many parts, it cannot, I fear fail to sustain some injury. But, last year, some of the Northern Talookas escaped this particular fall of rain, and it is to be hoped that on this occasion it may not be general. A slight wetting, perhaps, does no harm. I have heard merchants say that it makes the staple draw out better. But it is of little use to point to the possible advantage of a few showers, when the certain injury from a probable excess of rain is so much to be feared. Except on our experiment fields, and on the Bhurgaum Farm, cotton picking has not commenced, and as usual, there is no intention of touching the crop till after the Dewalee. In ten out of the sixteen talookas, the aggregate increase in area for cotton amounts to 63,687 acres 11 goontas, from which has to be deducted the large amount 17,129 acres 29 goontas, constituting the decrease in Pachora. The falling off may, in some measure, be due to the discouragement induced by the spoilling by unfavourable circumstances of perhaps the finest portion of the Khandeish crop last year in the above talooka. But the figure which the cotton area had attained to last year in this talooka, viz. 89,084, 18 was, I imagine, too large to main tain in consistency with a proper rotation of crops. It is probable that the cotton area in the remaining five talookas has been increased, and that the whole area sown in the Collectorate this year approximates to 600,000 acres. In a day or two I shall be able to furnish the exact figures, as also a return of stock which may now be roughly stated at 3,000 bales."

SIND.

Mr. Strachan, the superintendent of cotton experiments in Sind, writing under date the 21st instant, reports as follows, regarding cotton crop in that province, and the experiments under his charge :—"The present crop, the natives say, is botter than that of last year. The canals were high this season, so that the plants got plenty of water during the early stage of their growth, and are now in fine bearing order. Picking was begun about the first of the month and is now pretty general. In Upper Sind where the season is a little earlier, harvesting operations are further advanced.

"Many of the ryots say cotton is the best paying crop they raise, but as they cannot eat it they cannot give up growing grain; still cotton cultivation is gaining favor among them, and the area under it this year, throughout the province, is said to be considerably in excess of last season. In the Halla talooka of the Hydrabad Collectorate the land under cotton is estimated at 5,000 acres, nearly the same as as was sown last year, and as

The Foresters' Gazette.

CALCUTTA, 15TH NOVEMBER, 1870.

FORESTS—BENGAL 1868-69,

The information obtained by the inspection of forests in the several divisions of the Lower Provinces up to the close of the year may be briefly recapitulated as follows:—

In the temperate parts of British Sikkim the Government forests cover an area of about 17½ square miles, are in four blocks, of which three, covering an area of 15½ square miles, are available for working, while the fourth is isolated and unapproachable. These three blocks contain about 2,000 magnolia trees, 17,000 oaks and chestnuts, and 17,200 trees of inferior but useful kinds. The temperate forests on the Bhootan side of Teesta valley are supposed to be more extensive than those on the Sikkim side, and to contain larger stocks of timber; but they have not yet been explored. The sal forests on the outer hills of British Sikkim and in the Sikkim terai cover about 29 square miles, and are estimated to contain some sal timber fit for conversion into sleepers, and about 1,800 chelawnee trees, but no mature sal. They are, however, very rich in young trees, and will become very valuable 30 or 40 years hence. The sal forests in the Teesta and the Great Runjeet valleys are estimated to occupy an area of 23 square miles, and to contain about 12,000 sal and 5,000 chelawnee trees fit for felling. In the plains of the Western Dooars the sal forests are estimated to extend over an area of about 40 square miles, in thirteen blocks, averaging from 1½ to 8 square miles each; but it is estimated that in only four of these are there any first class sal trees. The sal forests in the hills of the Western Dooars are reported to cover 60 square miles and to contain 5,000 first class sal trees, besides abundance of chelawny, urjun, and cutch trees. The sissoo forests in the Sikkim and Bhootan terai cover an aggregate of about 15 square miles, in five blocks, of which the largest, and the only one containing any quantity of large timber, is on the banks of the Torsa, and is 6 square miles in extent and estimated to contain 2,300 sissoo trees above 5 feet in girth. In the Eastern Dooars the sal forests are estimated to extend over some 364 square miles, but only 200 square miles are covered with forests in which this is the characteristic and principal tree, the rest containing sal in varying proportions.

There are also sal forests in Assam, of which it is reported that that those in the Kamroop district, south of the Brahmapootra, and in the Nowgong and Seebsagur districts, contain mature trees. The forests on the south of the Brahmapootra have not yet been examined, but are believed to be very extensive and valuable, although only one-tenth of the whole is said to contain mature timber. The india-rubber or caoutchouc forests of the Durrung district extend over an area of about 585 miles, and besides the caoutchouc tree contain many serviceable trees. The plan of working these forests was still under consideration. In the Chydooar block there are considerable patches of forests in which the soom tree predominates, the leaves of which are used for rearing silk worms. More extensive soom forests exist in the district of Luckimpore. There are also forests of wide extent in Upper Assam, some of which have been examined and found to contain many useful kinds of timber. Many others have not yet been reported upon; but those on the Dehing and the Derang rivers, large affluents of the Brahmapootra, are believed to be rich in timber trees. The Nambar forests on the Naga Hills contain valuable supplies of timber.

In the Dacca division the higher hills throughout the district of Cachar are covered with forests, which have not yet been explored. There are dense forests also in the valley of the Jeri, and in the southern portion of the Hailakandy, Chatla, Howhur, and Sonai plains; and in addition to these, there lies to the south of Cachar an extensive forest tract extending to Chittagong. In Sylhet there are thousands of acres of forests, for the most part uninhabited and almost impenetrable. There are forests also in the hill tracts of the Chittagong division, the workable portions of which are estimated to cover about 1,500 square miles. There are neither teak, sâl, nor sissoo to be found either in the Cachar or Chittogong forests, the principal timber products in them being nagissur, jarool, and toon, with the addition in the Chittagong forests of jamboo and gurjun.

The operations of the forest department were confined during the year to the Sikkim and Bhootan divisions. In the Sikkim division the Government forests have all been reserved, and the general outlines of the tropical and temperate forests have been delineated in the revenue survey maps of the Darjeeling district, and a number of boundary pillars erected where the tropical sal forests are not naturally defined. In the Bhootan division important progress has been made in the preliminary demarcation in the reserved forests, both in the Eastern and Western Dooars. In the former four large blocks have been demarcated, aggregating 200 square miles, and a fifth west of of the Sunkoss river, having an area of above 13 square miles. This last mentioned tract has been permanently demarcated by the erection of sal posts a hundred yards apart the whole way round, except on the east side, where the Sunkoos forms a natural boundary. In the Western Dooars thirteen other tracts, which have been surveyed by the revenue survey party, have been similarly demarcated by the forest department. Some of these demarcated tracts contain cultivation, and it may be possible to induce the occupants to plant or to sow sal seed, broadcast, over a certain area annually in consideration of exemption from taxation, which will further the ends of Government in forest conservation at little expense.

PLANTATIONS.

In the temperate forests of British Sikkim about 202 acres have been brought under cultivation. Of this area about 28 acres were sown in January 1868, and are now sufficiently well stocked with young plants of bak and chestnut 7 or 8 inches high. The remaining 194 acres were sown out in January and February 1869. Large nursery beds have also been formed in convenient spots, and in these magnolia seeds are thriving well, though those of oak and chesnut have failed to a great extent. A teak plantation formed at Bhamanpookree in the terai has also failed; but a fresh supply of teak seeds having been obtained from Burmah, the experiment is being continued. Some teak seed has also been sent to Assam and the Bhootan Dooars, that experimental plantations may be formed. At Sookna, on the Mahanuddy, a mahogany plantation has been established, which is improving, though the growth of the tree is comparatively slow. As regards sal and sissoo trees, they reproduce themselves abundantly, and it has therefore not been deemed necessary to do more towards the improvement and extension of the natural forests in the Sikkim and Bhootan terai, than to supplement the efforts of nature by occasional sowings, broadcast, in suitable spots.

YIELD OF THE FORESTS.

The quantity of timber brought out of the forests of the Sikkim and Bhootan divisions during 1868-69 is detailed on the margin. The forests are still worked by the agency of petty contractors—contractors of sufficient influence and means to undertake the whole work of felling, converting, and transporting to depots, not having yet been found. The timber belonging to the department is all sold on indent only. No auction sales have been held, because there is no great demand for timber at present, and all local wants are easily and cheaply supplied from the private forests. An experiment was tried of sending down sal logs to the Calcutta market for sale; but the result was not encouraging, the expenses of transport to Rs. 7,890 and the sale proceeds of the logs to Rs. 5,840 only.

Logs	3,758
Sleepers	36,127
Shingles	2,46,103
Scantlings	1,404

The financial results of the transactions of the department during the year may be exhibited as under:—

RECIEPTS.		
From sale of timber at depots		1,65,568
Ditto removed by purchasers		3,405
Permit fees		766
Grazing dues and fisheries		916
Fines and forfeitures		198
Other items		331
		1,71,184
EXPENDITURE.		
Conservancy and working	95,581	
Establishments	30,675	
		1,26,256
Surplus		44,928

The estimated value of timber in hand on the 21st of April 1869 was Rs. 2,24,963, against Rs. 25,954 of the preceeding year, which show an increase of Rs. 1,23,009.

RULE FOR THE ADMINISTRATION OF GOVERNMENT FORESTS.

After a prolonged discussion between the conservator of forests, the commissioner of Cooch Behar, the Board of Revenue and the local Government, a code of roles was prepared during the year and submitted for the sanction of the Government of India, with a view to provide for the efficient administration of Government forests in the Lower Provinces. These rules have been framed under Act VII. of 1865, a bill for the repeal of which had meanwhile come under consideration of the Legislative Council of the Governor General; but it was considered undesirable to postpone the issue of the rules on this account, as it was found impracticable to carry on the administration of the forests without them. The amendment of the law when made, will probably necessitate some further revision of the rules

The introduction of a system of leases for working defined tracts of forest by private parties, to whom the timber worked out would belong on payment of a specified royalty, has been authorized. The scheme cannot, however, be carried out till the rules above referred to are brought into operation, when the nature and terms of the agreement to be entered into will have to be considered.

With a view to the introduction of forest conservancy into the forests of Assam, Dacca, and Chittagong, the sanction of Government has been asked to the establishment of a branch of the forest department on a suitable scale in each of those divisions; but this proposition was still under consideration at the close of the year. The forest department of any of the isolated Government forests in Bengal, situated in districts under permanent settlement, such as the sal forests on the Koel and Soane rivers, in Chota Nagpore and Behar and the forests of the Damin-i-koh in the Sonthal Pergunnahs.

The question of placing under the forest department the complete management of all public forests and plantations, including reserves for fuel for all purposes, was raised by the Secretary of State in connection with the question of the future supply of fuel to railways and steam boats, &c The opinion of the local officers having been taken on the position the commissioner of Poona, Dacca, and Cuttack expressed themselves as being in favor of the measure, and the commissioners of Chittagong, Assam, and Chota Nagpore as being against it, while the rest were either partly for and partly against the arrangement, or offered no opinion on the subject, there being no public forest and plantations in their division. The general conclusion to be drawn, from the replies received, was that the forests in the regulation districts might advantageously be placed under the management and control of the forest department, but that the generality of forests in the non regulation districts could not be so disposed of owing to the habits of the people in those districts, the large extent of the forest tracts, and the necessity of preserving undivided authority throughout their entire extent. An abstract of these opinions has been furnished to the Government of India, and it has been intimated that, judging from the difficulties which have been experienced in the transfer of specific tracts in two districts to the charge of the forest department, the Local Government is satisfied that the proposed measure of making over all forests entirely to the forest department could not be carried out without giving rise to the greatest complications, nterference with private rights, and consequent difficulties.

The Planters' Gazette.

THE ESTATES.

COFFEE.

THE *Ceylon Observer* points out that energetic, business-like action on the part of the Planters, is certainly called for with reference to questions bearing on the consumption of Coffee. The *Observer* advises that a collective appeal on the part of coffee-producers should be made to the British Legislature, with a view to the lowering or abolition of the Imperial duty on coffee, and the enactment of a stringent measure against adulteration. "The system of adulteration now legalized, specially requires "to be dealt with, and a spirited agitation at this crisis is all "that is necessary to secure concessions in this direction."

The same journal thinks that, "in improved machinery, there "is a great deal to be done for the Coffee-planter. We have "had a sight of the plans and specifications of a new pulper "within the last few days, which is likely to be much in advance "of existing machines in the economic and more careful pre- "paration of the coffee-berry. One on the new principle, a "combination of the disc and breast with a grooved iron cylin- "der, has been already tried with most favorable results. Cer- "tainly, everything connected with Coffee—looking at the en- "terprise as a whole—seems elastic to a degree; and there is "no lack of encouragement to the experimentalist in manures, "the mechanician, or Planter, engaged in devising the perfect "pulper of the future or in improving our coffee preparing ma- "chinery, or to the practical men who are grappling with the "question of providing new and extended means of transport."

TEA GARDENS.

THE *Englishman* contends that "notwithstanding the low "price at which tea shares are quoted in the published lists of "Joint Stock transactions, none but the most prejudiced per- "sons will deny that, after ten years of severe trial and difficul- "ty, such as few enterprises have been subjected to, tea culture "is now firmly established, and,—although shorn of the false "glitter attached to it by speculative projectors at the outset,— "rests on a sound commercial basis."

The Provincial Administration Report of 1869-70 appears to shew that the Tea plant thrives well in Coorg, and that it is more hardy than Coffee. A Mr. Forster points out how tea plants have survived in one of the bleakest and most exposed localities in Coorg, but he doubts whether the climate of Coorg will answer the requirements of tea cultivation. He says: "My experience is limited to experimental patches of small extent; and the opinion I have arrived at is that tea will grow very well in Coorg, under very adverse circumstances both at high and low elevations in the coldest and most elevated portions of the Surlabi Muthnad range of hills, where the rainfall during the south-west monsoons exceeds that in Mercara by about ⅓ to ½ the quantity; also in the warm villages of Yedanaknad at an elevation of 2,800 feet. In the former situation where I experimented with three small patches of Assam tea, side by side with coffee on a coffee estate I was interested in I found that the tea plants of one year had outstripped the coffee of three years, side by side. These tea plants were planted in 1865, and the whole clearing abandoned, because it was plain the coffee trees which constituted 120 acres would not pay, the cold and monsoon being too severe; on inspecting the place a few months ago, I found nearly all the coffee trees dead and nearly all the tea trees alive. The tea plants planted at an elevation of 2,800 feet in Yedanaknad are now very good strong sturdy plants, and superior to the coffee trees planted at the same time in the same place a few years ago. I found the infusion of the tea remarkably palatable, and to my taste superior to the Nilgiri growth. On the whole, I believe, that if we could be certain of early rains to induce a flush of young wood to the tea trees, the cultivation would pay. In dry seasons, as far as I can judge from my knowledge of the Coorg seasons for the last ten years, it will not pay. However, there is such a large extent of well wooded land in Coorg that it is to the interest of Government to test the matter fully, especially as the country is still threatened by the borer, and a lasting check has been given to the opening up of much fresh land for coffee."

CINCHONA.

GOVERNMENT GARDENS.

In the Government Cinchona gardens near Darjeeling, the propagation has been hitherto from cuttings only, as the shrubs do not produce seed till they have attained a few years' growth. It is expected that in a year or two large quantities of seeds will be obtained. Cinchona seed has hitherto always been raised under glass, in order to ensure the germination of the greatest possible proportion of the rare and precious seeds, but Dr. Anderson lately caused a quantity of the seeds of *cinchona pahudiana* to be sown under mats, and excellent plants were raised quite as well as under glass. It is hoped from the result of this experiment, that the propagation by cuttings may be shortly discontinued.

The propagation (at the Darjeeling Government gardens) of *c. succirubra* by cuttings has been discontinued, and the stock plants thrown away, as enough nursery plants have already been obtained to complete the planting of 1,000 acres, which is the area intended to be occupied by *c. succirubra*. The stock plants of *c. calisaya* have been increased from 4,158 to 10,000, because it has been ascertained that the species is very valuable in quinine. The stock plants of *c. micrantha* have been thrown away. The stock plants of *c. officinalis* have not been increased, as seed is expected this year, and better plants can be produced by seed than from cuttings.

The increase during the year of all the species of cinchona plants is 673,654, being 12,806 less than that of the preceding year.

In the nursery beds on the 1st April, there were 556,798 plants, all in excellent condition, and 200,000 of them ready for transplanting out in the plantations as soon as the weather should be favourable.

In the permanent plantations, 534,286 plants have been planted out. Of this number, 342,807 are *c. succirubra*, 167,320 *c. officinalis*, and 24,109 *c. micrantha*. The area of ground planted with *cinchonas* on the 1st of April 1869 was 600 acres of which 500 acres are *c. succirubra*. The remaining 500 acres of *c. succirubra* proposed to be planted have been cleared of jungle, and will be planted before the end of 1869-70. For *c. officinalis* 80 acres have been cleared, and for *c. calisaya*, 10 acres. The growth made by the plants in the Rungbee and Rishap plantations during the year has far exceeded that during the preceding year. The tallest plant of *c. succirubra* is 19 feet

high, of *c. officinalis* 11 feet 3 inches. Many plants of *c. officinalis* have a good crop of seeds ripening on them, and others are coming into flower. A few plants of *c succirubra* are also coming into flower.

The number of *cinchonas* distributed during the year was as under :—

Mr. Johnson, Dhooteria, Darjeeling	8,000
Officiating Superintendent, Botanic Gardens, North Western Provinces	1,300
Lord Lawrence	600
Dr J M. Coates, Hazareebaugh	100
Colonel Strutt, Kangra Valley	42
Mr Miller, Darjeeling	4
Total ...	10,046

PRIVATE CULTIVATION.

The Darjeeling Cinchona Association possessed, on the 1st April 1869, 671,518 *cinchonas*, of which 652,606 were *c. succirubra*. The area planted was 275 acres. The plantations are in good order, and the Association has lately purchased a large tract of land adjoining their plantation, and continued to push on the cultivation with great rapidity. On the Tukhvar Tea Company's estate, there are 75,000 *cinchonas*, 20,000 of which are planted out and are growing well The Darjeeling, Tea Company have 30,000 plants of *cinchona succirubra* on the Tukhvar tea plantation ; of these, 20,000 are planted out and are growing well In other plantations near Darjeeling, there are, 19,000 *cinchonas*. The total number of *cinchonas* in the Darjeeling District is 3,028,950, *viz.*, 2,232,532 in Government and 795,618 in private plantations. The area planted is about 965 acres.

CULTIVATION IN THE KHASI HILLS.

At Nunklow the total number of *cinchonas* in the Government garden was 18,975 on the 31st March 1869, as against 6,778 on 31 March 1868. Of these 18,221 are *c. succirubra*, 421 are *c. micrantha*, and 333 *c officinalis*. The garden has since been closed, and orders given to remove the establishment to Shillong

The total number and distribution of cinchona plants in the Government plantations of Darjeeling on the 31st March 1869, are represented in the following table —

Names of species of cinchona	Number in permanent plantations	Number of stock plants for propagation	Number of seedlings or rooted cuttings in nursery beds for permanent plantations	Number of rooted plants in cuttings beds	Number of Cuttings made during March	Total number of plants cuttings and seedlings
C Succirubra ..	6,15,730	20,000	2,83 008	3 44 970	None	12,43,715
C Calisaya .. .	220	10 000	2,40 0	17 174	1 500	27,354
C. Micrantha	29,667	None	None	None	None	29 667
C Officinalis and varieties ..	3,12,719	10,0 0	2,71,332	3,32,653	None	9,26 704
C Pahudiana	5 092	None	None	None	None	5,092
Total	9 63,428	40,000	5,56,798	6,70 806	1,500	22,32 532

DARJEELING GARDENS 1870.

To those who have never seen the Darjeeling Cinchona Gardens, it may be necessary to explain that Doctor T. Anderson, after some trials fixed upon the country on the N E. of the Sinchul range with slopes facing the Teesta valley, as the best place for the permanent plantations of the Government Cinchona Gardens. He got 50 square miles of country reserved and set off for his operations. Immediately alongside, and divided from the Cinchona principality by a stream called the Rungjo, lies the land of Poomong and Gielle, some 6,000 acres of freehold, held by the Darjeeling Cinchona Association. The Government gardens and Association's gardens thus join each other and form as it were, one garden.

The gardens of Government are, as might be expected, from their vast resources in money and clever men, in advance of the Poomong Garden, but not to any great extent It is true that the area occupied by permanent plantations of different kinds of cinchonas is nearly double that of Poomong, but upwards of 600 acres of it is occupied by C. Officinalis which does not thrive in this locality. Great credit is due to the managers and experienced men who have directed and formed these fine gardens, and they are likely to be a mine of wealth to the Government.

The D C. Association sent home 70 maunds of bark to London, and this year they can send 400 maunds, in 1871 they can send about 750 maunds, and in 1872 they can send about 1,300 maunds of red bark, which may be counted as worth 75 Rs. per maund. Any one can calculate that these figures will give a crop of bark worth a lakh of rupees in 1872 The Association are preparing to put in an extension of 600 acres of red bark in 1871, for which they already have a sufficiency of plants in nurseries

These results have only been obtained after some failures, and after great labor and expenditure of money.

The Association look upon their property as being of enormous value ; 15 lakhs of rupees is the most modest figure mentioned to us. There is, however, a skeleton in the cupboard. The Government after encouraging private enterprise, in this direction, is now determined to compete, and that too on such a grand scale as to completely swamp all private efforts. It is not surprising therefore if the Darjeeling Association should get faint-hearted, and almost fancy its golden dreams may melt away

Mr Clarke, the very able man at present directing the Government Cinchona operations in Bengal, is making an unbleached preparation of bark, at no great cost, and pronounced by the most competent medical men to be an efficient substitute for the sulphate of quinine, and likely to be used for that purpose in the Hospitals and charitable Dispensaries of this country. Unfortunately, Mr Clarke has not much bark at present to operate upon The State expenditure on Quinine must therefore for some years to come, be very heavy : and even then the poor fever-stricken villagers in Bengal and other parts of India, may be in their graves long before the State can afford to dole out to them with a liberal hand this grand tonic preparation.

The colouring matter in the red bark, is likely to be a cheap substitute for indigo The peasant of Bengal, half a century hence, may look back upon the cinchona tree as a new Avatar, curing him of his sickness and removing from his shoulders that "Old man of the Sea," the Indigo Planter, whose occupation will be gone

Table showing the number and distribution of Cinchona plants, on the plantation of the Darjeeling Cinchona Association, for the month ending 30th September 1870.

Names of Species	Number of plants in permanent plantation.	Number of plants in nursery beds for permanent plantation.	Number of cuttings or Seedlings in propagating frames, or hardening off.	Number of cuttings made during the month.	No. of Stock plants for propagation.	Total number of plants cuttings and seedlings.
C —Succirubra	8,67 400	2,20,530	2,80,401	88,000	15,000	1,471,331
C —Calisaya	..	..	900	..	205	1,105
C —Officinalis	9,413	..	..	..	..	9,413
C —Micrantha	547	..	..	..	..	547
C —Pahudina	1,720	..	..	..	..	1,720
Total .	8,79,080	2,20,530	2,81,301	88,000	15,205	1,484,116

Memo of—Height and girth of plants, &c

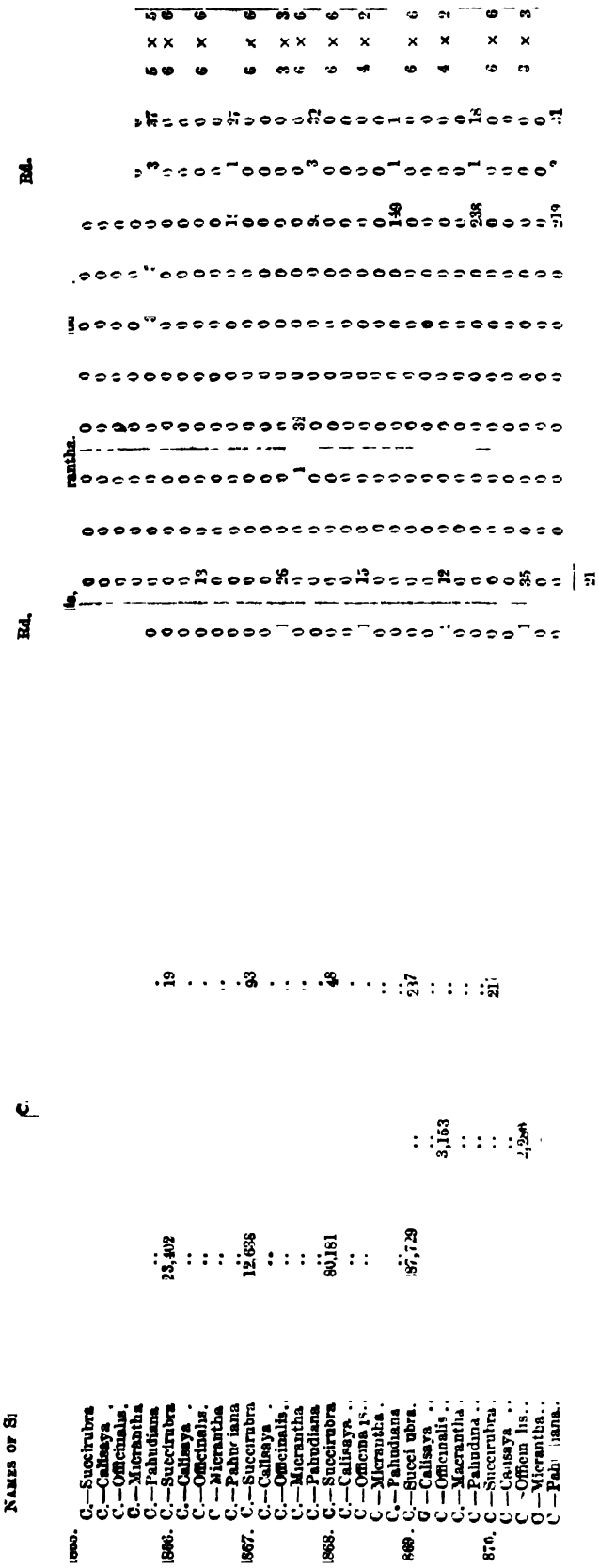
Labelled	Planted	Height on 30th June 1869	Height on 30th Sept 1869	Height on 31st Dec 1869	Height on 31st March 1870	Height on 30th June 1870	Height on 30th Sept 1870
		feet inches	feet inches	feet inches	feet inches	feet inches	feet inches
C. Succirubra	May 1866,	12 0	13 10	16 6	17 2	18 3	20 0
V1	Aug 1866,	Not	Measured		17 10½	19 1	21 8½
V2	Do 1866,	....	....	....	17 3½	18 9½	21 2½
N3	Do April 1867,	11 6	14 7	16 3	17 3½	18 2	20 6
C	Do Dec 1867,	10 3	13 2	14 6	15 4	17 3	19 8
A	Do June 1868,	Not	Measured	7	16 7	18 2	21 3
H	Do Do 1868,	5 5	7 11	7 5	7 6½	8 11	10 6½
H	Do Do 1868,	Not	Measured		7 8	8 8	10 10
H	Do June 1868,	....	....	....	9 9	....	....
H	Do Do 1868,	....	....	....	....	....	....
A	Do Do 1868,	....	....	....	....	....	....
D	Do July 1868,	....	....	....	....	....	....
A	Do Do 1868,	....	....	....	....	....	....
H	Do Do 1868,	....	....	....	....	....	....
H	Do June 1868,	....	....	....	....	....	....
H	Do July 1868,	....	....	....	....	....	....
C. Pahudiana	Do Do 1868,	....	....	....	....	....	....
C. Micrantha	Do July 1868,	....	....	....	....	....	....
C. Officinalis	Do Do 1868,	....	....	....	....	....	....
C. Calisaya	Do Jany 1869,	....	....	....	....	....	....

Poomong, 8th October 1870

J. Munro, Manager.

* Young Shoots from trees cut down † in March 1870. ‡ in Mar 1870. § in March 1870.

TABLE Showing the number of plants of the different Species of Cinchona planted out at Poomong up to the 30th September 1870, with their distance apart, and Area in Acres.



COFFEE.

OLD COFFEE DISTRICTS REVISITED.

An Editor's holidays are so few and far between that the enjoyment attendant on an occasional escape "into purer air" is in proportion. Such enjoyment has recently been ours, and although for the very reason that we were out on a holiday we did not "tak' notes," still a discursive notice, recalling a few of the prominent impressions received during short residences in and excursions through a few of the older coffee districts, our first acquaintance with some of which dates back so far as thirty years ago, may not be uninteresting to our readers. The idea, more or less definite, floating in our mind being that the majority of the estates in the earlier opened districts were either hopelessly "shuck" or "gone out," so much the more were we pleasingly disappointed with the state of things revealed by actual inspection. Where soil and climate had been favourable and management fairly good consecutively or even with intervals of neglect, we saw fields of coffee, thirty and more years of age as fresh and fruitful as in the first vigour of their "maiden" existence. And what was still more gratifying as affording proof that there is hope for the ultimate restoration of much abandoned land in the coffee regions of Ceylon, we found portions which had been lying fallow under a dense covering of the ubiquitous *lantana* for ten or a dozen years, again cleared, cultivated manured and bearing well, steadily and profitably. The operations of our railway in facilitating and cheapening the transport of bones, poonac, alkalis and composts, for manuring, has very materially added this renovating process (one of the strongest possible argument for extending the railway upwards to the great coffee reserves of Dimboola); but we were much struck and greatly pleased to find so strong a consensus of opinion amongst planters in favour of the once dreaded *lantana*, a plant introduced into the Island just as the coffee enterprise was about to begin in earnest some forty years ago and the introduction of which a recent writer in our columns compared to the introduction into Australia of the thistles which have proved such a pest to the colonists of the Southern lands. The *lantana*, when it once finds entrance into low scrub or jungle, gradually extirpates all other plants until nothing can be seen but its own brown pliable stems, its orange coloured flowers and the strongly flavoured leaves and fruits which have attached to the plant the popular name of "the currant plant." Purple and pink blossomed varieties of the lantana, exceedingly beautiful, are pretty common, but the rare white blossomed plant we have seen only in gardens. A plant which fruits so freely might be supposed to exhaust the soil, but the birds do not seem to care for the seeds which, with falling leaves, gradually form a covering of vegetable matter. The covering is so dense that combustion from solar heat is reduced to a minimum while the destructive "wash" of heavy rains, so fatal to steep coffee estates in Ceylon, is almost entirely prevented. More than this, the roots of the *lantana* are said to permeate and open up the subsoil, so that after a piece of land has lain fallow under *lantana* for a certain period, it is said to be nearly as well suited for coffee cultivation as primitive forest. So strongly did one gentleman of wide intelligence and experience entertain these views that he said to us, "I believe the *lantana* will prove the salvation of Ceylon coffee land." Our planter readers will know how far this representation is generally correct, but there can be no possible question as to the beneficial effects which have already accrued and the still greater benefits which will yet accrue to the coffee enterprise in Ceylon from increased and increasing facilities of returning to the soil those fertilizing substances which are taken away with each crop and in proportion to the quantity and quality of that crop Just as the railway and improved road communication provided for the cheaper transport of manures, it seem as if every part of the world was laid under contribution to send us the phosphates and the alkalis, for which our exhausted land cries one. Simultaneously men like the Lecchmans extend their operations in the manufacture of valuable composts, while Tytler with half a cocoanut shell of concentrated mineral matter in one hand and a scraper in the other exclaims, "Here's your perfect cure." Others there are, "too numerous to mention" who have done much in directing attention to imported manures, simple or mixed, and to the fertilizing substances available on coffee estates and in the country generally To each and all a debt of gratitude is due. Of course, the element which will ultimately decide the question of what manures should be used are quality and cost. Bulk, as we always said, even when our old friend Tytler so strongly preached the contrary doctrine, has a value of its own, and so also has the moisture which is applied to the soil with cow-dung and pulp. Nor must we ever lose sight of the immense effect on most soils of the digging of large holes and heaping of the loosened earth over the masses of manure into which the feeding roots of the coffee plants so rapidly extend themselves. Indeed there are not a few who believe that the partial "trenching" of the soil and the draining connected with manuring operations are almost, if not quite, as beneficial in their effects as the fertilizing substances applied. Without going by any means this length we may say that we have the most vivid conviction, of the great value of every road, drain and hole that can be opened on a coffee estate, if only destructive wash of the soil is effectually provided against, a difficult problem certainly on very steep estate, such as so many of the Ceylon plantations are. Fresh air is as beneficial to soils and plants perhaps, as to the higher orders of animals The danger is of riding any one idea to death. We know enough of the constituents of sombreorum to feel certain that it contains in very large quantity the very elements, potash and phosphoric acid, which go to the formation of the coffee bean and which are taken away when the "crop" is sent from the estate. But it by no means follows that Mr. Tytler is, or rather was, right in asserting that small quantities scraped in close to the root of a coffee bush would answer all

restorative purposes. Few estates can apply "spade husbandry" so effectually as Mr. Tytler has done in the case of the deep, rich alluvial soil of Pallikelly and his other estates in the valley of Doombera—a valley which would be just a paradise on earth did the sun but look on it with less fervency and were the rain-clouds less chary of their refreshing influences and less sensitive to the attractive influences of the neighbouring ranges of the Knuckles and Hewahette. By this time, we suppose Mr. Tytler agrees with Mr. MacLeod, of Kotmalie and others, that the action of the valuable mineral constituents of sombreorum is hastened and increased if applied in appreciable holes and with a certain proportion of damp humus such as is found in cow-dung and rotted pulp. There is a *via media* in all pursuits. Even cow-dung is improved by bones, especially when the bones are steamed in ammoniacal vapours as the Messrs. Leechman steam them. When a man like Dr. Kelson avows his belief that if you give coffee "large dollops of humus" you give it all it wants, you instinctively feel that the learned medico errs more seriously on the one side than Mr. Tytler ever did on the other, and surprise is modified when Mr. Taylor, of Lool Condera, is heard positively asserting that the application of rotted pulp alone covered the trees on a high estate with 18 cwts per acre, the good effects of the pulp lasting for a decade—the practice of Mr. Taylor's system of pruning being, of course, pre-supposed. Cow-dung, well matured, if regularly and carefully applied, would no doubt keep an estate pretty well in heart, if neither bones, nor poonac, nor any other fertilizing substance could be added. Nor do we undervalue the humus, saccharine matters and mucilage of pulp from which the acidity has disappeared in the process of fermentation. But that pulp alone, without any addition of bones, or poonac, or wood ashes, or lime, or fresh earth could produce great and permanent effects *on crop-bearing*, is certainly contrary to the principles which seem established in the science of agricultural chemistry. Still much respect is due to opinions which an experienced planter like Mr. Taylor is known to hold. Mr. Tytler makes light of carbonate of lime, but it would seem, we respectfully submit, that pulp equally with soil from ravines and swamps would be benefitted by an application of coralline lime, or even the lime obtained by burning the dolomite of the hill region: we mean of course that the lime should be applied only when the soft stuff is put into the holes between the coffee trees and that both pulp and lime should be well covered up with earth. The reasons why imported fertilizers and Colombo manufactured composts are so largely used are not far to seek. Many of the coffee estates are distant from good pasturage for cattle, or the climate is unfavourable from wet and cold to the healthy existence of cattle or the growth of artifical grasses, and even where circumstances may be otherwise favourable, the extent and steepness of estates may make the mere application to the trees of so bulky and heavy a substance as cow manure, so expensive in the mere item of labour, as to be unremunerative. Even where circumstances are most favourable, cow-dung is almost always supplemented by other fertilizers,—phosphates, more or less rich, and composts.—*Ceylon Observer.—(To be continued.)*

TEA.

TEA GARDENS.

The cattle disease at present appears to extend between the station of Darjeeling and Kissenguni, a distance of nearly 100 miles. It is the foot and mouth disease, and many bullocks are dead. The disease is very likely only in its infancy and may go on for another two three months with increasing virulence. The disease is contagious, and all animals working along a line of road where the disease exists are liable to catch it. Under these circumstances it becomes a very important consideration to the tea planters of Darjeeling how the tea crop is to reach the Ganges. Four-fifths of the crop of 1870 is still at the gardens, being packed for transmission to Calcutta after the close of the rainy season.

The quantity of tea to go down will be about 1,200,000 lbs. nett weight, or lbs. 1,600,000 gross weight. The total gross weight of this year's crop must have exceeded 2,000,000 lbs. and the annual increase must be taken at about 500,000 lbs. This shews the great advantage of a railway. The Government Bullock Train and the Calcutta and Darjeeling Carrying Coy. must necessarily become paralyzed when the bullocks become dead, lame or die outright; fresh cattle if brought on to the line only leads to expense without any counter-advantage, as the new cattle immediately get attacked.—*Darjeeling News.*

TEA.

To the Editor Delhi Gazette.

I remark from time to time various letters in your columns on the subject of tea, the liabilities of certain companies, non-payment of dividends, non-realization of results flatteringly held forth at the time of formation &c. &c. I am therefore, having been for many years connected with tea plantations, tempted to say a few words on the subject, for a benefit, I hope, of the public, and of others who, like myself have been induced partly from being of a sanguine temperament, but mainly from the prospects held out by Government officials (supposed to have *proved* all they put forward in print) to embark capital in this hitherto-far-from-profitable investment.

To begin with the beginning; it has been pretty clearly proved and ascertained by actual experience of every plantation in the N. W. P. that Government when they published their "Report on Tea Cultivation in the N. W. P." knew *practically* nothing at all about the business.

They had carried on tea-planting in various localities for a series of years, just as they now carry on barrack-building, road-making, commissariat contracts &c. without having an idea of what they actually were about, or how they stood in the matter of profit and loss, in fact, with the same hazy vague feeling that the thing was "found to be a success" *because* carried on by Government, that Sir Richard Temple may be supposed to have entertained towards his Income-tax, or towards his nine anna per acre Settlement of the Central Provinces. It is however useless to enlarge on this part of the question; any gentleman wishing to inform himself on it has only to apply to "Government Report No. XXIII upon the present condition and future prospects of tea cultivation in the N. W. P. and Punjab," published in 1857, and compare the same with the experiences of to-day.

But the Government, though they doubtless ought to have "worked out the problem" before setting forth supposed profitable results, are not by any means wholly and solely to blame for the immense squandering of resources and waste of capital which has taken place.

Tea Companies were in most instances set going by people in good position, good too in their own line which was Government employ, but often, alas, totally ignorant of business.

In consequence, what these gentlemen chiefly looked out for in a manager was, an aptitude for business; they wanted good book-keepers, good accountants, not good agricultural knowledge and experience, or this was at any rate made quite a secondary consideration. Now a "good man of business" has lately been defined as a man who is often very busy with other people's money, and it does not follow that a good accountant must necessarily be ignorant of a certain process known as "cooking accounts."

Let it be understood that I wish to make no insinuations or draw any sinister inference. I merely state the above facts by way of demonstrating that the shareholders, while by no means *certain* to secure honesty in those whom they employed as managers and entrusted with their capital, also in many instances failed to secure men of practical working experience, the chief, in fact, the one thing needful (plus honesty) to make their concerns pay.

What is the result? The result is that plantations exist, the amount expended on which would suffice (properly managed) to to create half a dozen such estates, equal in area of tea, in extent of land purchased from Government, in buildings and plant, and in actual value

Where has all the money gone? Echo (to use a rather hackneyed but appropriate quotation) answers, where? Worse than this, where are the dividends?

The New Englanders have it that of the three branches of education, reading, writing and ciphering ought to come first. Reading, they say, hurts the eyes and don't pay, beyond reading newspapers; writing, they say, is apt to bring a man to grief (especially if the writes so-like some-body else as to cause a mistake in the signatures,) but knowing *how to cipher* has made our great nation.

Let us apply a little ciphering to the tea question. The Yankees generally cipher first, but we Indians have chosen to take the Government ciphering for granted in order to save trouble, and it turns out, as usual, that they have left out a figure or two in the *hissab*, therefore we had better, though perhaps rather late in the day, add up accounts for ourselves.

Let us commence with the yearly profit and loss on the plantations as they stand, not troubling ourselves whether their cost up to date has been one lakh or ten. A tea plantation carefully worked *by the owner* with every anna of expense noted down, the expense of all descriptions reduced to a minimum, cannot produce its tea (exclusive of carriage to market) under *eight annas per pound.*

This is the lowest average yet attained for *good* tea, well and carefully packed, and bad tea or even inferior tea is, it is needless to say, not worth making at all.

The average cost per pound on plantations owned by companies is considerably higher, for the simple reason that they being of great extent are obliged to keep labourers on during the whole or greatest part of the year, otherwise they might at any time find themselves without hands to work the place, and lose thereby a great part of their crop; they also require a greater number of chowdries, and last, not least, a Manager on Rs. 300 to 500 per mensem, sometimes an assistant also on, say Rs. 150·

On the whole the average for the tea made and packed may be taken at twelve annas per pound; I am convinced that the average of many companies is above this figure.

Large companies are obliged to sell their tea wholesale, sending it to the auctions either in England or in Calcutta, where, as a rule, they realise 12 annas per pound, sometimes less.

Thus, to say nothing of the interest on their capital, they are minus the carriage or rather the cost of the carriage of their tea to the market, and often find that they have been paying a Manager, auditing accounts &c. &c,, to enable them to sell tea at a loss of two to four annas a pound avoirdupois.

This "jeu" one would think would be hardly "worth the candle," yet do we still go on playing it. Why? Because some deeds of partnership are so drawn up that the shares lapse, or because we have a vague notion that it will all come right in the end, or because we think it was all the fault of the last Manager, or because we have got a new patent dodge of manuring or hoeing, or irrigating, or planting, or machinery to roll tea, or because we hope to outlast other plantations and get a monopoly, or because we think we can sell our shares, or *because we can't cipher*,—any how it is a good game while it lasts for the

MANAGER.

TEA IN THE LOWER PROVINCES.

The following return exhibits, in a condensed form, the actual state of tea cultivation in those districts of the Lower Provinces in which it is carried on :—

		Number of Gardens.	Europeans.	Natives above rank of dumdar.	Held in grants under old rules.	Held in fee-simple under new rules.	Held under cultivation leases or rent-paying pottahs.	Total.	Brought under cultivation during the year.	Out-turn. In 1867-68.	In 1868-69.	Total.	Average Monthly number of Laborers employed during the year. Imported.	Local.
					Acres.	Acres.	Acres.	Acres.	Acres.	lbs.	lbs.	lbs.		
Assam	Kamrup	35	4	42	5,474	15,023	275	20,772	2,794	237,651	317,858	555,509	255	1,184
	Durrung	60	19	137	5,375	32,101	10,881	48,357	4,476	691,119	863,053	1,554,172	2,420	1,745
	Nowgong	22	4	32	20,053	4,477	587	25,117	1,497	121,928	176,110	298,038	337	489
	Sebsagur	24	72	332	116,249	19,896	6,290	42,435	15,566	2,121,268	595,625	2,716,893	13,523	1,819
	Luckimpore	49	17	94	14,224	35,435	6,884	56,543	4,569	497,846	497,121	994,967	5,132	3,546
Cooch Behar	Darjeeling	44	50	164	26,563	7,912	10,440	44,924	9,764	441,189	851,549	1,292,738	317	6,542
	Gowalparah	4		3	Particulars not stated.		Particulars not stated.	.....	1,044	5,[illegible]	2,016	.....	. .	42
Dacca	Dacca	22			Particulars not stated.		....	43	Particulars not stated.	....	1,760	1,760	Not stated.	566
	Sylhet	18			Particulars not stated.		....	28,144	2,460	144,193	239,909	384,102	587	Not stated.
	Cachar				231,970	5,414	35,443	72,827	25,469	[illegible]31,310	906,835	[illegible]	14,076	
Chittagong and the Hill Tracts					No statistics furnished.									
Chota Nagpore	Hazareebaugh				Particulars not stated.					11,07[illegible]	12,729		Not stated.	
	Lohardruggah				Particulars not stated.					Not stated.	5,090		Not stated	

The statistics furnished for Assam are expressly stated to be imperfect, owing to the inability of the district officers to obtain accurate information from the planters, many of whom are stated to have given no information, while others sent partial information only, and that in an imperfect form.

The information obtained in regard to the two districts of the Cooch Behar division is more reliable. In Darjeeling there has been an extension of cultivation, and the order of Government allowing portions of lots to be given up and payments made on account of entire lots to be credited to the portions retained has been taken advantage of, and is already bearing good fruit. The increased cultivation during the year in this district covers an area of 303 acres, and the increase of out-turn is shown at 410,360 lb. It is confidently expected that the results will be still better next year. The case is very different in Gowalparah, where the gardens are entirely in the hands of natives, and have been so neglected that the number of plantations has decreased from 21 to 4, the area under cultivation from 1,044 to 338 acres, and the out-turn of tea from 5,170 lb. to 2,016 lb.

In the Dacca division the cultivation is carried on mainly in Cachar and Sylhet, and also to an inconsiderable extent in the district of Dacca, where there are two gardens occupying 113 acres of land, which produced 22 maunds of tea, or about 1,760 lb.

In Sylhet the quantity of land under cultivation is shown to have decreased, owing to the collapse of the Sylhet and Cachar Tea Company, whose gardens were last year almost entirely closed. The out-turn of tea for the year was estimated at 173,000 lb., but the actual out-turn amounted to above 239,000 lb., showing an excess over the estimate of 66,000 lb. The estimate for 1869-70 is 215,100 lb., but there is reason to expect that even this estimate is too small.

The information received regarding the gardens in Cachar is this year unusually complete; returns having, for the first time, been received from all the gardens in the district. The number of grants held under the Assam rules is 146, but the tea is cultivated in 67 of them only, the total area of which is 162,235 acres, while the total area of the remaining 79 unopened grants is estimated at 225,000 acres. The area of 35 holdings, which were granted under the old Assam rules, and which it has been proposed to commute to fee-simple grants, is 69,735 acres. There are besides 13 existing fee simple grants, with an area of 5,414 acres. The number of estates held under cultivation leases is 5, with an area of 35,443 acres, of which the area included in tea gardens is roughly estimated at 20,000 acres. The total area of all the estates upon which tea is cultivated, is therefore above 270,000 acres. It is expected, however, that more than 70,000 acres of this will have to be relinquished before the end of next year.

The area actually under tea cultivation during the year was 24,376 acres, and the number of factories 118. In the preceding year the area was 25,469 and the number of factories 115; so that there has been a decrease of 1,093 acres of cultivation, and an increase of three in the number of factories. The decrease in area under cultivation has, however, been owing mainly to the abandonment of lands the cultivation of which was found to be unprofitable; but in spite of this the advance of tea cultivation has been very marked, and promises to be still more satisfactory year by year.

The amount of the tea produced during the last year was 4,006,835 lb., against 3,163,310 lb. produced in the preceding year. The out-turn for 1869-70 is estimated at 5,051,220 lb.

The number of imported laborers employed on the tea gardens was 14,076, besides whom about 15,002 more were working in the district from choice, after termination of their original agreements.

The amount remitted to the district during the year by supply bills for purposes connected with tea cultivation was Rs. 18,88,847, to which is to be added Rs. 96,110, the value of notes cashed at the treasury for the same purpose, which gives a total of Rs. 19,84,957.

No statistics have been furnished in regard to Chittagong and the Hill Tracts, but it has been stated generally that cultivation had progressed satisfactorily in them during the year. There has been no addition to the number of gardens, but those that exist have increased in value with a year's growth of tea bushes, and the yield of tea in 1869-70 is expected to be very largely in excess of the yield in previous years.

In the Chota Nagpore division the cultivation has neither increased nor decreased to any considerable extent. In Hazareebaugh the area under cultivation is reported to be nearly the same as in the preceding year, but the out-turn of tea has increased by 21,652 lb. The results in Lohardruggah are less favourable, as the damage caused by the drought of 1866 has not been repaired, and the gardens are reported to be falling off in extent.

The aggregate quantity of tea exported from Calcutta during the years was 11,434,002 lb., against 8,789,344 lb. exported during the preceding year, showing an increase to the extent of 2,644,658 lb.—*Administration Report.*

NEILGHERRY TEA.

India Office, London, 16th August, 1870.

His Excellency the Right Honorable the Governor in Council, Fort St. George.

My Lord,—I have considered in Council the Despatch from your Excellency in Council, numbered 10 Miscellaneous, and dated the 26th of April, which transmitted a copy of the report of the Commissioner of the Neilgherry Hills on the Agri-Horticultural and Industrial Exhibition held at Ootacamund in October last, together with a box containing specimens of Tea, which you requested that I would have examined by the London Brokers.

2. On the receipt of your Despatch, I took the measures requested by you in regard to this Tea, and forward herewith a note by the Reporter on the Products of India, together with the report from Messrs. W. J. and H. Thompson, who exmained the specimens contained in the box sent by you.

3. The exhibition seems to have been well managed, and on the whole successful. Much valuable information seems to have been obtained as to the Live Stock, Produce and Manufactures which are either now in existence in these Hills, or might be introduced into them. The introduction of the Quinoa, the cultivation of the Salep-misere; Mr. Grove's method of cleaning Coffee, and the dyes procured from the Cinchona tree, seem to be among the most useful matters brought to notice in the report.

4. Mr. Broughton's Exhibition of Chemical Products cannot fail to be of practical as well as scientific use.

5. I approve your Proceedings sanctioning the expenditure and commending the Commissioner, and the Committee and Jurors who assisted him on the occasion.—I have, &c.,

(Signed) ARGYLL.

Report by Dr. Watson, dated 9th July, 1870.

On openenig the box stated, in Madras Revenue Letter, No. 10 of 26th April, 1870, to contain sixteen specimens of Teas, it was found that parcel No. 2 comprised ten distinct samples, whilst that marked No. 16 held six different kinds of Tea.

The actual number of samples thus amounted to thirty.

JOHN FORBES WATSON

19th September 1870.

Report by Messrs. W. J. & H. Thomson, on Samples of Neilgherry Teas, referred to in Madras Revenue Letter, No. 10, dated 26th April, 1870.

No. of Package.	Place of production and remarks accompanying samples.	No of Sample.	Strength.	Flavour.	Manufacture.	Market Price.	Other Remarks.
1	Belmont Estate	1	Very good.	Good	Very close twist 1, Orange-Pekoe kind	2/9 3	Fancy Tea.
2	Tudor Hall Gardens; made October 28th, 1869, and therefore rather new. An opinion on the twist of the leaf is requested, as it is machine-rolled..	2 1-A	Pungent.	Fine	Fine Ivory Pekoe kind much Flower	3/ 3/3	As a class is greatly estimated in all its grades. Fancy Tea. Leaf small, closely curled, and of a bright black hue, with a few light Pekoe tips. Suggest more care to be taken to produce an even fermentation. The color to aim at is an even light bright brown.
	Mr. Groves' Pendulum Roller, Tudor Hall Gardens, Prize Green Tea.	2 1-B	Good	Strong Burnt	Small Ivory young Hyson ...	2/2 2/4	Good Tea.
	Tudor Hall Gardens, Black Tea, disqualified for prize because of broken leaf having been put through Tea Mill	2 1-C	Fair	Fair, but coarse	Good Pekoe class	2/2 2/3	Good Tea, but uneven fermentation.
	Kulhutty 4,300 ft. above Sea level. Green Tea	2 1-D	Fair	Fresh	Fairly made, Hyson class... ...	1/10	Fair.
	Tudor Hall Gardens, Black Tea, made October 23rd, 1869..	2 2-A	Good	Brisk & strong	Curled black leaf with Pekoe ends.	2/2 2/4	A favorite class.
	Tudor Hall Gardens, Black Tea, No. 2.	2 2-B	Thin	Poor	Small Pekoe Souchong grade ...	1/10 2/	Good leaf, but uneven fermentation.
	Tudor Hall Gardens, the highest on the hills, some 6,500 ft. Prize Green Tea	2 2-C	Good	Flavory	Well made, young Hyson... ..	2/2	Good.
	Kulhutty, 4,300 ft. very dry climate. Green Tea	2 2-D	Fair	Full	Coarse leaf, Hyson kind	1/10 2/	Medium.
	Tudor Hall Gardens. Black Tea, made 23rd October, 1869	2 3-A	Good	Brisk peculiar	Broken, flat round leaf	1/10 2/	Fancy class, but not a good style.
	Kulhutty, 4,300 ft. very dry climate Green Tea	2 3-B	Thin	Fair	Hyson kind	1/4	Coarse, half-made leaf.
3	Forest Dale	3	Thin	Very flavory and fine	Curled, Orange Pekoe kind, much flavour	2/6 2/8	Fancy.
4		4	Fair	Very full and fine	Close curled, dull black leaf, Pekoe or Pekoe Souchong	2/2 2/4	Fancy fine Tea on account of high flavor.
5	Curzon Estate	5	Thin	Odd, very pale water.	Very fine, close curled flowery leaf	Leaf for 3 Flavor 1/6	Flavor most objectionable.
6	Vellanic Estate	6	Very good	Fine, but think the muster is somewhat injured	Close Ivory and full of flower ..	3/3 3/6	Very saleable as a class, fine type.
7	Craigmore Tea Garden	7	Thin	Coarse	Fair Souchong, a medium class ..	1/4	Fair common.
8	Kotagherry, Findlay's Estate ..	8	Poor	Coarse and Odd	Close Ivory black leaf ... .. Pekoe leaf few ends	Leaf for 2/6 Flavor 1/4	Badly manufactured, almost sour.
9	Balmadies Estate	9	Fair	Coarse and burnt	Bold curled black leaf	1/8	Bad type of color; spoilt in manufacture; over burnt.
10	Brooklands Estate	10	Thin	Flavoury but peculiar	Bold Pekoe Souchong class ..	1/10	Superior leaf, but flavor inferior.
11	Hopewell Estate	11	Thin	Odd, poor and sour	Coarse curled	1/3 1/4	Bad type.
12	Avenue Estate	12	Thin	Very sour the worst flavour tea can have	Flat Ivory dull black leaf	Leaf for 1/6 Flavor 1/	Bad manufacture; as a class unsaleable.
13	Vellanic Estate	13	Good	Fair but coarse or rather odd	Very fine Ivory Pekoe kind ..	Leaf for 2/4 Flavor 1/10	Flavour great drawback on value
14	Vellanic Estate	14	Fair	Good, but rather smoky	Fine Pekoe Souchong kind ..	1/10 2/	Good Tea, but over fired.
15	Col. Grant's Estate	15	Fair	Full flavoring	Bold wiry Pekoe, Souchong kind, olive hue	2/	A very good useful class, save the hue of leaf.
Dunsdale Estate.	Pekoe, 1869	16 A	Poor	Sour	Small broken dull black	1/4 1/6	Bad type, spoilt in manufacture over fired.
	Orange Pekoe, 1869	16 B	Thin	Odd, burnt a bad quality in black Tea			
	Souchong Pekoe, 1869	16 C	Fair	Thin and rather burnt	Even Ivory black leaf .. .. Well curled but dull leaf	Leaf for 2/6 Flavor 1/2 2/	Ditto. Fair leaf but flavor poor.
16	Uncolored Gunpowder, 1869 ..	16 D	Very good	Pungent, high burnt, a good quality in Green Tea [illegible]			
	Uncolored Hyson, 1869.. ..	16 E	Good	Full burnt	Fine Ivory Hyson leaf but inferior Color	2/6	Very good.
	Flowery Pekoe	16 F	Weak	Vapid	Fine Ivory leaf between Hyson and young Hyson .. .. .. All flower	2/4 2/6 5/ 6/ ormore.	Very good. Fancy Tea, flowery Pekoe.

CABBAGE.

CABBAGE-TREE OF NEW ZEALAND.

It may not be generally known that the cabbage-tree, *Cordyline Australis*, which grows so abundantly in New Zealand contains a very considerable proportion of saccharine matter. In former years, says *Applied Science*, the Maoris used, when on their fishing excursions up country, to hack down a few of these trees near their encampments, and, after a day's exposure to sun and air, cut off quids which they chewed with great gusto. Fifteen years ago a gentlemen resident in Otago obtained a fair sample of sugar, manufactured by the Maoris from the cabbage-tree, which he sent to London for inspection. The process for extracting the sugar, so far as we are aware, has not been divulged by the natives, and probably no individual European is conversant with the matter. It might, then, form an interesting subject for inquiry and dissertation how the process was accomplished, and how far the tree could be utilized for such a purpose. The cabbage-tree may be readily propagated from seed, and its growth is comparatively rapid. The whole tree is fibrous, and can be made into paper. It grows to a diameter of from 1ft. to 3ft and height from 10ft. to 20ft., and is found chiefly in swampy situations, although it grows on hill-sides. The stem is thickly fibrous, and the leaves, which are long (ribbon-like), and about 2½ in. broad, contain a good deal of fibre.

TOMATOES.

PRUNING AND TRAINING TOMATOES.

Everybody seems to have his own plan for cultivating tomatoes, and just now everybody seems to be putting his plan into the papers. One proposes to pinch down the vine into a kind of dwarf bush; another proposes to train them on brush; another to mulch the ground with straw, and let the vines fall down as they choose; another advises as much manure as you can get; another as little as you dare. The truth is, tomatoes will grow almost any way, and yield a fair return; but my experience is, that pruning the vines has as great an effect as it has upon Catawba grape-vines. I tried this plan last summer with wonderfus effects. My tomatoes were last year (and are this year, and will always be) right over a secret ditch, in a low moist place—in fact, water ran from the underdrain all the summer, dry as it was. Holes were dug about 3 by 3 feet apart and 18 inches deep, and filled with stable manure and Baugh's phosphate well mixed—that is, with all the manure I could get. The vines were worked several times, and then mulched with straw and "laid by." At each hill a stake five feet long was driven firmly into the ground, and a hole was bored through every stake about the middle, and at the top, with a three-quarter auger-bit. The vines were pruned to a single stalk, and tied with strips of factory cloth an inch wide to the stalks, and bands going through the holes above mentioned to prevent slipping (a galvanized nail would be better and easier, a common nail would rot the band in a few days). The vines thus stood about four feet high, were tied in the middle and at the top, and were then allowed to take care of themselves, except that they were pruned heavily throughout the whole season. The result was magnificent clusters of the largest tomatoes I ever saw, and in spite of the drought, the severest ever known in this region, they bore steadily till frost. To make the experiment complete, some vines were left unpruned; they produced plenty of vine and some small fruit, but after the drought set in they almost ceased to bear at all. To make the experiment further complete, I put some vines on high land, and, though treated the same way, the vines burnt and died early in the summer. These experiments convinced me completely; or, more exactly, my having an abundance of tomatoes all the summer, when nobody else had any scarcely, convinced me that heavy manuring, constant pruning, tying up at least four feet high, and planting on a low moist place, but thoroughly underdrained, will ensure the finest tomatoes, and the most of them; while unpruned vines in the same place did almost nothing, and vines on high land did absolutely nothing. —*Carolina Farmer.*

MARKET REPORT.

LONDON, 13*th October* 1870.

COFFEE.—The parcels brought to public sale on Tuesday went off without spirit at about last week's currency. 950 casks, 100 barrels, 230 bags plantation Ceylon chiefly sold: triage, &c., 38*s.* to 50*s.*; small to bold grey, 52*s.* 6*d.* to 63*s.*; good to find bold colory, 64*s.* to 77*s.* 6*d.*; peaberry, 71*s.* to 77*s.* 6*d.* 400 bags native Ceylon, all sold; small, 39*s.* good ordinary, 47*s.*; bold, 51*s.* 630 cases and 300 bags other East India all sold: fine Mysore, small to bold, 68*s.* 6*d.* to 82*s.*; peaberry, 77*s.* 6*d.* Winaad triage, 37*s.* to 47*s.* 6*d.*; ordinary and small, 53*s.* 6*d.* to 57*s.* middling to bold, 60*s.* to 77*s.* 6*d.*; peaberry, 70*s.* 6*d.* to 79*s*, 15 packages Jamaica, 43*s.* to 48*s.* 130 bags Costa Rica, 53*s*, 6*d.* to 54*s.* 6*d.*; and 430 bags washed Rio, middling to good, 58*s.* to 66*s.* Yesterday 230 casks plantation Ceylon at auction realised from 56*s.* 6*d.* to 78*s.* 1,600 bags washed Rio brought from 56*s.* to 64*s.* 3,700 bags Costa Rica went from 53*s.* to 59*s.* 6*d.*

TEA.—4,300 packages of Indian growth were advertised for sale on Tuesday, but the bulk found buyers by private contract at full prices. Of the remainder a fair portion sold at their previous prices. The deliverie in London estimated for the week, ended 6 October 10, were 1,825,496 lbs. which is an increase of 188,157 lbs. compared with the previous statement.

INDIGO.

CALCUTTA, 2*nd March.*

Forward sales of a secret nature alluded to in a former issue are now permitted to come to the light of day. The J & R W produce, consisting of 4,000 maunds, has been settled for at Rs. 280 per factory maund being Rs. 42-8 below the price realized for the same mark of last season's produce, or with present exchange equal to a decline of Rs. 47 per maund. It may just be asked in passing, if fine Indigo is so much less valuable this year as compared with last year, what is to be the probable decline in common dye, which is now giving a loss of 1 to 2*s.* per lb. in London on the prices paid here last season. The annual public sales are likely to begin about the middle of the current month, and will indicate more correctly than private sales how prices are likely to rule for the season.

INDIAN TEA.

Two Auctions have taken place during the week at which 1,638 chests were offered, all finding buyers excepting 31 chests. There was a very active competition for all descriptions, and prices paid were consequently very full. Good Broken Pekoes show a considerable advance upon rates ruling a few weeks previously, and all Pekoes are in good demand at stiff rates. Pekoe Souchongs brought about the same figures at sale as medium to fair Pekoes, and very little Souchong is obtainable under 11 annas per lb. In Congous scarcely any thing is selling under 9 annas per lb. All Teas with strength are in particular request. Private sales comprise 111 chests Debrooghur Tea Estate, at 15 annas per lb.; 254 packages "Dehra Doon" Green Tea at 15½ annas per lb., 264 chests Darjeeling { S. S. / Kurseong } mark at 14¾ annas per lb., and 260 chests "Kallacherra" Tea at 13 annas per lb. About 3,300 chests are advertised for Public Sale during this week.

JUTE

Continues in unprecedentedly large demand, and arrivals from the growing districts are taken off the bazar as they come to hand at the rate of 18 to 20,000 drums daily, and should the shipments continue for another three months on the same large scale as at present, the year's crop of Jute will be exhausted by the end of January next. Prices remain very high for all descriptions, and low as well as fine qualities are both in scarce supply and higher in value, why even Rejections are in demand at Rs. 3.12 per B. maund, and small quantity of fine Northern realized as much as Rs. 6-2-6 yesterday. It must be confessed that the ruling rates taken together with the current high freight, lay down Jute in Great Britain at a dear cost, but on the other hand there is at present no prospect of lower prices for the year's crop. —*Toulmin & Co.'s circulars.*

INDIGO OUTTURN.

CALCUTTA, 19*th Oct.* 1870.

The manufacturing season having now been brought to a close, we are desirous of giving the result of the operations as correctly as it is possible to do until the Indigo is weighed off, but have thus far ascertained from the final manufacturing reports, but a comparatively small proportion of the whole of the factory outturns. In *Lower Bengal* our estimate of 26th August is confirmed. In *Tirhoot, Chumparun* and *Chumpra* the second cuttings have proved a complete failure. The heavy rain of August and early part of the September checked the growth of the *Khoonties* and turned the leaves yellow, and the result of the second cuttings in some factories has been worse than was ever known. In the *Benares* districts the *Assares* sowings (effected in June and July on the setting in of the rains) have also produced very little, and in many instances the plant was utterly destroyed by constant rain and a consequent heavy growth of weeds choking it, and in other instances by inundation. With reference to this fact we may observe that as the chief crop of Benares districts is the produce of *Khoonties*, or stubble of the *Assares* plant of the *previous season*, the prospect for next year in absence of the usual amount of such *Khoonties* is any thing but cheering. As regards the *Doab* we are still very uncertain about the amount of Indigo it is likely to send down. The enormous fall in prices in London during the past twelve months of from 2*s.* to 3*s.* per lb. (equal to 60 Rs. to 90 Rs. *per maund*) will we fear, have the effect of making the sale of *low to good Native Oudes* a matter of great difficulty in the approaching selling season, and as it is a common practice to keep back such Indigo up-country when prices here are low and the market depressed, we think the actual amount of such Indigo produced this year will remain a mystery for some time, and we give 21 to 23,000 maunds (against 30,500 maunds last year) as the extreme quantity likely to be available for shipments this year.

Our present estimate of the crop is as follows:—

Lower Bengal .. .. Fy. Mds.	27,000
Tirhoot, Chumparun and Chuprah ...	31,000
Benares Districts	16,000
Doab	21,000 to 23,000
Total Fy. Mds.	95,000 to 97,000

—*William Moran & Co.'s Circular.*

CALCUTTA, 1*st November.*

The rains appear now to have come to a close with such a downpour throughout the country as has seldom, if ever, been witnessed so near the end of October. It has come too late to affect the Indigo of this season beyond probably delaying the drying and packing of it for a few days. For next season it secures splendid moisture for spring sowings in *Tirhoot*, and *Chuprah*, where the rain guages have indicated a fall varying from six to twelve inches between the 22nd and 27th ultimo. In *Lower Bengal* the rivers have risen in some places from three to four feet, and the loss of sowings lately effected, by this and the heavy rains, has been considerable and will involve great expense in the cost of extra seed for re-sowing.

To the labouring population of the districts the injury their newly sown grain crops which will require to a great extent to be re-sown, but to do which, in many cases the ryots have neither seed nor the means of purchasing it, will be very great and the destruction of their huts adds further to their distress.

We are told that the outturn of *Benares* districts will fall short even of our reduced estimate of 16,000 maunds, but for the present we hold to our estimate 95 to 97,000 maunds, as the probable result of the season. About 300 chests of up-country Indigo have arrived in the market, but we do not anticipate any business in such qualities until the public sales commence, probably about the middle of the month.—*Id.*

MESSRS. SHAIKH KASIM & CO.,

TENT MAKERS,

FUTTEHGURH.

WHO received a certificate from H. M. Mackenzie, Esq., Commissary of Ordnance, Futtehgurh, on the 11th November 1867.

Respectfully beg to inform the public, that they make tents of every size and description to order, of best materials, handsome shape, and good workmanship, at very reasonable prices, in support of which they have obtained a highly recommendatory testimonial from the above gentleman.

They beg also to announce that they have a large stock of tent materials always in hand to execute all orders promptly and with much care and attention. Brass eyelets will be supplied in lieu of leather ones in every tent; also ventilators will be made in under fly of large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny-bags, pegs and mallets, as follows:—

No. 1, 30 feet by 18 feet	Rs.	825
,, 2, 28 do. by 16 do.	,,	690
,, 3, 24 do. by 14 do.	,,	625

II.—Single-poled tents of 4 cloths throughout and 4 feet verandahs, complete as above, viz:—

No. 4, 20 feet square,	Rs.	640
,, 5, 18 do.	,,	540
,, 6, 16 do.	,,	475
,, 7, 14 do.	,,	420

III.—Hill-tents, double fly and single kanats of 4 cloths, complete as above, viz.:—

No. 8, 14 feet square, with 2 saibans, 3 cloths, 5½ feet high,	Rs.	270
,, 9, 12 do. do. do.	,,	225
,, 10, 10 do. do. do.	,,	190
,, 11, 8 do. do. do.	,,	1

IV.—Swiss Cottage tents, double fly and circular saibans, the rear one being closed by 6 feet kanats to form a dressing-room of 4 cloths throughout, complete as above, viz:—

No. 12, 14 feet square,	Rs.	37.
,, 13, 12 do.	,,	340
,, 14, 10 do.	,,	285

V.—Swiss Cottage tents, double fly and circular verandah, and 3 feet saibans, the rear one being closed by 4 feet kanats to form a bath-room, 4 cloths throughout as above, viz:—

No. 15, 14 feet square,	Rs.	290
,, 16, 12 do.	,,	240
,, 17, 10 do.	,,	200
,, 18, 8 do.	,,	175

VI.—Rooties of 4 cloths in fly and 4 cloths, in 6 feet kanats, complete as above, viz:—

No. 19, 16 feet by 14 feet,	Rs.	225
,, 20, 14 do by 12 do.	,,	200
,, 21, 12 do. by square,	,,	180

VII.—Sleeping pals for gentlemen, of 4 cloths, including chintz, and with 4 feet kanats, wooden poles, complete as above, viz:—

No. 22, 12 feet square,	Rs	100
,, 23, 10 do.	,,	90
,, 24, 8 do.	,,	80

VIII.—Bechoba tents of 4 cloths in fly and kanats, complete with durree, &c.:—

No. 25, 12 feet square,	Rs	140
,, 26, 10 do.	,,	125
,, 27, 8 do.	,,	110

IX.—Shameanahs of 4 cloths in fly and kanats, 7 feet high, with 5 feet curtains, hanging from above, of 3 cloths, complete with 8 wooden poles as above, viz:—

No. 28, 24 feet square,	Rs.	400
,, 29, 18 do.	,,	325
,, 30, 16 do.	,,	290

X.—Sepoy pals of 3 cloths, with Lamboo poles:—

No. 31, 16 feet by 15 feet,	Rs.	60
,, 32, 14 do. by 12 do. servants' pals do.	,,	50
,, 33, 12 do. by 10 do. do. do.	,,	45
,, 34, 10 do. by 8 do. do. do.	,,	40

NECESSARY TENTS.

No. 35, 5 feet square,	Rs.	30
,, 36, 4 feet square,	,,	27

XI.—Swiss Cottage tents for hills, double fly and circular saibans of 4 feet, the rear one being closed by 4½ feet kanats to form a bath-room, and two bath-rooms will be two sides, the upper fly 3 cloths, under fly 2 cloths, complete with wooden poles, as above, viz:—

No. 37, 12 feet square	Rs.	250
,, 38, 10 do.	,,	210
,, 39, 8 do.	,,	185

XII.—Mess tents, three-poled, of 4 cloths throughout and 4 feet verandahs, complete, with glass shades with 4 branches with a brass clasp and two punkhas, complete as above, viz.:—

No. 40, 40 feet by 20 feet,	Rs.	1,500
,, 41, 32 do. by 16 do. of two-poled do. do. with one punkha..	,,	1,250
,, 42, Bath-room, 6 feet square, with top for single-poled tent, without durries	,,	38
,, 43, Zanana kanat, 8 cloths, 7 feet high, 72 feet long, in two pieces	,,	72
,, 44, Shutrinjee of best materials, per square yard, (14) fourteen annas		

TERMS.—Two-thirds the price of the tent in advance, the remainder on delivery. Risk and cost of transport to be borne by purchasers, as also any charges for discounting their cheques and hoondies. No orders will meet with prompt attention without a remittance mentioned as above.

Apply to

MESSRS. SHAIKH KASIM & Co.,
Tent Makers, Futtehgurh.

The Ravages of White Ants.

ARE completely prevented by the Preservative Composition patented by Major Forbes, R.A., Executive Engineer, D. P. W.

This is the only effectual process yet invented for protection against White Ants, it also arrests decay in woodwork whether sheltered or exposed.

The dry Ingredients, packed in tins, containing 25 lbs. each, can be obtained from the undersigned; this quantity, mixed with a due proportion of oil, will form a paint sufficient to prime 1,000 superficial feet. Price per tin, Rs. 5.

Sole Agents,
7, Hastings Street. BURN & Co.,

HOWRAH STEAM SAW MILLS.—The undersigned having erected extensive Steam Saw Mills, with vertical and circular saws, are prepared to execute every description of Woodwork on a large scale. Rates can be obtained at our Howrah Iron Works, or at the Offices, Hastings Street.

BURN & Co.,
Calcutta, January 1870. Iron Founders and Mechanical Engineers

HOWRAH IRON WORKS.—WROUGHT IRON BRIDGES, Roofs, Irrigation, and Pumping appliances, Cotton, Jute, and Oil Presses, Pug Mills, (the latest Akra Pattern,) Jute, Flax, and Cotton Mill Gearing and Shafting; Machinery for Collieries, Indigo Concerns, and Silk Filatures, Iron Steamers, and Barges, Ships' Capstans and Windlasses, Portable, Stationary, and Marine Engines, Hydraulic Presses, High and Low-pressure Boilers, Tanks, Gasholders, Railway, Mining, and Contractors' Plant; Turn-Tables, Crossings, and improved jointed Levers for Switches, Road Rollers, Cranes, Winches, Traversers, &c., &c., manufactured.

Having a very extensive Foundry, the undersigned are in a position to execute orders for all kinds of Castings with great despatch.

Head Office, 7, Hastings Street, Calcutta. BURN & Co.

DURBAR TENTS & CAMP EQUIPAGE

OF EVERY DESCRIPTION,
MADE TO ORDER AT THE
FUTTEHGURH ORPHAN ASYLUM TENT MANUFACTURING COMPANY, LIMITED, OF EXCELLENT CUT, BEST MATERIALS PROCURABLE, AND HANDSOME WORKMANSHIP.

ESTABLISHED IN 1838.

INCORPORATED AND REGISTERED IN 1866.

PRIZE and MEDAL by N. W. PROVINCES' EXHIBITION held at AGRA, during FEBRUARY, 1867.

FIRST PRIZE AND MEDAL BY BROACH EXHIBITION IN BOMBAY, HELD DURING DECEMBER 1868, WITH CERTIFICATES OF MERIT.

Printed Price Lists will be forwarded on application to

MESSRS. PREM MASIH & Co.,
Managing Directors.

A revised List of Tents, with their reduced prices, made by

MESSRS. MOULA BUKSH & Co.,

TENT MAKERS,

FUTTEHGURH,

WHO received the following certificates, one from R.C. Oldfield, Esq, Collector, Furruckabad, on the 29th October 1869, and another as follows:—

MESSRS. MOULA BUKSH & Co.,
Futtehgurh,

I have much pleasure in stating that the tent you made for me has given satisfaction as regards materials, tent and workmanship.

J. E. KIN, Surgeon,
37th Regiment.

Shahjehanpoor, 1st February 1870

Have the honor to inform the public in general, that in their manufactory the best materials are supplied, and brass eyelets are supplied in lieu of leather ones Ventilators will be made in large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny bags, pegs, and mallets as follows:—

No. 1.—30 feet by 18 feet	Rs. 825	No. 3.—24 feet by 14 do.	Rs. 620
,, 2.—28 do. by 16 do.	,, 690		

II.—Single-poled tents of 4 cloths throughout, and 4 feet verandahs, complete as above:—

No. 4.—20 feet square	Rs. 540	No. 7.—14 feet square	Rs. 420
5.—18 do.	,, 540	,, 8.—12 do.	,, 390
6.—16 do.	,, 475		

III.—Hill-tents, double fly and single kanat of 4 cloths, with 2 outriggers of 3 cloths, complete as above:—

No. 9.—14 feet square	Rs. 270	No. 11.—10 feet square	Rs. 200
,, 10.—12 do.	,, 225		

IV.—Swiss Cottage tents of 4 cloths throughout, double fly and circular saibans, the rear one being closed by 6 feet kanat to form a dressing-room, complete as above:—

No. 12.—14 feet square	Rs. 380	No. 13.—12 feet square	Rs. 340

V.—Swiss Cottage tents of 4 cloths throughout, double fly and circular verandah and 3 feet saibans, the rear one being closed by 4 feet kanat to form a bathing-room, complete as above:—

No. 14.—14 feet square	Rs. 290	No. 16.—10 feet square	Rs. 200
,, 15.—12 do.	,, 240		

VI.—Rooties of 4 cloths, in fly and in kanat, complete as above:—

No. 17.—16 feet by 14 feet	Rs. 225	No. 19.—12 feet square	Rs. 190
,, 18.—14 do. by 12 do.	,, 200		

VII.—Bechoba tents of 4 cloths fly and kanats, complete as above:—

No. 20.—12 feet square	Rs. 150	No. 21.—10 feet square	Rs. 140

VIII.—Shameanahs of 4 cloths in fly and kanat, 7 feet high, with 5 feet curtains from above, of 3 cloths, and eight wooden poles, complete as above:—

No 22.—24 feet square	Rs. 400	No. 24.—16 feet square	Rs. 290
,, 23.—18 do.	,, 320		

IX.—Sleeping-pals for gentlemen of 4 cloths, including chintz and 4 feet kanat, wooden poles, complete as above:—

No. 25.—12 feet square	Rs. 110	No. 27.—10 feet by 8 feet	Rs. 80
,, 26.—10 do. do.	,, 90		

X.—Sepoy pals of 3 cloths, with bamboo poles:—

No. 28.—16 feet by 15 feet	Rs.	60
,, 29.—14 do. by 12 do. servants' pals	,,	50
,, 30.—12 feet by 10 do servants' pals	,,	45

XI.—Miscellaneous.

No. 31—Necessary tents 5 feet square	Rs.	33
,, 32—Ditto do 4 do	,,	27
,, 33—Bathing room, 6 do with top for single-poled tents, without durries	,,	38
,, 34—Saibans for 2 feet hill tents	,,	18
,, 35—Shutrunjee per yard Re. 1.		
,, 36—Mess-tents of three poles complete, with glass shade, brass clasp, punkha &c., of 4 cloths throughout, 40 feet by 20 feet	,,	1,500

TERMS.—Two-thirds of the prices must accompany the order to meet prompt attention, the remainder on delivery. Risks and any discount charged in cashing the cheques, &c., to be levied on purchasers. All orders will be executed without the least delay.

Apply to MOULA BUKSH & Co.,
Tent-Makers, Futtehgurh.

CHARTERED MERCANTILE BANK OF INDIA, LONDON AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies.

Circular Notes and *Letters of Credit* are also granted for the use of Travellers in the *East*, on the *Continent* and to *Europe* overland.

The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Cocanada, Ceylon, Hongkong, Foochowfoo, Shanghai, Hankow, Singapore, Penang, Mauritius, and Yokohama

INTEREST ALLOWED.

On Deposit Accounts payable on demand Interest will be credited half yearly on 30th June and 31st December, at the rate of two per cent. per annum on the daily balance, not exceeding one Lac Rupees.

ON FIXED DEPOSITS.

12 months	5 per cent.
3 do.	3 „

All letters should be addressed and Hoondies made payable to the Chartered Mercantile Bank.

ORIENTAL BANK CORPORATION.

Bombay Agency.

EXCHANGE.

THE CORPORATION grant Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope.

No Draft at six month's sight is granted for a sum under £50 Sums under £20 are only drawn for on Demand.

COMMISSION

The rate of Commission charged by this Agency on the purchase or sale Government Securities negotiable in Bombay is one quarter per cent and on the collection of Bills one per cent. and Postage

The Corporation take charge of Government Paper, Shares in the Bank Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms —

If to be remitted through the Corporation	Without charge
If to be paid in India, a Commission will be charged of ..	¼ per cent
On delivering Securities out of safe custody	¼ do.
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869.

ORIENTAL BANK CORPORATION.

INCORPORATED BY ROYAL CHARTER, 30TH AUGUST, 1851.

Paid up Capital, £1,500,000. | Reserve Fund, £444,000.

DEPOSITS.

Interest is allowed at 5 per cent. per annum, on Deposits of not less than Rs. 500, and not exceeding Rs. 50,000, is lodged for 12 months certain Deposits for shorter periods, or for sums above Rs. 50,000, must be arranged for with the Agent.

No Interest is allowed on Current Deposit accounts.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius, Australia, and New Zealand at the exchange of the day.

Drafts are drawn for sums of £1 and upward.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued.

N. B..—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if married lady, her own Christian name, not that of her husband, is required.

JOHN S. SCRYMGEOUR, Agent.

Calcutta, 15th September, 1870.

NATIONAL BANK OF INDIA, LIMITED.

BOMBAY BRANCH.

CURRENT DEPOSIT ACCOUNTS.

The Bank opens Current Deposit Accounts, and allows Interest at the rate of 2 per cent. per annum on Customers' daily balances, from Rs 500 up to Rs. 100,000.

FIXED DEPOSITS

The Bank receives money on Fixed Deposit, and allows Interest thereon as follows:—

On Deposits subject to 6 months' notice of withdrawal, 4 per cent.
Do. „ 12 „ „ 5 „

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta, Madras, and Hongkong. It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange.

By order of the Directors,
JAMES WINDRAM, Manager.

Bombay, 26th August 1870.

NEW BANK OF BOMBAY,—*(Limited).*

RATES.

DISCOUNT.

On Government Bills	6 per cent.
On Private Bills and Notes	8 do.
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares . . .	6 do.
On do. do. do. Goods or Shipping documents for Goods	8 do.
On Cash Credits, on Security of Government Paper, Bullion or Railway Shares, subject to a Commission of ½ per cent. on the amount of Credit..	7 do.

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts.

Bombay, 15th July 1869.

LLOYD'S BANK,

DARJEELING.

Fixed Deposits.—Interest is allowed on deposits of Rs. 100 and upwards on the following terms:—

On sums lodged for 3 months certain 7 per cent. per annum.
Do. 12 do. 7 do
Do. 2 years certain 8 do.

Interest is allowed at 2 per cent. per annum on floating deposits or Current Accounts, when the balances exceed 500 Rupees.

There are many who have a dread of speculation, and yet who desire a *fairer* rate of interest than is obtainable from investments in Government paper and Railway scrip, or from fixed deposits in Joint Stock Commercial Banks. Remittances can be made by cheques on any part of the world.

Interest paid half yearly in India or London.

A. B. L. WEBB, Manager.

Darjeeling, Northern Bengal, 1st August 1870.

ADDIS'S IRON PERMANENT WAY FOR RAILWAYS.

The advantage of Addis's Permanent Way in addition to its cheapness and durability, consists in its being a longitudinal Sleeper Road; it combines the office of sle per and fish-plate, and thus enables chairs, spikes and trenails to be dispensed with. The parts being fewer, in cases of shipment to foreign countries, is of great importance in saving of freight, as well as for facility of close packing of carriage over long land distances.

It has also great advantage in simplicity of laying, and cheapness in maintenance. The staff needed for this purpose may be limited, and no special or previous knowledge is required.

For plans specifications, price lists, and all other information, apply to the undersigned

F. KLINGELHOFFER, Sole Agent for the above.

Tanna Iron Works *TANNA*

MOORLEE DHUR, A RELATIVE OF RAO JOTEE-PERSHAD & Co.,

Tent Manufacturers, Futtehgurh.

A revised List of the prices of tents, &c., made at the manufactory of Moorlee Dhur and Co.

Double poled tents of 4 cloths throughout and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny bags, pins and mallets as follows:—

No.	1, 32 feet by 20 feet	Rs. 1,020
„	2, 30 do by 18 do.	99
„	3, 28 do. by 16 do.	810
„	4, 26 do by 16 do.	760
„	5, 24 do by 14 do.	615

Single pole tents of 4 cloths throughout, and 4 feet complete as above, viz.:—

No.	6, 20 feet square, ..	Rs.
	7, 18 do ditto, ..	„ 64
	8, 16 do, ditto, ..	„ 57
	9, 14 do. ditto, ..	„ 510
	10, 14 do. ditto, ..	„ 43
	11, 12 do. ditto, ..	„ 400

Hill tents of 4 cloths, in kanat and top and in sachans 3 cloths, and complete as above, viz.:—

No.	12, 14 feet sqn. with 2 sachans,	Rs. 310
„	13, 13 do. ditto do. 2 ditto,	„ 270
„	14, 12 do. ditto do. 2 ditto,	„ 250

Routies of 5 cloths in top, and 4 cloths in kanats, complete as above, viz:—

No.	15, 16 feet and 14 feet,	Rs.
„	16, 16 do. do. 12 do., ..	„ 225
„	17, 14 do do. 12 do., ..	„ 215
„	18, 12 square, ..	„ 205

Swiss cottage tents, double fly and circular sachans, all the four enclosed with kanats to form rooms, 4 cloths throughout, with carpets.

No.	19, 16 feet square, ..	Rs. 520
	20, 15 do. ditto, ..	„ 495
	21, 14 do dit o, ..	„ 450
	22, 13 do. ditto, ..	„ 425
	23, 12 do ditto, ..	„ 400

Sleeping pals, 5 cloths, chintz lining and wooden poles, with one carpet, 4 cloths in kanats, complete.

No.	24, 12 feet square, ..	Rs. 125
„	25, 10 do. by 12 feet, ..	„ 110
„	26, 10 do. square, ..	„ 95
„	27, sepoys' pals, 15 by 16 ft. (4 cls.,)	75
„	28, ditto 14 by 12 ft. (3 do.,)	55
„	29, lascar pals, 18 by 16 ft. (3 do.,)	85

Shamianas.

No.	30, 40 feet square of 4 cloth in flies and 12 feet high, with kanats, complete as above, being 16 wooden poles, ..	Rs. 830
„	31, 24 feet, 8 wooden poles, with kanats, ..	„ 500
„	32, 20 feet, 8 ditto ditto ditto,	„ 410
„	33, 12 „ square, ..	„ 250

Stable Tents.

34,	8 by 12, for one horse. ..	„ 60
35,	Necessary tents, ..	„ 25
36,	ditto small, ..	„ 20
37,	Zenana kanats of 3 cloths 7 feet high and 3 feet broad, Rs. 3-8 per yard.	
38,	Division curtain and kanat will be charged for agreeably to size of tents,	„ 32
39,	Glazed doors, with boxes for packing, each, ..	„ 22
40,	Bathing tents, 6 feet and 10 feet (3 cloths,) ..	„ 32-8
41,	Boots for tents, per boot,	„ 20
42,	Shutrunges of best material per square yard, 18 annas.	

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Futtehgurh, 25th September 1867.

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Futtehgurh, August 1870.

ROHNEE TEA AND COTTON ASSOCIATION.

Prospectus.

The Estate. The land extends from near *Garidhoura* to *Kuprail*, all along the East side of the Darjeeling and Silligoree road, and may be said to be *the finest soil in the teral*—well suited to the growth of Tea, Coffee, Cotton, Tobacco, Ginger, Castor Oil, &c. The area of the Estate is 1,777½ acres, and the leasehold has cost the undersigned Rs. 15,993 exclusive of stamps, conveyancing, &c. A small annual rent has to be paid to Government

Sixty acres are in tea, planted 4' by 2' so as not to lose altogether the cold season 1869-70.

To be worked by a private Company.—The undersigned proposes to associate with himself several partners and to utilize the land by gradually putting five hundred acres of the very pick of the soil under tea, reserving the remainder for cotton and timber, unless the Association would prefer selling portions at a profit.

It is a very fine lay of land and is quite worth 17 Rs. per acre, on an average.

Management.—Payments of calls to be made quarterly or monthly to Lloyd's Bank, Darjeeling, Mr Lloyd to be Agent, charging sixty Rupees monthly for his time, trouble and responsibility. The garden to be in charge of an experienced manager who would have to hold at least one anna share in it.

Yield of tea, and estimate of outlay and profit.—From sure data already obtained from similar or somewhat inferior soil in the neighbourhood, the yield of tea may be taken at ¾ md. per acre the 2nd year, 3rd year 2½ mds., 4th year 4 mds., 5th year and afterwards at least 5 mds. per acre. During the cold weather of 1869-70 only 60 acres were planted out, in the following season 240 acres, and the year after that 200 acres or as much as the funds economically used, will admit of. The land would have to be paid for during the 1st year by quarterly instalments, with interest at six per cent. per annum, on the unpaid quarterly balances. The price of the tea has been taken at the moderate figure of 55 Rs. per maund, but ordinary *terai* has hitherto sold at an average of 14 annas per lb.

It is now proposed, as being the most practicable arrangement, that there be 16 one anna shares and that any one may take one, or more of these anna shares, and pay Rs. 200 per anna share monthly, or if he prefers it Rs. 600 quarterly, in advance and that the most be made of this money.

The project is not intended for large capitalists but for the savings of poorer men with salaries. Mr. Lloyd is prepared if necessary to take ½ of the shares.

He is already in 5 similar associations in the terai and he started this last one to utilise this fine block of waste land. The terai gardens are all doing remarkably well. If present circumstances continue, and there is no reason to anticipate any change whatever, this garden will pay 40 per cent. per annum.

Amount of calls to be paid in Darjeeling free from loss by exchange, so that all the shareholders may be on equal terms. Cheques on any Indian or English Bank or good house of business, will be found the best ordinary means of remittance.

There need be no fear of this Company being anything but a success; *vide* the Commissioners last report on our *young terai* gardens, Northern Bengal.

WILLIAM LLOYD.

Darjeeling, 1st August 1870.

Printed for the Proprietor by JAMES PEARSE, at the *Oriental Press*, Bombay. Published by WYMAN & Co., Calcutta.—Nov. 15th, 1870.

THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, THURSDAY, 15TH DECEMBER, 1870. [No. 5.

Advertisements.

PRIZE OF £5,000.

Fort William, the 11th January 1870.

THE GOVERNOR GENERAL IN COUNCIL is pleased to direct the publication of the following advertisement:—

ADVERTISEMENT.

1.—The Government of India, after communication with various Agricultural and Horticultural Societies in India, and with persons interested in the subject has arrived at the conclusion that the only real obstacle to the development of an extensive trade in the fibre of Rhœa or China-grass is the want of suitable machinery for separating the fibre and bark from the stem and the fibre from the bark, the cost of effecting such separation by manual labour being great

2.—The demand for the fibre is now large, and no doubt might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown

3.—The requirements of the case appear to be some machinery or process capable of producing, with the aid of animal, water, or steam-power, a ton of fibre of a quality which shall average in value not less than £50 per ton in the English market, at a total cost, all processes of manufacture and allowance for wear and tear included, of not more than £15 per ton. The said processes are to be understood to include all the operations performed after the cutting and transport of the plant to the place of manufacture, to the completion of the manufacture of fibre of the quality above described. The machinery must be simple, strong, durable, and cheap, and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation.

4.—To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offers a prize of £5,000 for the machine and process that best fulfils all the requirements named above

5.—Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named.

6.—Arrangements will be made by the Government of India for the supply of carefully dried stems, and specimens of fibre separated from the bark, but subjected to no other process, to mechanical firms and others desirous of competing, on application to the Secretary to the Government of India in the Home Department

7.—All machinery, &c., must be brought by the competitors at their own charge to a locality which will be notified hereafter, probably in the North-Western Provinces or the Punjab, and there worked under the supervision of their own representatives for a sufficient time to enable the judges appointed by Government to determine whether all the conditions named have been complied with. The prize machine is to be transferred, if required, to Government at 5 per cent. above cost price; the patent right in any such machinery to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of 5 per cent. on the cost price of all machines manufactured under the patent during its currency

8.—One year from the date of this advertisement will be allowed for the preparation of the machines and their transport to the locality named for the competition, and the trials will then be made and the decision of the judges announced. If no invention of sufficient merit is received in the above-named period to obtain the prize offered, the Government will continue to allow machines to be tendered for trial till the end of two years from the same date after which, or on award of the prize, the offers herein made will be withdrawn.

Agricultural and Horticultural Society of India.

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ON THE

CULTIVATION AND MANUFACTURE OF TEA.

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Metcalfe Hall, Calcutta, 16th March 1870.

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THE

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, THURSDAY 15TH DECEMBER, 1870. [No. 5.

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AN AGRICULTURAL DEPARTMENT.

WE have read with unfeigned astonishment the comments of a part of the Indian press upon the proposal to found a Department of Agriculture in India. The notion seems to be that a great job is about to be perpetrated under the guise of a great reform. It is difficult to imagine what can have given rise to the belief, for, as every one knows, the measure has been forced upon the Government by the persistent demand of influential societies at home.—The Society of Arts, the Cotton Supply Association, the East India Association, and the Chambers of Manchester and Liverpool.—We are to understand, it seems, that these Associations are leagued together to force the Government of India upon the perpetration of a great job. To notice such criticism further, would be to descend to its level. It is a just reproach against our administration that so plain and urgent a want was not long since supplied. In view of the fact that the Government is the *Landlord* of the soil, its complete neglect hitherto of the Agriculture of the country lays it open to the most just animadversion. The appointment of a minister of Agriculture is being strongly urged at this moment upon the ministry at home, although the Government there has no interest in the soil whatever, and the private landlords of the country, with vast capital and skill, have concentrated all their energies upon its improvement for many years.

The *Englishman* says that the Government of India is already too bureaucratic, and that it would be better to lop off existing departments than to engraft fresh ones. What is needed, according to our contemporary, is not a Minister for Agriculture, but half a dozen Professors of Agricultural science. "The only mode of improving Indian Agriculture "is by founding professorships in the principal colleges, and "by encouraging the study of the science in such manner as "may commend itself to the heads of the Educational Depart- "ment. Zemindars, as a body, are by no means blind to their "own interests, and will at once recognise the advantage of "having their sons instructed in a science, the direct aim and "tendency of which is to increase the value of the product of "their lands. Science alone, however, will not suffice. Capi- "tal also is needed, but beyond the permanently-settled districts "what Zemindar will care to lay out his money, when the first "fruits of his enterprize will be gathered by the Government "in the shape of an enchanced assessment? The creation of a "department that is not wanted, and for which the country is "not ready, is nothing more or less than a folly and a job. It "is only a personal and officious Government that would ever "dream of establishing an Agricultural Department. The "business of a Government is to do for the people what the "people cannot do for themselves—anything beyond that is an "unjustifiable assumption and exercise of power. Let the "Government point the way to improvement, if it will, by the "institution of chairs of Agricultural science. If the in- "struction thus afforded be really of practical and useful charac- "ter, it will soon be sought, appropriated, and applied; for the "natives of India are neither children nor simple savages, but "quite competent to judge of what is really to their advantage."

So we are to understand, it seems, that all that is required for the improvement of the Agriculture of this great continent of thirteen nations is "the institution of half a dozen chairs of Agricultural science," and "the appointment thereto of professors of Agricultural science" in the principal colleges of the country. The suggestion shows a want of all true conception of the work to be done, and of the scale on which it must be done. The requirement is that here in India, we shall inaugurate a system of Agricultural education upon the model in which it is being pursued in other lands, and upon a scale commensurate with the country's want. In Prussia, there is a public model farm and Agricultural academy for nearly every province of the kingdom. The institution at Mögelin consists of a model farm of 1,200 acres, with a college of professors, chemists, geologists, botanists, veterinary surgeons, and practical agriculturists, complete. The kingdoms of Europe are being filled with institutions of the same order, though not upon so grand a scale. The most noble existing institution of the kind is perhaps that at Grignon, (France) where one of the old royal palaces with the dominion attached to it, consisting of 1,185 acres of arable, pasture, wood, and marsh land has been given up for the purpose. The professors are paid by the Government. To assist our contemporary to understand the work which we have to inaugurate in this country, let him read the following account of what is done at Grignon:—

For the purpose of imparting theoretical knowledge, courses of lectures are given on the following subjects:—1, The rational principles of husbandry, and on the management of a farm; 2, The principles of rural economy applied to the employment of the capital and stock of the farm; 3, The most approved methods of keeping farming accounts; 4, The construction of farm buildings, roads and implements used in husbandry; 5, Vegetable physiology and botany; 6, Horticulture; 7, Forest Science; 8, The General principles of the veterinary art; 9, The laws relating to property; 10, Geometry applied to the measurement and surveying of land; 11, Geometrical drawing of farming implements; 12, Physics as applied to Agriculture; 13, Chemistry as applied to the analysis of soils, manures, &c; 14, Certain general notions of mineralogy and geology; 15, Domestic medicine applied to the uses of husbandmen. The practical part of the education is conducted on the following system:—The pupils are instructed in succession in all the different labours of the farm. Some, for instance, under the direction of the professor of the veterinary art, perform the operations required by the casualties which are continually occurring in a numerous stock of cattle. Others are appointed to attend to the gardens, and to the following departments: woods and plantations; inspection of repairs taking place on the premises; making of starch, cheese, and other articles; the pharmaceutical department; book-keeping and the accounts. A daily register is kept of the amount of the manure obtained from the cattle of every kind. A pupil newly entered is appointed to act with one of two years' standing; and at the end of each week all are expected to make a report, in the presence of their comrades, of whatever has been done during the week in their respective departments. The professor, who presides over the practical part of their education, explains on the spot the proper manner of executing the various field operations; and he also gives his lectures on these different processes at the time when they are in actual progress. The professors in each department render their courses as practical as possible, the professor of botany by herborisations; the professor of chemistry by geological excursions; the professor of mathematics by executing, on the plan he has pointed out, the survey and measurement of certain portions of land. After two years' training in the theory and practice of rural economy, the pupils undergo an examination from the professors collectively, and, if satisfactory, a diploma is granted, which certifies to the capacity of the pupil for fulfilling the duties of what may be styled an "Agricultural Engineer."

Europe and America swarm with schools and model farms of this order, and our only right to be in India rests upon our giving its people the benefits of Western advance in civilization and the arts and sciences. In England and Scotland the *laissez faire* prejudices of the people have hitherto prevented the State founding similar institutions, their want being fairly supplied, however, by special instruction in agriculture given to boarders in the private farms of the country, and the courses of lectures constantly under delivery in the kingdom. In Ireland, however, the State does much for the agricultural education of the people. There are, or were but a few years ago, not less than 37 model Agricultural Schools, and 124 National Agricultural Schools in Ireland.

The Central Model Farm at Glasnevin, consists of nearly 200 acres, cultivated by from 80 to 100 pupils, chosen for their merit from the minor Agricultural Schools of the country, which a few years ago numbered 3,000 pupils. The Albert Institution alone (Glasnevin) turned out 270 trained Agriculturists between 1847 and 1855, while the Templemoyle Seminary (Londonderry) many years ago had turned out upwards of 1,000. Now, all this was being done years ago in Ireland, with a population of not more than 6,000,000 of people, and it is work of this order, upon the right scale for 200,000,000 of people, that we have to introduce into India. It will be a subject of great reproach to our rule if India does not teem with school farms of this order, numbering them by the hundred, before the close of the present century. The Department we are about to set up will require unflagging energy, special abilities and training, and the utmost devotion in its members. Our own fear is that in burdening it with Land Revenue and other branches of the administration, we are not keeping sufficiently close to the ideal we should set before us. We want to improve the agriculture of India a task that will exhaust all the powers that can be directed to its accomplishment. We trust we shall hear no more of the "six professors of Agriculture in the Colleges of the country." The suggestion reads like a piece of grave irony.

CINCHONA.

A CAUTION.

THE quantity of Quinine issued from the Medical Stores in this city during the year 1869-70 for the Hospitals of Bengal, the North-West Provinces, Punjab, and Central Provinces, was 2,671 lbs. A Cinchona plantation, worked "coppice-fashion," should produce, according to Mr. Clarke, 2,000 lbs. of *bark* per acre; and the bark should yield at least two per cent. of amorphous quinine, or one per cent. of crystallizable sulphate. An acre of Cinchona should thus yield 20 lbs. of quinine a year. These estimates, it is admitted, are uncertain, but should they prove approximately correct, the wants of the local Government would be met by about 1,000 acres of land, of which about 150 acres (yielding 3,000 lbs. quinine) might be cut annually, "if worked coppice-fashion." A contemporary states that, as at Darjeeling so also in the Neilgherries, private enterprize has outstripped Government in the cultivation of Cinchona. According to the *Neilgherry Excelsior*, 4,000 lbs. of bark will be shipped this season from the Deva Shola estate to England, being the first private shipment from the Madras Presidency. In view of this extension of the cultivation, it is desirable, perhaps, for us to give prominency to some remarks upon the subject lately placed before the Government of Bengal by the gentleman we have just named. He writes from Rungbee, under date 1st July last, as follows:—

"There are about 3,000 acres of private Cinchona in the Neilgherries, and about 500 acres of private Cinchona in Sikhim. These plantations will probably be highly remunerative if bark maintains its present price; if, however, bark be reduced to one-sixth its present price by the large produce of Government plantations, they hardly could be remunerative. The C. succirubra bark, at from three to five years old from this plantation, is now worth 1s. 8d. per lb. in the London market. We believe that we see our way to growing it here in almost any desired quantity at 3d. per lb.; so that a fall in the price of bark to one-sixth its value is at least conceivable.

"On the other hand, I believe that Cinchona cultivation may be very largely extended here before any such fall in price as this can take place. A fall in the price of quinine to half its cost would far more than double the consumption; it might very probably quadruple the consumption, not merely in India, but in Austria, Prussia, &c., where quinine is now almost a prohibited article by its high price. Moreover, a very large fall in the price of quinine might enable it to be employed by manufacturers for the creation of the unrivalled dyes of which it is the base.

"The quantity of quinine issued from Government medical stores for the official year 1869-70 (for Bengal, North-Western Provinces, Punjab, and Central Provinces,) was 2,671 lbs.

"Suppose that the existing 1,000 acres of C. succirubra at Rungbee are worked coppice-fashion (which we know can be done, though we do not know it to be the most profitable manner of working), at least 150 acres could be cut annually. These would produce at least 2,000 lbs. of bark per acre, and if this bark produce 2 per cent. of amorphous quinine, or one per cent. of crystallizable sulphate, this would give 6,000 lbs. of amorphous quinine, or 3,000 lbs. of crystalized sulphate annually; *i. e.*, more than enough to satisfy the present Government wants.

"These figures are extremely uncertain and speculative, but they are, I believe, certainly within the mark. We expect to cut 3,000 lbs. of bark on an acre worked coppice-fashion, and even from this class of bark I should hope to get 3 or 4 per cent. amorphous quinine instead of the 2 per cent. assumed above.

"It would appear, therefore, that if Government is disposed to grow Cinchona only to meet its own local requirements, it is not necessary to extend further the cultivation of C. succirubra at present. And this is, I believe, the opinion both of Mr. McIvor and Mr. Broughton.

"But, as I understand the official papers, Government did not commence the cultivation of Cinchona in India with any definite intention concerning the manufacture, but with the design of keeping down the price of bark in the London market, and thus diminishing the price of quinine, not only as against themselves, but as against the general consumer. The parties who will be really injured by the large growth of bark here, are not the London manufacturers, but the barbarous governments of South America. Their treatment of the bark monopoly deprives them of all title to consideration."

Mr. Clarke's paper is so valuable, that we hope to reproduce it entire in our next issue.

EDITORIAL NOTES.

COTTON IN MADRAS.

WE learn from the *Madras Times* that the Board of Revenue in that presidency recently submitted to the Madras Government reports from the various Collectors throughout the presidency of the experiments made with Hingunghaut and New Orleans cotton seed, which on the whole they do not consider to have been successful. They point out the futile character of these attempts to improve agriculture by the issue of seed, ill-understood agricultural exhibitions, and the like, and urge the adoption of a system wherein the gradual improvement of general tillage and the technical instruction of the agricultural classes are aimed at. They recommend the establishment of model and experimental farms with which are to be associated classes for instruction, and if the proposal be approved, they consider that some land may well be devoted to the scientific cultivation of cotton in the cotton-producing districts. The Government of Madras records upon this report that the experiments with Hingunghaut and New Orleans cotton seed have not been successful, but that this is mainly to be traced to want of rain, to the fact that the seed was not sown at the proper season, and to the bad quality of the seed. The experiments in Kurnool and in South Arcot were a success, and in Trichinopoly, the New Orleans seed yielded encouraging results. The Government is fully prepared to consider the project relative to model farms, that there is no reason for discontinuing experiments which offer a fair chance of success. The Cotton Commissioner, in the Central Provinces, will therefore be requested to send two thousand pounds of Hingunghaut and the same quantity of New Orleans, fresh and sound seed, for distribution in Madras; and a portion of the seed will also be forwarded for trial to the Collectors of Malabar and South Canara.

A RECENT consular report states that the average size of farms in Normandy in the neighbourhood of Havre is from 10 to 20 hectares (25 to 50 acres). A few run as high as 50 hectares, and there is one in the neighbourhood of Honfleur of 750 acres. These farms are generally one-third grass (planted with apple trees), and two-thirds arable land. About two-thirds of the land is held by large proprietors, and let to tenants on leases of six and nine years. The remaining third is in the hands of small owners, who farm it themselves. Good grass land will fetch as high as £90, and arable land £50 an

acre. Ploughmen are paid £16 to £20, ordinary labourers from £10 to £12 (women the same) per annum, and are found in food, lodging, and washing. The farm hands have the same food, and eat together with their masters—the small tenants or proprietors. Those hired by the year live, the women in the farm houses, the men in the stables. The population are an orderly, contented class, of fair morality. Education is pretty well attended to, and schools for girls and boys are established and supported by Government in every commune. Those parents who have the means, pay about 1f. 50 c. (1s. 3d.) a month, while the very poor receive instruction gratis. The rate of wages, and the material prosperity of both the farmers and their labourers, have greatly increased since the treaty of commerce with England, which has given tenfold activity to a very large trade in every description of agricultural produces. The average yield of the land may be taken as—Wheat, 19 bushels; Oats, 24 bushels; Rye, 18 bushels; Barley, 17 bushels: Rape, 30 bushels; Clover, 4½ tons; ordinary hay, 5 tons per acre.

A PRACTICAL farmer writes to us,—"I have long thought that a "Cotton Commissioner" is a great mistake. What we want is a Minister of Agriculture, not Cotton. If Manchester wants more Cotton, she must stimulate our Agriculture generally. It is useless to bolster up Cotton culture, and is simply killing the goose that lays the golden eggs—living on capital instead of interest. It is surprising that Government, with the experience it has gained in Ireland should persist in following this course. All the money they have spent in Ireland in the encouragement of flax cultivation, has been entirely lost; indeed, it is worse than lost, as the thousands of acres of land exhausted by continued flax culture will testify. Had they gone to work to improve agriculture generally, plenty of flax would have been grown; but instead of this, the press and the platform, were employed in showing how tenants would rapidly become rich by growing flax, and all were advised to grow it, regardless of their different circumstances. I know many tenants that were ruined by the flax mania, and I have seen hundreds of acres of land which will not now pay for cultivation, which before the flax mania gave capital crops of oats and potatoes. I notice that in the province of Ulster alone, there were last year 30,000 acres less land under flax than in the preceding year. The same result will follow this cotton mania. It is impossible to do any permanent good in Agriculture by forcing any branch of it at the expense of others. Instead of teaching his tenants how to exhaust his soil, a provident landowner seeks rather to protect its fertility by checking their recklessness and greed. In India one seems wholly to forget the future, in the ever present cry for "more cotton."

THE German armies around Paris are being fed almost exclusively, it is said, with pea-porridge.

The *dhall* of India is all but identical with the grain of which this porridge is made. We should have supposed that Indian corn, upon which the labouring classes chiefly depend for sustenance in America, would have been substituted, with advantage, for the troops. It is a matter of astonishment to us that Indian corn is not more largely used as food by the people of this country.

AMERICA continues, says the *Cotton Supply Reporter*, to lead the way in the growth of cotton. Last year's crop of 3,154,946 bales is the largest since 1860, and had only five times been exceeded before that period, while there is every reason to expect that the season just commencing will produce the largest crop with one or at the most two exceptions, that has ever been made. The abolition of slavery, and the impoverished condition of the Southern States have brought into operation better methods of cultivation and greater scientific skill, which, with the use of fertilisers and improved machinery, are securing the desired results. The period of a plentiful supply of cotton cannot be far distant.

A VALUED correspondent writes to us,—"I believe and hope "that we are on the point of starting either a Department of "Agriculture, or an Agricultural Commissioner. I trust the "latter. A department cannot work during the transition "state of things. In the absence of any practical experience, "the opinion of members of the department would be of little "worth, and each would have his hobby to ride. Better have "a Commissioner for a season, until some definite programme "is arranged and a system organized. I need not tell you "that such organization would be impossible with three or "four men at the head of affairs each having a strong opinion "of his own as to the right course to pursue."

ACCORDING to Colonel Monier Williams (1825) five-sixths of the soil of the Broach Zillah consist of the *Kala bhow* or black Cotton soil of India, and the produce in the Jambooseer Pergunnah of clean Cotton per acre, in his time, was 128 lbs. In 1844, Dr. Burn, who had charge of the Broach experimental farm, estimated the yield to be 83 lbs. per acre under careful cultivation, and 55 lbs. only under ordinary circumstances. Mr. Davies, the Collector, reduced these estimates to 54 lbs. and 40 lbs. per acre respectively for the seasons 1843 to 1846-47. Mr. Cassel, in his elaborate work, gives four estimates of 80 lbs, 108 lbs, 80 lbs, and 70 lbs respectively. It is a terrible reproach to us that after all these years of research and experimentalizing, we are as ignorant as ever of the true fact. If we strike a mean between these conflicting estimates, we have an average return of 77 lbs. per acre, as the yield of the great cotton field of Guzerat.

"The primary requirements for good husbandry," says a correspondent of the *Field*, "are equitable covenants, judicious expenditure, and good management. Without these no man can farm with profit to himself, nor with justice to the land in his occupation. Let agriculturists, have the assurance that whatever improvements they may effect in manufacturing their produce shall be *for their own benefit* as well as that of their landlords, and their progress will be rapid also. The cost of good cultivation is but little in excess of bad, and it is on the increased produce grown that the farmer's profits are greatest, as on this produce neither rent, rates, taxes, nor cost of management have to be paid."

What would G. A. D. say to thirty years' leases with all improvements secured to the tenant? This peculiar Indian tenure is, we believe, the very best a nation ever possessed, It is not good enough, however, in the eyes of the Permanent Settlement men.

A WRITER in a home journal calls attention to the fact that the "permanganate test," as it is called, of the purity of water is found to be a very untrustworthy one. Permanganate of potash is contained in an impure state in Candy's purple fluid, but its indications as to the presence of organic matter in water are not safe. "Whether this organic "matter is likely to be injurious to health or not is a problem "which can only be answered with tolerable certainty when "a large number of the indications afforded by analysis are "favourable or the reverse. The discolourisation of permanganate solution by a water may arise from the presence not "only of oxidisable organic matter, but of ferrous carbonate "and several other substances. No chemist now depends "upon the permanganate test. Frankland and Armstrong, "Wanklyn and Chapman, and water-analysts, unite in condemning it. We test the quality of a water by seeing how "much more dissolved matter it has than it naturally, in the "district, ought to have; how much salt from human excreta it "has taken up, how much nitrate and nitrite it has got from "decaying muscle, how much phosphate from decaying bone, "how much organic matter from putrescent flesh. To come "to really trustworthy conclusions on any of these points, "and on many others nearly as important, demands the most "precise and critical processes, the most careful manipulation "and the most perfect apparatus. The experienced chemist "recognises in the dried residue of a portion of water certain "appearances which he has learned to interpret; he observes "the changes which ensue when this residue is heated, more "and more strongly, such as blackening, deflagration, and "sublimates. He estimates with scrupulous precision those "ingredients of a water which are only suspicious when the "quantities present exceed a certain natural and normal "amount. Nor does he omit a microscopic study of the "water and to note its colour, as seen through a depth of two "feet against a surface of white enamel, nor the taste and "odour of the water at various temperatures. It is a mistake "to suppose that a single test applied to a water can lead to "a satisfactory result."

AGRICULTURE IN EUROPE.

THE WHEAT CROP OF 1870.—GREAT BRITAIN.

THE following interesting and instructive communication has been furnished by Mr. J. B. Lawes, of Rothamstead :—

Although the climate of Great Britain is proverbially changeable, our seasons are seldom characterized by great extremes, either of cold in winter or heat in summer, while the amount and distribution of rainfall are generally suited to a considerable variety of crops. Not more than two or three times in a century do seasons of remarkable winter cold, summer heat, or drought occur. Two years ago (August 1868) I called attention to the fact that we must go back for about half a century to find a season characterized by dryness and high temperature to the same extent as the one then just past. The present season has been remarkable for extreme dryness, commencing one month earlier and prevailing later than in 1868, while the temperature has also frequently been very high. Throughout the southern and eastern parts of England, scarcely any rain fell during April, May, and June. There was rather more, but still very much less, than the average in July, and much of that which did fall was in heavy and more or less partial storms; while August, again, has been, up to this time, extremely dry. Vegetation has therefore been in a great degree dependent upon the moisture retained within the soil from the supplies of the winter and early spring; and the amount of this resource must obviously have been very variable, according to the character of the soil and sub-soil.

A drought very similar in character occurred in 1844. In that year, as in the present, the produce of grass-land was exceedingly small, and the crop was in many cases left uncut, its value being considered insufficient to pay the cost of making into hay. It was, too, in 1841 that the first experimental wheat crop was taken from the field on this farm, which has been devoted to the growth of wheat every year from that time to the present, and as the characters of the first and the twenty-seventh seasons resemble each other pretty closely, a comparison of the first and twenty-seventh crops will be of some interest. In the first season, 1844, the produce of wheat without manure was 15 bushels per acre. In 1870, the twenty-seventh season of wheat in succession on the same land, the unmanured produce is again exactly 15 bushels. In 1844, the highest produce by mineral manures, without ammonia, was scarcely 17 bushels, and in 1870 about 18½ bushels. In 1844, the addition to the mineral manures of 81 lbs. per acre of sulphate of ammonia increased the produce to 24¼ bushels. In 1870, the addition of salts of ammonia, in quantities of 100, 200, 400, and 600 lbs. per acre, gave respectively, 26, 30½, 40½, and 45¼ bushels. When it is considered that between these two periods twenty-five crops of wheat have been carried off the land, the identity of the produce without manure in the two cases, and the general similarity of effect with different descriptions of artificial manure, is very striking.

The following table shows the amount and quality of the wheat yielded in 1870, the twenty-seventh crop in succession; the results being those obtained from the same plots, and under the same conditions of manuring year after year as have been selected for illustration in previous years, and, for comparison, there are given by their side those recorded on former occasions, and also the average results for a period of eighteen years.

Bushels of Dressed Corn per acre.

Harvests.	Without Manure. Plot 3.	Farm yard Manure. Plot 2.	Artificial Manure. Plot 7.	Plot 8.	Plot 9.	Mean of Plots 7, 8, and 9.	Mean of Plots 3, 2, 7, 8, and 9.
1863	17¼	44	53⅝	55⅝	55½	54⅞	38¾
1864	16½	40	45⅝	49⅝	51	49	35⅛
1865	13¾	37¼	40¼	43	44	42⅝	31
1866	12¼	32⅝	30	32¼	32½	31⅓	25½
1867	8	27½	22½	30½	29½	27¼	21¼
1868	16⅝	41⅜	39⅞	46½	47⅜	44⅜	34⅜
1869	14½	38¼	28½	34½	39	34½	28⅞
1870	15	36½	40⅞	45½	45½	43¾	31¾
Average of 18 years :—							
1852-1869	14⅞	35⅝	35¾	38½	36½	36⅞	29⅛
Weight per Bushel of Dressed Corn (lb.)							
1863	62·7	63·1	62·5	62·3	62·1	62·3	62·7
1864	62·0	62·5	63·1	63·5	62·6	63·1	62·5
1865	60·6	61·5	61·6	61·4	61·1	61·4	61·2
1866	61·3	61·7	61·0	60·1	60·6	60·6	61·2
1867	56·1	61·4	61·0	60·7	59·9	60·5	59·4
1868	61·0	61·6	61·1	62·0	61·1	61·4	61·3
1869	56·1	56·9	57·4	57·2	57·1	57·2	56·8
1870	61·7	63·4	63·3	63·7	62·7	63·2	62·8
Average of 18 years :—							
1862-1869	57.5	59.9	59.2	58.8	58.2	58.7	58.7

Thus, the permanently unmanured plot gives 15 and the farm-yard manure plot 36½ bushels per acre, or, respectively, slightly over the average of the eighteen preceding years. The three artificially manured plots give, on the other hand, very much over the average; plot 7 yielding 40½, plot 8, 15¼, and plot 9, 45½ bushels per acre; or, respectively, 4¾, 6¾, and 9 bushels over the average of the previous eighteen years. It is evident, that so far as wheat is concerned, the past season has been very favourable for the action of certain artificial manures, but much less so for farm-yard manure. A somewhat similar result was obtained in the case of the hay crop also, certain artificial manures having yielded more than 2½ tons, while dung gave not more than half a ton.

The quality of the grain this year is very high, averaging 6 lbs. per bushel more than that from the same plots last year, and 4 lb. per bushel more than the average of the preceding eighteen years. In fact, this experimental field has not yielded grain of so high a weight per bushel since 1849.

Taking, as in former years, the average of plot 3, plot 2, and plots 7, 8, and 9 taken as one, the average produce this year is 31¾ bushels, or 2½ bushels more than the average of the last eighteen years. But as the average weight per bushel is this year 62¾ lbs., or 4 lbs. more than the average of the eighteen years, the 31¾ bushels are equivalent to 32¾ of the standard weight of 61 lbs. per bushel, and to nearly 4¾ bushels more than the average produce of the preceding eighteen years if the latter be calculated to the same standard weight per bushel.

The following are results obtained this year in fields which are not under experiment, but cultivated according to the ordinary practice of the farm, and, for comparison with the new results, those recorded in former years are here repeated :

Bushels of Dressed Corn per Acre.

Harvests.	Fields. No. 1	No. 2	No. 3	No. 4	No. 5	Av'ge.
1863	..63					
1865	.38	48	48	51		46½
1866	..40	42	46	...		42⅝
1867	..32	35	36½	...		34½
1868	.43	46¾	50⅝	51		48
1869	.32½	36½	43½	45½	53¼	42¼
1870	.34	44½	39⅝	41¼		40

Weight per Bushel of Dressed Corn.

	lb.	lb.	lb.	lb.	lb.	lb.
1863.	63⅛					
1865.	.59½		58	58		
1866.	.60¾		60⅝			
1867.	.57		60¼			
1868.	.64		61⅛	63⅜		
1869.	.59¼		59½	59⅜	59½	
1870.	.62¼		63	62⅜		

It should be mentioned that the yields of 34 and 44½ bushels were both obtained in the same field, the smaller produce being due to loss of plant, so much complained of over large wheat-growing districts this year.

In another field, the whole of which was uniformly manured, thirteen different descriptions of wheat were sown, and the average results of five lots already threshed is 48¾ bushels per acre, and more than 65½ lb. per bushel, the weight of one description reaching very nearly 67 lbs.

The above records afford evidence of a very superior crop of wheat this year under favourable conditions, and also of considerable falling off under unfavourable conditions. Indeed, in endeavouring to form an estimate of the produce

of the country at large, based on the results here given, we must not lose sight of the fact that the plant has this season been unusually deficient, more especially on the lighter soils. So far as wheat is concerned, there has been a splendid seed-forming and maturing season, but acting in many cases upon an insufficient amount of plant, and it is probable that some of the heaviest and some of the lightest crops ever known in England have been grown this year.

Under the circumstances described, it is of course extremely difficult to form a satisfactory estimate of the average yield over the United Kingdom. Considering, however, that the best wheat-lands have suffered the least, that many of them have yielded large crops, and that the quality at any rate is generally considerably over the average, I think the crop of the United Kingdom may be estimated as equivalent to from 30 to 31 bushels per acre, weighing 61 lbs. per bushel.

Taking, for safety's sake, the lower of these estimates as the basis of further calculations, and assuming, in the absence of the official returns, the area under wheat to be somewhat less than in 1869, but equal to that in 1868, namely, 3,937,275 acres, the gross product of the United Kingdom will amount to 14¾ million quarters. Deducting from this 2¼ bushels per acre for seed, there will remain available for consumption as food 12 2-3d million quarters; and taking the average population during the next twelve months at 31 millions, and the requirement per head to be 5½ bushels, the total requirements will be 21 1-3d million quarters, leaving about 7 2-3d million quarters to be supplied from foreign sources. Last year, following a similar method of calculation, I estimated that not less than 9¼ million quarters of wheat would be imported during the harvest year ending August 31, 1870. The quantities of wheat and wheat-flour, reckoned as wheat, actually imported from September 1, 1869, to August 13, 1870, amounted to about 9¾ million quarters, and assuming the recent rate of import to continue to the end of the month, the total imports for the harvest year will probably exceed 10 millions. A study of the tables of imports for past years is, however, sufficient to shew that estimates so made are liable to certain special sources of error, which are more liable to lead to under than to overstatement. Thus, it is obvious that over and above the quantities of wheat imported to complete the supply required to meet the average demand for human food, we sometimes receive a considerable surplus, dependent on the amounts which foreign growers have to dispose of. For example, the home crop of 1867 was an extremely bad one, and that of 1868 one of great abundance; and yet the imports for the harvest year following the abundant crop were only three-quarters, or a million quarters less than those for the year following the preceding very bad one. It is probable that when wheat is very abundant, and the price low, there is both an increased consumption of bread and a considerable quantity of wheat used as food for stock. I will only add in conclusion, that, with a great European war proceeding, it seems of little use to hazard any estimate as to the probable range of prices up to the next harvest.—*Country Gentleman's Magazine.*

WOOD ASHES IN AGRICULTURE.

Much has been said of late years of the virtues of ashes, says the *Albany Country Gentleman*, for farming purposes, but we are confident the half has not been told. Our experience with them extends back a-quarter of a century, and every year's experience has strengthened our conviction that ashes are the cheapest fertilizer we can purchase. We formerly paid ten cents a bushel for them, and though the price has doubled, we are satisfied that the commercial is still below the intrinsic value. We have tried lime and plaster, and on some soils and some crops found them useful, and on other soils and crops we have lost our money and labour in the use of these mineral manures; but ashes have never failed to pay well on all soils and all crops. Of course, they do better on sandy and loamy soils than on clay, as the latter, being formed chiefly of granite rocks, naturally contains more potash, but there are few, if any, long-cultivated fields from which the inorganic matter is not so far exhausted that ashes will not prove beneficial. This condition is the result of our experience. Now let us consider briefly the teachings of science on this point.

If we burn any vegetable or seed, we find the greater part goes into the air, but a small portion, varying from 1 to 12 per cent., remains behind in the form of ash. Thus, the grains of wheat burned leave 1·18 per cent. ash; oats, 2·58; potatoes, 2·65; carrots, 5·09; turnips, 7·05; wheat straw, 3·51; oat straw, 5·74; red clover dried, 7·48; carrot leaves, dried, 10·42. This inorganic part or ash must be derived from the soil. It is of an earthy nature, and can be found only in the earth. The inorganic part, which when burned vanished into the air, may be obtained from the air again, but it is plain enough that the plant must find its mineral food in the soil. This food diminishes with every crop that grows, with some faster than others, as may be inferred from the varying quantity of ash from different plants; but in all our old pastures and cultivated fields that have been long cropped without suitable return, the inorganic food will be found deficient. Hence the wonderful effect that phosphate or sulphate of lime sometimes produces. England is now transplanting from Egypt the bones of the mummies to be worked up in the first place into turnips, thence into the carcases of shorthorns and South Downs, and finally into corpulent Englishmen. If no crops are taken from the soil, the slow disintegration of the rocks and stones, and the decomposition of vegetable matter, will gradually replenish the exhausted mineral elements; but this is a slow mode, requiring many years to accomplish what one good dressing of ashes will speedily effect.

The great advantage which wood ashes have over other mineral manure is, that they contain not one or two, but all the inorganic constituents lants. Plaster does well on some soils, and fails on others, because in the first case sulphate of lime is deficient, and in the other it is not, and after a time, even where it does good, its effect ceases, not because the land has become "plaster-sick," but plaster-surfeited, and some other plant food is required. We have known some farmers who, having experienced magical effects from plaster, concluded they could set their hay and keep up their farms by plaster alone, but we have never known the experiment to succeed for a course of years. The truth is, that in the ash of most plants we find ten or a dozen elementary substances, and plaster only furnishes two of these, namely, sulphur and lime. These are necessary, and so also are phosphorus, potassium, sodium, magnesium, chlorine, silica, aluminium, and iron, and these can all be found in wood ashes, either combined with each other, or oxygen. The analysis of the ash of hard wood shews that all these elements can be cheaply furnished, if we can buy hard wood-ashes at 20 or 25 cents per bushel. The following is Johnston's analysis of the ash of beech:—

Potash.	15·83
Soda	2·88
Lime...	63·33
Magnesia	11·29
Oxide of	·79
Phosphoric acid	3·07
Sulphuric acid	1·35
Chlorine.	·14
Silica.	1·32
Total.	100·00

Our practice has been to leach the ashes and make soap of the soluble alkalies, and use the leached ashes on our land. These are more valuable than is generally supposed, for only a part of the potash and soda is leached out, while the phosphate of lime and other valuable compounds, being comparatively insoluble, still remain.

Leached ashes can commonly be bought for half the price of the unleached, and for agricultural purposes they are worth nearly as much per bushel, as by leaching they are condensed some 15 or 20 per cent. Potash is the main ingredient that leached ashes have lost, and generally only four-fifths of the entire amount of this soluble ingredient. For the same money we are confident more valuable matter can be furnished the soil in purchasing leached than unleached ashes. If the land is particularly deficient in potash, or if it is desired to raise potatoes, or any other crop requiring a large per cent. of potash, then buy unleached ashes. But if phosphates or sulphates are wanted that will continue their fertilizing influence for a series of years, then, by all means, buy leached ashes.

Besides giving back to the soil the mineral elements which are soonest exhausted, and thus furnishing direct

food for plants, ashes also serve another valuable purpose in aiding the decomposition of the particles of the soil, and bringing them into a soluble condition. Even the hard flint stone succumbs to the influence of potash and soda; as every one must have observed who is accustomed to use soda in a glass goblet, the polished glass is soon roughened by potash or soda, the silica being decomposed. Hence the wonderful effect of ashes in stiffening the straw of oats, wheat, and other grains, by rendering the silicious sands soluble.

We have time to mention only one more benefit from the use of ashes, and this is, they furnish the alkalies which will absorb the ammonia wherever decomposition is going on, and then, by the aid of the oxygen of the air, form nitrates of potash and soda, two very valuable compounds in agriculture. In order to secure their formation, however, we must have the decomposition of some bodies that will furnish the ammonia; and this leads us to say that ashes will act with most force when the soil is enriched with ammoniacal manures. If we wish to find nitrate of potash (saltpetre), we look for it in the soil under barns or horse-sheds, where the urine has settled, and where the rain has not dissolved the nitre. From the rich soil of such localities our fathers leached their saltpetre from which they made their gunpowder. Unless nitrogenous manures are used in connexion with ashes, they will fail after a time to exhibit much virtue, but when the land is properly enriched, ashes operate with full force, and their effects continue for many years.—*Country Gentleman's Magazine.*

AGRICULTURAL STOCK.

MANAGEMENT OF STOCK.

(From the *Gardeners' Chronicle.*)

[A paper on "The Management of Cattle" was read by Mr. Hugh Stephenson, of Throckley, at the last meeting of the Newcastle Farmers' Club, from which we abridge the following extracts.

We see it frequently mentioned in the papers that if the Continent were thoroughly opened out by railways, our markets would become glutted with foreign cattle. This I certainly do not believe, as the Continent is unsuitable for growing root crops, with the exception of Mangels, and the pastures are very liable to be burnt up in summer. Besides, the transit always damages an animal to the extent of 21; and as foreigners are acquiring more and more a liking for roast beef, I am rather of the opinion that the time is not far distant when they will consume all they can produce. The management of fattening cattle requires more skill and energy on the part of the master, and more attention on the part of the servant, than any of the branches of husbandry. Every stock-feeder should have a good smattering of veterinary, so as to thoroughly understand the digestive system, and to know when an animal is healthy or not, and be able to deal with slight disorders prevalent amongst cattle. This I have found to be of great service to myself—for, by keeping a few simple medicines and a lancet, and knowing how to use them, I have often saved an animal's life; as in my instance, I should have had six miles to send for a veterinary surgeon. In considering this important subject, I have taken two main heads—summer and winter management:—

SUMMER MANAGEMENT.

There is a great diversity of opinion amongst graziers as to the laying on of cattle: the first and most generally adopted system is that of allotting so many cattle to a given number of acres—the animals remaining in the same field until sold to the butcher or housed for the winter; by this method there is no expense on the cattle for attendance. The second system is that of double stocking: by this I do not mean keeping twice the number of cattle on the same number of acres, but putting the whole of the cattle on half the land, changing them backwards and forwards, according as the land becomes soiled. Cattle are naturally fastidious, and prefer their food clean. In this way you are constantly giving the animals a change, and we all know that the oftener this can be done the better they go on. I have adopted the plan myself during the last two years, and found that stock did better; and I have been able to keep more on the same quantity of land. I have even changed feeding cattle on to very poor land (which was clean) for a few days now and then to great advantage. The great rage at present is "large fields." This is well enough for tillage land, but let me have fields of not more than 14 or 15 acres for grazing, so as to be able to keep my stock in little bounds, and change often. In every case it is highly essential that the animals should have a good supply of wholesome water. Some of you have, no doubt, been at great expense during the past summer in providing water. I myself had to cart it for both cattle and sheep, and I firmly believe it was the cheapest thing I could give them. I do not approve of driving cattle to the water at stated times, for they drink more than is beneficial, and are liable to overload the stomach and cause inflammation. When water is required to be carted, the best way is to have a trough in the field, with a plug in the bottom, so that when the fresh supply is brought, any remaining from the previous day may be let off. All pastures should be well provided with shelter in the shape of a good hedge or plantation, as in the middle of the day the cattle are very much annoyed by heat and flies, causing them to gallop, hence putting in force a greater amount of power than necessary, and consequently a waste of flesh takes place. The third system is the one least practised in this country, but, I am glad to say, is gradually gaining ground. I refer to soiling cattle in the house—either in courts or boxes. It applies most particularly to the arable or mixed farmer, and enables him, by judicious management, to cope with the grazier! as by growing certain green crops, such as winter and spring vetches, rye-grass, clover, &c., he can have fat stock all through the summer. In my opinion the greatest benefit to be derived from this mode is in the early summer months, for cattle that have not been made fat on the winter keep. We all know that by turning a feeding beast out to grass it gets a complete check and does not improve for at least a fortnight or three weeks; this can only be avoided by changing the food gradually. Not having any first-rate grass-land, I find this system of great benefit. It enables me to keep a large proportion of stock, and of course this means more manure, and hence more corn, and best of all more money in my pocket at the year's end. A farmer requires to make preparations for this system of feeding:—He must provide himself with a sufficient quantity of straw for litter, or he may use with great benefit dried peat, or any other dry vegetable matter. He must also have his food coming forward for use in regular stages, so as to ensure a continuous supply. It should be cut at least every morning. Care should be taken to give it in small quantities, so that the animal may eat it at once, nothing being left to cause fermentation. I find it a good plan to place a little common salt either amongst the food, or as rock salt in the manger, as it gives a tone to the stomach, and assists digestion.

WINTER MANAGEMENT.

This division applies especially to arable farmers, as they generally produce their fat cattle during the winter season. All cattle forward in condition should be housed not later than the first week in October, as after that period the grass has lost all its feeding qualities, and the animals just wander about the fields seeking shelter from the cold winds. For a few days previous to their removal they should be given roots of the softer kind, to accustom them to the change. The first important point that strikes me is that of house accommodation. Now, there is a great difference of opinion as to which is the best of the three systems generally adopted—viz., open courts, stall, and box-feeding.

OPEN COURTS.

The old-fashioned farmers cling to this style, because I suppose their forefathers did so; but there are other farmers who would like to change, but do not see their way clear to expend the money themselves. This brings it to a landlord's question, and no doubt it does belong to the landlord to provide suitable buildings for his tenants. It is a very difficult matter to alter old buildings, and I have often seen more money wasted in endeavouring to remodel them than would have built new ones; and I am sorry to notice that even in the erection of new ones there is a great lack of proper accommodation and means of feeding stock. The outside of the building is made beautiful, but no attention seems to be paid to the internal arrangements for the wel-

fare of the stock, or the advantage of the tenant, who I hold is the first person to be consulted, as he generally has to pay interest for the capital invested. For fat stock, open courts are not suitable, the animal has too much exercise, and the temperature being cold and very irregular, it requires more food to sustain the body and keep up a natural heat. By the food being laid in open cribs, a great deal is wasted, especially in snowy or wet weather. There is a system still adopted amongst a certain class of farmers—viz., that of filling the cribs every morning with turnip, which he exposed to the weather, and are cut at intervals during the day with a spade or some such implement. The evil is easily imagined; and the loss of the present turnip crop will prove a blessing if it teaches them economy. Another important item attending feeding in open courts is the waste in the manure. An opinion very prevalent amongst farmers is, that to get their straw crushed down and made thoroughly wet with rain-water is all that is required to constitute manure. Here is a great mistake; for manure should not be valued by quantity but quality, and the only pure manure is the dung and urine of the animal, with just a sufficient amount of straw to absorb it. I often see a black stream flowing away from a fold yard, and on examination finding it is nothing less than the strength of the manure being carried away by the rain-water. By spouting the buildings, the great evil is materially lessened.

[We have been favored with the following observations upon this paper by a gentleman of much experience.—Ed. *A. G.*]

OBSERVATIONS.

Management.—I agree with Mr. Stephenson on the necessity of the cattle feeder being both *energetic and skilful*. He must be energetic in his general management, must *attack disease directly it appears*, see that the animals are fed at proper times, and ascertain that the *food is really* producing the effects he desires. He must be skilful in the selection of the animals to be fattened, and in the choice of the food he uses. Cattle will not make good progress if they are fed irregularly, and the food will not produce satisfactory results *unless adapted to the wants of the animal*. It would be a great waste of material to give young growing animals food rich in fattening matters, such as rice or maize. Such animals should have food rich in nitrogenised and phosphatic materials—the one to form the flesh, and the other bone; and it would be as great a waste to give too large a proportion of nitrogenised, and phosphatic materials to animals which only require fattening, to these the cheaper food containing an excess of starchy and fattening matters are more suited.

Pastures.—It is certainly very beneficial to have pasture land divided. Stock do much better when they can be changed from pasture to pasture, than when always confined in the same park or enclosure. You can feed more cattle on four twenty-five acre fields, than on one field of 100 acres; though you cannot have your arable land divided in too large fields; your grass fields should never be larger than will allow of the stock being changed every 3 or 4 weeks.

Water.—Cattle, whether put up for fattening or grazing, should always have a good supply of pure water *before them*, when the water is only given them at certain times of the day they are apt to drink too much at a time. Great loss results from animals indulging too freely in this respect after a hearty meal of green food. Indeed, I have always noticed that *animals which always have water at hand suffer much less from diseases of the digestive organs*, than animals which can only obtain water when it is supplied to them.

House feeding.—Feeding stock with produce in the house is certainly by far the most economical way of consuming our farm crops. When stock are grazing at large, they tread down a great quantity of valuable food, and a good deal is injured by the dropping of the animals. Again there is little waste of animal matters, the cattle being less exposed to changes of temperature, and having no cause to exert themselves.

Green crops.—When the animals are fed in the house, you must have a regular succession of green crops. In England they grow vetches, clover, rape, turnips, &c., in succession, keeping the animals gradually progressing, instead of the up and down system of this country; while the grass is good the animals thrive, and when the grass is scarce the animals stareve. I see no difficulty in having a succession of green crops adapted to the wants of this country.

Stall feeding.—Stall-feeding is simply feeding animals that are tied up by the head in stalls, as is common at home in dairy byres. It is a better plan than the open yard, but not nearly so good as the box system. Animals have no exercise and become lame from their cramped position. Where space is valuable, as in large towns, this system is preferred.

Box-feeding.—This is beyond doubt the most perfect system of fattening cattle. The box system is now becoming general amongst our best farmers. We *have introduced it* on the farm *here, and as far as my experience has gone, I consider it well suited to the wants of this country.* I shall be glad, if you desire such information, to give you details of the working of this system.

Green Food.—Mr. Stephenson is quite right in condemning the system which admits of 150 lbs. or 160 lbs. of turnips being given to a bullock daily. I have known 224 lbs. daily consumed by fattening bullocks, but consider it wretched management. Feeding bullocks require something more nutritious than a root containing 95 per cent. of water. I think we are even better situated with regard to cattle food than the English farmer. Most of our green foods are rich in saccharine matters whilst English green foods employed for feeding cattle are poor in these matters, the cold damp climate of England not favouring the development of saccharine matter.

Oil Cakes.—I believe we have in the oil cakes sold in India as nutritious feeding materials as English linseed cake, sold at three times the price: and can feed animals at much less cost than the prices quoted by the writer of the paper. Indeed, I have an analysis made by Dr. Voelcker during the time I was in his laboratory, showing that earth nut cake is nearly as nutritious as linseed cake.

Preparation of Food.—It is usual to recommend steaming cattle food; with Mr. Stephenson, I have grave doubts as to the profit of this operation—it consumes a great deal of time. It may be beneficial to steam food for pigs, but the complicated and complete digestive system of the sheep and ox in my opinion renders this unnecessary. Indeed, I fear if we lessen too much the need for mastication, we must seriously interfere with the digestive operations; for if a sufficient amount of mastication does not take place, the proper amount of saliva will not be mixed with the food, and the starchy matter, instead of being converted into sugar, will pass into the stomach in their original condition. Chaff cutters are, I believe, invaluable, as with their aid you can mix together the proper proportions of green and dry straw, and prevent the animals from selecting and rejecting one or the other.

Feeding Compounds.—I believe it is a very good practice to make up compounds for feeding; with a knowledge of the analysis of different kinds of feeding materials, you may compound a food which may suit the wants of any kind of animal. In this country I don't think it would be advisable to go to much expense in this direction, as suitable food, containing the requisite amount of nutritious matters can be purchased at a fair cost.

I must draw this to a close. I would repeat what I have already stated that the paper is a very good one. I have enjoyed Mr. Stephenson's acquaintance for the past 8 or 10 years, and have frequently visited his farm, and know that he practices what he advocates. I fear I have troubled you too long with my observations.

MALIGNANT CATARRH IN CATTLE.

From Clater's valuable "Every Man his own Cattle Doctor," we extract the following, from the pen of the editor, Mr. Armatage:—

Malignant catarrh or coryza, known also as coryza gangrenoza, has been confounded with purpura hæmorrhagica and cattle plague or rinderpest, in some points of which great resemblance exists.

Nature.—A specific or malignant condition of the blood in which catarrhal signs are prominent, affecting chiefly the sinuses of the head in young cattle and oxen generally. Old cows are seldom affected. It has been denominated "glanders of the ox tribe."

Symptoms.—Three stages of the affection may be described. In the *first*, a shivering-fit may be observed, and the animal is separated from the rest in the pasture. Shortly he is dull, the head is held low, ears pendulous, visible membranes are of a bluish-red colour and dry. The eyes are closed and swollen. Tears flow, and light cannot be endured. The muzzle is dry and hot, and saliva is sometimes discharged abundantly. There is a painful cough, pulse is frequent and full, but the heart's action is feeble. The cough becomes even more painful as the disease advances, and the breathing is accelerated and sometimes catching. The bowels are costive, fæces black and hard, but shortly diarrhœa ensues. The animal is thirsty, but eats nothing, and the urine is scanty, offensive, and has a high colour.

The *second stage* occurs within eighteen or twenty-four hours from the appearance of the first signs of disturbance, and are denoted by a marked change in the character of the discharges. The membranes of the eyes and nose now furnish a purulent secretion, having an admixture of blood and ichor, which irritates and makes sore the skin over which it flows. Within the sinuses of the head, large accumulations of pus occur, and when the bones over them are tapped by the fingers (percussed) a dull sound is emitted. If the mouth is opened, red patches will be observed, which in some places will have fallen off, exposing a foul ulcer beneath, and the membranes are now of a deeper purple hue, and the breath fœtid. The animal is lame, and experiences great pain when urine or dung is discharged. Pregnant animals are almost sure to cast their young (abort.) From the first, an increase of temperature may be noticed, but now the thermometer registers 104 deg. or 105 deg. F.

Third Stage. Great prostration is evident. Sloughing of membranes extensive, and probably the horns and hoofs have come off. The pulse has become imperceptible; convulsions ensue, with general coldness. The thermometer indicates a rapid and unusual fall, 90 deg. to 95 deg. F., being the amount of heat that can be registered at the rectum. Sometimes ulceration of the cornea is effected before death, and the contents of the eye-ball discharged, giving rise to a great amount of additional pain.

Post-mortem Appearances.—These will be apparent, having alluded to them greatly in an enumeration of the signs. The whole series of membranes—mucous and serous—are studded with ecchymosis, and sometimes the brain and spinal cord afford signs of inflammatory action and softening, while the cavities contain an increased quantity of fluid. The whole organs of the body are softened and congested, and the blood-vessels are filled with dark or black fluid blood. The sinuses of the head are filled with offensive pus, the bones are softened, lining membranes covered in places with blue or purple spots, while at others the epithelium is removed, and angry-looking ulcers occupy its place, having discharged blood before death. The surface of mucous membranes have a livid or Modena red colour. Removal of epithelium, with the changes just stated, are also common to the back of the mouth, fauces, gullet, windpipe, stomach, and intestines generally.

Diagnosis.—Malignant catarrh may be confounded with cattle plague (rinderpest) and purpura hæmorrhagica. It is, however, distinguished by the following tests. From rinderpest it is known by the fact that young animals and oxen are chiefly affected; that it occurs after exposure to cold, rains, &c.; that only one, or perhaps at most two out of a herd are seized, and with their death the affection ceases, thereby deciding its non-contagious nature. From purpura hæmorrhagica it is known by the absence of diffused swellings and sanguineous (bloody) or sero-sanguineous (blood and serum) exudations from the skin.

Duration.—From four to nine, or eleven days. The writer's experience of the affection has been confined to some of the most rapid cases.

Treatment.—Remove the animal from the pasture, and place it in a comfortable cool place with good bedding. Cooling or evaporating lotions (Nos. 2, 3, 4, 5, 6, pp. 30, 31), water, &c., should be constantly applied to the head. Bleeding moderately, while the pulse is full, may be attended with benefit. Injections should be thrown up, and a laxative dose administered, such as the oil mixture recommended for purpura hæmorrhagica, or the following drench:—

RECIPE No. 25.

Take of Epsom salts	12 oz.
Calomel	15 grs.
Ground ginger	2 oz.
Treacle	½ lb.
Warm ale	1½ pts.

Mix, and give to a two-year-old beast; two-thirds for a one year-old; half at six months; and quarter for lesser animals, as calves, sheep, and large pigs. A long seton placed in the dewlap, in the earliest stages, also proves beneficial. Two to four drachms of nitre may be given in water three or four times a day. Acetate of ammonia also, in doses of one to four ounces at similar intervals, in water, during the existence of great fever.

When the animal is found at the termination of the second stages, mineral acids should be given after the laxative medicine—such draughts as are recommended in Recipes Nos. 20, 21, 22, page 69. Solutions of carbolic acid or sulphurous acid gas and chlorine in water, should be used for the purpose of dressing the wounds, and cleansing the points of discharge, &c. It may also be necessary to open the sinuses and syringe them, using the same solutions. Sometimes setons passed through them are beneficial. Frequent stimulants are needed from the commencement of the second stages.—*Country Gentlemen's Magazine.*

INDIA-BRED HORSES.

Colonel Henry Shakespeare thinks that the cause of the decline of the native horse in India, arises from the fact that Government has encouraged the supply of a larger description of animals than the country produced, and has imported English horses, which as a rule are too large for the small country mares. The hardy small breeds of native horses have thus been neglected, while a larger breed has been produced inheriting all the unsoundness and vice as well as the constitutional delicacy of the English horse.

In the Madras Presidency there was but one stud established in Mysore, which went on a different plan, and was much more successful in the stock it bred, using chiefly Arab horses of high caste and character. As one stud could scarcely supply the wants of ten regiments of cavalry, besides horse artillery, recourse was had to the imported Arab Gulf Persian horses. Bangalore became the chief mart in Southern India, and the Arab dealers landed their horses at Mangalore on the West coast, and marched them up to Bangalore through the great Wynaad jungle. That station became superior to Madras or Calcutta for the supply of pure Arabs; while the Government Remount Agent for both Madras and Bombay was located at Bombay; in short, Bombay became the great mart for Arab and Persian horses that were brought down the Gulf from Bussorah between the months of October and February. The price paid by the Remount Agent for horses varied from 550 to 650 Rs., while officers were entitled to remounts at 800 rupees each. For the horse artillery, Persian or Gulf horses, were the best being heavier than the Arab. The Gulf horse is a cross between Arab and the Persian, and in every way superior to the latter. Of late years Arab horses have been very much on the decline. The terms on which they are now allowed to run against other breeds is a proof of this; while in former days they could always hold their own at even weights against all but imported English race horses. Colonel Shakespeare thinks that one of the great errors at the studs in Bengal and the N. W. Provinces is giving too much grass to the colts, by which their bodies grow too heavy for their legs. It would be far better that they should be turned out to pick up their own forage than that they should be allowed to cram themselves with coarse straw. The Mahratta system-feeding in the Deccan is as follows—Gram split in a handmill is given dry to horses, but foals are fed on moong and oorrud, which are always boiled, and are better adapted for young animals, whose grinders are not perfect, than dry gram. Cooltee, the grain which is the substitute for gram in the Madras Presidency, is always boiled before being given; it is wonderfully nourishing, race-horses being trained on it quite as successfully as on gram or oats. The Mahratta usually takes up the foal at a year old, and as there are no pastures properly so called, the colts are turned loose in the small space adjoining the village. The plains of grass in the Deccan belonging to the landholders, and the grass is usually cut or burnt once a year to improve the next year's growth. The chief forage, however, is the stalk of the jowar. The *dadree kurbee* is the stalk of the finer jowar, and grows about four feet high and

as thick as the little finger, but the coarser or red jowar stalk which grows seven feet in height is fit only for buffaloes and bullocks. The grass runnahs in the Deccan being intersected with ravines and patches of low jungle, are the abodes of tigers and panthers, and therefore not very safe places for horses to feed in. The bullocks are being constantly thinned by the jelidoc. It is not the custom of the country to cut colts, and as entire horses cannot be pastured together, they are fastened up with head ropes and heel ropes, and the mares are kept in separate stables. The Mahratta allows his fillies to breed when between two and three years old, and is often very careless as to the condition of the horse, but not as to his blood. The syces proceeding up-country from Bombay constantly make a few rupees by allowing their Arabs to cover pony mares; and an instance was known of a famous racer that was purchased for 8,000 rupees at Hyderabad being ruined before he reached Calcutta, by the rascality of his keeper.

Between 1837 and 1857 the cavalry regiments of the Hyderabad Contingent were the best irregular cavalry in India, being paid nearly double what the Bengal irregulars received, and were officered by Europeans. In five regiments, mustering about 3,000 horses, there were not one hundred of any other breed than Deccanees.

The great Malliguam fair supplied the remounts to the number of 300 annually. The very pick of the fair could be about at 250 to 300 rupees a head, and there would have been no difficulty in securing 500 colts at that price. The bulk of the native officers and men being well to do, could afford to buy and keep a colt for a year before he was entertained in the regiment and he was then broken in, a thing more easily done with a three-year-old than with an older colt. The system of breaking-in with a standing martingale and severe bit, so that the horse should be able to turn at speed in the little more than his own length, necessitated that the hocks, knees, and other joints, should not be thoroughly set, as in horses that have done growing. Besides, there was always the chance of the colt improving, which a grown horse would not do.—*Delhi Gazette.*

TOBACCO.—MADRAS.

TOBACCO CULTIVATION.

In the Proceedings of the Madras Government, Revenue Department, 21st October, 1870, we find the following interesting account of experiments in the cultivation of tobacco. The first communication is from the Acting Collector of Tanjore.

With reference to the Board's Proceedings of the 11th ultimo, I have the honour to state that foreign tobacco will undoubtedly grow in this district. Mr. Whiteside has for some time been raising some from Ohio and Shiraz seed, and has supplied me with a memorandum on the experiment which I enclose, together with two bundles (sent separately) of the cheroots from his first crop by baughy. They are sound, but after all are very like the ordinary Dindigul cheroots, with perhaps slightly more flavour. But it must be remembered that they are not a good sample, because the plants were allowed to grow up to their full height, and were exceedingly luxuriant in growth, some being four feet high with leaves 1½ feet long, and in flower and seed, the result of which gives a much coarser tobacco than when the plants are kept small, and the leaves picked when smaller and younger. I also enclose a memorandum from Dr. Ross, who, by putting down the seed in the very hot weather, managed to get something considerably worse than the country variety, but then, as he says, it shows that the plant will grow under unfavourable circumstances. On the whole, I have no doubt that Havannah tobacco will grow in this country just as it will in Germany; but it does not by any means follow that the result will be Havannah cigars any more than there. It may give a slight improvement on the country variety, but it is exceedingly doubtful whether this would find a market in England. This can only be proved by actual experiment, and the best plan, therefore, undoubtedly is, as mentioned in paragraph 3 of the Proceedings of the Agri-Horticultural Society circulated, to try foreign seeds of this kind on a large scale, and under various circumstances with regard to time of sowing, mode of culture, soil and manure, amount of irrigation, &c., &c., at the gardens in Madras; and then, when a fair estimate can be made as to the actual market value of the crop in England and prices that merchants are actually willing to pay, the culture can be confidently recommended to the natives. But they have no taste for *experimenting*, and I think it may be a mistake to invite them to attempt it until the possibility of success has been fully demonstrated elsewhere, since a failure, through ignorance or mistake, might seriously endanger or retard the introduction of what might otherwise be successful. I should like, however, a small quantity of the Havannah and Manilla seed for distribution to a few who may be expected to give it a fair trial. I may add, for the information of others who are making trials, that the cultivation requires a certain amount of care when the plants are young, as the soil must just be kept moist and nothing more. Mr. Whiteside tells me that covering over the young plants with tatties and cocoanut leaves, and watering them, so that the moisture may gradually drip through, is a very successful plan. The soil also should be decidedly rich and superior to the usual class of dry lands. Ants are also very fond of the seed, so that it ought to be sown in boxes or pots raised from the ground.

Extract of Memorandum from W. S. Whiteside, Esq., C.S.

In the latter part of 1866, Mr. J. D. Sim gave me a few small packets of Ohio and Shiraz tobacco seed, of which I distributed some to ryots in South Arcot, (with what result I never heard), and some I planted in my own garden at Cuddalore. It grew luxuriantly, and the crop was approaching maturity, when I was unexpectedly ordered to act as Collector in South Canara. I went and never returned to Cuddalore. My servants gathered the tobacco, and reported that it was very fine; but as I did not see any of them for some eight or nine months the tobacco had all been smoked; at any rate, I never got any of it. I did not know I had any of the seed left till after I came here in September, 1868, when unpacking a box I came upon four packets, two of each kind. I fancied the seed must be quite spoilt by that time, but resolved to give it a trial. I gave two of the packets to Dr. Ross, the Zillah Surgeon here, and two I planted myself. To my surprise, every seed came up. I did not plant the seed till the beginning of January 1869, if I recollect right; at any rate I put it into the ground much too late. It grew magnificently, some of the plants being more than four feet high, with very large leaves; but I left Tanjore, when my Court closed in April for the recess, before the tobacco was fit to cut. I left very strict orders about it this time, and my servants gathered it carefully and stored it in a dark dry place till I came back. I then sent into Trichinopoly for one of the most skilful cheroot-makers, and he came over and pronounced the tobacco to be first rate. The only misfortune was that the two kinds of tobacco leaves had been stupidly mixed by the gardeners when they were drying them. The cheroot-maker made up the tobacco for use, and, putting aside all the inferior leaves, I had enough to put together 1,000 cheroots. These were made up last October. Several persons who have tried them, declare them to be capital, not by any means strong in flavour, and only wanting keeping, to be first rate. I let a good many of the plants run to seed, and the people here who grow tobacco told me that the leaves gathered from such plants make an inferior description of cheroots; so very probably these of mine might have been much better, if more care had been observed in gathering the leaves, keeping the two kinds separate, and so forth. I gave a quantity of the seed to Mr. Brooks, to distribute amongst the Badagas on the Hills, and I have still a little left. I planted some of it in September last year, and reared a very decent little crop. This time, I tried to carry out the system observed by the Telugoo tobacco-growers in the Rajahmundry and Godavery Districts, and for which purpose I got a paper of instructions prepared for me by a native up there; but I am inclined to think that the tobacco of this second crop has not been quite of such fine quality as on the former occasion, and the sun seemed to affect it. I noticed that those plants, which were screened from the hot afternoon sun grew very luxuriantly and to a great height, while those that were exposed to the sun all day, were almost dwarfed. Whether this had anything to do with the seed used I do not know. I am now collecting the seed, and have gathered a tolerable quantity of each kind; and I have a good quantity of leaves, too, now drying. But this year I have purposely allowed the whole crop to go to seed, as I want to get enough to try an experiment on a more extensive scale next cold weather.

Extract of Memorandum from J. Ross, Esq., M. B.

Early last year, Mr. Whiteside was good enough to give me two small packets of seed, one of Ohio, the other of Shiraz tobacco. In March, I think, I sowed these seeds in boxes filled with a moderately rich mould. Though the seed was sown rather thickly, I was not prepared for the very thick crop of seedlings which came up. Many of these, however, soon died down simply from over-crowding, and the survivors having more space, throve luxuriantly. In due course, they were transplanted into ordinary garden-soil, without any special preparation, in rows about 18 inches apart, and when I left this for the Hills in the end of April, every plant was doing well. Some weeks before my return, that is about the beginning of July, the plants, being pronounced ready by a man who was supposed to understand this part of the process, were cut a few inches from the ground, and then followed the usual process of curing. On my return, I found that the cut-stumps had sent forth vigorous shoots, which ultimately attained to the height of 18 inches or 2 feet. From a few plants which had not been cut, I obtained an abundant supply of seed and this seed was sown about the beginning of last north-east monsoon. It germinated just as freely as the orginal seed had done, but owing to want of space and rather unsatisfactory results of my first crop as regards cheroots, I planted out very few of the seedlings. The past, season in my gardon at least, has been very unfavourable in one respect. Everything suffered severely from the ravages of various species of caterpillars and flies, and my tobacco was no exception. Over and over again every leaflet was stripped to the midrib; then young shoots came up to be eaten in their turn, and yet in spite of all this, so vigorous and full of life were the plants, that in the end they triumphed and shot up to the height of two feet and over; but the effect of this prolonged struggle for existence was to dwarf the leaves, particularly those at the base, and to make them course, tough, and fibry. The plants, however, flowered and seeded freely, and I have now a small supply of this seed. What with my absence the first year, and the ravages of insects this last season, I am unable to offer any comparison between the two kinds. Ohio and Shiraz both, so far as I can now judge, did equally well. I have already alluded to the results of my first year's experiment as regards the cheroots made from the tobacco. I got a man, trained to the work, from Trichinopoly, to manufacture them; but, on examination, he pooh-poohed the tobacco as worthless, and it required considerable persuasion to make him set to work. For obvious reasons I persisted and watched him carefully while making up 1,000. He said they would smoke badly, show a black ash, and be deficient in flavour. So far as I have tried them, and that, you may suppose, has not been to a great extent, they have fulfilled his prediction in every point. But then, he said, the bad quality was due to the seed having been sown at a wrong season, to the plants not having been carefully tended, and to the leaves not having been properly cured. And in this matter, also, he is, so far as I know, perfectly right. You will see, then, from this what my experiment amounts to. It proves that these two kinds of seed will grow and thrive vigorously under every disadvantage; for could anything be more trying than the hot season in one case, and swarms of insects in the other? And there is nothing in the experiment to show that, under proper conditions and with due care, the tobacco may not ultimately be found equal, if not superior, to any of the native kinds. I shall feel obliged by a small supply of the seeds you mention, more particularly if you can give me any practical directions as to the mode of cultivation, &c.

The Board considered it right to consult the Superintendent of the Government Farm on the subject of the cultivation of tobacco, as they learned that he had turned his attention to the matter in connection with proposals to introduce the cultivation of tobacco in Ireland. He has favoured them with a memorandum in which he expresses his opinion that "the questions to be investigated are as yet more physiological than agricultural. As agriculturalists, we can, with ordinary skill, grow large crops of tobacco; but we cannot be so sure *that the manufactured article will possess a value equal to the cost of its production.* It has been ascertained by analysis that the best tobaccos contain a very little albumen and nicotine, while the bad smelling and bad tasted tobaccos contain a large quantity of both; thus, Maryland and Havanna tobaccos contain scarcely two per cent. of nicotine, while French and German tobaccos contain as much as eight per cent. The question to be determined is how to grow *good* tobacco, rather than how to grow tobacco? The investigations to be made are too minute for any but those who have been used to such investigation; it would be perfectly useless to turn them over to any other class of men. The experiments had better be conducted by the committee of the society themselves, under the advice of an analytical chemist, versed in organic chemistry; indeed, such a chemist as Mr. Broughton, "in whose special line the investigation appears to lie." The Board have taken an opportunity of consulting Mr. Broughton on the subject demi-officially, and his opinion is strongly corroborative of Mr. Robertson's. He points out that the cultivation of tobacco is a scientific pursuit in France, under the management of a Chemical Director, and further kindly expresses his willingness to undertake the requisite analysis and experiments here, if the Government will authorize him to do so. The Board attach much importance to the whole question, but consider it obvious that scientific analysis and carefully managed experiments must precede any further attempts to improve tobacco; and accordingly request Government to place Mr. Broughton in communication with the Farm Committee and Mr. Robertson with this view. The Board would then procure a carefully prepared sample of the best indigenous tobacco for analysis by Mr. Broughton, and would request the Superintendent of the Farm to undertake experiments in the cultivation of indigenous and exotic kinds in communication with him in order that he may have an opportunity of testing the produce raised under different conditions of cultivation, and cut at different stages of its growth, so as to secure a thorough examination of the whole subject.

Order thereon, 21st October 1870.—The proceedings of the Board are approved. The Board should forward samples of the best indigenous tobacco which can be procured to Mr. Broughton for chemical analysis, and that gentleman will be requested to undertake the required experiment. The experimental culture of tobacco at the Government Farm should be commenced as proposed, and the Government will receive with interest an account of the result attained.

COTTON.—NATAL.

It now appears to be most probable that cotton can be advantageously planted in Natal in certain tracts of land, lying chiefly in the bottoms of the deep and sheltered valleys through which the larger rivers run, and in the ramifying offsets from these which receive the tributary streams of the next order in point of size. These tracts, it seems, are scarcely ever affected by winter frost, and rarely visited by the hail storms which occasionally burst upon the tops of the surrounding hills. They are more subject to dryness than the neighbouring heights and higher slopes, which are abundantly visited by mists and rain; and on that account are not altogether well suited in all seasons for the cultivation of maize,-the staple corn crop of the country. But this is found to be no disadvantage whatever in regard to the planting of cotton. The cotton has thriven with exceptional luxuriance in the last season, which was altogether too dry, in the same localities, for maize. The climate in these deep cotton valleys is warmer, and more forcing to vegetation, than it is in the surrounding high lands; and these districts are consequently characterised by the presence of the mimosa, the aloe, and the euphorbia, which are there the wild products of the ground.

The best soil for the cultivation of cotton, in these districts, is a fertile alluvial deposit, which commonly skirts the actual course of the streams. But the cotton succeeds in all soils, excepting those which are very heavy and very wet.

The yield of cotton varies from 100lbs. per acre in the worst seasons, and under the least favourable circumstances of situation and management, up to 640 lbs. per acre in the best seasons and circumstances. 200 lbs. of clean cotton per acre is held to be a safe average; and 300lbs. to 400lbs. per acre, a by no means unusual reward of good management.

Field labour is very cheap and very abundant, on account of the large number of black-skinned natives of the Kaffir race living within the colony. In every district visited by the commission it was found there was no lack of labour of this class, and the wages of these labourers was 7s. 6d. or 8s. a month; the rations amounting to about as much again, or

a trifle more. The cost of preparing the land, and of picking the cotton, under these circumstances, amounts to £2 per acre; and about other 35s. per acre has to be added for the expense of packing, carriage, and freight. Cotton recently produced in Natal has been selling at ninepence and tenpence a pound. The nett profit of the cultivation per acre upon the low average of a yield of 200lbs. per acre, is therefore at least £3 15s. per acre. With a yield of 500lbs. per acre it would amount to £15 per acre. Fifty acres of land under cultivation would in the one case give yearly a clear return of £187; and in the other case of £750.

The Orleans, or Uplands seed, is found to give the best and surest results. The Egyptian and Sea Island cotton is more subject to the ravages of the fly. Failure in attempts to plant cotton, previously made in Natal, are referred in the main to the ravages of the fly, the Egyptian and Sea Island varieties having been adopted on those occasions. It is still considered to be an unsettled question whether the fly, which proved destructive on those occasions, was introduced with the seed, or whether it is indigenous to the district. But it is held that there can be no doubt that the fly becomes very much more troublesome on plants grown on bad and unsuitable soils; and under improper cultivation and management. From the success at present secured, it is deemed to be tolerably sure that there need be no further anxiety about the fly in Natal, if the Orleans variety of seed be grown upon suitable land, in proper localities, and with fairly good cultivation. It is distinctly stated that at the present time, with the Orleans variety, the fly is still found in every field, but that its ravages are comparatively trifling. In the fly seasons, in the old experiments, the yield of cotton proved to be from 100lbs. to 150lbs. per acre.

The plant yields much larger crops under the system of ratooning in Natal. All that is necessary to secure good results from this method of proceeding is to cut the plant down to within six inches of the ground after the crop has been gathered, and then to pass the plough on each side of the rows, so as to earth up the stumps of the plants during the period of possible frost. The frost, when it does chance to occur, is so transient and light in these localities and in this climate, that this serves as a sufficient and certain protection. During ten years of close and constant observation of climate, I only registered actual frost at night ten times at a height of 2,090 feet above the sea, where the mean temperature of the year is nearly five degrees lower than on the coast. The lowest temperature experienced during that time was 29 degrees of Farenheit.

The Surveyor-General of the colony reports that there are, on the lowest estimate, half a million acres of land in Natal, of the character which has been named as fitting it for the growth of cotton, of which 100,000 acres are still in the hands of the Crown, and available for grants to settlers of the right class. Other 100,000 acres are held by private proprietors, from whom the land may be procured at the present time upon very reasonable terms. 300,000 acres lie in districts reserved under the charter for the benefit of the native population; but that will all obviously be open to the planting of cotton under some proper arrangement, if the planting goes on with satisfactory results. It is therefore no very unreasonable hope that the day will yet come when Natal will furnish yearly from 100 to 200 millions of pounds of cotton to the English markets, with a return of from four to eight millions of money to its own coffers.

Some considerable portion of the 100,000 acres of cotton land held by private proprietors belongs to the Natal Land and Colonization Company, which, at the present time, is making free grants of land to suitable applicants, under the conditions given in a printed circular, which can be obtained at the office, as well as a second printed circular, which gives the conditions and regulations under which free grants of land are made by the Natal Government.

A detailed estimate and statements, drawn up by an intelligent and experienced settler in the colony, Mr. R. E. Ridley, who is at this time a member of the Legislative Council, which can also be obtained, shows that a settler starting with £535 to plant cotton in Natal, should have realised a clear balance of £817 at the end of the fourth year, if his cotton sold for sixpence per pound; and that in addition to this 100 acres of land, of which 70 acres were in ratoon cotton, would be worth at least £250, and in all probability there would be buildings and other permanent improvements on the estate worth £300 more.

I necessarily feel very great interest in the question of a possible large cultivation of cotton in Natal, because this staple furnishes exactly what is needed to enable men of small means to effect an advantageous settlement in the colony under the facilities which can be offered for the easy acquisition of land; namely, a marketable commodity which can be produced by a comparatively small outlay. It is obvious that thrifty and industrious men may begin to grow cotton and find a bare living at once, and have a fair prospect before them, upon a very much more moderate scale than that which has been drawn out by Mr. Ridley.

ROBERT JAMES MANN, M.D., F.R.G.S.,

Late Special Immigration Commissioner for Natal.

London, September, 1870.

CAROLINA PADDY.

CEYLON.

Is it possible to believe that the cultivators in the Colombo district are less alive to their own interests, that they are more ignorant, more prejudiced, than the villagers of Saffragam and the Four Korles. The Agent for the Western Province would persuade us that such is really the case, and that they prefer the renting system, with all its inconveniences, to a money obligation. We are compelled to differ in opinion from the Agent, who is, no doubt, deceived by the artful representations of head men having an interest in the continuance of the present system. Of the experiments in the cultivation of Carolina Paddy, we are told merely the bare fact of the want of success, except in one instance, where the cultivator was rewarded by a return of thirty-fold, but we hear nothing of the reason for the failure of success in the other cases, though we can readily understand them without enlightment from a Government Agent. To our mind the marvel is that any of these attempts have succeeded, seeing that they were carried on in complete ignorance of the precautions necessary to ensure success. The needful instruction and guidance were originally tendered to Government by an outsider, who had the temerity to tender aid, but he was snubbed, and the whole affair has drifted to that melancholy bourne, the way to which lies through most Provincial Cutcherries! The Assistant Agent of Saffragam is an exception to this general rule: he has not only taken some trouble in the matter and bestowed some thought on the subject, but has appended to his report a tabular statement of the various trials of this species of grain in his district. He says:—

"It has been clearly shewn that the climate and soil of Sabaragamuwa is not so favourable to Carolina Paddy as that of other districts, and that the Carolina seed has little advantage over the Native variety, if equal care and attention are bestowed on both. One bushel of either will, when sown broad-cast on fair ordinary soil, produce 8 to 12 fold; on good prepared (*i. e.*, manured) soil, 20 to 30 fold; and if transplanted, and tended carefully, about 40 to 50 fold. But as this last operation requires 8 or 10 times the area, it is the least profitable when there is any scarcity of land, or (artificial) supply of water." We believe these conclusions have been formed from an unacquaintance with the proper treatment of this variety of the grain; under similar circumstances, Carolina Paddy should and would yield double the quantity of any country variety. Mr. Saunders appears to be aware that the proper mode for this paddy has not yet been discovered, as he remarks further on that. "The chief objections to the Carolina Paddy are, that the ordinary means of preparing it for seed do not answer, and a small proportion only throws out the little roots that should appear before it is sown; then the blossoming is irregular and continues for so long, that blossom and ripe grains are often together on the same plant, and reaping has to be done very carefully and as many times as eight in one season. Naturally a good deal of the paddy so reaped is unripe, and becomes chaff; and thus, though the harvest appears large in the stock, yet, when the paddy is sifted and winnowed, the outturn is very little better than that of the ordinary variety. Some of these difficulties, and those mentioned in my previous report, will doubtless be overcome by experience, and though at present I think more may be done by manuring and by improving our agricultural implements, I would not

discourage attempts to introduce other varieties of this most useful and indispensable article of food."

Although instrumental in advising the introduction of this description of grain, we confess that it was only as a portion of a general recommendation in regard to introducing new and better varieties of seed paddy, one of which was cited as the Carolina Paddy. It was never thought of being better suited to Ceylon than any other, and yet this and this only has been introduced. In the report from the Central Provinces, there is a tabular return of the result of nineteen experiments with Carolina Paddy, which is interesting as shewing the causes of the invariable failure, viz., the smallness of the quantities sown, which rendered it impossible to give the necessary attention, and secondly the error in season which in nearly every case led to the ears being destroyed but which need not be the case had the proper sowing time been observed.

The report from Hambantotte tells us but little on this subject, though that little is satisfactory. It is to the effect that "Carolina Paddy was tried with varying success in several parts of the district in the last quarter; and, when more extensively introduced, will, I feel sure, answer well. The rice, though not plump in grain, is very well-tasted and nourishing, and is by some considered much preferable to Rangoon rice. The short period of four months, which intervenes between sowing and reaping, is also materially in its favour.—*Kandy Herald.*

Official Gazette.

CALCUTTA, 15TH DECEMBER, 1870.

COTTON EXPERIMENTAL FARMS.

[Under Mr. Rivett-Carnac].

THE WURDAH FARM.

Madnee, July 31st, 1870.

SIR,—I send, in obedience to your request, my views on cotton cultivation, and agriculture generally.

Irrigation later on during the boll forming, or seed maturing process, would be attended with good results, no one can doubt, and in a climate like India, where the heat is great and evaporation likewise, a somewhat retentive soil is absolutely necessary. But the young plant suffers during the rains from excessive moisture; the land being saturated is rendered impervious to air acting on the root; and as the root of the cotton has a direct downward tendency, the spargioles are in a medium to absorb more water than the respiratory organs of the leaf can part with at this early stage of growth, when the foilage is but little, and weather cloudy or rain falling. I therefore consider a system of drainage as necessary as that of irrigation.

The rain-fall here is greater than in Brittany, even if we include extreme limits—Orkney and Cornwall—will not reach thirty-two inches yearly, whilst that of Middlesex is below twenty-four, from the observations taken for the last twenty or thirty years. Farmers and landlords are fully aware of the benefits of draining as will be seen by the rentals. The wet summer of 1860 or so, clearly demonstrated the advantages of deep drained to that of shallow or undrained land. Before draining became general, four or five sacks per acre was the usual out-turn; now a load of wheat per acre is a common occurrence. Not that I attribute the present out-turn solely to drainage; sowing or drilling thinner, more stock being kept for manure, with better implements of husbandry, has likewise been the cause of a greater return. Draining has raised the temperature in cold, stiff, heavy lands, by rendering the soil permeable to air, for where water will go, air will follow, and the texture of the soil is thereby altered, is less clung and easily worked, and if carried out here would lower the temperature by freely admitting air. The ammonia in the atmosphere, which is absorbed by rain water, and falls on the earth during the rains, would be kept by the soil in the descent of the water downwards to reach the drains. Every gardener must have noticed when he has applied liquid manure to mies in pots or borders, that the liquor is deprived alike of colour and smell in its passage through, but the land is filled to repletion and can take no more, the water forces all matters held in solution to a lower level, is taken away by the river, and deposited at its mouth for the benefit of future generations. Good cultivation strives to check soil from being brought from a higher level.

As regards manure, I see but little prospect of getting enough to improve the land whilst so much is used for fuel, and the remainder allowed to dissipate its virtues in the air. If the farmers could be persuaded to dig pits on their farmsheds, into which all matters could be thrown, and the urine to flow water according to requirements, the small quantity so made would be worth cartage. Bones, if collected and taken to the jails to be crushed, or what is better,—ground, and applied at the rate of fifteen bushels per acre, more or less according to the land, whether rich or poor, would be a valuable manure. Half this quantity, if mixed with soil and sulphuric acid, would answer equally as well; the latter causes prompt and immediate action by a speedy decay of the bone. I might add, as a rule, gardeners and farmers avoid putting bones on wet or undrained land; but perhaps India does not furnish bone or rag gatherers as in Brittany, hence the reason of the bones left to bleach where the animal dies. Putting drainage, manure, and bones aside, I see no other means of a greater out-turn, but by bringing under cultivation some of the waste land yearly, allowing at the same time a corresponding acreage that has been so long tilled for cotton and cereals two years or so fallow, attention being paid at the same time to the rearing of a better breed of cattle on the principle of selection, instead of, as now, allowing miserable tadpole-looking bulls for stock. Agricultural societies, established in different parts of India, in which Europeans are likely to be long residents, could take these matters in hand, and impress on the Native the advantages of better animals for stock.

As to species and varieties of cotton most suitable for India, perhaps the Indian varieties are better adapted for the soil and culture it here meets with, and if acted on the principle of continued selection, a better variety will be raised than any at present. Still I do not take it for granted, because the exotic kinds have been tried once or twice, and failed, that such will always be the case; if the exotic kinds can be flowered in India, I consider a point gained; and should seed be produced, a stride in advance; as the pollen of the long staple exotic could be applied to any vigorous growing indigenous variety, bearing in mind that the mother plant be healthy. Whilst the matured seed of the exotic would give rise to different varieties, plants of any kind, if raised from cuttings, grafts, layers, &c., may be said to be constant, as it is a continuation of the same plant, or life prolonged, whereas if raised from seed, are ever liable to vary according to circumstances, soil, heat, moisture, and in proof of this I might cite the Deodora, or Sacred Indian Cedar, which has not been introduced into Britain more than fifty years, and has given rise to as many varieties. Still I am decidedly against large consignments of exotics being planted in the expectation of a remunerative supply. If the plant becomes acclimatised in two or three years, is as much as one can expect, and when seeds are received, or sent rather, should be obtained from districts resembling as much as possible the places to which they are destined, the rain-fall here light, soil, &c., being ascertained; for, however much we may esteem the Hinguughat for its quality and produce, the easy method by which the land is tilled, in my mind not any kind of cultivation and fertilising would ever give an out-turn like that of any varieties of the States, Sea Island, &c., which are varieties of Barbadense, a finer species than that of Indicum, judging from what I have seen in museums. However, I hope to be able, during my stay in India, to set this vexed question at rest.

F. BARTER,
Superintendent Farm, Wurdah.

THE BOOLUNDSHUHUR FARM.

Boolundshuhur, 1st August 1870.

SIR,—I have now the honour to forward you my report on the cotton farm, showing the work done.

From the 13th to the 28th June, the work done was principally cleaning and manuring the ground; on the 29th and 30th there was a little ploughed and ready for sowing.

The sowing was commenced on the 1st July, and kept sowing daily the fields as they were ready, and on the evening of the 4th we had over thirty acres sown, but the rain on the morning of the 5th being so heavy, that it completely destroyed over twenty-six acres. The soil being of such a sandy nature, that in the fields which had any incline the seeds were so deeply buried, and the hot suns that we had immediately after the rain, formed such a hard cake on the surface, through which only a few of the seedlings were strong enough to make their way.

Some of the fields are also flat, that when they get flooded the water remains such a long time upon them that it perishes both seeds and seedlings; some of the fields are a little higher round the sides, and the ground all round being so flat that there is no way of letting the water away.

On the 7th, some of the fields were again dry enough for sowing, and from that time up to the 17th we continued sowing daily the fields as they were got ready, and by that time some of the fields were very dry on the surface, and, until the rains came on the 20th, several of the fields showed no signs of germinating, but since then they have come up wonderfully (except in a few of the fields that the rain kept flooded for several days). I have also had for several days past a strong staff of men cleaning off grass, and a few going behind filling up the blanks, as several of the fields are rather thin, but if the weather keeps a little cool they will soon germinate.

Since the last rains came, I have taken every opportunity of getting the fields that were destroyed by the rain resown, all being finished on the 30th; some of them are coming up beautifully.

The exotic seed I brought with me, viz., Persian and Sea Island, has been a complete failure, scarcely a seed germinating of either sort. The Egyptian and New Orleans have come on very well, and the plants are now looking very healthy. New Orleans, sent by H. Rivett-Carnac, Esq., is doing very well, but rather thin; a great quantity of the seed being bad.

The Hybrids, sent by Major Trevor Clarke, have germinated well, and of twenty-five varieties sown I have got twenty-four representatives; very few seeds having perished.

The ground on which the Sea Island and Persian was I have resown with maize, to avoid self-hybridising as much as possible; and three fields that were too wet for cotton I have sown with jowaree, all of which was finished on the 31st July.

I have also put in over six hundred of mulberry cuttings, but the water being also so canny for them, I thought it better not to put down any more at present, until the water could be had more convenient. The Rhea is also planted out. I have put in some of the forest seeds, and when we get a little rain shall put in the rest of them.—I have, &c.,

J. SIMPSON.

THE OOMRAOTEE FARM.

Oomraotee, 4th August 1870.

SIR,—The accounts which I have just received from the different parts of the province, show that all crops grown on light and medium soils are flourishing, but that those which were sown on black, deep soil have suffered considerable damage from the heavy rain. Most of the plants of cotton and joowaree on deep soil are looking yellow, and in some fields the plants are totally rotten. Such fields will have to be re-sown either with Sessamum (Thillee) or some other spring crop. In the Darwah Talook of the Wom district, the rain is reported to have done greater damage to the cotton and the jowaree crops than in other localities, and I shall try and visit the locality within a few days, and then submit a detailed report to you on the subject.

More rain would certainly have destroyed the sickly plant, but I am glad to report that, fortunately, since the last five days the weather has been as favourable as could be desired. The days are bright, sunny, and stray winds prevail during both days and nights. It may, therefore, be hoped that the moisture will soon be dried up, and that most of the yellow plants will regain their vigour. I hope that this favourable dry weather may last, at least, until the jowaree sowings are completed, and the cotton and jowaree and the jowaree fields are hoed and weeded.

The soil has been much hardened (caked) by the action of the heavy rains, and, moreover, the weeds have crowded the young plants of cotton and jowaree, and consequently the plants appear now to be stunted. The cultivators are now so busily engaged in finishing the jowaree sowings, that they cannot pay much attention to anything else. Many of the fields which were prepared for the jowaree crop, but were not sown before the heavy rains, are now covered with weeds, so much so that nothing can be grown in them until they are ploughed and prepared again; while some of the fields are still too wet to be worked in. It is said that all these fields will be sown with spring crops towards the middle or end of November, by which time they will be easily got into order. The jowaree sowings will be completed within a few days, and then the cultivators will get on with the hoeing and weeding operations.

On the whole, I think that the prospects of our crops this season are not as yet unfavourable, as the present dry weather may, it is hoped, counterbalance the damage done by the rain. This heavy monsoon will prove most beneficial to the spring crops.

Mr. Pillan's detailed report on the present state of the Oomraotee seed-garden is herewith submitted. It will show that our garden crop is still in an excellent condition. In one of the wells we have now about eight feet water, while in two it is only about three feet. The rain did a great mischief to the fourth well, which I hope soon to get into order. I have now arranged to get the masonry work done at once, and hope the wells will be quite ready within a fortnight or so. There will not be necessity to irrigate our land till a month or two longer.—I have, &c.,

NAGO RAO J. N. KRISTNA,
Assistant to Cotton Commissioner.

The Foresters' Gazette.

CALCUTTA, 15TH DECEMBER 1870.

IT is beginning to be doubted whether trees even induce a greater fall of rain. One writer asks what real ground there is for connecting together the presence of forests and the frequency of rain as cause and effect? The assertion is so commonly made, that to doubt its truth seems almost like contradicting a received physical fact. And yet it will be found on examination that it really rests on no solid foundation either of reasoning or experience. The question is a *procès jugé et pas plaidé*. As for the reason of the supposition none whatever has been assigned, so far as we are aware, except that a surface shaded with woods is somewhat cooler than one denuded of it, and therefore likelier to attract the passing shower. How far this may be true it would be difficult to verify, or whether a hundred acres covered with wood really present a cooler area than if covered with turnips or other vegetation; but the effect of such a cause as this must be very limited at any time, and (which is more important) it can apply only at the warm season of the year, In cool weather, when rain-fall takes place, the "open" is notoriously cooler than the shaded surface, and therefore should, by the supposition, attract more moisture. In cold countries—Canada, for instance—the woodman can ply his trade in the sheltered interior of the forest when out-of-door work is completely suspended in the cleared land by reason of extremity of cold. Supposing, therefore, the precipitation from the air to be in any degree affected by the presence or absence of forest covering, one half of the year ought to balance the other. We hope that the above theory will be so accepted as to help to save our forests from further destruction. Forests, even if they do not at present pay the expenses connected with their preservation, will, in the future, pay the same with interest. In India, especially, forests are valuable—the common trees can be used for firewood; the more valuable as sleepers for our railways, timber for our ship-building, and wood for our cabinet-makers and upholsterers. But the shelter of older trees is absolutely necessary to let the young ones take root, so our forests must be managed by careful hands, and not cut down at random. Government must attend to this matter, and see that the work is done by those who understand it. If, then, it can be proved that, added to their prospective value, trees are the cleansers and purifiers of our atmosphere, we have an invincible argument for

their preservation. We should like to know what Medical and Sanitary Officers on this side of India think of the matter.—*Deccan Herald.*

IMAGINARY CHANGES OF CLIMATE.

Pall Mall Gazette.

THREE consecutive years of drought, while they have stimulated the inventive resources of practical agriculturists, have had the natural effect of calling forth a plentiful crop of speculation from weather prophets, and projectors, and half-instructed meteorologists, and all the philosophic tribe of Laputa in general, to whom the periodical press now affords such fatal facilities. We have often noticed that in the tabular statements of those compilers of weather records who write to the *Times*, useful and welcome as their communications are, every season is sure to be "extraordinary," almost every month one of the driest or wettest, or windiest, coldest, or hottest, ever known. Much observation, which ought to correct a tendency to exaggerate, seems in some minds to have rather a tendency to increase it. And many seem now to regard three dry hot years in succession as betokening some general change of climate, as if it was not perfectly certain, in the wide range of the table of what we call chances, that with our existing conditions of climate such a combination must every now and then recur. We know an ingenious theorist who would fain persuade us that a cycle of six hundred unfavourable years has just reached its termination, and that English agriculturists, who left off making wine about A. D. 1250 because their grapes ceased to ripen, will soon be making it again, and continue to do so for an equivalent number of centuries. Others, speculating quite as conjecturally and even more absurdly, seem to attribute the impending change of climate—of which they assume the reality—to the operation of men. They fancy that by extended drainage and the cutting down of trees the amount of rain-fall may have been diminished. As to drainage, it may suffice to remember that our rain is derived from the evaporation of the Atlantic, and is not likely to be affected by the diminution of that which proceeds from a few swamps. As to the effects of cutting down trees, the subject has been made so much of in recent times that it requires to be treated more respectfully. Yet there are two considerations which militate against the theory; the first relative to its application to England, the second to the doctrine in general. As to the first, it may be greatly questioned whether there has been for some generations past any diminution of our tree-covered surface. There is a balance of gain and loss. Some woods have been felled. Some districts, once rich in hedgerow timber, have been partially stripped for reasons of scientific agriculture. But, on the other hand, the Englishman's passion for planting and for preserving timber has been steadily at work in the contrary direction. Take the neighbourhood of London for an instance: any of us who are old enough may remember how, scarcely more than a generation ago, the spectator from any height commanding an extensive prospect would note great bare tracts of heath, of cultivated but unenclosed land, and of recently enclosed common with low treeless hedge. All this is altered now. Go where you will for a view in the "home countries," a sea of leaves seems to extend around on every side. And we believe that most people, if they consult their experience, will make the same report of the parts of the kingdom with which we are acquainted. The local authorities who have been lately bestirring themselves to prevent the disforesting of the New Forest, on the ground of apprehended deficiency of rain, are certainly indulging in very imaginative apprehensions.

But, in the next place, what real ground is there for connecting together, in temperate climates at all events, the presence of forests and the frequency of rain as cause and effect? The assertion is so commonly made that to doubt its truth seems almost like contradicting a received physical fact. And yet it will be found on examination that it really rests on no solid foundation either of reasoning or experience. The question is a *procès jugé et pas plaidé*. As for the reason of the supposition none whatever has been assigned, so far as we are aware, except that a surface shaded with woods is somewhat cooler than one denuded of it, and therefore likelier to attract the passing shower. How far this may be true it would be difficult to verify, or whether a hundred acres covered with wood really present a cooler area than if covered with turnips or other vegetation; but the effect of such a cause as this must be very limited at any time, and (which is more important) it can apply only at the warm season of the year. In winter, when a full half of our rain-fall takes place, the "open" is notoriously cooler than the shaded surface and therefore should, by the supposition, attract more moisture. In cold countries—Canada, for instance—the woodman can ply his trade in the sheltered interior of the forest when out-of-door work is completely suspended in the cleared land by reason of extremity of cold. Supposing, therefore, the precipitation from the air to be in any degree affected by the presence or absence of forest covering, one half of the year ought to balance the other.

In France, the prevalence of the theory that the clearing of woodlands diminished rain was such, a few years ago, as almost to produce a panic among philosophers; and in France the question could be tried experimentally with greater ease than here, because the surface of that country is more markedly divided between thick wood and bare fields than is the case with ours. Something meriting the name of observation was, therefore, applied to the problem, and we believe we are right in saying that the result hitherto arrived at is altogether adverse to any connection between the alleged cause and effect. Rain-fall cannot be shown to have diminished generally in France through the removal of forests which in the last hundred years has been very extensive, nor can it be shown locally that rain has diminished where forests have been cut down. One experimentalist compared, for some years, the meteorology of two adjoining valleys in Burgundy, the one covered with wood, the other entirely bare, and found that less rain fell in the former. But observations of this kind must no doubt be far more extensive and more prolonged to be really valuable, and none such has been applied since this question began to be agitated.

Of course, this scepticism of ours does not in any degree touch the real and probable utility of forests in agricultural economy. It has not been shown that they increase the rain-fall, nor any good reason given for supposing it, but they are of the greatest service in economizing it. They preserve the fallen water, both by the percolation which takes place more readily on the soil shaded by them than on exposed surfaces, and also by obstructing evaporation. They are most useful accessories both against flood and against drought. But under our English climate there is a contingency perhaps more injurious in the long run both to human health and the fruits of the earth than either flood or drought. This is the prevalence of damp, cold, sunless weather. Some suppose that an over-abundance of trees has a tendency to aggravate this particular evil. Certain it is that in the vicinity of that very New Forest, of which the maintenance is now so strongly urged by some climatologers, a large number of the inhabitants who can afford it are apt to migrate in what they deem the unhealthy season—the fall of the leaf—and resort to a more bracing and invigorating air.

Not only the effect of forests but the effect of modern field-drainage requires to be established on far more accurate evidence than has as yet been obtained. We do not mean its effect on climate in the general sense, which we believe to be none at all; but on the preservation and distribution of water, on the permanent productiveness of the soil, and on human and animal health. These are questions of which we shall have to leave the scientific investigation to those who may come after us; for the present we seem likely to content ourselves with deductions from very narrow experience with very large conjecture and very confident assertion.

REPORT ON THE DEODAR FORESTS IN KASHMIR.

I MAY preface these notes on the *deodar* resources of the Jummoo and Kashmir territories by mentioning the means I have had of forming an opinion on their extent and capabilities. In autumn 1865, I came down along the Chenab from the eastern boundary of Padar at the Sansai (after inspecting the Pangí forest, higher up) to Jangulwar, below Kishtwar (whence I re-crossed into the Ravi basin). And Mr. E. Sparling, Assistant Conservator, furnished me with a Memo. on the *deodar* upon the Bhutna, a tributary of that

part of the Chenab. In autumn 1866, I went up the Chenab from near Chineni to Kishtwar, thence traversed the length of the Wardwan Valley to the highest *deodar*, and after crossing the Kashmir Valley, passed along the *deodar* tract on the Jhelum below Baramula. The latter, as well as the Bhimbur and Rajaori tract, I had travelled over some years previously. In the autumn of 1867, crossing from the Khagan Valley, I came down the Kishengunga from Shard to Mozuffurabad. Thus I have had opportunities of examining great parts of the *deodar* tracts in the territories of His Highness the Maharaja. And in these tours I lost no chance of questioning officials or others who could give information as to forests and timber.

Beginning with the east, it may be noted that two small tributaries of the Lower Ravi rise and pursue much of their course in Jummoo territory. These are the Siawa and Uj; and although I have never found occasion to visit either there seems every reason to believe that almost all the available *deodar* on both has been felled for export, the original stock not having been large, and the demand being great, owing to the proximity to the plains. The *deodar* tract on the Uj is of small size, and lies quite in the outer hills, and its timber is said to be in esteem with Lahore buyers, owing to its being dark-coloured.

Resembling those of the Uj in some respects are the still smaller *deodar* tracts on the Tawi (a common generic name of small rivers in the Punjab), which rises in and flows through the low hills to the north of Jummoo to join the Chenab. This also is stated to be cleared after about 7 years' felling, not for export, but for use at Jummoo. The trees are said to all have been of small size, and to have been squared in the forest (as was often the case on the Uj) and as the stream is quite small, with only freshets and no great floods, the timber was brought down only by the expenditure of much labour in dragging, &c.

In taking up the Chenab itself within Jummoo territory, I may mention that I have not thought it advisable to enter in detail many matters noted, as these forests are in foreign territory and only need our attention in a general way. The part of the Chenab with which we have here to do may naturally be divided into two portions: the upper, from the boundary with Pangi at the Sansai down through Padar, &c., to the junction of the Wardwan river near Kishtwar about 65 miles; and the lower, from that point down for 55 miles. In the upper part the course of the river is on the whole westerly, its bed falling from about 6,000 at the mouth of the Sansai, the boundary stream, to about 4,400 feet near Kishtwar, and it flows between lofty mountains with rather steep slopes, but of a milder type than those of Pangi further up.

As noted in my Chenab Forest Report, there are considerable *deodar* forests on both sides of the Sansai stream, growing to 2,000 feet over the river, and probably aggregating not fewer than 1,800 or 2,000 first-class trees; those on the right bank, which are the finer, ranging up to 10 or 11 feet girth and 150 in height. At the time of my visit it was believed that the Sansai stream was the boundary, which would have left the *deodar* on its left bank in the hands of the Forest Department. But since then the Superintendent of Chamba has decided that the ridge on the east of the Sansai Valley is the boundary, so that the whole of that *deodar* belongs to Kashmir. About 1,100 trees are said to have been felled there within the last three years.

On this (the right) bank of the Chenab from the Sansai down to Gulabgurh, (24 miles), where the level of the river is about 5,400 feet above the sea, there are three or four considerable forest tracts, but as launching is tolerably easy in most of them, great part of the available trees have been felled. Along the left bank in the same part the *deodar* tracts are more extensive, and, as much of the ground is more difficult, there has been less felling in proportion to the stock. On both banks there is, besides *deodar*, a good deal of other coniferous forest, chiefly *Pinus Excelsa* and *Abies Smithiana*.

At Gulabgurh, the Chenab is joined from the right bank by the Bhutna or Bataur, a tributary of some size, up the valley of which there is a good deal of traffic to Zanskar by what is for some 20 miles at least a good road. All my information as to the *deodar* on it is derived from Mr. Sparling's memo. and native information. The nature of the ground is said to be similar to that on the Chenab above this point, but easier, and *deodar* extends to Hamuri, nearly 25 miles up, reaching perhaps 8,500 feet. The trees would appear not to be of great length, only giving 3 logs each; one tree of 29½ feet girth was seen by Mr. Sparling. There seems no doubt that at one time there was a great deal of *deodar* on this river. From 1,000 to 1,500 trees appear to have been felled in each of a good many years since 1848, with an intermission, after Mr. Prinsep was, in 1850, sent up by Government to investigate the probabilities of *deodar* supply. The aggregate felled up to 1867 probably reached 10,000. The stream at Galabgurh is nearly equal to the Ravi at Chamba; and up to where the river becomes too small for floating, felling has been carried on so vigorously that many of the lower slopes are cleared of every tree down to those of 8 inches in girth; only the trees in higher parts of the forest being left, and only one forest high near Chisot on the right bank having remained virgin. This is the more to be regretted, as Mr. Sparling reports reproduction as much less active than in Pangi. With these statements as to nature of the ground, and the over-clearing, I cannot put much faith in Mr. Sparling's estimate (stated to be founded on actual enumerations by his native subordinates) of 7,784 first class *deodars* still standing on the right and 12,825 on the left bank of the Bhutna. Other conifers are scarce here, most of the *excelsa* growing above and apart from the *deodar*.

For the remaining 40 miles downward from Gulabgurh on the right or sunny bank of the Chenab there are only three or four plots of *deodar* of any size, and these not of great value. On the left bank in this part there are six or seven valuable forest tracts of considerable extent, the trees in some ranging up to a large size. But most of these are either distant from the river or over bad precipitous ground, so that the amount of felling has been relatively small, and some of the forests are still virgin. Nor does it seem likely that on the Kashmir method of working forest—to be noted subsequently—most of these are likely to become speedily available. In the lowest of them, Dhankut, no trees have been felled for export, but some have been taken for use at the Government *Khoti* in Kishtwar, a few miles off.

The portion of the Chenab from Kishtwar downwards is of less importance as to *deodar*. From that place to Bhagar, 55 miles, the bed of the river falls from 4,400 to 3,000 feet; the slopes are easier, and the hills bounding the valley are lower. In this tract the *deodar* is for the most part not found, as on the Chenab generally, in massive forests, more or less pure, on the great slopes fronting the river, but more like that on parts of the Ravi, is generally found in greatest quantity in the smaller lateral valleys. For 10 or 12 miles on the right bank below Kishtwar a good deal of *deodar* exists in such situations and also in less quantity very high on the slopes fronting the river. Below this down to Bhagar there is little or no *deodar* on this bank. No felling for export has ever taken place here, nor are these trees likely to come into the market on the present system unless prices should rise very high.

On the left bank, for 20 miles below Kishtwar, the river running south, there is little or no *deodar*, except small tracts so deep in the valleys of two or three minor tributaries, that timber could not profitably be got out. At Derana, above Jangalwar, there is a good forest of fair sized *deodar* with tolerable reproduction. And there are smaller tracts on the Lolru ridge, and in the neighbouring valleys to the south of it, but here also export, under present circumstances, would not pay. For 20 miles below this, the Chenab having again turned west, there is, or has been, a good deal of *Pinus longifolia* near the river, but there are only one or two small patches of *deodar* until the range between Bhagar on the Chenab, and Chinen on the Tawi, is reached. Here at Sutrorgurh or Patni Talao, there is a large and valuable *deodar* tract, whence a good deal of timber has been taken for use at Jummoo, &c., to the south, but none for export by the river, which is five or six miles off, and for which conversion would be necessary. There are still a large number of good trees here for use when prices have risen sufficiently, to bring them out. The trees are fine, ranging up to 10 or 11 feet girth and 120 or 130 high, and reproduction is good.*

In this lower part of the course of the Chenab, there are three considerable right bank tributaries,—the Lidar, the Bichlari (one branch of which comes from near the Banihal pass), and the Ans. Each of the two last has a considerable body of water and drains a large area, and there is reason to

* I hear that in 1868 trees were here felled for export.

believe that there is *deodar* on at least the Ans. But the trees are placed high, and floating is difficult, so that no *deodar* has ever been felled for export.

To return to the Marru or Wardwan river, which joins the Chenab from the right bank near Kishtwar, after pursuing a nearly north and south course, with one or two great bends, down the Marru Wardwan Valley from Inshin, above which there is little or no *deodar*, to the confluence with the Chenab, is about 65 miles, the bed falling from 7,500 to about 4,400 feet. For nearly 20 miles from Inshin down to Marru, where the Kadran—a large tributary—joins from the left bank, the *deodar* tracts are not extensive on the right bank, and on the left they are still smaller, and the trees more scattered, as well as frequently at some distance from the river. In this locality the tree reaches an elevation of nearly 9,000 feet. The ground, especially on the right bank, is fairly good for forest operations, and on both a good deal of felling has been done, especially for a few miles above Marru, felling having only been extended to the higher part of late years, since trees became scarcer below.

For 12 or 15 miles up the Kadran tributary there is a good deal of *deodar* on both banks, and many trees have been felled for export on the right, where the slopes are easier. In places there are still a good many left.

On the main river, the chief forests commence some miles below Marru, when from Telar downwards for 12 or 14 miles *deodar* is almost continuous along the right bank. Wherever launching is easy the felling has been carried on vigorously in places to complete clearing. Along the left bank also there is much *deodar*, but the ground is more difficult, and there has been less felling. And a large proportion of the trees on both banks will probably remain untouched till some other system of working the forests comes into play.

On the right bank, opposite Sundar, there is a considerable forest, in which there has been a good deal of felling, and there is a large extent of *deodar* forest, more or less scattered and mixed, on the left bank for six or seven miles below Sundar. But much of it is some way from the river, with not very easy ground intervening, so that there has not been a great deal of felling, and there are probably not less than 3,000 or 4,000 trees left here. Still further down, on the right bank, over the villages of Mian and Kuch, there is a considerable *deodar* tract high above the river; and further west towards Mogul Maidan, on the road to the Mirbal Pass to Kashmir, there is another; but both of these are said to be virgin, except a little experimental felling in the former, which was unsuccessful.

I was informed on the spot that felling commenced on the Wardwan as much as 30 years ago; and it seems certain that for several years at least 1,000 to 1,500 trees have annually been felled here. But on the whole, the number taken appears to have been small relatively, many of the best tracts having been protected by the nature of the ground. Though the difficulties of the latter could in most places be overcome by systematic effort under European supervision, they are sufficient to deter the villagers, through whom alone the work is at present done.

In many parts of the forests both on the Chenab and Wardwan, the reproduction of *deodar* is fair, but waste and carelessness as to the trees is everywhere visible. In many places trees are lopped or barked without any need, and near villages the young trees are cut without mercy. In forest operations also it is the same. A large number of the stumps are left much higher than is necessary, sometimes to 10 or 12 feet high; too many trees are taken wherever the ground is easy; there is no preparation of slides even where there are considerable drops, so that the logs suffer much more than they ought to do, and sometimes, apparently without cause, a considerable proportion of the wood is left lying for years, or perhaps for ever, without being launched.

It need hardly be stated that there is no effort by clearing parties to push the timber down the rivers. The floating difficulties are, as a rule, not great in either the Upper Chenab or the Wardwan river, where felling has hitherto been carried on, but great accumulations of logs are at times seen stranded in places whence but a little trouble and expense would have removed them. The Chenab has a great annual seasonal rise of many feet, and there are few difficulties of floating in the greater part of its course. The worst place is near Gulabgurh, where at a bend called Artolike-pher there has for some years been an immense accumulation of jammed logs. These are estimated to number 3,000, and belong partly to Government and partly to the Maharaja, and it is thought that most of them can be moved, if a side channel is dug, both parties agreeing to share the expense.

The greatest evil in connection with these forests is the prevalence of forest fires, of which the traces are everywhere seen in old scarred newly-charred trunks and branches, and dead standing trees, often in large numbers. Some idea may be formed of the extent of this evil from Mr. Sparling's statement last October, after having travelled down the river, that "from Sansai to Kishtwar, 82 live fires had been counted, while those that had died out were innumerable."

It is impossible to get reliable figures as to the number of *deodar* trees that have been actually felled, but the number for these rivers must have been very large. I was assured in 1865, by the official then in charge of forest operations, that 25,000 trees had in two years, 1859 and 1860, been cut on the Chenab and Wardwan rivers. And although the annual number has diminished very much since then, it seems likely that at least 60,000 *deodar* (and perhaps many more) have been felled for export on these rivers. And I should not be inclined to put the number of *deodar* still available in tolerably workable ground at much more than the same number.

With regard to the Government depôts on this river—and the system of the Maharaja's officials is similar—it may be noted that there are several catching depôts from above Riassi, a few miles within the hills, to Akhnur where the river enters the plains. At and near the catching depôts the logs (*geli, latha*) are caught singly by swimmers with skins (*surna*). They are then formed into small rafts (*jhunda*) of three logs each and conveyed by skinsmen to Akhnur. From that point down to the sale depôt at Wazirabad the timber is floated in large rafts (*talle*) of 25 logs, guided by men who live upon the rafts. The latter are fastened together by poles, which formerly were mostly bamboo (got from a small jungle a few miles from Akhnur), but recently *chil* has been more used. The rope employed is sometimes made of *babar* (Andropogon or Eriophorum), but *pachi*, the refuse of sugar-cane stalks, is reckoned the best. Many of the logs which in floods pass the upper depôts become entangled in the net-work of islands (*chanda*) and flats below Aknur, where most of them are sold as they lie, as the expense of removing them for sale to the depôt, would, in many cases, not be covered by the advantage gained.

We now pass on to the western part of Kashmir territory in the basin of the Jhelum. In the eastern portion of the Kashmir Valley there are a few small *deodar* forests, and on the wooded slopes on the northern aspect of the western part of the Pir Ponjal range (near Baba Pam Rishi), there are, or have been, a good many scattered trees, though no continuous forest of *deodar*. From the last as well as from the Lolab pergunnah to the north of Baramula,—where also there are large forest tracts, but, as I believe, no great quantity of *deodar*,—a good many trees of that and *Pinus Excelsa* have been felled. But these appear to have been mostly employed locally for boat and house building, and it may be doubted if much timber has ever been felled for export above Baramula, and timber is even carried from below that place for use in the valley itself.

From Baramula to Uri, some 24 miles, in which the level of the river falls from 4,900 to about 3,000 feet, includes most of the only *deodar* tract on the Jhelum river proper. On the right bank, there is not much coniferous forest of any kind, and there are only a few small *deodar* plots (the chief one being near Tatamal), in most of which the trees are not of great size, and have often been much lopped and injured. On the left bank the forest is tolerably continuous, reaching 1,500 feet above the river, and in many places consists, or has consisted, mostly of *deodar*, the trees often of good girth, but of no great height, and in places given to multiple trunks. For 10 or twelve miles below Uri on the left bank there are occasional patches of *deodar*, but generally high and distant from the river, so that launching would be expensive.

The slopes and launching are on the whole not difficult—indeed, are in many places very easy, so that almost all the large trees fit for felling have in many parts been cleared, only those in the higher or steeper parts (which are rare) having been left. Another circumstance which has perhaps

conducted to this is, that here, more than in most other parts of Kashmir territory where *deodar* grows, not only are supervision and pressure easy, but there is more population, and therefore more labour available.

Felling would appear to have commenced here very early, for I find it alluded to (but have mislaid my authority) as going on upon a large scale in 1850. And Dr. Adams, in his "Wanderings of a Naturalist," mentions felling as being very vigorously carried on in 1854. I have also been informed by a Kashmir official that in that year 4,000 *deodar* were felled in this tract, and although the number in succeeding years diminished considerably, and there appears to have been no felling from 1860 to 1864, I believe we may reckon on an aggregate of at least 12,000 trees having been felled here.

How the work was carried on may in part be gathered from what can still be seen. Stumps of 5 and 6 feet high are not uncommon, and some even to 14 or 15 feet occur; many places have been quite cleared, and still more over-felled; no care had been bestowed upon the slides, and only the easy nature of the ground prevented the logs from being still more injured in their descent; logs are left for years, until the outer part is quite rotten; and although the bed of the river is by no means difficult, great numbers of stranded logs were left without an effort to clear them out. How bad the results sometimes were may be gathered from the statement that in 1850, only one-third of the logs were counted on as reaching depôt, the rest being smashed, stranded, or purloined *en route*—and this in a river which is one of the easiest in the Punjab, whether as to character of the ground nature of the channel, or extent of the floods.

Nor do the trees appear to have fared better as to conservancy than the timber. Adams mentions that in 1854 great damage had been caused to the *deodar* by charcoal burners (!) setting fire to and then hollowing out the trunks; even now large trees are often seen charred or barked (sometimes to a wonderful extent and still green above), and in many parts they are much lopped, and the young ones cut over and developing multiple trunks.

As the *deodar* tract here is limited in extent, and there have been so large fellings, I do not think we can put the number of first class trees still standing at more than 5,000.

The length of the course of the Kishengunga from Nade to Mozuffurabad, where it flows into the Jhelum, is about 75 miles, and in that distance there is a fall in its bed from about 6,200 to 2,000 feet, the direction being on the whole about south-westerly, but with several considerable bends. I did not go above Naddi, but am inclined to think there may be a good deal of *deodar* higher up. The ground, however, is said to be very difficult, and there are no inhabitants, so that whatever trees there are can hardly be considered as available at present. From Naddi, where the tree reaches about 8,500 feet, downwards for nearly 50 miles, there is a great deal of *deodar*, which indeed constitutes most of the forest to a considerable height above the river in that tract, the upper portion of the valley having much more than the lower.

In the uppermost part, near Shard and Kharigam, including the mouth of the Sungun, a large tributary from the right bank, there has been a great deal of felling on both banks, occasionally to complete clearing wherever the slopes and launching are tolerably easy. But much of the ground is steep, and often rough and precipitous, so that a large number of fine trees have been left in most forests. This state of things continues to about Keran, some 25 miles below Naddi, the forests falling off somewhat, and the ground being rather easier towards the former place.

Down to about Nosheri, some 25 miles further, there are also considerable *deodar* tracts on both banks, but of less extent and gradually receding further from the river, and there has thus been much less felling here. For some miles below Nosheri there are still a few *deodar* plots on the left bank, but much too distant to have been operated on. On the Karna, a left bank tributary also, which joins not far above Nosheri, there is stated to be a good deal of *deodar*, none of which has been felled on account of the stream being too small for floating.

In the forests on this river there is a larger proportion of *Pinus Excelsa* than I have noticed in any felling locality in Kashmir territory, but I am not aware if any of it has ever been felled for export. In many parts again, along the lower 30 miles of the river the large forests of *pinus longifolia*, generally—as is its habit—growing on steep, arid slope. It would appear that no felling of it for export has taken place here, most of the supply having as yet been got from much further down the river.

On the Kishengunga—even more than elsewhere—hacking and lopping have been lavishly practised, with a general waste of wood, and fine *deodar* are at times seen killed by a short segment of the bark having been removed to roof a shanty. Blackened stumps and scarred and scorched trees are everywhere seen, the last often in large patches. The worst case I saw was close to Keran, where a very large extent of fine *deodar* forest had recently been completely devastated by fire, at least 500 large trees standing dead on it. Nor had there been more care bestowed on the preparation of slides or the clearing of stranded logs than has been indicated as to the other rivers.

The river is at least 200 feet wide at Shard, and during most of its course there are but few obstacles to successful floating, so that it seems probable that felling was commenced early. The years for which I have figures from officials give 22,500 *deodar* as felled in various seasons from 1854 to 1867, and it seems likely that an aggregate of not fewer than 30,000 have been felled here.

As to the numbers of *deodar* still left, I was more particular on this than on most of the other Kashmir rivers, as it was the last of considerable size I should see; the forests are more extensive than elsewhere, and the nature of much of the ground makes it possible to frame estimates founded on enumeration of portions from opposite. This method is more likely to lead to an under-estimate, but on fair ground and with some care will give a tolerable approximation to the number of first class trees. The estimate for the whole right bank of the Kishengunga is 20,100 and for the left bank, 19,450, first class *deodar*.

Previous to inspection of the Kishengunga, my attention had been drawn in Khagan to the circumstance noted in paras. 16 and 17 of the Khagan Forest Report, *viz.*, that in the upper part of the course of the Kunhar river the *deodar* most affects the sunny and not the shady aspects. As the south-westerly course of the Kishengunga affords more decidedly sunny and shady sides, I chose Dwarian, about 25 miles below Naddi, as about the centre of the *deodar* tract as to capabilities, and have totalled the estimated *deodar* on either side above and below it. The results are, 13,050 on the sunny and 7,050 on the shady side above Dwarian, and only 5,110 on the sunny *versus* 13,980 on the shady side below it. This, then, is strongly corroborative of what was found on the Kunhar.

On the Jhelum, below the confluence of the Kishengunga, there is no *deodar* along the left bank, which is in Kashmir territory. But in some parts there are considerable *chil* (longifolia) tracts where felling has been largely carried on for export to the plains. In this part the most considerable tributary is the Punch river, which drains an area of large size south of the western part of the Pir Panjal range. This I have not as yet found an opportunity of visiting, but it does not appear that, if there is *deodar*, any has been felled for export and it is very doubtful if the upper part of the stream and its tributaries would be capable of floating large timber at any season of the year.

As a point of some interest in connection with the forest resources of Kashmir territory, it may be noted that on the Return Pir and to the west above Punch there would seem to be a larger stock of box trees than in any other Punjab locality. Thence is obtained most of the supply of box-wood (*chikri*) for making combs, &c., from Rawalpindi to Amritsar.

I have but few general remarks to make on the Kashmir forests, most of the chief points having been touched on in the preceding sketch. It may be noted, however, that on the whole the *deodar* in the Maharaja's territory lies at lower elevations than most other *deodar* in the Punjab Himalaya. And upon this, to some extent, may depend the fact that in the former the tracks of extensive snow slides were seldom observed. On the whole, also, the slopes of the *deodar* tracts in Kashmir territory are easier than elsewhere, which again has rendered over-clearing more frequent.

Partial over-clearing also is greatly encouraged by the system of felling which is pursued. This varies in detail in different parts; nor is it easy always to get definite and distinct information about it. But the general method appears to be, that the whole felling, &c., in each of the eastern and western

tracts is managed by an official called a *jittant* (adjutant), who stays at some central comfortable place, and probably never even sees more than one or two of the main forests from year's end to year's end. No labour is imported, but under the *jittant* are certain subordinates whose duty it is to see that each villager in the forest tracts operates on a certain (varying) number of trees. The officials state that the villagers are paid for this, but I doubt if in many cases it is not a form of *bigari*, or State service. Be this as it may, the choice of ground (within certain wide limits), and the absolute choice of trees, is left to the villagers. The consequence is, that when the ground and launching are tolerably easy, it is the interest of the villagers to take every tree that will *count* as such, while, as no expenditure is made for slides, &c., all the rather or very difficult parts are left untouched. I was informed that there had at times been disputes as to the *shortness* of the trees felled, the rate paid being for *girth*, irrespective of length.

Owing to the nature of the system, the season of felling differs somewhat from that generally adopted for Government work, and by traders on most of the Himalayan rivers. These generally fell and launch throughout the summer season, but the Kashmir villagers appear mostly to fell late in autumn, when the work connected with cultivation is more slack. The timber thus has more generally a chance of a year's seasoning ere launching than in the former case. There felling also is more capricious and apt to be influenced by incidental causes. Thus, when felling was begun, on the Sansai in 1865, two men were accidentally killed, and the others stopped work for the year.

For about two years, up to the end of 1867, Mr. F. Drew had held the general supervision over forest operations and timber dealings for Kashmir, which rendered matters more easy of settlement in the case of differences between the Forest Department and the Kashmir authorities. But in the beginning of 1868, I am informed that matters were put upon a new footing, the lease of waif with permits to cut a certain number of trees on each river being granted to certain natives. But the sums stated to be paid for waif, - Rs. 8,000 on the Ravi, 18,000 on the Chenab, and 12,000 on the Jhelum,—and the seignorage, Rs. 18 per tree, are so very high, that it appears not improbable that these arrangements had been contrived with a view to get the management put upon a slacker footing.

I may conclude with an estimate of the total number of *deodar* now left in the various *deodar* tracts in Kashmir territory that have been enumerated. But it must be borne in mind that, except in the case of the Kishengunga, where there was time and opportunity for greater care, these estimates are very much of the nature of guesses, and the numbers given may perhaps be assumed as maxima of first class trees available without very great trouble and expense. Allowing 5,000 trees for the Siawa and Uj, then, we may estimate the Chenab with the Bhutna at 35,000, the Marru Wardwan at 32,000, and the Jhelum below Baramula at 5,000, while the estimate for the Kishengunga is nearly 40,000. This would give an aggregate of 1,17,000 trees, probably as many as the whole number now available in the Punjab forests in British territory, or leased by the Punjab Government.

I forward with this two sketch maps indicating roughly the position, &c., of the *deodar* forests in the tracts comprised in this report.

J. L. STEWART, M.D.,
Conservator of Forests, Punjab.

Lahore, 30th December 1868.

The Planters' Gazette.

CALCUTTA, 15TH DECEMBER 1870.

THE ESTATES.

OUR contemporaries are disputing whether tea planting, upon the whole, has been a success, or not. The *Englishman* maintains that it has, and affirms that the "prospects" of the tea planter are more "bright." It says that "the great care and attention lately bestowed on manufacture has resulted in producing good tea of such uniform quality, as fully justifies the conductors of tea companies in using their utmost exertions towards introducing pure unadulterated Indian Tea to all classes of the community, not only throughout the United Kingdom, but also on the Continent of Europe, and in America and the Australian colonies, so as to enable the whole civilised world to draw comparisons between the teas of China and those of this country. The tea planters of our Eastern districts, and in India generally, may look forward with full confidence to the result of the trial.

Many planters are in the habit of sending small parcels to their friends in Europe, and after making due allowance for the flattering language that people use in acknowledging the receipt of presents, there is every reason to believe that if Indian tea could be readily procurable in retail quantities, it would soon drive the China tea out of the market, or at any rate compel the Celestials to supply something superior to the average of the shipments they now forward.

When we read the disclosures about the abominable trash supplied to the poor of London by unprincipled shopkeepers, we can fully understand the demand that the strong pungent tea of Assam and Cachar is acquiring for mixing purposes. The probabilities are that a very large portion of the China teas can only be sold when doctored with Assams. London Brokers not unfrequently conclude their remarks on Indian tea by remarking—*this cannot be sold separately, but mixed with China to soften it*—such remarks being, as we are now aware, made in the interests of their trade. Far different, however, is the opinion of private persons in England unconnected with the business, and it is to them we should look for approval. Agents and Directors of Tea Companies should bestir themselves in this matter of advertising the produce of the different plantations. It might be possible to induce some of the large dealers—such as Horniman, Twinings, Dakin, Ridgway, and others—to give Indian teas a fair trial, and dealers in all parts of the kingdom should be communicated with."

We fear our contemporary is somewhat sanguine, but his suggestions are practical, and therefore worthy of attention.

The Darjeeling News affirms what the tea districts really require to enable them to make India the greatest tea producer of the World, "is a number of private banks placed in the middle of the tea gardens with local knowledge to guide them in judiciously assisting the tea planter who may require temporary advances while *growing* his tea. There are plenty of folks ready enough to advance on the manufactured article, but no one to help the planter to reach that stage. Agents advance on such more gambling transactions as Indigo crops, and yet the difficulty in getting an advance on a crop of tea, a really safe transaction, subject to few fluctuations, is a sad and incomprehensible fact. We can only attribute it to the ignorance and incompetence of Calcutta financiers, or stupid orders from the "Boards" at Home of these joint stockeries."

CINCHONA.

MR. J. BROUGHTON the Government, Quinologist has analysed the Calisaya bark from Bengal, and reports on it as follows :—

"*I—Calisaya bark grown at an altitude of* 2,000 *feet.*—This bark greatly resembled the yellow bark imported from Bolivia, but its longitudinal markings were less clearly developed. Its analysis gave the following numbers, expressing the contents in 100 parts of dried bark :—

Total alkaloids	6·17
Quinine	4·55
Chinchonine and cinchonidine	1·62
Crystallized pure quinine sulphate obtained ...	4 18
Crystallized cinchonidine sulphate obtained ...	0·30

"*II—Calisaya bark grown at an altitude of* 3,500 *feet* :—This bark was younger, but of the same general appearances as the foregoing. Its analysis gave—

Total alkaloids	
Quinine	2·58
Chinchonine and chinchonidine	0·68
Quinine sulphate obtained crystallited	2 37
Chinchonine sulphate obtained crystallized ...	0·12

"The above numbers show that the bark possesses the most excellent qualities. Its total yield of alkaloids is large

and consists mainly of quinine and cinchonine, as is the case with the finest yellow barks of the English market. The comparatively small yield of cinchonidine renders this bark an admirable source of pure quinine sulphate, as the ordinarily tedious separation of the cinchonidine is greatly simplified by the small amount of the latter. Specimen No. I. is far richer in quinine than is usually the case with even the finest samples of the Bolivian calisaya. If the rate of growth of this bark is at all rapid, its cultivation ought certainly be pushed at the expense of the *C. Succirubra*, whose yield (according to the samples I received on a former occasion) is certainly less valuable than that of the admirable kind which forms the subject of this report."—*Madras Times.*

Private Cinchona Plantations.—The plantations of the Darjeeling Cinchona Association almost vie with those of the Government in extent and the number of plants, and they certainly exceed the Government plantations in the value of their returns. It is expected that four hundred maunds of bark will be shipped to London this year, which will realise in the market there Rs. 75 per maund, or a total of Rs. 30,000. In the year 1872 they expect to be able to ship 1,300 maunds the proceeds of which should amount to nearly one lakh of rupees—no bad return for the money laid out. When, however, the Government plantations commence sending their bark to market, the increased supply will no doubt somewhat lower the price.—*Englishman.*

Cinchona at Darjeeling.—The Government gardens will be extended, we hear, very much this year and the work has already commenced though the Government of Bengal professes to have issued no orders for such extension! Probably the Government of Madras has taken upon itself to push on the bark production of this district. Some one, clearly, must have ordered it, or it would not have been commenced.

The Darjeeling Cinchona Association proposes to extend by some 600 acres of red bark this year.—*Darjeeling News.*

COFFEE.

WEEDY ESTATES.

A correspondent writes :—"Can you inform me if there is any law in Ceylon for preventing proprietors of estates from having weeds on their estates, the seeds of which wash and blow on to their neighbours' causing much extra trouble and expense. In Australia, there is the Scab Law and the Thistle Law (*or Act*)." There is not, that we are aware, any special local law on the subject of weedy estates in Ceylon, such as that which applies to the thistle in Australia. Parties whose property is injuriously affected by the existence of weeds in lands adjoining such property can, however avail themselves of the common law remedy. An action for damages would lie and evidence would be received to establish the fact of damage and its amount. We can quite feel however, that this is an unsatisfactory remedy and that there ought to be special provision made for enabling neighbouring proprietors, after due notice to the owner, and, if necessary, the mortgagee of a weedy estate, to employ labour to eradicate the weeds, keeping an account of the expenditure incurred; the law giving them a first claim on the land operated on and its produce, for the repayment of such expenditure A law of this kind might seem to bear hard on proprietors unable to raise money sufficient to keep their estates properly cultivated, but, in truth, no man has a right to hold land who is not in a position to cultivate it so that at least it may not be a nursery of goat-weed to the loss and perhaps the ruin of innocent neighbours.

TRANSPORT OF PARCHMENT COFFEE.

A correspondent of the *Ceylon Observer* writes as follows :—"In your article of Thursday on the Wire Tramway, you have made an error in calculating the rate the proposed Company would charge per bushel of parchment from Badulla to Kandy. Stating the amount at 3s. per cwt. you say it would be 7d. per bushel. You have evidently arrived at this conclusion by dividing the 3s. by five. It is quite correct that in a rough way of calculation five bushels of parchment coffee are required to yield one cwt. of coffee as shipped; but as despatched from estates in parchment containing more or less water (afterwards evaporated in Colombo) coffee generally weighs at the rate of 3 bushels to one cwt. This would make the rate 1s. per bushel instead of 7d. for carriage from Badulla to Kandy."—This re-opens a question which we thought had been definitely settled by Mr. Leake some years ago on the understanding that, on an average, *five* bushels of parchment coffee went to the cwt. But on reference to the experiments made by the Ex-Secretary to the Planters' Association in 1863, we find our correspondent is quite correct and that we have been thinking of clean parchment Mr. Leake's information to Government gave 34lb as the average weight of a bushel of parchment coffee ready for transport from the estates. This will make less than 3½ bushels to the cwt. and our calculation of the cost of transport must therefore, as our correspondent points out, be proportionally increased :—that is 3s. per cwt. equal to 1s. per ton per mile (the maximum charge allowed to the Wireway for 60 miles from the Happootella Pass to Kandy) would be nearly equivalent to 1s. per bushel and adding the cost thence to Colombo the rate would be 1s. 4d. per bushel against 2s., the cartmen's charge from Badulla to Colombo this season. Seeing that Mr. Molesworth's calculation for working expenses was 6d. to 8d. per ton per mile, in allowing 1s. we afford an ample margin for all contingencies. If the Wireway experiment proved at all a working success, its promoters would probably be able to bring their charge for carriage over 60 miles into a fairer proportion with that by Railway from Kandy for 74 miles to Colombo, than four to one, which is the ratio estimated for above—the charge by Wireway for 60 miles being put down at £3 per ton, while from Kandy to Colombo, 74 miles, the rate is £1 per ton.

GLOOM IN COORG.

THE true position of the unfortunate province of Coorg, regarded from the British Colonist's point of view, can no longer be hidden from the conception of even the most sanguine settler in the district; and the plain truth that Coorg is a very inferior country for the Coffee Planter to risk his health and money in is becoming a plainer and uglier fact as the experience of each year steadily saps the hopes which at first clothed the undertakings in which he embarked. A few years have only to elapse, and the borer and excessive taxation, aided by the natural unsuitability of soil and climate, will have reduced the extent of cultivated Coffee land to a very small area; and deserted homesteads and abandoned coffee estates scattered throughout the length and breadth of this once prosperous Colony, will bear witness of the days that will then be past, and of the fearful loss of money and time that has been entailed upon luckless individuals who believed that a fortune was to be made by opening land in this part of India. Except in a very few places in Coorg, the necessary combination of good soil and climate, to say nothing of proper exposure, required for the proper cultivation of coffee, is not found; and the very localities where this happy union of circumstances *does* occur, is the very part where the borer has asserted its sway, and for the last five years has been actively engaged in destroying the finest estates this country should boast of. A faint hope exists in some minds that the borer will leave the coffee tree when the young bamboos grow up, but these young bamboos have been "growing up" for the last nine years in Munzerabad without making any perceptible difference in the appearance of the country. Some planters believe that the borer will not leave the coffee at all, so long as there are coffee trees to eat. The visitation has taken too firm a hold upon the country to be wiped away by any change of climate, and the grub has thriven so well upon coffee trees, that it will not leave such a suitable article to eat bamboos, which in any case would be a new diet to the last few generations of the insect. The Coorg Planters are so impressed with the conviction that Coorg is a sinking ship, that they are all trying to get away from the wreck. Scotchmen, in particular, are on the move; and as a leading member of the community remarked the other day "It's a sure sign of the decay of a place when *Scotchmen* leave it." The Coorg Planter sees that Coorg lies between the advantages experienced in Munzerabad, of good prices, and in Wynaad, of good crops, participating in neither, and that he is not far north enough for the one, and not enough south for the other. He sees that the laterite soils, which comprise such a large extent of Coorg, and which are often clothed with forests of a seductive vigor, are quite valueless to him, and have resulted in failure where planted. He has learned by bitter experience that the steep Ghat lands are exposed to too great extremes of climate wet or dry; in the monsoon deluged

with rain, which rots off 20 per cent. of the crop, and thus precludes planting under shade, and in the dry weather parched up by the sun for many months together, and visited, on an average, by early showers to set the blossom, only *once* in about three years, to give an average crop, which crop when gathered may meet a bad market. Finally the Coorg Planter feels that the continuation of the oppressive land-tax of rupees one and rupees two per acre per annum on all his land, cultivated, and uncultivated, is evidence that British India is being governed, upon the principle of getting as much out of its subjects as possible. The question of the reduction of this tax has been pressed upon the consideration of the Government, with what success time will show; but there is one thing certain that the revenue derived from it is a thing that cannot last, as the Planters are giving up large blocks of their land from their inability to pay the tax.—*Madras Paper.*

LETTER TO THE EDITOR.

Ceylon Times.

SHADE FOR COFFEE.

SIR,—I am no advocate for shade as a rule; but in dry districts I think it would be of advantage to *young plants.* To allow the high jungle to remain and only clear away the underwood, would necessitate great injury to the plants, when of an age at which they would thrive in the open sunshine better than in the shade, so far as crop is concerned. For then the lopping of heavy branches and felling of trees would destroy many years' labour. Both in India and here it has been our wish to find a plant, which would be quick of growth, to shelter the young coffee, and easily removed when no longer necessary, whilst at the same time one, which in itself might be profitable or at least pay for its culture, was a part of the scheme, not the least worthy of attention. Jack trees have been planted, which from their slow growth were of no assistance to the young plants, and when arrived at maturity caused a shade so dense as to be injurious to the bearing qualities of the trees, and the idea that the Timber would pay, has gone to account with other such notions for *the* records beyond the flood. The wild Bringall was also tried, but it proved a delusion and a snare. I many times suggested the cultivation of the castor-oil plant for this purpose, but the general answer was the fear that, like the devil's-trumpet, the lantana and other plants, it would prove more difficult to eradicate than to cultivate. However, as I by accident last year learned that the castor-oil plant is quick of growth, productive of good crops, easily manufactured into oil—and a plant *easier to be got rid of than any I know of,* the oil saleable at good prices in the local markets, and on the coast, the poonac a first-class manure, and all the products conducing to the health and comfort of the Tamil cooly, I take the liberty of introducing it to the notice of your readers, and assure such of them as are planting on borrowed capital, that planting thus between the lines will *pay:* will not injure the plant in any way; and, in the third year, when shade is no longer required, and when in most instances a dose of good manure would ensure many years prosperity, the accumulated poonac with ashes and other local refuse, *would* do more good than all the boasted patents advertised. A trial in a small way would do no harm, but might be productive of much good. Let me then state shortly the history and properties of the castor-oil plant.

The plant grows in every part of East and West India and Ceylon, on the coldest heights and on the burning plain, witness Labokelly and Batticaloa; it is hardy, requires no attention, and flourishes in any soil. It grows to 15 or 18 feet in a very short time.

It has a round thick-pointed furrowed stem, gleacons at the lower part, gradually acquiring a purplish hue towards the top. The leaves grow singly on very long pertioles; they are large and palmate, being deeply divided into from eight to twelve serrated lobus of a bluish green color. The flowers are disposed in terminating racsemes, which spring from the division of the branches; the male and female flowers are placed on the same spike, the male below, the female at the upper part of the spike. They are both without petals; the former having swelling empalements, and a great number of stamina, which are connected in several bodies and terminated by roundish twin summits. The female flower has a three-cleft reddish calyx armed with prickles; the oval germen in the centre changes into a trilocular capsule, about the size of a marble of a pale green color and covered with flexible prickles, when arrived at maturity it bursts elastically and expels the seeds, usually three in number. These are of an oblong flat form, of nearly quite a white color and a heavy mawkish taste.*

There are two kinds of the castor-oil plant.

The larger kind—*recinus communis fructors major:* in Tamil *pasramanku,* and in Singhalese *maha enderoo atta,* is used for burning in lamps, in cattle medicine, and is the cheapest oil to be found in India. It is burned only by the lowest classes, as it emits a thick disagreeable smoke, and offensive smell, which, like our Ceylon cocoon, taints everything in the house and causes the well known *smell* of our mountaineers. This, however, would be no objection to Mootoosamy, as the odour of his own cumblie would overcome all else.

The small kind—*recinus communis fructors mino:* in Tamil *sittamanaku,* and in Singhalese, *ratta enderoo-atta,* produces the oil of commerce, and used by us in medicine, this plant is also called *palma Christi.* In Travancore, the Malialum and Malabar, it is used as a lubricant for the body when bathing, an ungent for sores, and *a condiment for savouring curries.* Here, in Ceylon, the Singhalese use it only as a medicine, when made into oil and fomentations in various diseases, their quacks likewise make it the foundation stone of their never-failing-all-curing oils, and every household has a supply. The Chinese have a method of divesting it of a part of its medicinal properties, and use it as an excellent oil; so that even they have less fortified stomachs than the Indians as in Travancore, and all along the coast; they use it for everything; as the Italians do with their olive oils, even in frying cakes.

The imports into England are but small, as our taste is not this way; but a free and close market to open; by which, not taking into our prospect of sales to our train oil and candle eating brethren of the West, we may hope to make the venture pay- and mark, when mamotie weeding, hat-peg-pruning, handsome and orthodox handling forces us to abandon our estates, might not this come to the front?

Excuse this, it may not be in the way of a newspaper, but your old correspondent claims a "Wee place."

VAN TROMP.

Central Province, 11th October, 1870.

OLD COFFEE DISTRICTS RE-VISITED.

WE felt great interest, in the course of our recent trip, in two remarkable cases of estates in very different districts and characterized by very different conditions of soil at least. No. 1 is situated in the lower end of Dolosbagie at an elevation of about 2,500 feet and with a climate all that could be desired—excepting, perhaps, that it is somewhat cold for the better class of cattle. Spread over a series of undulating knolls, this property is but little exposed to the deleterious effects of "wash"—the carrying away of the loose soil by heavy falls of rain. Still its proprietor objects as much as the owner of any mountain estate can to the use of the destructive and wasteful iron scraper used in weeding, especially in contract weeding. Its use seems to be justified anywhere only by the fact of bad management, having allowed weeds to get established in the soil. On estates well and conscientiously managed from the first, hand-weeding ought to suffice. Of course there is danger that manuring may encourage the growth, and even lead to the introduction of weeds, and precautions on this score are necessary in the cases of cow dung, ravine soil, and similar substances. To the wasting effects of combustion from the sun's rays, on the other hand, the estate to which we refer was to a great extent liable, and, the soil not being specially rich, it would long years ago have gone down from the enriching average of 10 cwts. per acre to the unremunerative yield of three, but for the advantage which its able and experienced owner took from the very first of the favourable circumstances by which he was surrounded. His property lay in the midst of fine and extensive grass lands on which the numerous herds of black cattle and buffaloes belonging to the neighbouring villagers were pastured. Perfectly familiar with the language of the Singhalese and understanding the character of the people, our friend was able from the very first to make arrangements whereby he secured the benefit of copious supplies of manure.

Sheds were erected on the patnas all round his estate in which, for a moderate remuneration, the natives consented that the cattle should be housed each night after returning from the patnas. The same system is still continued, and the supply of manure is increased by a considerable number of cattle the property of the estate. Pulp, ravine soil and other substances, found on or near the estate are not neglected, while latterly large quantities of Leechman's composts have been used and sombreorum is to receive a trial. In roads, drains, freedom from weeds—all that constitutes good management in fact, the property is a model. Under such a system of working and manuring, this estate, with no special advantages of soil to boast of, has for nearly a score of years steadily borne at an average not much under 10 cwts. of coffee per acre. People who admit the good management and its results, have said to us "Oh! yes, but the working of the estate is awfully expensive." No doubt the annual expenditure is heavy, but the question is what has the balance of returns over expenditure been and what is the saleable value of the property now. In these respects the proprietor can say as Mr. Worms of the Rothschild estate said to us when we mentioned the charge of spending £10,000 in one year on manuring:—"My friend! if we had not spent largely on manuring we should have long ago ceased to obtain remunerative crops and we should not now be selling the property at a high price." Even patna land (the patna soil being of really good quality,) was and is kept well up in coffee on Rothschild by means of manure and so in many other places. But to return to the Dolosbagie Estate. It is only five miles by Tavelam Road from Gampola, so that the facilities for obtaining supplies of artificial manures are, with the operation of the railway, now equally good with those which always existed for obtaining cattle manure. When the railway is, as soon it must be, extended to Gampola and a road made from Gampola to the Dolosbagie Police Stations or further, the advantages will be still greater. The this property shews what can be done by good, intelligent management, and by taking advantage of all favourable circumstances.

The second estate to which we refer is possessed perhaps of greater advantages of soil, climate, &c., than the first. No. 2 is situated in Deltotte, and possesses every possible advantage of soil, climate, pasturage for grazing and stall-feeding cattle, with good means of communication to the railway station at Kandy, whence artificial manures and composts can be easily carted to the estate to be used, as they extensively are, in combination with the large quantities of manure made on the estate. A large portion of the property lies just under a huge, precipitous rock, composed to a great extent of limestone, the salts from which can be seen encrusting the face of the rock. Boulders of the same rock are scattered over the estate, and the water is so impregnated with lime that to procure a supply for drinking purposes, the neighbouring patnas (grass lands) have to be resorted to. With such soil to work upon, this estate ought, one would think to have been always a source of profit to its proprietor, and yet in the bad times which about a score of years ago swept over Ceylon, the property fell so low from neglect of proper cultivation that it changed hands for a sum which does not probably represent one-fourth of the profits realized on a crop of 15 cwts. per acre all round gathered last season. To bring about this result some of the bushes must have yielded at the rate of a ton an acre, and yet when we went over the estate with its intelligent and conscientious manager, the trees, including some which are known to be 35 years old, looked fresh and vigorous, giving promise of a crop in the coming season of not under 8 and probably equal to 10 cwts. per acre. Such results have been and are obtained by careful cultivation and by the most liberal application of manure made on the estate and fertilizing substances and composts from Colombo or abroad. Superior as the soil of the Deltottee property is to that which we visited in Dolosbagie, the system by which the Deltottee estate is kept in heart so as to yield heavy average crops is just the same: the constant return to the soil of the phosphoric acid and other elements of fertility sent away in the coffee beans. In this case as in the other, the expenditure on manure is very heavy: the money figures would probably startle some of the old stagers who say they "cannot afford manuring," from their propriety; but then the returns and the vigorous state in which the bushes are permanently kept, more than justify the expenditure. The system here pursued is a thorough manuring with cattle dung, bones, Leechman's compost, &c., every second year, with a "fig up" in the intervening year. The fig up comprises the addition to the soil of such fertilising substances as can be introduced into holes dug with crow-bars, the thorough manuring being effected by means of good sized holes between the trees. We may add that "supplies" of young coffee plants to fill the places of any which have gone out, are always put into the ground when the great supply of manure is given to the old trees. The danger is thus avoided, so extreme on estates where manuring is neglected, of the feeding roots of the old plants running into the holes prepared for the young ones and robbing the latter of the fertilizing matter necessary for their existence. To make assurance doubly sure, two young plants are put into each hole, and should both survive, as they generally do, the better plant is retained and the inferior destroyed. By this means gaps have been filled up and this old estate presents as even an appearance as any four-years old in the country. Without this restoration of trees it is unfair to expect that estates should continue to yield a remunerative rate per acre. At an average of ½ lb per tree, 1,250 trees will yield nearly 6 cwt. per acre, and so on, as good cultivation and heavy manuring raise the rate per tree But if trees die out and are not replaced until an acre is covered by only a third or a half of the original number of bushes, it is evident that the produce per acre must be diminished, generally in proportion. But without heavy general manuring supplies can scarcely be got to live. The number of trees to be planted per acre is an important question, depending on soil and climate. In some cases of hot climate and poor soil, such close planting as 4½ feet by 4½ has been advocated, while on rich soils trees so wide apart as 7 by 7 have been put down. We have mentioned the old medium above, but we learned from a planting friend who is well informed that the rule now is 5 by 5, giving about 1,700 trees to an acre. This secures the benefit of the "shade" system in the best—indeed the only—mode in which that system in most cases can be adopted: the ground is well screened from the sun, wash is lessened and weeds are denied the light necessary to their existence. For the first 6 or 9 years no difficulty is found in working estates thus closely planted, and the difficulties which subsequently present themselves can be easily obviated by ceasing to supply vacancies and by thinning out inferior bushes. This by the way. Our subject was manuring as equally applicable to medium and very rich soils, climate being fairly favourable. Provided there is soil to go upon, we believe that manuring will do much even where conditions of climate from drought or too much moisture are adverse: how trees can be kept in good heart through long periods of trying drought can be seen by the visitor to Pallikelli in Doombera. But, doubtless, there are cases where, although altitude, aspect and climate may be favourable, the soil is naturally so poor or has been so effectually exhausted of its phosphates by centuries of Chena cultivation that even manuring will not restore fertility or only at a cost which renders the pursuit unremunerative. With what Mr. MacKelvie calls good "choklet" loam, anything can be done: thorough manuring will more than double crops. But given a hard mass of pale red inorganic matter, all that remains after generations of native corn crops and a few crops of coffee, what can be done? To restore freshness and yielding power to the trees, nearly £20 an acre (as much as would open fresh land in Dimboola) must be expended on hole cutting and manuring, but the result will either be small, or if large often fatal to the trees. Poor trees on poor soil *can*, undoubtedly, be stimulated to death, as readily as a poor broken down debilitated "shuck" human being can be extinguished by an over-dose of alcohol. Even on fairly good soils manuring, if once commenced on a liberal scale, ought to be persevered in on the same scale. Where there is a fair basis of responsive soil to go upon, phosphatic manure of good quality must and will produce good effects, and economy in manuring is frequently the most fatal waste. The proportion of properties in the hill regions of Ceylon which will not respond profitably to manuring is not large. But we have added to our notices of the medium and rich soiled estates, mention of a typical estate in poor and exhausted Chena, such as ought never to have been planted, and which cannot be profitably restored by any means at present known. But, after all, such cases are the exceptions. If Ceylon is to retain its position as a coffee growing

country, not only must old estates be manured, but young ones, from the period of their commencing to yield crops. Coffee is quite as exhausting as wheat, but we cannot let coffee fields lie fallow. In the face of a constant yield there must be constant manuring. We are quite conscious that to many of our planting readers these impressions, by the way, will seem crude, and that some will ask with impatience "Where is the money to come from to enable us to carry out your grand system of manuring?" We can only say that if the principles we have thus discursively enunciated are at all erroneous, we shall be very glad to be corrected by those who to scientific knowledge have added practical experience. To the money difficulty we are by no means insensible. In the case of Estate No. 1, it is solved by the fact that the proprietor works the land now as he has always worked it with his own money. He is one of the happy few amongst the coffee planters who do not work on borrowed capital. In the case of Estate No. 2, the distant proprietors place, as they have good reason to do, the most implicit confidence in their able and conscientious manager, who thinks and cares as keenly and works as hard for the interests of his employers as he would for his own. The money he estimates for is, therefore, granted and the results are pleasant and profitable to all parties. To superintendents of a like character we cannot doubt that many agents would act with equal liberality, and we have no doubt that there are many cases where both agents and superintendents are "Doing their duty by the land" as religiously as Tennyson's Northern Farmer took credit for doing and a high religious duty, too, we believe it to be. By enforcing this duty we perform ours. We say, emphatically, that it is simply wicked selfishness for any man single to resolve that he will enter on the cultivation of land here or anywhere else with the single intention of getting what he can out of it and then leaving it a profitless waste. The blessing of God, in which we are old-fashioned enough to believe as an element—the main element of success in any pursuit, cannot be expected to follow enterprizes so conducted. But when we lapse into preaching, our readers will feel, as we feel ourselves, that it is time for us to stop. On a future occasion, however, we may further bestow our tediousness on our readers, in detailing some more of the impressions we received during four pleasant weeks spent amongst the older coffee districts.

Coffee.—Crops in parchment from both Plantations and Gardens, are now coming in from the interior with some steadiness, and there is at the present moment a good deal of unprepared coffee in Colombo Stores. We hear of a few transactions in estate crops mostly of low-growth, at 10s. to 10s. 6d. in Colombo. A few sales of crops from remote districts have taken place in Kandy at rates about equal to 10s. 3d. in Colombo. Of *Native clean Coffee*, the receipts of which continue on an insignificant scale, we have very little to report at about previous value.—*Ceylon Times*, 6th *Nov.* 1878.

The crops are ripening up fast and early ones are being gathered. They will be undoubtedly short. But gathering will be slow, and many low estates will be picking all through November and December, while high ones will see January and some of them February through ere their trees be fully relieved.—*Id.*

TEA.

TEA IN KUMAON.

SIR,—I have read SCRUTATOR'S letter on "Tea" of the 11th ultimo and OMEGA'S of the 20th. The latter seems very sensible and to the point, but it refers only to Kangra, and I therefore wish to say a word about Kumaon, in which I am interested.

With OMEGA'S permission I shall take SCRUTATOR as he has done.

Climate.—To my thinking, and I believe few men up here will disagree with me—is in every way suited to the tea plant, whether of the China, Hybrid or Assam variety, for what it loses in strength it makes up in flavour, and SCRUTATOR has only to compare the price of Kumaon teas in Calcutta or London with that of Assam or Cachar to satisfy himself.

Soil.—The generality is suitable: of course in places it would be folly to plant tea, and the same may be said of spots in Assam or Cachar: in the latter district steeper gardens are to be found than up here.

Inaccessibility.—That at present is, every one must admit, against Kumaon, but things are looking brighter *now*.

Spareness of Labour.—I distinctly deny this, for labour is cheap and plentiful—much cheaper than in any other district.

Difficulty of obtaining Land.—Good land is to be met with all over the country in quantity, but to obtain the same there is undoubtedly great difficulty. Kumaon officials do not seem to know what land belongs to Government, and purchasers of Government land meet with anything but assistance.

Yield and Quality of Tea.—I know Kumaon to have turned out 200 lbs. per acre, for *every* acre, under plants (4 to 7 years), and I can hardly think SCRUTATOR will consider that bad, especially when I tell him that only 2¾ per cent. was Bohea. 14 annas a pound, Bohea excepted, I have known the garden of which I speak, to have fetched in Calcutta. A personal friend of mine I know to have made last year 16 per cent. on *every* pice invested in his garden, and the same party will make 30 per cent. this year, even if his tea only fetches 12 annas in Calcutta; but for fear this should mislead, I must state that my friend bought his estate, *not* at a fancy price, but *dirt* cheap.

I will now conclude, and trust this, with OMEGA'S letter, may teach SCRUTATOR *not* to rush into print again on a subject with regard to which he is only partially informed.

MANURE.

TEA.

IT is satisfactory to be able to record the successful appearance of a young terai garden in the produce market.

The Adulpore Estate, is the property of three partners, a lady and two men of this neighbourhood. Though only 1½ years old, it has produced nearly a maund of tea per acre already without the slightest distress to, or injury of the plants, and this tea has fetched in Calcutta, at public sale, 13 annas per lb. and has thereby paid 16 per cent. on the capital invested. This undeveloped little garden has been growing while folks have been sleeping: and bids fair to do as well or better than similar enterprises in its neighbourhood of older standing.

Tea in the *terai* of Darjeeling can be cultivated at a cost of 300 Rupees per acre for a 2½ year old garden: and will then pay 40 to 50 per cent. on the outlay. With great care and economy it can be done for less, say Rs. 200 per acre.

Can anything better be desired by ordinary mortals.

We have no speculation to foster by these figures. There is no desire anywhere to push these terai gardens into notice. The good tea lands have been secured, and people wanting to buy get nothing but a downright refusal. There have been several people up from Calcutta lately, wanting to buy land and start gardens, but they have gone back disappointed. And we are glad of it. It is but just and fair that men on the spot who saw the field and believed in tea in the *terai*, should reap the benefit rather than the rich disbelieving jews of Calcutta, who rush in just too late. Ha! Ha!—*Darjeeling News.*

IT *appears* that the tea crop of the past season—it may be said to be past everywhere but in the *terai*, where they go on manufacturing till the first week in December—is being carried down to Calcutta by the Calcutta and Darjeeling Carrying Company, who charge only for the actual tea inside the boxes. The boxes and lead being carried for nothing this year, for the first time. It is amusing to notice the thickness of the wood, this year. Formerly the boxes were of ⅜ inch boards or at the most half an inch in thickness: this year substantial planking, fit for boarding the floors of a house, protects the tea from all rough usage. The poor bullocks tug away, and the *hackries* go screaming along the roads, and spite of its undue weight, the tea will soon be in Calcutta. Most of the planters in this District are "canny scots," and finding they could do it *vara cheap*, they have built very strong boxes for the Darjeeling Tea of 1870.

The Government and its bullock train, are not much favoured by the non-official folks in this district. We commend the independent spirit of our planters.—*Darjeeling News.*

TEA CULTIVATION—TRAVANCORE.

SEVERAL attempts have been made from time to time by the Travancore Government to induce capitalists to invest their money in the cultivation of tea in Travancore, but these have failed owing principally to the unwillingness of persons to take to tea planting from failures in other parts of India in similar speculation. The diversity of the soil and climate in India does not, however, appear to have entered the minds of speculators. We believe Travancore offers many advantages for the cultivation of tea which other localities, where tea planting has been tried and failed, do not possess. It has been observed that "neither tea nor coffee is the magnificent investment which they were supposed to be, and that the waste lands of India had better have been left *waste* in so far as the planter is himself concerned," but this is not true in all instances of agricultural enterprise in this country. For the cultivation of coffee, Travancore has proved itself eminently adapted; and in support of our assertion, we need only point to the increasing number of coffee estates in that State. We have not authentic information of the annual yield of coffee in Travancore, and we may mention, parenthetically, that the want of accurate statistics as regards this matter should not be allowed to exist any longer. It may still be safe to estimate the production of coffee as having doubled within the last decade of years, and we think that upwards of 20,000 acres have been already leased out for its cultivation. We hear of proprietors of coffee estates in Travancore realizing above 15 per cent. on their capital, and perhaps with more judicious management and economy, they may be able to derive more profit than they have hitherto done. We are told that an acre of ground yields more than half a ton of coffee, and if this be true of any part of Travancore, it must be the more so of the Peermade Hills. It is therefore evident that coffee cultivation is a decided success in Travancore, and it may therefore be worth the while of planters to enquire whether the cultivation of tea would be in like manner successful and profitable to the cultivator. We are aware that experiments were made on the Peermade, an elevation of about 3,300 feet above the level of the sea, to produce tea, which have satisfactorily proved the adaptability of the soil for its production. The introduction of tea at this place was undertaken, we believe, in 1865, when a few acres were allotted by the Sircar, but we do not think this attempt has been followed by any perceptible extension of tea cultivation. Let us examine whether there is any just cause for this disinclination on the part of capitalists to invest in the cultivation of tea in Travancore. We think not. If tea can grow luxuriantly on the Neilgherries, whose temperature and elevation correspond with those of the mountain regions of Travancore, we do not see why it cannot be produced to the great advantage of cultivators in the latter place, where the agricultural conditions are by far more favourable. In Travancore labour is cheaper. We shall enquire what would be the result to the enterprizing planter who may enter on the cultivation of tea in Travancore. It is a remarkable circumstance, worthy of observation, that, notwithstanding the unencouraging accounts given of the general results of tea planting in India, it has extended rapidly, and we have the astonishing fact that the annual production of this article is about two and a half millions of pounds, which at a rough calculation must be worth about four hundred thousand pounds sterling. There must be nearly 100,000 acres under cultivation in Assam alone, where tea is indigenous, and these tracts must assuredly yield more than half of the article exported from India. In Cachar, the production is also great, while the Nuddea Districts, Darjeeling, and other parts of Bengal, produce together above 500,000 lbs. annually. We make the above remarks in connection with the question of cultivation of tea in Travancore to indicate the possibility of the whole India producing all the tea required for consumption in England. The importation of tea into England does not perhaps exceed eighty millions of pounds in one year, and if we exclude the consumption in India of the article grown in the country, we may find how little we contribute to the English market. If good marketable tea can be produced,—we do not see why by careful manipulation we should not,—it would be more advantageous and profitable to the merchants to export it from India than from China. We may thus be able eventually to export the entire 80 millions of pounds consumed by England. Now, the above figures would show that it must be a safe investment in the cultivation of tea in Travancore, where the soil, as we have observed, is superior to that of other places. If the Neilgherries can yield good tea, surely the Travancore hills must do the same. There are hills, the vertical extent of which is above 6,000 feet, and tea must grow well on these sites. The thermometer does not stand below 66 degrees on the Neilgherries in such localities where tea is grown, and the glass on the Peermade indicate an equal temperature, inasmuch as it falls to 56 degrees in the morning and rises to 70 degrees in the afternoon. The fall of rain is variable on these hills, as in some places, a fall of 125 inches in one year is gauged, when in others it is barely 45 inches. The soil and temperature of Travancore having been shown to be favorable to the cultivation of tea, it is necessary to enquire what the yield may be estimated to be. The production in other places affords a basis in calculating the annual return to planters. We assume that an acre of land in Travancore would produce 500 lbs. of tea annually. The cultivator, making due allowances for the fluctuations of trade, can always reckon upon realizing two shillings for the pound, and an acre of ground would therefore bring him £100 of tea. The cost of production is comparatively small, but we would venture to estimate it at the rate of a shilling for a pound of the article; every acre would thus give as large a profit as lbs 50. We may have over-estimated a little in our calculation, but we are sanguine that under any circumstance, the cultivation of tea in Travancore must be profitable. Besides the fact that labour is cheap in this country, there are the facilities which the backwater offer for the transport of produce to the seaboard for ultimate shipment to England. There may be difficulties at the beginning in the manipulation of tea, but these are not insurmountable. We hope to see therefore, that tea would become, in the course of time, an article of export from this coast, and with this object it is desirable that the Travancore Government should offer all inducements for enterprising men to embark in its cultivation.—*Cochin Courier.*

TEA CULTIVATION IN THE N. W. P.—A REPLY.

SIR,—In the *Pioneer* of the 11th October I perceive a letter signed SCRUTATOR, setting us all right on the subject of tea in the N. W. P. and Punjab, by proving that we are, and always have been, "all wrong."

The gentleman who writes it is evidently implicated in tea cultivation elsewhere himself, or he would not show quite so much animus, and repeat quite so often that tea cannot be grown profitably out of "Assam, Cachar, and the Bengal Terai," which localities, according to him, "possess every qualification to ensure success," without any of the drawbacks and disadvantages attendant on the estates belonging to the unfortunates of the N. W. P. and Punjab. I will, therefore, endeavour to set down a few "facts and figures" for the benefit, not only of SCRUTATOR, but of the public in general.

He (SCRUTATOR) first falls foul of Dr. Jamieson. Dr. Jamieson has without doubt, sundry sins of omission and commission to answer for; he knew, for instance, very little about tea-planting practically, when he published his report on it in 1857, although he had been several years experimentalising and ought to have known a great deal; yet for all this it is hardly fair to tax him with stating what he knew not to be the case, as SCRUTATOR does. In fact, the statements made by Dr. Jamieson, with regard to the amount of land available for tea cultivation in the N. W. Provinces and Punjab, are, if anything, *under* the mark, there being at least 890,000 acres, as stated in his report, taking the line of the Himalayas from the east frontier of Kumaon to Cashmere;* and though SCRUTATOR may state that "from personal observation he is prepared to assert that it would be sheer madness" for anyone to open a single acre of tea in Kumaon, nobody is obliged (with the facts of flourishing tea plantations existing in many parts of the province before their eyes) to believe him. The reason that there has been such difficulty in procuring land in the Kangra valley, was not that the 30,000 acres of available land; reported by Dr. Jamieson, were non-existent, (as SCRUTATOR tries to make out,) but that the Punjab authorities chose to rule that *all* waste land in the province (of Kangra) belonged to the native cultivators. The 30,000 acres of available, or what ought to have been available, waste land were there all right enough, but they were not to be had: this, however, was no fault of Dr. Jamieson.

*Not 1,000,000 acres as, SCRUTATOR has it.

After saying that from *personal observation* he is prepared to assert that it would be madness to plant a single acre of tea in Kumaon, SCRUTATOR observes that he "knows very little" except by report of any district except Kangra, at the same time "he knows" (perhaps by clairvoyance or intuition) that "most of the gardens opened in the former province (Kumaon) are miserable failures." This is just what the Kumaon planters "know" to have been the case, only on a much larger scale, in Assam and Cachar, not, however, from the climate, &c., being unsuitable, but from the many failures caused by the ignorance, bad information, and carelessness of beginners, as happens in almost every new agricultural enterprise, all over the world. He then proceeds to "emphatically deny" that tea cultivation in any of the said localities (which he has admitted he "knows next to nothing about") will pay. He says tea "will grow in these districts or *in any part of India*," —a fact which is new to most of us,— but will only *pay* in "Assam, Cachar, and the Bengal terai."

He says next "that he knows" something of the management of the Government tea-gardens (in Kumaon, &c.,) and affirms that every pound of tea manufactured by them has cost Rs. 10. This may very probably be the case, but has nothing whatever to do with his argument. A Government experimental garden in Assam, Cachar, or the Bengal terai would, it is quite certain, under the same conditions, have contrived to manufacture tea at a still higher figure, for the simple reason that labour is *there* much dearer and scarcer and that the European assistants and others would require higher pay on account of the notorious climate. The amount paid for anything by Government, as we are all by this time pretty well aware, is a poor criterion of the actual value of the work and material, or of what it could be done for by anybody else.

After observing that it is a serious responsibility (on the part of editors) to allow certain statements to go uncontradicted, which I fully admit, he sums up his objections to the above districts (which, except Kangra, he has never visited) as follows:—

(1st) climate, (2nd) soil, (3rd) formation of land, (4th) inaccessibility, (5th) sparseness of labour, (6th) enormous expense of getting tea to market, (7th) objectionable character of tea when got there, (8th) difficulty of getting land. Let us examine these objections.

1st. Climate.—We all know how objectionable the climate of Kumaon is as compared with Assam and the Bengal Terai. We have unfortunately none of the delicious steamy warmth of those localities, none of their hot weather all the year round, none of their jungle fevers and none of the droughts which have half ruined their plantations this year.

2nd. Soil.—We have not such a rich soil either, but our plantations do not become tiger jungles, which one must traverse on an elephant once a month, and we can manage with proper arrangements to get 300 lbs. of tea per acre for all our bad soil.

3rd. Formation of Land.—What SCRUTATOR means by "formation of land" is rather inscrutable. If he means that our land is not *flat* enough, I agree with him: getting up and down hill *is* a nuisance. The Chinese, however, grow *their* best teas on mountains, and tolerably cold mountains, too; it is therefore not improbable that as far as tea is concerned, these may not be altogether the worst existing localities, and results have hitherto borne out the supposition.

4th. Inaccessibility—is a great fact, but where no roads are made, most hilly countries *are* inaccessible: this evil is however, fast being remedied.

5th. Scarceness of Labour.—The direct contrary happens to be the case, and it is far cheaper than in Assam, Cachar, or the Bengal Terai.

6th. Enormous Expense of Getting Tea to Market.—This ought to have been included under the head of "inaccessibility," in spite of which we get it to market for about 1½ annas per pound.

7th. Objectionable Character of the Tea.—This is another mistake of our friend, as any one who chooses to compare good Kumaon Pekoe, or Souchong with Assam tea (one cup of each will do,) may speedily convince himself. At any rate it is a question of taste.

8th. Difficulty of Getting Land at all.—There is plenty of land to be had on easy terms. There *were* difficulties, the natives being at first ignorantly averse to part with any land, and disliking the idea of planters settling in their vicinity. Every planter, however, in spite of this, ultimately succeeded in getting *more land than he required.* All the difficulties have since been smoothed away. Natives have discovered that planters, instead of being injurious to their interests, are directly the reverse. There is now not a pergunnah in Kumaon where land could not be either purchased at moderate rates from villagers, or procured from the authorities, to any extent requisite for tea planting, *i. e.*, for forming the comparatively small-sized plantations which alone answer well in the Himalayas.

A PLANTER.

☞ We are glad to receive so promising an account of tea prospects in Kumaon, coming, as it does, from a reliable man. At the same time we must add that the gentleman who formerly wrote has no rival interests to serve, as A PLANTER would appear to think probable.—ED. *Pioneer.*

INDIAN TEAS.

SIR,—In your paper of the 11th instant, there is a letter from SCRUTATOR on "Tea," that invites comment. He professes to correct some extracts from Official Papers on Indian Teas, in the *Pioneer* of the 3rd June 1870. Though right on many points, he is himself wrong on others, as I shall point out. Speaking of the last crop grown on the Holta Estate, he says:—"Two annas per lb. was the most that was offered for that crop." Now, I believe I am correct in stating that of the large amount sold to the Yarkundi traders at the last Palumpore Fair *one Rupee per lb.* all round is nearer the mark, and for some very fine green teas sold for export to Yarkund as much as two rupees per lb. or over was the sum allowed, the buyers remarking they wished the owner had more to sell them of that quality. Again, SCRUTATOR writes:—"I will sum up the objection to these districts (in which *Kangra* is included) as follows:—Climate, soil, formation of land, inaccessibility, sparseness of labor,—the objectionable character of the tea for the London market,—and, lastly, the difficulty of getting land at all," and he then claims for Assam, Cachar, and the Nepaul Terai that they have "not one of the disadvantages above named. First, as regards Kangra (with which like SCRUTATOR, I am chiefly acquainted) "climate," though not boasting the warm humid atmosphere of Assam, still I fancy Kangra planters would allow, if asked, that their climate was far from being unsuitable to tea; and that it tends to give a far *higher quality and raciness of flavour* to its teas than has been discovered in either the Assam produce, or that of any other Indian tea district; and those at home or in India, who have tasted the produce of the best Kangra growths, can attest the truth of this statement. "The *soil*," though of course variable, is in many parts excellently suited to tea, and where judgment has been exercised in the planting out capital results have been secured. *Formation of Land.*— The *bulk* of these plantations is on nice sloping ground, allowing of natural drainage, well suited for a tea estate. There *are patches* of very steep land on sides of hills, which were ignorantly planted out in the first formation of the gardens, when tea culture, was but ill understood; but the area of these patches is but small. *Inaccessibility.*— The Kangra tea lands are not *worse* off in this respect than many other tea districts, and will, at the close of 1870, be *vastly better* off than the majority, inasmuch as a good cart-road will then be open to Palumpoor, tapping the heart of the tea country. *Sparseness of Labour.*—This part is incomparably better off then Assam, labour being on the whole plentiful and far cheaper than in other districts *Difficulty of getting Land.*—To an outsider, or one now anxious to acquire land, perhaps this may hold good, as natives have a strong objection to admitting new comers among their fraternity as zemindars; but to those already possessing village rights there is but small difficulty where proper discretion and management are exercised. But the fact is the bulk of the planters are not so anxious to acquire more land for tea as they are for improving what they already possess, being now well aware that high cultivation on a small area is more remunerative than attempts to till a large surface in an imperfect manner.

"Assam, Cachar and the Napaul Tarai have *not one* of the above disadvantages."

It is probably news to most of your readers that Assam and (I think) the two other districts have no complaint on the score of obtaining labour. Letters and letters have and are constantly appearing, complaining of the great difficulty of importing coolies, and of the ruinous rates paid to them as wages. I need not now take up time and space further; but I would merely remark that when a person comes forward to

correct statements, he ought to be so well assured of the ground he is treading upon as not to require correction himself. OMEGA.

P. S.—I forgot to mention that as regards the unsuitability of the Kangra teas for the London market, I possess both letters and prices obtained at the public auctions in London quite equal to the highest obtained for the same class of teas by the Assam Company, and in some instances higher, and so extremely good as to draw the congratulations of Messrs. James Thompson and Co., Tea Brokers.—*Pioneer.*

Poisoned Tea.—Since the appearance of Messrs. Sillar and Co's paragraph in the *Overland Mail*, expressive of fears that the next season's China teas may be poisoned, our Indian products have advanced rapidly in value in the London Market, with a demand more than equalling average consumption. Our past experience, of the treachery of the Chinese in selling poisoned flour to Europeans might appear to lend a shade of probability to the supposition that means somewhat of this nature will be had recourse to in the event of a war, but we have to pit that suspicion against the certainty of a total cessation in the China tea trade to Europe, a contingency the celestials are in no hurry, we should imagine, to precipitate. Vindictiveness generally ceases at the point where it interferes with personal interests. The rumour may have the effect of attracting attention more largely than heretofore to our Indian teas, which in point of flavour, strength, and cheapness, are considered superior to the China product. If once the demand for Indian leaf becomes general, we may conclude that it will not very readily abate. It is quite time that our planting friends availed themselves of what may prove a golden hint, and establish a general Agency in London, as we have for nearly two years past urged them to do.—*Dacca News.*

The Manufacture of Tea-boxes.—The supply of timber suitable for box making purposes is a subject that may well engage the attention of our tea planters in Cachar. It is true that no difficulty has as yet been experienced, and probably for the next few years wood will be forthcoming in sufficient quantities; but in these days of progress it is necessary to look into the future. Taking into account the tea chests that will remain on hand at the different factories at the close of the present year, the number required for the ensuing season, 1871, may be roughly estimated at one hundred thousand, or one million feet of half-inch planking. Any one curious in such matters can calculate the number of trees that will have to be felled to produce this quantity of wood; but this is only one year's consumption, and as many companies are already considering the advisability of increasing their plantations, what will be their requirements when the produce of these extensions begins to come in? Cachar is not a large district; and although its forest tracts are pretty extensive, they cannot sustain the heavy demands made on them for any lengthened period. Unless, therefore, steps are taken to replace the trees annually cut away, the planters, some ten or fifteen years hence, will find themselves in a serious dilemma. The timber that a short time back lined the banks of the numerous khals and mountain streams has disappeared, and wood-cutters have now to go far into the jungles in quest of the proper logs, where they are at all times liable to attack from our troublesome neighbours—the Looshais. Were the whole of the forest preserved for the use of the planters, the timber would suffice for a long time to come, but as there is no conservation in either Sylhet or Cachar, the destruction of all kinds of valuable wood is enormous, and commanders of river-steamers frequently find the course of their vessels obstructed by immense rafts floating down in the months of August and September. Some idea may be formed of the drain on these districts, when it is remembered that all the timber required for boat-building, from the Megna upwards, is drawn from them. It would, of course, be unfair and unjust to deprive the natives of the privilege of wood-cutting, which they have exercised long before the planters came into the provinces—a privilege which they regard not unnaturally as a right—but the remedy rests with the planters themselves, and the sooner they realise this fact, the better it will be for them. On every grant throughout Cachar there are acres upon acres of uplands unsuitable for tea cultivation, but well adapted for raising jack, mangoe, and other soft wood trees, which should at once be planted. Although not very quick-growing plants, they will be fit to cut fifteen years hence, by which time the supply from the jungles will in all likelihood be exhausted.—*Englishman.*

Origin of Tea.—At what period the use of tea first became established in China is probably not a well-ascertained fact; but we have strange descriptions of its origin by Chinese writers. One of these, a legend believed in by the religious portion of the community in China, is as follows:—"A pious hermit, who, in his watchings and prayers, had often been overtaken by sleep, so that his eyelids closed, cut them off in holy wrath against the weakness of the flesh, and threw them on the ground; but a god caused a tea shrub to spring out of them, the leaves of which exhibit the form of an eyelid bordered with lashes, and possesses the gift of hindering sleep. When the hermit had tasted and proved the shrub, he taught the use of it to his fellow-men."—*Food Journal.*

INTRODUCTION OF THE IPECACUANHA PLANT IN INDIA.

From J. MURRAY, ESQ., M.D., Inspector General of Hospitals, Upper Provinces, to Governor General of India. *Simla the 5th October* 1868.

The success which has attended the introduction of the cultivation of cinchona into India leads to the desire for the introduction of other valuable medicines, the product of similar climates to that in which cinchona is found.

Ipecacuanha[1] is the most valuable medicine in the cure of dysentery. It was originally introduced in Europe in 1684 as a specific against dysentery, and has been used in India since 1830. It is the medicine in which I have placed most confidence since 1833 in dysentery, and in many children's diseases, where calomel was formerly used, and in the earliest stages of acute inflammation of the liver. It is equally valuable in the treatment of the diseases of Europeans and Natives, and there is no indigenous substitute of equal power grown in India. Ipecacuanha is expensive, but it is liberally supplied to the hospitals of the European and Native troops, to the jails, and also in a more limited manner to the charitable dispensaries. The exhibition of the remedy of late years in very large doses has been found of the greatest advantage in dysentery and hepatitis, and its more general use is to be anticipated, but a deficiency of the supply may be anticipated or at least an increase in the price, as it is stated by Pereira "that as no care is taken in the cultivation of the plant in Brazil, it has become scarce around the principal towns." The plant grows wild in low shady places in a hilly tropical climate in Brazil. It belongs to the same family as cinchona and coffee. These plants are found to flourish in India, and there can be no doubt but that a suitable habitat exists in many parts of India for the allied plant—ipecacuanha. I would beg to submit to the consideration of Government, whether it would not be desirable to introduce the cultivation of ipecacuanha in an analogous manner to that of cinchona. It would lessen the expense of the supply now required by Government, and it would render a most valuable remedy available to the Natives all over India in the same manner as quinine, it is hoped, soon will be, whose expenditure has hitherto been limited by the expense.

Memo: by Surgeon-Major T. FARQUHAR, M.D. *Simla, the 6th October* 1868.

It is hardly necessary to say that one of the severest and most fatal diseases met with in India, as in most tropical climates, is undoubtedly dysentery, the successful treatment of which was, until lately, one of the most difficult tasks set before medical men in the East. The powdered root of ipecacuanha, a small shrub grown in Brazil, and imported *viâ* Europe into India by Government, has long been used by English Medical Officers in the treatment of dysentery in Civil and Military hospitals here. Its full value, however, has only of late years been understood; for, though originally (200 years ago) given in large doses of 30 or 60 grains, it was used in very much smaller doses, till, in 1858, Assistant Surgeon Docker, a Medical Officer of the British Army serving in Madras, re-introduced the use of 30 grain or half drachm doses. This has caused quite a revolution in the treatment of dysentery, which, when of the ordinary form, and seen early in the attack, can be cured with as much certainty as ague can by quinine. The terribleness of the disease for which ipecacuanha is so useful in India may be imagined

from the fact that, during the last 10 years, 31,804 English soldiers have been attacked with this disease in Bengal, of whom 2,655 died; while in England, during the six years ending in 1864, only 739 cases occurred in an army double the size, and only 19 deaths. But the statistic that speaks in favour of ipecacuanha is the decreased death-rate since its use in its most efficient form, viz., in large doses in India. From Tables prepared by Dr. H. Macpherson, Deputy Inspector of Hospitals, on the vital statistics of the European army for eight years ending 1853-54, there were 21,221 cases of this disease (dysentery) in the then comparatively smaller army in Bengal, with 2,198 deaths.

This gives a proportion of about 103 deaths per 1,000 treated, that is to say, of more than one out of every 10 men attacked died. Again, in the first half of the past 10 years, the men died at the reduced rate of 9·3 per 1,000, or less than one in 10. This last was while a knowledge of the use of ipecacuanha was gaining ground among the Medical Officers of the English army. When, however, the remedy came into much more extended use during the last five years of the decade, the death rate was reduced to 57 per 1,000, that is, one man in about 20 only died when attacked with dysentery, a most gratifying improvement on the former death-rate of more than one in 10.

In acute dysentery 91·8 per 1,000.
In chronic dysentery 172 per 1,000 or about one in six.

DEATHS FROM DYSENTERY.

Year	*No. of deaths.*
1858	1,188
1859	562
1860	229
1861	165
1862	111
1863	121
1864	66
1865	83
1866	59
1867	68

No doubt, part of this improvement is to be attributed to the invaliding of sick soldiers to England for change of air, as the highest death-rate in former years was from the *chronic* form of the disease. The rapidity of cure effected by the "ipecacuanha" prevents, however, the acute disease from running into the chronic form, which is now comparatively rare. With Natives the success of these large doses, in ordinary uncomplicated dysentery, is equally certain and complete, and they too suffer severely from the disease from one end of the Empire to the other. Those of them cared for by Government, as the Native army and prisoners, are freely supplied with ipecacuanha, but, except at the Government Dispensaries, the mass of the population has no opportunity of benefiting by its use. It would therefore be a most valuable boon to the country if a number of plants were imported and its cultivation spread, as has been done with cinchona. It is quite a jungle plant in Brazil, and may be expected to be the same in India, so that little expense need probably be incurred in its propagation; and when it finds its way into the hands of the Native physicians and druggists, its market value will secure its being sufficiently cared for.

Memo: from Surgeon-Major P. W. Ross, to Surgeon-Major T. FARQUHAR, M.D. *Simla, the 5th October* 1868.

Considering that quinine and ipecacuanha are both indigenous to South America, and that the cinchona tree has been introduced into India with much success, it seems extraordinary that it should not have occurred to any one before to have introduced the ipecacuanha plant also. The great saving of life under dysentery attacks in recent years must show the presence of some active remedy in the treatment of the disease. Such a remedy is the administration of ipecacuanha in large doses. From my knowledge I should say that even now the remedy is not used in India as efficiently and completely as it might be, especially by officers new to the treatment of the complaint in this country; but its use by those who have studied its action has manifestly affected the average of the annual death-rate. Professor Maclean, in a recent article on dysentery, says, that "mortality among Europeans from dysentery in Bengal, during the 42 years from 1812 to 1853-54, amounted to 88·2 per 1,000. During 1860, when large doses of ipecacuanha were given to the almost exclusion of other methods of cure, the mortality was 28·87 per mille." Again.—"In the Madras Presidency, under the old treatment, the mortality from the disease during 17 years was 71 per 1,000 treated; but when ipecacuanha was largely used, it fell to 13·5 per mille." Dr. Ewart, in the 16th No. of the Indian Annals of Medicine, calculates that the decrease of mortality attributable to the substitution of large doses of ipecacuanha, in the treatment of tropical dysentry, amounts to no less than 46·60 per 1,000 to treated. The 3rd Annual Sanitary Report for Bengal (1855), reviewing the recent history of dysentery, states, "the death-rate to cases treated has been reduced to less one half of what it was. In 1859 it was 8·60 per cent.; in 1855 it had fallen to 4·19" (41·90 per mille). I first learnt to use the remedy in large doses, and properly guarded so as to ensure its retention on the stomach, from a report of the Surgeon of the 7th Fusiliers at the Mauritius, written about 1855, and since 1858, I may say I have had large experience of its efficacy in the treatment of British officers, soldiers, women and children.

I consider ipecacuanha, in the treatment of dysentery as it occurs in the North-Western Provinces and in the Punjab, to be quite as much a specific as quinine is for the treatment of all malarious attacks, and from its being the agent for combating and subduing more rapid and mortal complaints than are caused by malaria, it may be said to be of more importance than quinine in the diminution of mortality. When it does fail to act thus specifically, it is either from there being organic complications, which must of themselves in the end prove mortal, or that the remedy has been administered without proper knowledge or precautions.

The use of ipecacuanha can fortunately never be so extended as that of quinine, for there are fewer occasions in which its application is called for; but I think it is nevertheless quite as important that its cultivation should be introduced into India.

Telegram from Home Secretary, to Secretary to Government, Madras, 13*th October* 1868.

Has cultivation of ipecacuanha ever been tried at Ootacamund, if so, with what success?

Telegram from Commissioner, Ootacamund, to Simla, 17*th October* 1868.

The Superintendent of Government Botanical Gardens here says the ipecacuanha has been tried, and the plants are growing well, but their introduction has been too recent to test the value of the medicine. I see that the bastard ipecacuanha (*asclepias curassavica*) grows in private gardens.

From T. ANDERSON, ESQ., M. D., Superintendent, Botanical Gardens, to the Government of Bengal, 8th December 1868.

I have the honor to state that it appears to me advisable that the cultivation of the ipecacuanha plant should be encouraged in India. The memoranda by Drs. Murray, Farquhar, and Ross, which form the correspondence sent to me for perusal, prove how valuable ipecacuanha is in the treatment of the most prevalent and fatal of the diseases of tropical climates. Last year (1867) I received information from London that the drug is rising in value in the London market, where its wholesale price is nine shillings per pound. The drug (the root) is collected from plants growing wild in the Brazilian forests, and is nowhere cultivated as an article of trade. Thus the already high price is likely to increase. The plant is also becoming scarce from indiscriminate destruction, and by the greatly-increased consumption of the medicine which has occurred within the last four years. My attention had been directed to the introduction of the ipecacuanha plant into the Botanical Gardens of Calcutta for some years, but I was unable to procure any plants until April 1866, when one plant was sent to me by the overland route by Dr. Hooker, Director of the Royal Gardens, Kew. I am indebted to the care bestowed on the plant by Dr. George King, Assistant Surgeon of the Bengal Medical Service, during the voyage to India, for its having arrived in Calcutta in good health.

The ipecacuanha plant is so well known that it is not necessary to give a full account of it. For the purpose of this report, it will probably be sufficient to say that the plant belongs to the same sub-group of the natural order of plants called *rubiaceæ*, in which the coffee tree is placed by botanists. In habit the plant is, however, very different from the coffee. It grows in a diffuse semi-decumbent manner. It is found in moist shady valleys of the mountains of Brazil, and extends from 8° to 20° South latitude. The only part of the plant used in medicine is the annulated root. The appearance of the plants in the Botanical Gardens agree with this description, and the plant evidently loves shade and moisture with considerable heat, and, like most mountain plants, dislikes stagnant moisture in the soil in which it grows.

The plant of ipecacuanha originally introduced into the Botanical Gardens in 1866 is dead, but I now possess nine plants in this garden, which have been artificially propagated from the original one, besides five growing at the cinchona plantations at Darjeeling, to which place I sent one plant last year. I have thus 14 plants of ipecacuanha.

I am confident that the cultivation of this valuable plant could be carried on as successfully as that of cinchona, provided suitable places are selected for the experiment. Until now, the plants in the Botanical Gardens and in the cinchona nursery at Darjeeling have been grown under the shelter of glass-frames, which are used here for the protection of the most delicate exotics, and at Darjeeling for the propagation of the cinchonas. I am unable therefore to say from experiment what climate will be suitable for the cultivation of the ipecacuanha plant; but it is probable that the successful cultivation of the plant in the open air in India will be attained in the valleys of the mountain ranges possessing a climate in which coffee, tea, and the most tropical species of cinchona flourish. The measure to be adopted to introduce the cultivation of the ipecacuanha plant are, now that we possess the plant, comparatively simple. The cultivation must pass through the same stages as that of cinchona. The aim of those to whom the cultivation is entrusted should be to increase the present stock as quickly as possible, and to enable them to do so all the appliances of horticulture should be used. After two hundred plants have been secured, experiments on a small scale can be made on the power of the plants to resist the adverse climatological conditions of the situation selected, on purely theoretical grounds, for the cultivation.

The ipecacuanha plant belongs to an order of plants in which a dimorphic condition of the flowers prevail, and as all the plants I possess are the produce of one plant, their flowers illustrate the floral characters of only one of those two forms. Unfortunately, this is the form with long stamens and a short style, in which the power of producing seed even with a cross from the other form is least developed, and which, by itself, is very unfertile. The plant originally introduced flowered here, but bore no seeds. Plants possessing the other condition of the essential organs of the flower will be obtained from the plants of ipecacuanha now in India by sowing every seed there may be procured from them. Some of these seeds will produce plants having the other character of the flower, and from the spontaneous crossing of these two forms of flowers, the highest state of fertility of the species will be the result. Until then the propagation must be carried on by cuttings, layers, and buds, according to the methods by which the enormous increase of cinchonas has already been obtained.

The cultivation of the ipecacuanha can be carried on at the cinchona nursery in Sikhim. (I do not say Darjeeling, for the plantations are 15 miles from Darjeeling, and at 2,000 feet above the sea, in a narrow tropical valley). At least for the next two years, the experiment will cost nothing, as the same agency by which I carry on the cultivation of cinchona will suffice for the propagation of the ipecacuanha plants. All that is required is the permission of Government to my using my best endeavours, with the means at my disposal, to inaugurate the cultivation of ipecacuanha in Bengal.

If this is accorded to me, I shall divide the plants I now possess between the Botanical Gardens in Calcutta and the cinchona plantations in Sikhim, with the view of the propagation of the plants being carried on vigorously in both places. The progress of the experiment would be referred to in my annual reports of the Botanical Gardens and the cinchona cultivation in Bengal.

IPECACUANHA ON THE NEILGHERRIES.

Extract from Proceedings of Madras Government, 20th October 1868. Read the following letter from the Commissioner for the Neilgherries, *Ootacamund, the 17th October* 1868.

Your telegram to inform the Home Secretary, Simla, whether the cultivation of ipecacuanha had been tried on the hills, and with what success, was received on the evening of the 15th.

I called upon Colonel Hadfield, Captain Beddome, Messrs. Ouchterloney, Broughton, and McIvor for information, and this day despatched the following telegram to Simla:—"The Superintendent of Government Botanical Gardens here says the ipecacuanha has been tried, and the plants are growing well, but their introduction has been too recent to test the value of the medicine. I see that the bastard ipecacuanha (*asclepias curassavica*) grows in private gardens."

Colonel Hadfield sent me a plant which he thought was the ipecacuanha plant, but which Captain Beddome pronounced to be the bastard or wild ipecacuanha (*asclepias curassavica*), and which he says is used as ipecacuanha, and grows in gardens up here, but grows better in the plains. He added that two other wild plants, namely, *Tylophora Vomitoria*, *Hemidesmus Indicus*, answer the purposes of ipecacuanha, and grow well on the plains, but not here. To Captain Beddome's knowledge the true ipecacuanha plant has never been introduced up here. He could not give me its Botanical name, but said that it was a South American plant, and may possibly be one of the medicinal plants which Mr. McIvor or Mr. Broughton lately brought out.

Mr. Broughton is away somewhere. The Superintendent of Government Gardens (Mr. McIvor) gave me the information mentioned in my telegram to the Home Secretary.

With reference to the order of Government, No. 2667, under date 20th October 1868, I have the honor to state that on the occasion of my visit to England, I procured from Dr. Hooker, of the Royal Gardens, Kew, two plants of the *cephaelis* ipecacuanha, and planted them in the gardens on my return in December last. Previously I obtained one plant, brought out by Mr Broughton from Kew. I think there can be no doubt that the plants we have got yields the true ipecacuanha of commerce. Those three plants have now been increased to nine, and a few months I hope they will have attained such growth as to yield sufficient roots to test the quality of their produce.

From W. S. Atkinson, Esq., M.A., Superintendent, Botanical Gardens, to Government of Bengal, *Botanical Gardens, the 24th April* 1869.

With reference to your endorsement No. 1470, dated the 3rd instant, I have the honor to inform you that Dr. Anderson, who is now on his way to England, has in view the introduction of more plants of ipecacuanha for cultivation in India, and will, I know, endeavour to secure all available plants from the Botanical Gardens in Europe. I may also state that Dr Hooker, at the Royal Gardens, Kew, has been already communicated with on this matter, and will no doubt send any spare plants he has there under careful supervision. Seeds unfortunately cannot be had in Europe, all the plants in cultivation having as yet proved sterile, and they could only be secured by persons who have access to the native habits of the plant. It might be desirable that copies of this correspondence should be forwarded to Dr. Anderson, with an intimation that the Lieutenant-Governor of Bengal approves of the endeavours he is making for the promotion of the cultivation of ipecacuanha in India.

From Government of India, to Her Majesty's Secretary of State for India, *Fort William, the 25th January* 1870.

We transmit for your information a copy of the papers noted in the annexed list, on the subject of the experimental cultivation of the ipecacuanha plant in India.

The only places in India where the plant has actually been grown are Ootacamund, the Calcutta Botanical Garden, and the Cinchona Plantation near Darjeeling; but there are other localities where, as your Grace will perceive from the enclosed correspondence, the experiment may, in all probability, be successfully tried. The stock of plants in India, however, is very limited, and we are desirous of procuring a sufficient supply both of plants and seeds for trial simultaneously at different places. Dr. Anderson, Superintendent of the Botanical Garden, Calcutta, now on leave in England, is known to have taken considerable interest in the cultivation, and to have had in view the collection of plants from the Botanical Gardens in Europe for transmission to India. We shall feel obliged by your Grace asking Dr. Anderson to submit a definite plan for procuring plants and seeds in sufficient quantities for experimental cultivation in different localities in India. We would also be glad to have his opinion as to the proper localities where the cultivation may

be tried. And, lastly, we would suggest that if the Botanical Gardens of Europe cannot supply a sufficient number of plants, or if the difficulty about sterility, mentioned in the enclosure of the communication from the Government of Bengal, No. 1801, dated 7th May 1869, cannot otherwise be got over, Her Majesty's Representative at the Court of Brazil, or the Consul at Rio Janeiro, might be invited to assist in the attainment of our object. We would add, that if Dr. Anderson is likely to be detained in England, he could probably make some arrangement under which some officer returning to India could take care of the plants during the voyage.

From Secretary of State for India, to the Governor General in Council, *India Office, London, the 20th April* 1870.

I have considered in Council the despatch from your Excellency in Council, numbered 12, Public, and dated the 25th of January, urging upon me the importance of introducing the ipecacuanha plant into India, and suggesting that Dr. Anderson, the Superintendent of the Botanical Gardens at Calcutta, now in this country, should be asked to submit proposals as to the best means for obtaining the object in view. On the application of the Government of Bombay last year, I had already recognized the importance of introducing this valuable medicine; and the two plants received at Bombay having died, I had already taken steps for procuring others for transmission in July next. I transmit to you the correspondence which has been held with Dr Anderson on this subject, and I trust that, even should the other attempts fail, Dr. Anderson will still have a sufficient number of strong plants to send or to take back with him to India to secure the introduction and establishment of the plant. It seemed to me that an application through the diplomatic agents of Her Majesty was not likely to be so successful as an application through commercial or scientific gentlemen. You will see from the accompanying memorandum by Mr. C. R. Markham, of which I transmit 15 copies, that he has written to Messrs. Miers and Co., of Rio, to Mr. Bramah, and to Dr. Otho Wucherer, to obtain roots of the plant. The accompanying correspondence with Dr. Cleghorn and Dr. Balfour will show you that I have also enlisted the kind assistance of the Royal Botanical Gardens at Edinburgh besides the aid promised at Kew. I forward also herewith 70 copies of the memorandum on the propagation of the ipecacuanha plant prepared by Mr. McNab, of the Royal Botanical Gardens at Edinburgh. Dr. Christison and Dr. Balfour have likewise applied to Dr. Gunning, a medical practitioner at Rio, to assist in obtaining plants and seeds. I add to these documents the letters which have passed between Dr Hooker and this Office on the supply of plants for Bombay. You will learn from my despatch to that Government of this day's date, that the plants destined for them will be retained at Kew, and two healthy plants will be sent to them from the Botanical Gardens at Calcutta.

From H. Merivale, Esq., C. B., Under Secretary for India, to the Superintendent, Botanical Gardens, Calcutta, *India Office, London, 3rd March* 1870.

I am directed by his Grace the Secretary of State for India in Council to transmit to you a copy of despatch which has been received from His Excellency the Governor General of India in Council, dated 25th of January, No. 12, Public, with its enclosures, on the question of the introduction of the genuine ipecacuanha plant into India. You will perceive that His Excellency has requested the Duke of Argyll to call upon you for a definite plan for procuring plants and seeds in sufficient quantities for experimental cultivation in different localities of India. His Grace will be glad therefore to receive from you any suggestions as to the best method of executing the wishes of the Government of India. I am at the same time to acquaint you that, in consequence of a similar application from the Government of Bombay, this Department has been in communication with Dr. Hooker of Kew, and Dr. Balfour of Edinburgh, as to the best means of obtaining ipecacuanha plants for transmission to India. In a letter received from Dr. Balfour, it has been suggested by Mr. McNab, who has successfully propagated some plants in the Royal Gardens at Edinburgh, that the readiest and surest method of obtaining plants would be by the transmission of rhizomes packed in sphagnum moss. There would be no objection to try this plan, as well as the transmission of plants in Wardian cases, and also of seeds securely packed. Some might also be sown in the cases before they are closed up, provided that an agency, which could be relied on to obtain the genuine plant, might be secured in the Brazils. With regard to this point, I am desired to inform you that Mr. John Bramley Moore, whose firm is connected with the trade of that country, has expressed to a Member of the Council his willingness to assist the Secretary of State in procuring plants and roots, and does not apprehend that there will be any difficulty in so doing. You are at liberty, therefore, to place yourself in communication with Mr. John Bramley Moore, 10, King Street, St. James's.

(To be continued.)

PRODUCE MARKET.

LONDON, THURSDAY, *November* 10.

A firm tone has generally prevailed in the Colonial Produce Market throughout the past week. Yesterday very little business was done, the dense fog preventing the inspection of the goods on sale. Several of the actions were postponed. Full supplies of Coffee have, rather contrary to expectation, been cleared off readily at firm prices

Coffee.—Firm prices have been obtained for the parcels brought forward, and nearly all the parcels offered found buyers. 1,100 casks, 70 barrels, and 200 bags of Plantation Ceylon, triage, 38s. to 51s; grey small to bold, 51s. to 69s; small to fine bold colourv. 54s to 84s.; peaberry, 71s. to 77s. 6d. 20 casks Native Ceylon, ordinary to good ordinary, 47s. 6d. to 48s 6d.; peaberry. 53s. to 53s 6d. A part of 320 bags ditto small, at 43s.; 200 cases, 900 bags, East India Cochin, small to bold, 58s. 6d. to 69s. 6d.; peaberry, 77s. 6d.; Coorg triage, &c., 41s to 51s.; small to middling dull, 58s. 6d. to 63s., coloury, middling to bold, 65s. 6d. to 77s. 6d.; peaberry, 77s. 6d to 78s. 6d.; and part of 90 packages Mocha ordinary, at 89s. 6d.

Tea,—A sale of 526 packages of Assam Company's teas was held on Tuesday. The sale passed with good spirit, and generally at an advance of 1d. to 2d. per lb. on recent rates. The deliveries in London estimated for the week ended November 7 were 1,707,163 lbs., which is a decrease of 15,124 lbs compared with the previous statement.

Messrs. Townsend Brothers and Bowet's Monthly Report, dated November 3, has the following:—The animation which we noticed in our last has continued during the month, arrivals being barely in keeping with our requirements Monings, from 1s. 6d. to 1s 10d., and Kaisows from 1s 4d. to 1s 7d. have been eagerly bought; the superior grades have been rather neglected, though very few remain in first hands or afloat. The most remarkable feature is certainly the comparatively low price of inferior qualities of teas of all descriptions, which are, notwithstanding the late advance in all other classes, much neglected at the quotations at the lowest point—that is, lower than for many years past. It is, therefore, evident that they are in over supply, and that we could dispense entirely with them this season; this, we think, cannot too strongly be considered in late shipments from China, especially in the case of Black Leaf Congous, as shippers, our principal customers, have made their purchases in China themselves, and will probably not be large buyers throughout the season

INDIAN TEA.

CALCUTTA, 30*th Nov.* 1870.

Five Public Sales have taken place during the week, comprising 3,372 chests offered, of which 213 chests were taken out, leaving 3,159 chests sold. Although the late telegrams convey the idea that prices have about reached their highest point at home for the present at least, our market shows no change from the firm position it has of late maintained, and the above Auctions passed off with good spirit, and at rates which must be satisfactory to producers. Growers who are in the habit of shipping their produce, would do well to compare the prices being paid here with the average obtained in Mincing Lane. Private sales comprise about 150 chests of Darjeeling Tea, and 44 chests Cachar. Further public sales will take place at an early date.—*Toulmin & Co.'s Circular.*

INDIGO.

The first Public Sale of the Season is advertised for to-morrow, and, judging from the sales effected privately, it is more than likely that competition will not be wanting. Altogether the private sales since the season opened sum up 17,000 maunds, including about 2,500 maunds of native Oude descriptions, which, notwithstanding the very heavy losses made on last year's shipments, still command the confidence of buyers at Rs. 40 to 50 under the rates realized last season. The total out-turn of the crop remains estimated at 95,000 maunds, but as the produce is in a damp condition, it may possibly weigh out over this figure.

The private sales during the week amount to 5,510 maunds at prices ranging from Rs. 250 to Rs. 285.—*Toulmin & Co's Circular.*

MESSRS. SHAIKH KASIM & CO.,

TENT MAKERS,

FUTTEHGURH.

WHO received a certificate from H. M. Mackenzie, Esq., Commissary of Ordnance Futtehgurh, on the 11th November 1867,

Respectfully beg to inform the public, that they make tents of every size and description to order, of best materials, handsome shape, and good workmanship, at very reasonable prices, in support of which they have obtained a highly recommendatory testimonial from the above gentleman.

They beg also to announce that they have a large stock of tent materials always on hand to execute all orders promptly and with much care and attention. Brass eyelets will be supplied in lieu of leather ones in every tent; also ventilators will be made in under fly of large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny-bags, pegs and mallets, as follows:—

No. 1,	30 feet by 18 feet	Rs.	825
,, 2,	28 do. by 16 do	,,	690
,, 3,	24 do. by 14 do.	,,	625

II.—Single-poled tents of 4 cloths throughout and 4 feet verandahs, complete as above, viz:—

No. 4,	20 feet square,	Rs	640
,, 5,	18 do.	,,	540
,, 6,	16 do.	,,	475
,, 7,	14 do	,,	420

III.—Hill-tents, double fly and single kanats of 4 cloths, complete as above, viz.

No. 8,	14 feet square, with 2 saibans, 3 cloths, 5½ feet high	Rs	270
,, 9,	12 do. do do do	,,	225
,, 10,	10 do. do do do	,,	190
,, 11,	8 do. do do do	,,	170

IV.—Swiss Cottage tents, double fly and circular saibans, the rear one being closed by 6 feet kanats to form a dressing room of 4 cloths throughout, complete as above, viz:—

No 12,	14 feet square	Rs	375
,, 13,	12 do.	,,	340
,, 14,	10 do.	,,	285

V.—Swiss Cottage tents, double fly and circular verandah, and 3 feet saibans, the rear one being closed by 4 feet kanats to form a bath room, 4 cloths throughout as above, viz:

No 15,	14 feet square,	Rs.	290
,, 16,	12 do.	,,	240
,, 17,	10 do.	,,	200
,, 18,	8 do.	,,	175

VI—Routies of 4 cloths in fly and 4 cloths, in 6 feet kanats, complete as above, viz:—

No. 19,	16 feet by 14 feet	Rs	225
,, 20,	14 do. by 12 do.	,,	200
,, 21,	12 do. by square	,,	180

VII—Sleeping pals for gentlemen, of 4 cloths, including chintz, and with 4 feet kanats, wooden poles, complete as above, viz:—

No. 22,	12 feet square,	Rs	100
,, 23,	10 do	,,	90
,, 24,	8 do.	,,	80

VIII—Bechoba tents, of 4 cloths in fly and kanats, complete with durree, &c:—

No 25,	12 feet square,	Rs	140
,, 26,	10 do	,,	125
,, 27,	8 do.	,,	110

IX.—Shameanahs of 4 cloths in fly and kanats, 7 feet high, with 5 feet curtains hanging from above, of 3 cloths, complete with 8 wooden poles, as above, viz:—

No 28,	24 feet square,	Rs.	400
,, 29,	18 do	,,	325
,, 30,	16 do,	,,	290

X. Sepoy pals of 3 cloths, with bamboo poles:—

No. 31,	16 feet by 15 feet	Rs,	60
,, 32,	14 do. by 12 do. servants' pals do	,,	50
,, 33,	12 do. by 10 do. do do.	,,	45
,, 34,	10 do. by 8 do do. do.	,,	10

NECESSARY TENTS.

No. 35,	5 feet square,	Rs.	30
,, 36,	4 feet, square,	,,	27

XI.—Swiss Cottage tents for Hills, double fly and circular saibans of 4 feet, the rear one being closed by 4½ feet kanats to form a bath-room, and two bath-rooms will be two sides, the upper fly 3 cloths, under fly 2 cloths, complete with wooden poles, as above, viz:—

No. 37,	12 feet square	Rs.	250
,, 38,	10 do.	,,	210
,, 39,	8 do.	,,	185

XII.—Mess tents, three-poled, of 4 cloths throughout and 4 feet verandahs, complete, with glass shades with 4 branches with a brass clasp and two punkhas complete as above, viz.:—

No.	40, 40 feet by 20 feet,	Rs.	1,500
,,	41, 32 do. by 16 do. of two-poled do. with one punkah...	,,	1,250
,,	42, Bath-room, 6 feet square, with top for single-poled tent, without durries	,,	38
,,	43, Zanana kanat, 3 cloths, 7 feet high, 72 feet long in two pieces	,,	72
,,	44, Shutrinjee of best materials, per square yard, (14) fourteen annas?		

TERMS.—Two-thirds the price of the tent in advance, the remainder on delivery. Risk and cost of transport to be borne by purchasers, as also any charges for discounting their cheques and hoondies. No orders will meet with prompt attention without a remittance mentioned as above.

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MESSRS. SHAIKH KASIM & Co.,
Tent Makers, Futtehgurh

The Ravages of White Ants.

ARE completely prevented by the Preservative Composition patented by Major Forbes, R. A., Executive Engineer, D. P. W.

This is the only effectual process yet invented for protection against White Ants, it also arrests decay in woodwork whether sheltered or exposed.

The dry Ingredients, packed in tins, containing 25 lbs. each, can be obtained from the undersigned; this quantity, mixed with a due proportion of oil will form a paint sufficient to prime 1,000 superficial feet. Price per tin, Rs. 5.

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HOWRAH STEAM SAW MILLS.—The undersigned having erected extensive Steam Saw Mills, with vertical and circular saws, are prepared to execute every description of Woodwork on a large scale. Rates can be obtained at our Howrah Iron Works, or at the offices, Hastings Street.

BURN & Co.,
Calcutta, January 1870. Iron Founders and Mechanical Engineers

HOWRAH IRON WORKS.—WROUGHT IRON BRIDGES, Roofs Irrigation, and Pumping appliances, Cotton, Jute, and Oil Presses, Pug Mills, (the latest Akra Pattern,) Jute, Flax, and Cotton Mill Gearing and Shafting; Machinery for Collieries, Indigo Concerns, and Silk Filatures, Iron Steamers, and Barges, Ships' Captains and Windlasses, Portable, Stationary, and Marine Engines, Hydraulic Presses, High and Low-pressure Boilers, Tanks, Gasholders, Railway Mining, and Contractors' Plant; Turn-Tables, Crossings, and improved jointed Levers for Switches, Road Rollers, Cranes, Winches, Traverses, &c., &c, manufactured.

Having a very extensive Foundry, the undersigned are in a position to execute orders for all kinds of Castings with great despatch.

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DURBAR TENTS & CAMP EQUIPAGE

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MADE TO ORDER AT THE

FUTTEHGURH ORPHAN ASYLUM TENT MANUFACTURING COMPANY, LIMITED,

OF EXCELLENT CUT, BEST MATERIALS PROCURABLE, AND HANDSOME WORKMANSHIP.

ESTABLISHED IN 1838.

INCORPORATED AND REGISTERED IN 1866.

PRIZE and MEDAL by N. W. PROVINCES' EXHIBITION held at AGRA, during FEBRUARY, 1867.

FIRST PRIZE AND MEDAL BY BROACH EXHIBITION IN BOMBAY, HELD DURING DECEMBER 1868, WITH CERTIFICATES OF MERIT.

Printed Price Lists will be forwarded on application to

MESSRS. PREM MASIH & Co.,
Managing Directors.

A revised List of Tents, with their reduced prices, made by

MESSRS. MOULA BUKSH & Co.,

TENT MAKERS,

FUTTEHGHUR.

WHO received the following certificates, one from R. C. Oldfield, Esq., Collector, Furruckabad, on the 29th October 1863, and another as follows:

MESSRS. MOULA BUKSH & Co.,
Futtehgurh.

I have much pleasure in stating that the tent you made for me has given satisfaction as regards materials, tent and workmanship.

J. E. KIN, Surgeon,
37th Regiment

Shahjehanpoor, 1st February 1870

Have the honor to inform the public in general, that in their manufactory the best materials are supplied, and Brass eyelets are supplied in lieu of leather ones. Ventilators will be made in large tents

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny bags, and mallets as follows:

No. 1—30 feet by 18 feet ... Rs. 820 | No. 3.—24 feet by 14 do.....Rs. 620
,, 2.—28 do by 16 do ..... ,, 690

II—Single-poled tents of 4 cloths throughout, and 4 feet verandahs complete as above:—

No. 4—20 feet square .... Rs. 640 —14 feet square ..Rs. 420
5 18 do ... ,, 540 —12 do. ,, 390
,, 6. 16 do ..... ,, 475

III.—Hill tents, double fly and single kanat of 4 cloths, with 2 out-riggers of 3 cloths, complete as above.

,, 9—14 feet square .... Rs. 270 | No. 11.—10 feet square . Rs. 200
10—12 do. ..... ,, 225

IV—Swiss Cottage tents of 4 cloths throughout, double fly and circular saibans, the rear one being closed by 6 feet kanat to form a dressing-room complete as above:—

No. 12—14 feet square ... Rs 380 | No. 13. 12 feet square Rs. 340

V. Swiss Cottage tents of 4 cloths throughout, double fly and circular verandah and 3 feet saibans, the rear one being closed by 4 feet kanat to form a bathing-room, complete as above:

No. 14—14 feet square .. Rs 290 | No. 16 10 feet square ..Rs. 200
,, 15—12 do. ... ,, 240

VI.—Routies of 4 cloths, in fly and in kanat, complete as above:—

No. 17—16 feet by 14 feet ...Rs 225 | No. 19.—12 feet square .. Rs. 170
,, 18.—14 do by 12 do ,, 225

VII.—Bechoba tents of 4 cloths fly and kanats, complete as above:—

No 20—12 feet square . Rs 150 | No. 21—10 feet square .. ...Rs. 140

VIII—Shameanahs of 4 cloths in fly and kanat, 7 feet high, w th 5 feet curtains from above, 3 cloths, and eight wooden poles, complete as above:—

No. 22—24 feet square ... ...Rs. 400 | No. 24.—16 feet square ... ...Rs. 290
,, 23—18. do ... ,, 320

IX.—Sleeping-pals for gentlemen of 4 cloths including chintz and 4 feet kanat wooden poles, complete as above:—

No 25.—12 feet square ... .. Rs. 110 | No. 27. 10 feet by 8 feet .. ...Rs. 80
,, 26.—10 do. do ... ,, 90

X—Sepoy pals of 3 cloths, with bamboo poles—:

No. 28.—	16 feet by 15 feet	Rs.	60
,, 29.—	14 do, by 12 do. servants' pals	,,	50
,, 30.	12 feet by 10 do. servants' pals	,,	45

XI.—Miscellaneous.

No. 31—	Necessary tents 5 feet square	Rs.	33
,, 32—	Ditto do 4 do.	,,	27
,, 33	Bathing room, 6 do with top for single-poled tents, without durries		
,, 34—	Shabans for 12 feet hill tents		18
,, 35—	Shutrunjes per yard Rs. 1.		
,, 36—	Mess-tents of three poles complete, glass shade, brass clasp, punkha &c, of 4 cloths throughout, 40 feet by 20 feet		1,500

TERMS.—Two-thirds of the prices must accompany the order to meet prompt attention, the remainder on delivery. Risks and any discount charged in cashing the cheques, &c., to be levied on purchasers. All orders will be executed without the last delay.

Apply to MOULA BUKSH & Co.
Tent-Makers, Futtehgurh.

ORIENTAL BANK CORPORATION

INCORPORATED BY ROYAL CHARTER, 30TH AUGUST, 1851.

Paid up Capital, £1,500,000. Reserve Fund, £444,000.

DEPOSITS.

Interest is allowed at 5 per cent. per annum, on Deposits of not less than Rs 500, and not exceeding Rs 50,000, if lodged for 12 months certain. Deposits for shorter periods, or for sums above Rs. 50,000, must be arranged for with the Agent.

No Interest is allowed on Current Deposit accounts.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius Australia, and New Zealand at the exchange of the day

Drafts are drawn for sums of £1 and upward.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued.

N. B.—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if a married lady, her own Christian name, not that of her husband, is required.

JOHN S. SCRYMGEOUR,
Agent.

Calcutta, 13th September, 1870.

ORIENTAL BANK CORPORATION,

Bombay Agency

EXCHANGE.

THE CORPORATION grant Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope.

No Draft at six months' sight is granted for a Sum under £50 Sums under £20 are only drawn for on Demand.

COMMISSION.

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent. and on the collection of Bills one per cent and Postage.

The Corporation takes charge of Government Paper, Shares in the Bank of Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms —

If to be remitted through the Corporation	Without charge.
If to be paid in India, a Commission will be charged of	¼ per cent.
On delivering Securities out of safe custody	¼ do
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869.

CHARTERED MERCANTILE BANK OF INDIA,

LONDON AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies

Circular Notes and *Letters of Credit* are also granted for the use of Travellers in the *East*, on the *Continent* and to *Europe* overland

The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Coconada, Ceylon, Hongkong, Foochowfoo, Sanghai, Hankow, Singapore, Penang, Mauritius and Yokohama.

INTEREST ALLOWED

On Deposit Accounts payable on demand Interest will be credited half-yearly, on 30th June and 31st December, at the rate of two per cent per annum on the daily balance, not exceeding one Lac Rupees.

ON FIXED DEPOSITS

12 months	5 per cent.
3 do.	3 ,,

All letters should be addressed and Hoondies made payable to the Chartered Mercantile Bank

NATIONAL BANK OF INDIA, LIMITED.

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CURRENT DEPOSIT ACCOUNTS.

The Bank opens Current Deposit Accounts, and allows Interest at the rate of 2 per cent. per annum on Customers' daily balances, from Rs. 500 up to Rs 100,000.

FIXED DEPOSITS.

The Bank receives money on Fixed Deposit, and allows Interest thereon as follows:—

On Deposits subject to 6 months' notice of withdrawal,	4	per cent	
Do. ,,	12	,,	5 ,,

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta Madras, and Hongkong. It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors.
JAMES WINDRAM, Manager

Bombay, 26th August 1870.

NEW BANK OF BOMBAY,—*(Limited).*

RATES

DISCOUNT

On Government Bills	6 per cent
On Private Bills and Notes	9 do
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.
On do. do. do. Goods or Shipping document for Goods	8 do.
On Cash Credits, on Security of Government Paper, Bullion or Railway Shares, subject to a Commission of ¼ per cent on the amount of Credit	do.

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts

Bombay, 15th July 1869.

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DARJEELING

Fixed Deposits.—Interest is allowed on deposits of Rs. 100, and upwards on the following terms:

On sums lodged for	3	months certain	3 per cent. per annum.
Do.	12	do.	7 do.
Do.	2	years certain	8 do.

Interest is allowed at 2 per cent per annum on floating deposits or Current Accounts, when the Balances exceed 500 Rupees.

There are many who have a dread of speculation, and yet who desire a *fair* rate of interest than is obtainable from investment in Government paper and Railway scrip, or from fixed deposits in Joint Stock Commercial Banks. Remittances can be made by cheques on any part of the world.

Interest paid half yearly in India or London.

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Manager.

Darjeeling, Northern Bengal, 1st August 1870.

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The advantage of Addis's Permanent Way, in addition to its cheapness and durability, consists in its being a longitudinal Sleeper Road; it combines the office of sleeper and fish-plate, and thus enables chairs, spikes and trenails to be dispensed with. The parts being fewer, in cases of shipment to foreign countries, is of great importance in saving of freight, as well as for facility of close packing of carriage over long land distances

It has also great advantage in simplicity of laying, and cheapness in maintenance. The staff needed for this purpose may be limited, and no special or previous knowledge is required.

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Sole Agent for the above

Tanna Iron Works. *TANNA.*

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A revised List of the prices of tents, &c., made at the manufactory of Moorlee Dhur and Co

Double poled tents of 4 cloths throughout and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny bags, pins and mallets as follows.—

No	1, 32 feet	by 20 feet.	Rs 1,020
,,	2, 30 do.	by 18 do.	990
,,	3, 28 do.	by 16 do	810
,,	4, 26 do	by 16 do.	760
,,	5, 24 do	by 14 do	615

Single-pole tents of 4 cloths throughout, and 4 feet complete as above, viz:—

No.	6, 20 feet square,	...	Rs 675
,,	7, 18 do.	ditto, ...	645
,,	8, 16 do.	ditto, ... ,,	570
,,	9, 14 do	ditto, ... ,,	510
,,	10, 13 do.	ditto, ... ,,	430
,,	11, 12 do.	ditto, ... ,,	400

Hill tents of 4 cloths, in kanat and top and in saibans 3 cloth, and complete as above, viz.—

No	12, 14 feet sqn. with 2 saibans,		Rs. 310
,,	13, 13, do. do. do	2 do	Rs. 270
,,	14, 12 do do. do.	2 do	,, 250

Routies of 5 cloths in top and 4 cloths in kanats, complete as above, viz

No.	15, 16 feet and 14 feet,	....	Rs. 250
,,	16, 16 do do. 12 do.	....	,, 225
,,	17, 14 do. do. 12 do.	....	,, 215
,,	18, 12 square,	.....	,, 205

Swiss cottage tents, double fly and circular saibans, all the four enclosed with kanats to form rooms, 4 cloths throughout, with carpets

No.	19, 16 feet square,	.....	Rs. 520
	20, 15 do ditt	.....	,, 495
	21, 14 do ditt	.....	,, 450
	22, 13 do ditt	.....	,, 425
	23, 12 do ditt	.....	,, 400

Sleeping pals, 5 cloths chintz lining and wooden poles, with one carpet, 4 cloths in kanats, complete.

No	24, 12 feet square,	.....	Rs. 125
,,	25, 10 do. by 12 feet	.....	Rs. 110
,,	26, 10 do. square	.....	,, 95
,,	27, sepoys' pals, 15by16ft. (4cls.)		75
,,	28, ditto 14by12ft. (3do.)		55
,,	29, lascar pals, 18by16ft. (3do.)		85

SHAMIANAS.

No.	30, 40 feet square of 4 cloth in flies and 12 feet high, kanats, complete as above, being 16 wooden poles		Rs. 830
,,	31, 24 feet, 8 wooden poles, with kanats, ...		,, 500
,,	32, 20 feet, 8 ditto ditto...		,, 410
,,	33, 12 do. square, ...		,, 250

STABLE TENTS.

,,	34, 8 by 12, for one horse ..		,, 60
,,	35, Necessary tents, ...		,, 25
,,	36, ditto small, ...		,, 20
,,	37, Zenana kanats of 3 cloths, 7 feet high and 3 feet broad, Rs 3-8 per yard.		
,,	38, Division curtain and kanat will be charged for agreeably to size of tents, ..		3
,,	39, Glazed doors, with boxes for packing, each, ...		22
,,	40, Bathing tents, 6 feet and 10 feet (3 cloths,)		32-8
	41, Boots for tents, per boot ..		20
	42, Shutrunges of best material per square yard, 13 annas		

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Futtehgurh, 25th September 1867.

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MOULA BUX & Co.

Futtehgurh, August 1870.

ROHNEE TEA AND COTTON ASSOCIATION.

Prospectus.

The Estate The land extends from near *Goridhowra Kupcal* all along the East side of the Darjeeling and Silliguree road and may be said to be *the finest soil on the Terai*—well suited to the growth of Tea, Coffee, Cotton, Tobacco, Ginger, Castor Oil, &c. The area of the Estate is 1,777½ acres and the leasehold has cost the undersigned Rs. 15,993 exclusive of stamps, conveyancing &c. A small annual rent has to be paid to Government.

Sixty acres are in tea, planted 4' by 2' so as not to lose altogether the cold season of 1869-70

To be worked by a private Company.—The undersigned proposed to associate with himself several partners and to utilize the land by gradually putting five hundred acres of the very pick of the soil under tea, reserving the remainder for cotton and timber, unless the Association would prefer selling portions at a profit.

It is a very fine lay of land and is quite worth 17 Rs. per acre, on an average.

Management.—Payments of calls to be made quarterly or monthly to Lloyd's Bank, Darjeeling, Mr. Lloyd to be Agent, charging sixty Rupees monthly for his time, trouble and responsibility. The garden to be in charge of an experienced manager, who would have to hold at least one anna share in it.

Yield of tea, and estimate of outlay and profit.—From sure data already obtained from similar or somewhat inferior soil in the neighbourhood, the yield of tea may be taken at ¾ md. per acre the 2nd year, 3rd year 2½ mds., 4th year, 4 mds., 5th year and afterwards at least 5 mds. per acre. During the cold weather of 1869-1870, only 60 acres were planted out, in the following season 240 acres, and the year after that 300 acres or as much as the funds economically used, will admit of. The land would have to be paid for during the 1st year by quarterly instalments, with interest at six per cent per annum, on the unpaid quarterly Balances. The price of the tea has been taken at the moderate figure of 55 Rs per maund, but ordinary *tea* has hitherto sold at an average of 14 annas per lb

It is now proposed, as being the most practicable arrangement, that there be 16 one anna shares and that any one may take one, or more of these anna shares, and pay Rs. 200 per anna share monthly, or if he prefers it Rs. 600 quarterly, in advance and that the most be made of this money.

The project is not intended for large capitalists but for the savings of poorer men with salaries. Mr. Lloyd is prepared if necessary to take ¼ of the shares.

He is already in five similar associations in the terai and he started this last one to utilise this fine block of waste land. The terai gardens are all doing remarkably well. If present circumstances continue, and there is no reason to anticipate any change whatever, this garden will pay 40 per cent. per annum.

Amount of calls to be paid in Darjeeling free from loss by exchange, so that all the shareholders may be on equal terms. Cheques on any Indian or English Bank or good house of business, will be found the best ordinary means of remittance.

There need be no fear of this Company being anything but a success; *vide* the Commissioners last report on our *young terai* gardens, Northern Bengal.

WILLIAM LLOYD.

Darjeeling, 1st August 1870

Printed for the Proprietor at the *Perseverance Printing Press*, Bombay.—Published by Messrs. WYMAN & Co., Calcutta.—15*th Dec.* 1870.

THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH FEBRUARY, 1871. [No. 7.

Advertisements.

Agricultural and Horticultural Society of India

PRIZE FOR AN ESSAY

ON THE

CULTIVATION AND MANUFACTURE OF TEA

To any person who shall produce on or before the 1st March 1871 the best practical Treatise on the Culture and Manufacture of Tea in India the sum of Rupees 500 and the Grant Gold Medal

The Treatise must afford full information on the following points, founded on the writer's own observations and experiments and not merely a compilation from Books —

1 Selection of sites soil, and climate
2 The laying out of a Garden
3 Preparation of the soil sowing of the seed either in nurseries or *in situ*
4 Transplanting and the effects of the use of manure
5 Hoeing and weeding
6 Pruning—the best mode of
7 Plucking—the best mode of
8 Labour—management of, with details, as to apportioning of work, payments, and advances
9 Manufacture in all its branches including the use of mechanical inventions and contrivances as tending to reduce the cost of production generally
10 Box making—machinery—to simplify and cheapen its cost, packing, leading, stamping and preparing for shipment
11. Seed-plucking, drying, transport —best mode of preserving and its utilization when not saleable
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13 The cost of cultivation in full detail
14. The cost of manufacture in full detail

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A. H BLECHYNDEN,
Secretary.

Metcalfe Hall, Calcutta, 16th March 1870

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Calcutta Review, April 1870.

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Futtehgurh, August 1870.

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

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LAND REVENUE AND PRODUCE.

To the Editor of the

"Agricultural Gazette of India."

DEAR SIR,—I read with great pleasure in the *Agricultural Gazette*" of the 15th October, the letter of "A Settlement Officer" on "Produce per acre, and the Court of Wards." The subject is one which will amply reward judicious and well directed enquiry, and one in which enquiry is intensely interesting; while the province in which the investigation must be conducted is at present all but a *terra incognita*. I am glad to see a brother Settelment Officer take it up, even though he has given us no experiences of his own on the subject, and has misinterpreted those of others which he has given.

I have latterly been devoting considerable attention to the subject, and in the hope of eliciting discussion, and of inducing others to bring forward the results of similar investigations of their own, I venture to state what I have so far arrived at

First,—as to the means I have employed. Hitherto, as far as I know, most officers have been in the habit of accumulating data on the subject of produce by means of actual experiments—of application more or less wide. I do not think that by means of such experiments as are possible to most officers any reliable data can be obtained as to produce. Usually only small patches are cut and weighed, and it is quite impossible to allow accurately for the excess or deficiency over or under average of the particular piece experimented on, for poor spots round the edges and at the corners of fields, for increase of weight due to the greater or less greenness of the newly cut crop, for the ratio borne by the crop of the particular season to an average crop over a number of years, and such like elements of uncertainty. I believe that much more reliable results are obtainable by intelligent conversation with the actual cultivators than by such experimental cuttings as are alone possible to 99 out of 100 officers.

During the present cold season my chief work has been the inspection of a portion of my district, village by village, almost field by field, preparatory to its assessment. During the morning and afternoon of each day I go over to six or ten villages, according to size; I catch single cultivators in the fields, two or three, one after another, in the course of my ride through each village; I have no one with me; I engage the cultivators in conversation, question and cross-question them as to the yield of each principal species of grain crop in a good year and in a poor year; and I dot down the results of each conversation on the spot in a tabulated memo. book. The general result of the day's queries is recorded in the evening, and on every Saturday evening I draw up a list of what my enquiries and conclusions up to that day have led me to look upon as reliable crop produce rates, revising the previous week's list where necessitated by the experience of the week just over. For the last two or three weeks I have not altered my entry in that list, and I think that I may look upon the contents of it as very fairly reliable.

I have gone fully into my plan of investigation in the double hope that I may induce others to try it, and that faults may be pointed out in it, and improvements suggested. It is not open to the objection noticed by your former correspondent in his second paragraph, viz., "That the persons from whom the information is gathered are interested in deceiving their questioner." I never question the owners of the village lands on the subject of crop produce, except out of curiosity, and most astounding results I sometimes am favored with by these gentry! The informants whom I seek are always the tenant cultivators. They have no interest in deceiving me by decreasing produce. Being, as a rule, in a state of greater or less antagonism to their landlord, I have, it is true, sometimes to guard against their over-estimates. The indirect interest which the cultivator has in my inquiries, from the probability that his rent may be increased if the Government revenue is increased, is too reflex and distant to affect his answers.

I here give the result of my investigations up to the present time. First, in the shape in which I received the information :—

Wheat—No. 1—Unmanured and unirrigable—	1¼	local pukka mans to the kutcha Beegha.
No. 2—Manured but unirrigable including irrigated unmanured	2¼	" " " " " "
No. 3—Manured and artificially irrigated	4	" " " " " "
Barley	2	
Rice—No 1—Fine Rices	3½	
No. 2—Course Rices	2½	
Gram	2½	
Urd, Moth, Bajra, &c.	1½	" "

Then taking the kutcha beegha to be 900 square yards—which is pretty nearly what it is in my district,—say 5 beeghas 8 biswas=1 acre,—the rates per acre will be,—

											lb.
Wheat	No. 1.—8	mun	4	seers,	local	weight	= 9	mun	4½	seers	Govt. weight = 750
	No. 2.—13	"	20	"	"	"	= 15	"	7½	"	" " = 1250
	No. 3. 21	"	24	"	"	"	= 24	"	12	"	" " = 2000
Barley	—10		32	"	"	"	= 12	"	6	"	" " = 1000
Rice	No. 1.—17		22	"	"	"	= 19	"	30	"	" " = 1625
	No 2.—13		20	"	"	"	= 15	"	7½	"	" " = 1250
Gram	—14		34	"	"	"	= 16	"	28	"	" " = 1374
Urd, Moth, Bajra, &c.	— 8		4	"	"	"	— 9		4½		= 750

(counting the Government mun as = 82 2/7 lbs. avoirdupois.)

This is the estimated rate of produce of average soil in a good year. In order to arrive at a rate of produce fair and reliable over a series of years, I think that it will be sufficient to make the following allowances on the above rates :—

On all crops, except manured and artificially irrigated wheat, and coarse Rices	12½ per cent.
On coarse Rices	20 per cent.

On manured and irrigated wheat I should make an allowance as its produce is independent of seasons. The allowance on coarse rices is not a whit too high where, as in my part of the country, there is little or no irrigation; it is of all ordinary crops the most sensitive to climatic influences, producing nothing without rain, and failing to an almost equal extent if there be excessive rain. The allowance on other grains contemplates a complete failure of the crops once in eight years, which is, roughly speaking, about what has latterly occurred in the North-Western Provinces. The result will then stand thus—

Wheat.—No. 1 —Unmanured and unirrigable	656	lbs. per acre.
No. 2.—Manured and unirrigable, and irrigated unmanured	1094	
No. 3.—Manured and artificially irrigated .. .	2000	
Barley	875	
Rice—No. 1 —Fine Rices	1422	
No. 2.—Coarse Rices	1000	
Gram	1202	
Urd, Moth, Bajra, &c.	656	

These rates may be a trifle too low for an average of the whole North-Western Provinces, but I venture to think that they are not very far wrong.

"A Settlement Officer" says:—"Except in some peculiar situations wheat, not artificially irrigated is quite an anomaly

and practically unknown." This statement points to one of the great difficulties met with in trying to determine a rate of produce which shall suit the capabilities of large areas, such as the North-Western Provinces. The circumstances of different districts differ wondrously, and the modes of agriculture follow them. I know of whole districts where only 20 per cent or thereabouts, of the whole wheat crop is irrigated. Again, there are many parts of these Provinces where manure is so plentiful, that the most distant fields in the village are, as far as regards field crops, as highly manured as are the nearest. In such districts the division into the classes enumerated by your correspondent—*graded* with respect to the quality of manure—is quite unknown, instead of being "conventional," as your correspondent called it.

"A Settlement Officer" believes that "the returns of the old North-West Settlement Officers are all under the mark," and comes to the conclusion that "in real practice, the great Akbar's estimate is after all the correct one." You, in your admirable article of the 11th July last, come to much the same conclusion, though you worked out the equivalent of the said estimate to not much over half what your late correspondent made it!

But let us for a moment examine the so called "estimates" of the Ayeen Akbari. In the first place, they are no where stated in the Ayeen Akbari to be "the result of 19 years' experiments conducted over the whole of India," as given by you. Akbar's rule did not, as well as I remember, extend to anything like half of India, and I fancy that the "benevolent neutrality" of those days would hardly have allowed him to experiment out of his own territories; but so far from being recorded as the result of extended experiments anywhere, these produce rates are not given as having resulted from any experiments at all! Their mention is in this wise: Akbar's determination of a standard yard, jareeb, and beegha is recapitulated, and it is then declared that he wished an alteration made in the mode of collection of the revenue, and fixed one-third of the gross produce as the "mahsool" (?) and one-third of that third as the king's share, in lieu of the system of one Shere Khan. It is then stated that the collection is in future to be made as follows:—Wheat, a beegha of first class land 18 maunds, middling quality 12 maunds, poor land 8 maunds 35 seers, amounting in all to 38 maunds 35 seers, of which one-third 12 maunds 38¼ seers is "mahsool," and of the mahsool 4 maunds 12¾ seers is to be taken for the king;—and so on through the rest of the crops.

As, who would say to his Collectors,—"Here is a supposed case; a raiyat's farm is 3 beeghas, one 1st class, one second class a middling, and one 3rd class or poor; you find, say 18 maunds produced in the 1st, 12 in the 2nd, 8-35-40ths in the 3rd; you will bring the gross produce together and divide it as follows;—⅓rds to the raiyat, ⅛th for me, and ⅛th for mahsool.

Nothing is said about these rates of produce being authoritatively fixed or carefully estimated, and had they been so fixed as estimated, we may be sure that the very laboriously minute writer of the Ayeen Akbari would have said so, and would, with great wealth of detail, have explained to us how they were arrived at.

I feel sure that these rates were not intended to be taken as accurate estimates of produce per beegha, though they would naturally be tolerably approximate guesses at the truth.

In the second place, in all the arguments founded on these Ayeen Akbari produce rates, no one seems to have supposed that the Akbari maund was not as our maunds ("A Settlement Officer" has further complicated matters by taking the maund at 80 lbs,—which is neither one thing nor the other,—and adding on the odd seers as pounds!); the fact being that the seer of the Ayeen Akbari was only 52 tolahs 2½ mashas, *i. e.* 10 chittaks 2 tolahs and a fraction Government weight; the Akbari mun being equal to 26 seers 1¼ chittaks, *i.e.* 53 lbs 11 oz. nearly. The produce rates of the Ayeen Akbari expressed in pounds per acre are as follows:—

1st Class lands	1,546	lbs. per acre.
2nd „ „	1,031	„ „ „
3rd „ „	762	„ „ „
Average	1,113	„ „ „

"A Settlement Officer" will be surprised to find "the great Akbar's estimate lower than the majority of the returns of the old North-West Settlement Officers."

Now, I look upon these produce rates, rough though they may be, as valuable corroboration of my rates. My highest rate is much higher than Akbar's highest, and my lowest rate is lower than his lowest, and this I think is as it should be. Irrigation is more plentiful, more perennial, and more valuable now than it was in Akbar's days: the first two facts would lead to its being more thoroughly applied, the latter would ensure its being more carefully applied. Cattle have increased, and with them manure; cultivators have increased, and with them competition. Competition has, in spite of Act X. 1859, more or less brought about a selection of the best cultivators, producing the most plentiful and most skilfully rotated crops, and hence able to pay the highest rent. All these causes would lead to increased produce, and that increase would be largest in the best lands.

My lowest rate is naturally lower than Akbar's because increased numbers and high prices have caused lands, which in those days were not worth the cultivating, to be now greedily broken up. Hence 3rd class land now-a-days is not as good as was 3rd class land in Akbar's day, while the average produce of all cultivated land is higher than it then was.

There is another reason why an acre of land should be made to produce more now than it did in the time of Akbar; and that is that it was not then necessary to insist on Nature doing her best, and to strain every nerve to help her to do it. Now it is. To the Indian mind, and especially to the Indian Assami class of mind, not caring to do more than live from hand to mouth, this would be a potent argument. That one of them would work his lands as carefully with wheat at 86 seers 6 chittaks (Government weight) for the rupee, (an average price given in the Ayeen Akbari,) as he will feel it necessary to do when it rules at 20 seers.

It may in a measure explain where your "19 years' experiments" came from if I say that, in the Ayeen Akbari, immediately following the "Ayeen" containing the produce rates, is given a long list of prices current of 19 years, arranged for the various Soobahs of Akbar's empire.

I may also point out that in your article of July 11th 1870, you have apparently misunderstood Captain Tuckett's table of the results of the 2,000 experiments made when the settlement was in progress. I have not access to Captain Tuckett's book (I wish I had); and therefore I cannot tell whether the mistake was his or is yours; but I gather from your article that the experiments were carried on in the Bareilly district only, as the "districts" detailed in the table given by you are in fact pergunnahs of Bareilly. Those produce rates, therefore, were not "the average produce of wheat lands in the provinces." The produce of Bareilly is, I should say, rather below the average of the North-Western Provinces.

There is also a hasty conclusion, made apparently on conjecture alone, in your division of the several produce rates into those of "irrigated land" and "dry cultivation." The conclusion is plainly unsound in at least one instance;—the tabulated results of the 2,000 experiments recorded by Captain Tuckett shew that the estimate "No. 4 Revenue Officer Bareilly, 1046 lbs" (included by you among "dry cultivation,") presumably comprises every sort of cultivation, for it is an average of rates ranging from 676 lbs. to 1456 lbs. per acre.

If we now take the whole of the wheat produce estimates at hand, we find that they compare as follows:—

Ayeen Akbari	1113
Bareilly	1046
Mozuffurnuggur (average)	1040
Bulandshahr	1508
Saharunpore (average)	1357
Agra (average)	1229
Meerut	1464
English Zamindar Muthra	1845
Montgomery	836
Thornton (average)	950
My average	1250

These eleven estimates give an average of 1240 lbs. of wheat per acre. This is as far as we can go at present, but am far from being satisfied with this result. It is too plain that here we are not comparing the same things; we do not know of what description of cultivation all these several estimates were made; nor do we even know that they were all estimates of produce per acre. Moreover the great element of error in all such calculations of averages, intensified when the average is intended to apply to a large area, is that they are at best more paper averages of the produce of different descriptions of cultivation, without any consideration of the quantity of land under each description of cultivation in the area intended to be estimated for. To make my meaning clear.

Say—Irrigated and manured wheat produce	2000	lbs per acre
Manured dry (with irrigated unmanured) wheat produce	1100	„ „
Unmanured dry wheat produces	650	„ „
The average will be	1250	„ „

Ergo. 1000 acres of wheat will produce 1,250,000 lbs.

This will however be true only of a tract where 333⅓ acres of wheat are grown of each of the three descriptions estimated for. But say that the 1000 acres are really cultivated as follows:—

Irrigated and manured Wheat	100	acres
Manured dry (and irrigated unmanured)	300	„
Unmanured dry	600	„

} About the relative areas in my district

The produce of the 1000 acres will then be

100	acres	@ 2000	lbs. =	200,000	lbs
300	„	@ 1100	„ =	330,000	„
600	„	@ 650	„ =	390,000	„
1000	„			920,000	„

and the true average produce is 920 lbs. per acre.

Hence it would be clearly a fallacy, and for all purposes of generalization, a mischievous fallacy, to say that the average yield of wheat per acre in my district is 1,250 lbs. Therefore, until we know how much of the wheat producing area of the North-Western Provinces is cultivated in each of the various modes or which we have estimates of produce, any general average we may educe from those estimates will be an unsound average.

There is another point which requires elucidation, and it is one which vitally affects all your calculations of net general outturn of crops in the North-Western Provinces, &c. I mean the question of seed drn. It has been variously stated in the *Indian*

Economist and its appendices at 1-7th of the crop, 128 lbs. per acre, 110 lbs. per acre, 123 lbs. per acre, &c. It will surprise you to learn that out of the hundreds of cultivators I have questioned, and from whom I elicited the produce rates I have given above, I have not met one who stated the seed of wheat, barley and rice otherwise than as "dhurreo beegha"—*i.e.* 5 local pukka seers per cutcha beegha,=30⅔ Government seers, or 62½ lbs. per acre! In a very few favored spots, where the soil is exceptionally good, manure plentiful, and irrigation abundant, 6 local pukka seers=75 lbs. per acre, of seed is sometimes sown; but I confidently assert that 62½ lbs. per acre is the quantity of seed usually sown in this and the adjoining districts; and the people apparently never heard of more being sown anywhere! My estimated produce rates, therefore, are to the seed sown as follows:

Wheat	Unmanured and unirrigable	10.50 fold
„	Manured and unirrigable (with irrigated unmanured)	17.50 „
„	Manured and irrigated (taking the seed at 75 lbs. per acre)	20.67 „
Barley		14.00 „
Fine Rice		22.75 „
Coarse Rice		16.00 „
Gram		19.23 „

In view of such a discrepancy between the teachings of my experience and of that of wiser and more experienced men, I invite and await discussion on the point.

And now a word as to "A Settlement Officer's" suggestion that Government should utilize their management of the estates under the Court of Wards in ascertaining correct crop produce rates. I cordially agree with that suggestion; but the management of the estates must be, as your correspondent hinted, radically changed from that which is at present the usual custom. In some districts certainly,—in many, I fear,— the practice is to order the tahseeldar to call for, and, subject to *a pro forma* sanction, accept tenders for leases of these estates, village by village, and from year to year: the evil consequences are prominently two,—the estates are leased generally on a rule of "fear, favor, affection, or malice," often far very much below their value, to the serious temporary deterioration of the family income,—the lessee has no interest in caring for, much less in improving, the estate, his tenure being so short and so precarious, and he rack-rents and grinds it to the utmost, to the permanent ruin of each individual village.

These estates, and the various other estates which for divers reasons, or from time to time come under the management of Government in order to be of the slightest reliable use as nurseries of agricultural statistics, must be under direct and efficient European superintendence. I should like to see their management confided to the new Department of Agriculture, and the attention of its Chief especially directed to them. Ten years intelligent administration of these estates would supply a wealth of reliable statistics.

To "A Settlement Officer's" remark that—"were the real "yield of the land known to Government officers, the revenue "of the Upper Provinces could be easily increased by 25 per "cent beyond what any Settlement Officer, in his present state "of ignorance, would venture to assess it at," I heartily assent; but I should almost be inclined to alter the last portion to "in the present state of ignorance, could get any Government to sanction it at." I believe that among the present race of Settlement Officers in these Provinces are several men who fully and others who dimly, recognized the fact of potential increase of revenue. But Government could not expect the over-worked Collector,—who was invariably also the Settlement Officer of six years ago or less —to be up in such matters of details as produce rates; or even to devote any respectable amount of attention to them. But, *Ten cro duce et auspice teneri*, we have changed all that; and in place of the portly gentleman, of urbane manners but scanty conversational Urdu, making a progress—stately in form, but partial in extent—seated on an elephant, and followed by half the tahseel officials and all the tahseel races,—with his attention equally divided between the state of the roads and the state of the crops, between mortuary statistics and produce statistics;—we have substituted the agile S. O (one at least is 6 feet 3, and stout in proportion,) on the clever Arab,—able to talk his own "boli" to every "goanwar,"—not missing a village, or a feature of a village, in his laborious round,—and with nothing else to do but to apply his experiences to their assessment. It is a pity that only a few districts still remain unsettled.

I am, yours sincerely,

S. O., N. W. P.

To the Editor of the

"Agricultural Gazette of India."

Sir,—The exhaustion of the soil by cotton cultivation has often been remarked upon by you. The fact, however, does not seem to be so well recognized as it should be. I may mention in confirmation of your opinion, if it needs any, that having the power of management over a number of villages in which the Bhagbutae system of revenue collection prevails, I proposed to reduce the share of cotton produce claimable by the landlord in certain villages on the ground of the land of those villages being less productive in cotton than the remainder of the district. In answer to my offer I was met by the suggestion from the cultivators themselves that instead of the landlords share of cotton being reduced, they would prefer the grain share of the landlord being reduced, in order that less inducement might be held out to cultivate cotton. This has occurred in one of the richest parts of Kattywar, I mean as regards the fertility of the soil.

Narad.

7th February 1871.

To the Editor of the

"Agricultural Gazette of India."

My Dear Sir,—I promised you the statistics regarding the cultivation of paddy and cotton. I send herewith the results after experiments made by me, and can answer for their correctness. Press of work must be my excuse for not having sent them sooner.

Paddy.—One acre was taken up of the soil best known as "Kabred," *i. e.*, black cotton, but it is said to have been worked out previously.

It had to be ploughed four times, being overgrown with weeds; (three ploughings is usually sufficient); 37½ seers of the best kind of rice (dhan) were sown. The cost of this seed amounted to Rs. 3-0-6, 4 ploughings Rs. 2.

Weeding cost more than usual, as the weeds were peculiarly rank and difficult to eradicate altogether. Weeding, cutting and winnowing cost Rs. 8-6-3, making a total expenditure of Rs. 13-6-9.

When cut the produce amounted to 17 maunds and 30 seers of uncleaned rice; the value of which amounted to when sold, at the rate now in force, to Rs. 18-12, giving a profit of Rs. 5-5-3.

Uncleaned rice sells in the bazaar generally at the rate of one rupee per maund, and the produce has been calculated at that. The cost of rice stored has not been calculated, as it is a drag in the market So much for rice.

As regards *cotton*, 27 seers of Hinghunghat cotton seed were sown in 2 acres 3 roods, 14 poles of land, not manured; the soil was good but not remarkably so, and the land was slightly sloping, so that the water drained off easily. The cost of this seed was exceptionally high as a mistake was made in sending it by post instead of by cooly. I will, however, in this calculation estimate the seed at the usual bazaar rate: 45 seers per Rupee:—

Cost of seeds	Rs.	0	9	6
Ploughing and weeding	„	11	11	10
Picking	„	3	15	6
Total	Rs.	16	4	10

You will see that both ploughing and weeding cost more than usual; the reason was that the land was grass land, not previously cultivated, and it had to be continually weeded during the rains to save the crop from being choked. The land was not taken up until June; whereas cotton land should properly be first ploughed in February, again in April, and the third time just before the seed was sown.

The out-turn of the crop amounted to 6 maunds and 30 seers= 540 lbs. uncleaned cotton sells in the bazaar at the rate of 2½ seers or 5 lbs. cleaned and 20 lbs. uncleaned per rupee; at the latter rate this would give the value of the out-turn as Rs. 27.

I hope these figures may be of use to you, and if there is any other point on which I can give you information, I shall be very glad to do so. Had I not been going to England, I would have got you correct data for other crops during the present year.

W.

P. S.—The sagar maund is equivalent to 80 lbs.

THE AGRICULTURE OF INDIA.

CENTRAL PROVINCES—Hoshungabad.

(By A. C. Elliott, Esq.)

Wheat.

The distinctive crop of the district is wheat, and it is the only one respecting the kinds and growth of which I think it worth while to enter into any particulars. There are five kinds of wheat grown,—the *Jelalia*, *Kutia*, *Soharia*, *Bungusia*, and *Pissi*. The *Jelalia* is the finest: it is a large white wheat and a sample of it, taken from the village of Rehsulpoor, obtained the first prize at the Lucknow Exhibition of December 1864, as the "largest and finest" wheat exhibited, among a great number of competitors. *Kutia*, however, runs it very hard: it is a first class red wheat, very little inferior to *Jelalia* in weight, and said to grow better than it in second class soil. *Jelalia* ripens about ten days earlier than *Kutia*. *Soharia* is a white wheat brought from Bhopa, where it is called *Daoud-khani*: it is small, but of fine quality, and it is not extensively sown. *Bungusia* is rare, and is only sown east of the Towa. *Pissi* is a very inferior wheat, and is chiefly grown east of the Towa. Its name is derived, on the "*lucus a non*" principle, from the fact that in the rains it grows so soft and pulpy that it cannot be ground for flour. No beardless wheat is grown here. When the plant is green, *Pissi* may be known by the yellow tinge of its ear, and the grains being a long way apart, but the other wheats are hard to recognize. The *Jelalia* ear when ripe has a deep red color, and the beard has a red tinge at the end before it is quite

ripe, while the *Kutia* ear is quite white. *Bungusia* has a black beard. In Rajwara and Sohagpoor *Pissi* is chiefly sown either alone or mixed with *Kutia*; in Hoshungabad *Jelalia* and *Kutia* are sown in equal quantities in Sconee and Hurda *Jelalia* is the most prevalent *Pissi* fetches a much lower price than *Jelalia* or *Kutia*, ranging generally at Rs. 2 or Rs. 2-8 a *Mauni* below them in value. The table in the margin shows the price of each grain at the chief marts in the district on the 18th March, 1865.

	Jela	Kut	Gadurwara Wheat.-Kutia and Pissi.
	Rs. a.	Rs. a.	Rs. a.	Rs. a.	Rs. A.
Sohagpore .	10	10	9 8	8	
Hoshungabad	13	12 8	11	10 12	
Sconee	14	...	13 8	12 8	12 0
Hurda....	16	.	13 8	...	12 8

Seed and Produce.

The rate of sowing is as nearly as possible a maund to the acre, or two *pai* to the biswa. It varies slightly, for the cultivator will sow less in a moist season and in a dry one, when he knows that many grains will not germinate; and more is sown in light undulating than in rich flat soil. But this rate, as a general average, is accepted by the people and agrees with my experiments. The average number of grains of *Kutia* and *Jelalia* wheat to a rupee I find to be 2½, and at this rate 752,000 grains are sown in an acre, and 621 in four square yards. I made a great number of experiments on plots of this size in different parts of the district, and found that the average number of stools is 160, and of ears, 330. Thus, of four grains sown only one comes up, and throws out only two ears; an inability to tiller which seems to me the chief fault of our wheat. The average length of straw is only 2 ft. to 2 ft. 6 inches. The average produce, a point very keenly debated, but the best native judges are now inclined to put it at fivefold, which, after making allowance for the loss by reaping, gleaning, and treading out, corresponds to a gross produce of sixfold, or six maunds, or eight and a half bushels to the acre. This is the general average I have assumed after much careful enquiry. The common cultivators talk of three and fourfold, but I know by experiment how miserably poor a field must be to produce only threefold. On the other hand, ten and twelvefold are not uncommon, and in six places where I cut a biswa in March, 1865, I got from fourteen to seventeen fold. One amusing case happened in a village, Gurrolie, which I visited when the wheat was young, a cultivator expostulated against my average rent-rates, asserting that his field would only produce threefold. I offered to give him the price of every seer below fivefold if he would give me the same for every seer above, but he declined the bargain. I reaped his field for him. The produce was five *kucha manis* and twenty-one *koonees*, or fifteenfold; but then it must be remembered that the harvest of 1864 was a very exceptionally fine one.

Diseases of Wheat.

The chief disease to which wheat is subject is the *gheroua*, a mildew which first attacks the stalk and leaf, turning it yellow and speckled, so that it leaves a yellow stain on the clothes of any one passing through the field, and then affects the ear, shrivelling it up. Some of the grains are merely rudimentary, and blow away with the chaff in winnowing, and all have a wrinkled, withered look. I have heard it said that these grains have not lost vital power, and are as good for seed as any other grains, but the universal native impression is that they are worthless for seed. From the smallness of the grain the disease is called *jirrie*, the grains being almost as small as those of *jeera* (cummin). The great and famous year when the wheat was entirely destroyed by this disease was 1831, and the country has had partial visitations of it since. High-lying thin fields appear to be safe from it; it attacks low situations and fields where the wheat has come up very thick. The native idea is that it is caused by the heat thrown back by clouds in the end of January, and they say it is born on the *Bussunt Punchmi*, if within ten days from that time: there are no clouds, the wheat is safe. Another disease is the black smut, or *karie*: it attacks single ears, is not contagious, and is supposed to be a sign of richness in the soil, and never does extensive injury. Withering (*oomuljana*) can hardly be called a disease, as it arises solely from dryness. Every stool is generally seen surrounded by dead stalks and leaves, which it has thrown out but has not been able to keep alive. Irrigation is the obvious remedy for this, but then the fear is generally felt that irrigation would bring on mildew.

Soils.

The soil that prevails throughout the district is the black alluvial loam commonly known as "black cotton soil." It has all the well known characteristics that distinguish this soil wherever it is met with—the uncommon fertility, the tendency to crack and sink into fissures and holes, which makes it very dangerous for riding, the great powers of absorption, the extreme muddiness and softness in rainy weather, and the retentiveness of moisture. It is of varying depths from 6 inches to 30 feet, and its average depth is probably about 10 feet; beneath it is found red gravelly clay, or sand. The general name for it all over the district is *mar*, or *marriar*, but in Rajwara it is usually called *kabur*. Elsewhere *kabur* is considered a more clayey variety of *mar*, quicker to dry, and apter to fissure, mostly found in low bottoms. It is a stronger soil than average *mar* if it gets water enough, but it dries so rapidly that, unless a shower of rain falls during the ploughing, it is as hard as a stone before sowing can be begun. The true mar should be perfectly flat and level, free from stone or sand, the water running off it by gently sloping channels, without denuding the land. Where it is undulating, the action of water carries off the top dressing of good soil, leaving the gravelly clay or sand exposed; or else it cuts deep channels down to these sub-strata, and spreads their materials over the land. Hence the classification of every description of soil depends on the degree in which it departs from the standard, either in undulation, stoniness, or sandiness. If it lies in a hollow it is called *kabur*. If it undulates slightly the soil loses its richness, becomes brown in color, and contains small stones or *kunkur* pebbles; it is then called *maria*, or *marumi*, or *mondu*. If it undulates still more, and becomes fuller of gravel and pebbles, it is called *rankur*, if it becomes sandy, instead of loamy, it is called *sehar* (I presume, from the same root which we find in the great "Sahara"); but this is only the case along the banks of rivers, where the sand brought down from the hills has been deposited by floods. If it is a stony hill-side it is called *burrooa*, or *bardie* or *kyar*, or in some parts *khurrurra* or *khyrie*. Thus flatness and richness go together, and pebbles and light soil are always found where the land undulates considerably and lies in little hills, separated by ravines. There are no great sandy plains or *oosar* tracts, such as are common in Upper India. Every part of the valley is culturable, except where a hill spur stands out into the plain, or a network of ravines leaves no surface for the plough to work upon. From this character of the soils it follows that the best kinds must be given up to rubbee crops, and khureef sown only in the lighter soils. From its richness, its depth, and its capacity for retaining moisture, the *mar* is probably unsurpassed by any soil in India as a producer of wheat; but in this so called "cotton soil," cotton or any other khureef crop could not grow. When unlimited heat and moisture are supplied, it becomes so rank in its luxuriance that it is absolutely too rich to grow any useful crop; the plant grows up unhealthy, and is choked by the mass of weeds around it. These in ordinary seasons it is impossible to clear away, for if hand-hoeing is used the labourer's feet sink in; and the hoe brings up the sown plant along with the weeds; or if the *kolpa* is used the bullocks' feet sink in. When a break in the rains occurs, and the land gets dry, or *butur* as it is called, it can be weeded; but the breaks are rare, and in rich soil the weeds would extirpate the plant before the hoe got its chance. A good system of sub-soil draining might do something to remedy this, but at present the result is that *mar* and *kabur* lands are devoted entirely to rubbee; the lighter lands produce the khureef crops. There is a debateable class of land the *mesin*, in which either class of crop can be sown, and there rotation can be followed; but for all practical purposes at present, black soil, level land, and land growing rubbee crops are convertible terms, while undulating, light, and khureef lands convey one and the same idea. The soil round villages is called *khera*, a word which originally meant the raised mound on which a village is placed, and which is applied to mean both the village and the soil of the mound round the village. From its saltness it is good for tobacco, and maize (*mukka*) is also grown on it; but though it is enriched by animal refuse, it is not regularly manured, and has not the same value as the *gowhan* land of Hindustan.

Analysis of Soils.

I submitted three samples of black soil to Mr. D. Waldie, of the Barnagore Chemical Works, near Calcutta, for examination and analysis; and I now proceed to give the results, together with extracts from his report. The samples were taken from Puchlaora, a village in the Rajwara pergunnah; from Rehsulpore, the finest village in the Hoshungabad pergunnah and from Chewul, a village in the Taptee Valley, where the black soil is still almost virgin, and produces crops of about twelvefold. After describing the first process of grinding the earth in a mortar, Mr. Waldie goes on to say:—

"Each sample was subjected to a mechanical analysis, by thoroughly softening the soil with boiling water, and elutriating. This was done by subjecting the softened earth, placed in a tall deep glass, to a current of water through a pipe issuing from an orifice of about a sixteenth of an inch in diameter near the bottom of the glass (the column of water in the pipe

being about fifteen inches high) till all the finer portions were washed off; the residue being coarse sand. The finer portions being allowed to settle, were again subjected to a gentle current of water, or rather a rapid dropping through the same tube, till all the finest particles were washed off. The residue was fine sand. The finest particles settled were the clay. Each portion was dried at 212°, weighed, burnt, and weighed again, and the following were the results :—

No. I.—Black Soil from Purchlaora, Pergunnah Rajwara.

LOSS BY DRYING AT 212° 6·8 PER CENT. MOISTURE.

	Incombustible earth.	Matter expelled by ignition.
Coarse sand and gravel	4·50	·04
Fine sand	18·92	1·68
Clay, or finest particles	68·10	6·76
	91·52	8·48
Loss by ignition	8·48	
Soil dried at 212°	1·00	

No. III.—Black Soil from Rehsulpore.

LOSS BY DRYING AT 212°, 5·7 PER CENT. MOISTURE.

	Incombustible earth.	Matter expelled by ignition.
Coarse sand and gravel ...	10·32	·44
Fine sand ...	23·34	1·41
Clay, or finest particles ...	59·02	5·47
	92·68	7·32
Loss by burning ...	7·32	
Soil dried at 212° ...	100·	

No. III.—Black Soil from Chewul

LOSS BY DRYING AT 212°, 7 PER CENT. MOISTURE.

	Incombustible matter.	Matter expelled by ignition.
Coarse sand and gravel	4·03	·41
Fine sand	28·14	3·41
Clay, or finest particles	55·57	8·44
	87·74	12·26
Loss by burning	12·26	
Soil dried at 212°	100·	

"The loss by ignition consisted principally of water, the proportion of organic matter being very small. Sample No. III contained most organic matter; by an approximate trial No. I contained rather less than No. II, and No. III. about twice as much as No. II.

"After ignition, to destroy organic matter, according to general practice, the soil was digested with moderately diluted muriatic or hydrochloric acid for an hour or two, then diluted, and the soluble portion filtered off the insoluble. In general the insoluble portion of a soil treated in this way consists of siliceous sand or small particles of quartz mixed with some particles of other minerals, in so small a proportion as to make an analysis quite unnecessary. In the present instance, however, the portion insoluble in the acid was evidently a mineral substance composed of silica combined with bases, and it was necessary to analyze it also. The following is the result :—

"[To Mr. Waldie's analysis I add, for the sake of comparison, an 'Analysis of the Regur, or black soil of the Deckan,' taken from *Ansted's Elementary Geology*, p. 343."]

Constituent of the Black Soil No. II, from Rehsulpore.

	Dissolved by Hydrochloric Acid.	Insoluble from Hydrochloric Acid	Total	Ansted's black soil of the Deccan
Alumina	5·120	9·750	14·870	2·030
Black oxide of iron ..	4·293	2·950	7·243	1·0
Lime	1·386	1·765	3·151	1·6
Magnesia	1·186	·510	1·696	10·20
Potash	·595	·898	1·493	
Soda...	·115	·167	·282	
Carbonic acid and loss	1 580		1·580	
Sulphuric acid	·017		·017	
Phosphoric acid ..	·070		·070	
Silica	·092	61·720	61·812	
	14·454	77·760	92·214	
Humic acid, dissolved by alkaline carbon	·374		·532	
Humus	·158			
Water, with a little organic matter ...	...	...	7·254	4·30
			100·	1·00

"It contained almost nothing soluble in water, gave no indication of nitrate or of ammonia, and only very faint indications of any nitrogenised or animal matters.

"The soil consists of trap-rock in process of disintegration, and the two columns of soluble and insoluble in acid shew the process of the decomposition of the rock. The very finest particles of clay obtained by elutriations, when digested with acid, leave a residue of dark brown particles, differing from the coarser in being more mixed with and incrusted over by the silica separated from the dissolved basis. The largest particles, when washed clean and examined by a magnifier, shew the appearance of the original rock. The black color is due to the original rock. The color is somewhat browner than that of the sample of trap-rock sent with it, owing, no doubt, to the oxidation of some of the black oxide to red oxide. The appearance of extreme blackness in the soil, when it looks blacker than the rock, is fallacious, and is principally due to the presence of water. When powdered and dried the soil looks browner than the rock, not blacker.

"I have omitted in my analysis of No. II to notice the presence of chlorine, as the quantity was so minute that it could not be estimated. No doubt it exists as a trace of chloride of sodium, or common salt, which is found in almost all natural waters."

Area cultivated by a Plough.

It follows, from the nature of the soils thus described, that in many villages no khureef crops at all are grown, and in a few no rubbee is grown.* But on the whole the average proportion of the two crops is seventy-six to twenty-four. Every plough can till twenty-five acres on an average, of which twenty are sown with rubbee. In villages where there is no khureef the plough will only till twenty acres. In the eastern pergunnahs the proportion is a little less, in the western a little more; and I have even known of thirty acres being tilled and sown with one plough, but this entails prodigiously hard work in September and October. Four bullocks form the complement for a plough: one pair is yoked from morning to 9 A.M., and the other pair from 9 to noon. Then the ploughman eats his dinner, and after 1 P.M. ploughing recommences, and the two pair have each a spell of work. The poorer cultivator, who has only one pair, ploughs from morning till 12 A.M., and from 3 P.M. to evening. The total number of ploughs in the district, as shewn in the Settlement Returns, is 29,321, which gives an average area of twenty-five and a half acres to a plough. I should think this too large an area, considering that there are many men who cannot get as much land as they can till, and several village artisans, &c., who do a little agriculture besides their regular trade; but perhaps this is balanced by the two-bullock ploughs, which only count as a half, but do more than half the work of a four-bullock plough.

The cattle used in agriculture are those bred in the valleys, or cattle from Malwa, Nimar, and Berar. The latter bear a good character, but are uncommon; the Nimaric is small and active, a capital trotter, better suited for the cart than for the plough; the Malwa bullock is large, heavy, and sluggish. Large bodies of Bunjaras make a regular trade of driving them to the south and selling them there, returning generally after harvest to get the money. Most cultivators keep two or three cows, and breed their own calves, and have no occasion to buy. The superstition against castrating them is, however, useful to prevent breeding in and in. Several large castes always sell their young bulls to less scrupulous dealers, and buy oxen in return. Almost every cultivator has at least one buffalo, and many have more; large cultivators owning four or five ploughs, in Hurda and Seonee, often have eight or ten buffalos. They calve in July or August, and remain in milk for six months; those that do not calve again next year give milk for a whole year. The buffalos are very well fed, and as long as they are in milk their owner will grudge them nothing. A seer of *binola* and a seer of oil-cake or *ulsi* are commonly given as a daily ration, and in the cold weather the cultivator regularly cuts a large basketful of leaves of the *ber* for his buffalo. In old times he sold the *ghee*; now that he is rich he eats it.

* Rubbee and khureef are terms not used here: *Oonhaloo*, or hot-weather crop, and *Siyaloo*, or cold-weather crop, are the terms in use, referring to the season when the crop is cut, not when it is grown. Rubbee is a general phrase for any crop, and *fusl*. *Khutani* is used in Hurda for the rubbee crop, but in the eastern pergunnahs it denotes only the wheat and gram, which are "cut" *i. e.*, reaped—in opposition to the *teora* and *masoor*, which are pulled up."

LAND SYSTEM—OF IRELAND AND GREAT BRITAIN COMPARED WITH THE CONTINENT AS TO TENURE, RENTS, PRODUCE, WAGES, &c., ON AVERAGE SOILS.

We give a tabular statement of the tenures, rents, leases, wages, and produce per acre of Ireland, Great Britain, Belgium, France, Prussia and other countries, of Europe, from which it will be seen that very erroneous views of the condition, of the agriculturists and peasant proprietors, as being superior to ours and our neighbours in Great Britain, have been entertained. Wishing the statement to be tested, we sent copies to the Earl of Clarendon for our Ministers at Paris, Brussels, Berlin, &c., who can report to the Government as to the facts. We wish also to call the attention of our readers to the figures, and especially the small acreable produce where subdivision of lands and small holdings, whether in the hands of proprietors or cultivators, exist.

	Ireland.	Great Britain.	Belgium	France.	Prussia.	Austria	Italy, Spain, Portugal.
Rents per English acre	15*s.* to 20*s.*	35*s.* England, 46*s.* Scotland	27*s.* to 40*s.*	25*s.* to 30*s.*	25*s.* to 32*s.*	20*s.* to 26*s.*	20*s.* to 26*s.*
„ Irish acre	24*s.* 6*d.* to 32*s.* 6*d.*	56*s.* England, 74*s.* Scotland	44*s.* to 65*s*	40*s.* to 49*s.*	40*s* to 51*s.*	32*s.* 6*d.* to 42*s.*	32*s.* 6*d.* to 42*s.*
„ „	Grass farms let lower than tillage.	East of Scotland 50*s.* to 70*s* per imperial acre.	Average rise since 1830, 2 per cent. per annum.				
Leases and tenure	All tenures, 21, 31, 61, 99, 999, and perpetuity with lives. There are middle landlords with sub-tenants. Over half of Ireland has no leases from head landlord or leasee.	Few in England ... 19 to 21 years of tillage in Scotland, and 7 to 9 of grass farms.	3, 6, and in a few cases, of 9 years. Great demand for land. The short tenure with the small holdings on the Continent is against improvement in agriculture.	6, 9, and in a few cases of large farms, 18 years.	6, 9, to 18 years State lands 18 years.	9 to 18 years	Rents one-half to one-third the produce in kind or cash. 3, 5, and 7 years, except for large farms of 18 years.
Peasant owners	Few; some holding perpetuity leases at 6*d.* to 5*s.* per acre Scarcely any of the original lessees' families hold at present.	Few in Great Britain, the rich buying out the yeomen and small owners The Statesmen of Westmoreland and Cumberland of 30 acres, disappearing.	250,000, about half tenants under 2 acres, 20,000 of 30 acres, 10,000 of 100 acres, 1,000 of 250 acres, average of all, 11 acres. Average number of small holders from 1 to 5 acres 400,514 out of the total of 572,550 in 1856; most of them in Hainault and Luxemburgh.	Millions of small owners, under Code Napoleon, holding over half the area.	900,000 under 4 acres	Numerous, from 15 acres lowest to 60 acres largest of the peasant estates. Some large farms worked by owners and tenants.	Chiefly small owners or tenants of 15 to 20 acres.
Small proprietors	On old leases, and by purchase under Landed Estates Court.		Over ⅓ of Belgium worked by large farmers and owners.	10 acres considered necessary for a family.			
Small farmers and holders	142,000 of 13 acres, at £8 rent, and 175,000 of 4½ acres, at £4 rent, as stated by the Right Hon. Robert Lowe.	Few, except in west and south-west of England, and highlands of Scotland.	Very large beet farms	Large beet farms in the north	Some large farms held by owners and tenants. Much beet grown.		
Medium and large farmers and graziers	Ten millions of acres in grass, giving very little employment. Numbers in the middle	Large tillage farms	Few middle class tenants like the British farmers, chiefly peasant owners or small tenants eking out a poor life, worse off than labourers in the east of England and Scotland.				
Wages	10*d.*, 1*s.* to 1*s.* 6*d.* per day, formerly 5*d.*, 8*d.*, 10*d.*, and 1*s.*	2*s.* 6*d.* to 3*s.* Scotland 2*s.* to 2*s.*, 6*d.*, England.	8½*d.* to 1*s.* 8*d*; average 1*s.* 1*d.* Working 16 hours & Sundays.	1*s.* 2*d.* to 1*s.* 8*d.*; average 1*s.* 4*d.* Labourers harder worked and worse off than in England.	1*s.* to 1*s.* 3*d.*; in Silesia 6*d.* to 10*d.*	9*d.* to 10*d.*	9*d.* to 10*d.*
Interest on mortgages	4 to 5 per cent	4 to 5 per cent	10 per cent.	10 per cent.	10 per cent., unless in state bank land loans.	10 per cent.	10 to 14 per cent.
And by banks	5 to 7 per cent.	4 and 6 per cent	10 per cent.	10 per cent	Few banking facilities on the Continent.		
Value of land per acre	£30 to £45	£50 to £100	£50 to £85	£40 to £60. Some small estates bringing more.	£40 to £60		
„ Tenant right	£10 to £15 in Ulster	None.	None.	None.	None.	None.	None.
Produce per acre of wheat in bushels.	26 average 38 to 40 in high farming	28 44 in high farming	21	14	17 Silesia, 10	15 to 16	12 to 14.

One average acre cultivated in England and Scotland produces treble the meat, grain, and green crops of one acre on the Continent, owing to the subdivision and the small holdings there.

A farm of 670 English, or 430 Irish acres, under a proper rotation of corps, gives £1,200 to £1,300 in wages in the east of England and Scotland, while the same extent in Ireland under grass gives only £50, to £60, making a difference of £1,150 to £1,250 paid in labour; hence the Irish have to emigrate, or remove to England or Scotland. If the grass farms were turned into tillage, double the meat would be fed, besides the raising large crops of grain and employing the people.

We are indebted to the *Scotsman*, of 12th February, 1869, for the Belgian statistics; also to Mr. Howard's report on "Continental Farming," which, with Mr. Read's, Mr. M'Lagan's, Caird's, Mr. M'Combie's and Mr. Samuelson's statements, letters, and pamphlets on Ireland, we recommend to our readers for a solution of the land question coming from practical men, most of them tenant farmers. Mr. M'Lagan, M. P., estimates the average rents of Ireland at 15*s.* per imperial, or 24*s.* 6*d.* per Irish acre, which are not half those of Belgium and England, and not one-third those of Scotland.—*Irish Farmers' Gazette, 25th Dec.*, 1869.

AGRICULTURAL STOCK.

PREPARATION OF CATTLE FOOD.

To the Editor of the Madras Mail.

SIR,—You republished in a back number of the *Mail* a letter of mine about chaff-cutters. I now send you an extract from the *Mark Lane Express*—attached to an advertisement sheet of stock feeding implements—for milling, grinding, pulping and steaming cattle food. The extract contains some useful information, and is written by an eminent agriculturist:—

"Now that it is known to absolute certainty that the root crop, however much, it may yet improve, will be very much under the average, a considerable amount of anxiety is beginning to be felt as to how the live stock are to be got through the winter in anything like profitable condition. Although extra care and attention will not increase the available supply of food that has been provided for use during the winter months, yet it is astonishing how much may be done in even the apparently small matter of permitting nothing to be wasted, and utilizing every substance capable of being used as food, such, for instance, as straw and inferior hay, which in ordinary years would be looked upon as fit for no other purpose than that of being converted into litter.

"For the prevention of loss by waste, for the better economy of valuable food, and for enabling the beasts to thoroughly assimilate their food, and extract all the nourishment it contains, the machinist has come to the aid of the farmer, and by so doing, has rendered agriculture a most important service. First, and probably most important of all, we have the chaff-cutter, worked by steam, by horse, or by hand. According to the size or necessity, the occupation required. It is scarcely necessary to say, that the chaff-cutter should be one of the indispensable requisites of every farm, not on any consideration to be done without, and used regularly at all seasons.

"In conjunction with the pulper they become eminently useful, as when roots are pulped they can be mixed up with chaffed hay or straw of even middling quality, and when permitted to undergo a kind of incipient fermentation by being mixed together for 24 hours or so, the mass becomes so sweetened as to become extremely palatable to all cattle, steers, feeding bullocks, and dairy stock alike thriving on it. Crushed oats, Indian corn, linseed meal, ground oil-cake, or any other substance in the shape of meal can be mixed with the chaff and pulp, either dry or boiled, and poured on it, so as to form a mucilage, in which state the whole mixture is still more relished by the animals, and being so well prepared, they can fill themselves quickly and spend the greater portion of their time in repose. Thus by the use of these machines, we have economy at the very outset, inasmuch as by their use we can utilise food of inferior quality by being enabled to mix it with other substances, which render it palatable, and which could not possibly be done without it being previously reduced to a state of communition. When the dry food used is of superior quality, the animals have all the advantage of it, and their progress is correspondingly quick. In spring and early summer, when Italian rye grass, tares, &c. are being given to stock, it is exceedingly desirable to mix such excessively green and succulent food with hay or straw to counteract the looseness engendered by their watery nature; the mixing can only be done in a way that the stock will eat both, by putting the whole through the chaff-cutters, as when attempted to be given long, however well they may be mixed, the green food will be picked carefully out, and the dry left behind. Excellent results follow this mode of preparing green food, and an increased number of heads can be kept by horse-feeding, and increased fertility imparted to the soil, by the large quantity of manure made. There is, to be sure, the first cost of the machine, wear and tear, and the expense of working to be deducted from the profit; this, however, bears no comparison whatever to the beneficial results to be derived from their use. One season's trial being sufficient to convince any one of their value, and the truth of this assertion."—Yours faithfully,

E. BODDAM.

2nd Feb. 1871.

CATTLE FODDER.

From Lieut-Colonel E. Boddam, on Special Duty, to the Secretary to the Chief Commissioner of Mysore, Bangalore, dated the 14th November 1870.

SOME time ago, in a conversation with the Chief Commissioner of the Province and in correspondence with district officers, I advocated the use of chaff cutters for working up and economizing the rough food given to the cattle here, and I wrote to England for a model of the simplest and cheapest chaff cutter. I would even suggest a further step in this direction.

The idea of breaking up their food for the beasts of the field has taken firm hold of agricultural practice in Europe. Chaff cutting, pulping, grinding hay, milling corn, prepared condiments for cattle food, &c., all seem to point to one direction—a more natural treatment in feeding domestic animals.

Oats given to a horse will often grow after passing through his stomach, and the rooks may be seen picking the corn out of the horse dung on the highway; when the dung of the hay-fed horse in summer has been dried and scattered, we find the shape and substance of split hay still remaining in it; part of this food therefore has filled the stomach, but has not been reduced from its original state for want of grinding. If we wish to see the importance of wet grinding, let us study the process a cow undergoes in chewing the cud. After the food of the cow has been soaked some time in the first stomach, it is subjected to the cud chewing process of her powerful jaws; when its remnants have been voided at last in form of manure, we see that trituration has been well performed;—grass, hay, straw, roots, &c., have been ground to pulp. Now if all the food of the cow could be reduced to pulp or powder by artificial means, the rough work of rumination would be less laborious.

The coarse stalks of plants, jungle grass, tough straw, and fibrous matter, which for months form the food of cattle here, if subject to the grinding or mealing process, might be mixed with aromatic seeds, salt, oil-cake, and condiments known as cattle food and form a wholesome and palatable food, instead of being trodden under foot as it is by the poor beasts, and only eaten when they are reduced by hunger to such a state that they are glad to eat whatever comes within their reach. With a more intelligent system of preparing cattle food, we should hear less of the looseness prevailing among the cattle in the rains, and of the constipation they undergo in the dry hot season. The meat-butchers would give us better beef and realize quicker returns.

SORGHO—AMERICAN FORAGE PLANT.

Extract from a letter from Lieutenant-Colonel E. Boddam, on Special Duty, Mysore Commission, to the Officiating Secy. to the Chief Commissioner of Mysore, dated 26th Dec. 1870.

ON my return from the country I found the sorgho had made very rapid growth in the preceding fortnight; it was 3½ to 4 feet high, and now in the 12th week of its growth, it is from 6 to 7 feet high and coming into flower; if I included the height of the flower stalk it would be 9 feet from the ground. The crop has quite an imposing appearance with its abundant rich foliage, full of saccharine matter, and it quite comes up to the description given of it by the Americans as a first rate forage plant. I gave a small quantity of it to my bullocks and they eat it greedily; have also cut a small quantity as specimen of dry forage and to see whether one or more cuttings can be got out of the plants as is done in America; but there the first crop is cut very much earlier than mine has been, and the lateness of the season is against it. I shall grow the remainder of the crop for seed.

* * * * * * *

The sorgho so far has answered admirably, and should be further experimented on. In the rainy season I have no doubt it will be still more luxuriant, but grown as it has been by me after the rains; it turns out a most heavy crop of the most fattening kind of green cattle food, when green grass is no longer abundant for fattening cattle; I should think it unequalled by any thing grown at present at Bangalore.

* * *

CATTLE DISEASE.

SIR,—In your issue of the 7th instant there is an interesting letter by Dr. Smith, of the 11th Hussars, respecting the prevention of pleuropneumonia in cattle, by inoculation. This was first generally advocated about the year 1853, when pleuropneumonia was very prevalent in England and in the neighbouring countries on the continent of Europe. I was at that time attending lectures upon the subject by Professor Symonds, of the Royal Veterinary College in London. He tried inoculation, and also watched its effects in great numbers of cattle upon which it had been tried by others. After a thorough investigation, he came to the conclusion that it did not, like inoculation for small-pox, generally secure immunity for ever afterwards, but that so long as the irritation in the tail lasted, an animal was very rarely attacked by pleuropneumonia. In this way great numbers of cattle were probably saved, because the disease, when sweeping over a district, frequently remains only a few weeks or months in any one locality.

Inoculation was performed by taking some lymph from the lungs of an animal which had lately died, and inserting it with a lancet into the tails of the other. It did not produce any form of pleuropneumonia, but a feverish state of system, which was often mistaken for a mild attack of that disease, though it was really caused by the irritation of a large sloughing sore in the place where the lymph had been introduced. Frequently, as Dr. Smith found at the Cape, the tail mortified and dropped off. About thirteen years ago I saw a great deal of pleuropneumonia, and quite agree with your correspondent that no medical treatment is of the slightest use. From 20 to 25 per cent. of the cattle attacked recovered, when warmly clothed and carefully nursed, and the extension of disease among the healthy ones

seemed to be almost entirely stopped by inserting large setons in their dewlaps, which no doubt acted as temporary preventives, much on the same principle as the introduction of lymph into the tails. Salt given daily in large quantities with the food also appeared to be beneficial.

If the disease which is now destroying cattle in several parts of India proves to be pleuropneumonia, I believe that by far the quickest and surest way to eradicate it would be to adopt measures similar to those which were so successful in England during the late cattle plague, *viz*,. drawing a line round the infected districts, allowing no cattle to pass out, and immediately killing and burying any that are attacked.

J. J. MEYRICK, V.S. R.A.,

Jhansie, 10th December 1870.

SEWAGE-GROWN GRASS.

APROPOS of the sewage question, the following extract from the *Lancet* is worthy of the consideration of all practical men interested in the matter: "Our attention has recently been directed to the occasional occurrence of disease of a fatal character among cattle pastured on sewage-irrigated land. These results are naturally attributed to the character of the pasture, which is erroneously supposed to have originated a new and special kind of disorder. The following may be taken as an illustration. The owner and occupier of some thirty or forty acres of land, irrigated by the sewage flowing from a town containing about 4,000 inhabitants, discovered, during the last three or four months, three bullocks and a cow dead in this property; and a bull which was kept in a shed, but fed on some Italian grass grown on the same land, was likewise attacked with a disease of which it rapidly died. The appearances discovered after death were those of blood effused on the brain, enlargement of the spleen, and inflammatory injection of the lining membrane of the stomach and intestines. Such is a concise but graphic account of a disease which has been well known in this country to veterinary surgeons for more than thirty years as splenic apoplexy—an anthracoid malady due to an excessive supply of stimulating food. It occurs most frequently on highly-manured lands, but often on poor soils; although the lias clays and red sandstone may be said to be its habitat. Water impregnated with organic matters will cause the disease; and for this reason animals cannot always be grazed with impunity on sewage-grown grass. Yet the herbage, if cut and given in moderate quantities, has not been found injurious. Although the principles of sewage irrigation may be perfectly sound and irrefragible in themselves, difficulties of detail involved in a new process of a complicated kind cannot be overcome at once. Almost everything depends on the system of irrigation pursued. The amount of sewage must be so proportioned to the crops, that the noxious elements in the former can all be taken up and transmuted into the tissues of the latter, otherwise the supply of manure will be too liberal, and the herbage will become what the shepherd terms 'stenchy,' and in this state, as can be readily imagined, the grass acts as a vegetable poison—most deadly always in the case of animals that are being fed for the butcher."

DEODORIZATION OF SEWAGE.

To those interested in the development of sewage farms in this country, a discovery just made by Messrs. Forbes and Price, for precipitating the fructifying matter in sewage in an inodorous condition, will be of some value. Mr. Forbes observed at a meeting of the British Association for the advancement of science, held at Liverpool on the 20th ultimo, that "while fully admitting the advantage of sewage irrigation applied to certain localities, he believed they would agree as to the importance of searching out for some chemical process by which the sewage might be at once deodorized to such an extent that the liquid could be run off into rivers or the sea without danger to health." This Mr. Forbes does by adding a solution of the mineral phosphates, especially those containing alumina, and milk of lime to the sewage, when the ammonia is precipitated in the shape of a double phosphate. "Mr. Forbes," the report proceeds to inform us, "illustrated the process with a bottle of Liverpool sewage, and the result was that in a few minutes the precipitate was seen falling to the bottom, leaving the water perfectly clear and free from smell. In fact, he contended that the sewage water so purified could be drunk without offence, and he caused some amusement by drinking a wineglass of the water clarified from the London sewage."

AGRICULTURE IN TRAVANCORE.

IT is curious to notice how little is known in a country so purely agricultural as Travancore of agriculture and the growing of crops. Little, if anything, is done to the soil in the way of manuring, and the unfortunate land has to go on producing crops, in many cases year after year, without any assistance save that of a few boatloads of "scrub" and leaves. We have repeatedly argued with ryots on the subject, and our arguments have in most cases been met by the remark, "I do as my father did, he made his paddy-field pay, and so do I." But surely this is a poor argument. We know how hard it is to bring a native to believe that any *change*,—that anything in fact that runs counter to his deeply-rooted ideas, which are often mere prejudices,—can be for his good. Yet, there can be no doubt that in the matter of agriculture many and great changes are seriously necessary. Travancore is making great advances in education and civilisation generally, many men who years ago would have ridiculed the idea of sending their sons to school to learn English, Greek, Latin, Euclid, &c., now are only too glad to acknowledge the benefit of education; why, then, should there be any difficulty in bringing the ryots to believe that after all they are making a mistake in adhering too strictly to the rules that have been their own because their father's guide in the matter of agriculture. That they are "cutting their own throats," to use a common expression, and that a future generation will suffer for their ignorance, we have no hesitation in stating. There can be no doubt that land becomes impoverished, by degrees of course, and consequently only perceptable to the experienced eye, by the "take-all-that-you-can-get-out-of-the-land" system which obtains in Travancore. The remedy is in the hands of the landowners. A few hundred rupees worth of English manure—guano, phosphates, and bones, are all excellent,—would suffice to give a large extent of land a good "top dressing;" of the result we have no doubt, the yield would be greatly increased, the quality of the grain improved, and the landowner, by a judicious application of the manure abovementioned, would be enabled to cultivate his land every year, instead of as is the case with some allowing it to lie fallow every second year. Good farming always pays the best. The best farmer is he who, while working cheaply, shows the best returns for his money. Labour is so plentiful, and consequently so cheap in the plains of Travancore, that we fear it will be many years before machinery will be introduced into the country generally. Still there can no be doubt that steam ploughs, pumps and mowing machines would be of inestimable value to the landowner and would also prove highly remunerative. With a good system of cultivation, and a supply of machinery—the latter, of course, would, at the outset, be expensive—a man might cultivate his land for a mere nothing, and it would produce double the crops it now does, aye, and more. It would be an excellent thing if agriculture were generally taught in our schools, and if the Sirkar were to start a model farm—certainly not out of place in the model state—in some central part of the country, where men could see with their own eyes the benefits derived from a good system, we feel sure that ere long most of the old prejudices now prevalent would be cast aside, and that with the assistance of the Sirkar, a thorough system of agriculture would soon be spread throughout the length and breadth of the country.—*Travancore Herald.*

POPPY CULTURE IN NORTH AMERICA.

IN order to supply the requirements of American pharmacy, the cultivation of the poppy has been commenced in various parts of North America. According to the *Journal Pharmacie d' Anvers*, Californian agriculturists have tried it upon a large scale, and as they have been assisted by the extensive experience of the Chinese, great numbers of whom are now settled in the state, the experiment has succeeded very well. There is much in this enterprise to tempt the farmer. It is well known that the poppy will grow in almost every kind of soil, and in nearly all climates, and that it needs very little skill for its cultivation. The amount of labour, too, required for collecting the opium is small. No process can be more simple than to split open the poppy-head when it is mature, and to extract from it the milky juice; this is rolled into ball by means of a spatula with as much ease as a dairymaid forms a roll of butter. Twenty-four hours afterwards the opium is ready for sale. The poppy is also cultivated in Louisiana. Last spring a farmer planted seven acres with it there, and he hopes to collect fifty pounds of opium per acre. This would be an excellent return; but much depends, as in the case of cotton, upon the rapidity with which the gathering is done. The *Journal of Applied Chemistry*, in a recent number, states that Mr. C. Wilson, of Monkton Vermont, sowed in the spring of 1868 rather more than six and a quarter acres with opium poppy seed. The yield from the gathered juice of the poppy-heads or capsules was 140 pounds, which, when dried, became marketable opium. For this the grower obtained prices ranging from eight to ten dollars per pound from druggists and physicians in New England. The opium furnished 6·25 per cent. of morphine. It is stated by Professor Proctor, that with greater care in obtaining the pure juice of the capsules, the opium might be made to yield 10 per cent. of morphia. The proportion of this alkaloid which the best Turkey opium is capable of affording varies from 9 to 14 per cent.—*South of India Observer.*

MODEL FARMING IN CEYLON.

DEAR SIR,—I am, with many others, interested in the development of the model farm, and every one who has the interest of this colony at heart must feel that such an undertaking is neces-

sary for the improvement and upkeep of the many valuable products of the island, which must and will deteriorate without the aid of proper culture—based on scientific principles.

We are all aware of the ill-effect of inbreeding, and with all species, be it man, beast, or vegetable creation, nature has ordained a fixed law of change, without which decay by some vital disease commences, until utter prostration or even extermination ensues. To arrest this, and to prove to the natives of Ceylon the benefits arising from high cultivation, I presume is the aim of the promulgators of the Alfred Model Farm.

It will no doubt take time to impress the value of the teaching on the minds of so apathetic and listless a race as the Cingalese generally, but with an institution at all times open to the public, the evidence of the startling results which must follow high cultivation will, I have no doubt, rouse agriculturalists to the value of precept based at it will be on positive proof.

The small yield of paddy land in Ceylon, and consequent small return, has roused the Government to the necessity of introducing foreign seed, and the results of this first experiment of Colombo seed has been variable, dependant on locality, climate or other causes, with which we are unacquainted, and many doubts have arisen as to whether the right seed has been imported or not. I know nothing of the merits or demerits of Carolina seed, but am convinced that whatever seed is introduced, that better results will be obtained by sowing a mixture of our present stock with any fresh importation, and by following up this until total reproduction follows by innoculation, for which nature has provided most amply.

The Cingalese have several sorts of paddy, viz. marvee, deveredil- huneraval, damahala elvee, tudduvee and others, all of which serve different purposes, and are grown at distinct seasons, and I feel that to induce them to cast aside their prejudices in favor of a new seed will be impossible, but a gradual improvement of the sort in use would be appreciated, while a total change would be repudiated as unserviceable for purposes to which their present supplies are devoted.

The same rule is applicable to the whole of the vegetable creation, and when nature in any degree falls short in the innoculative power, science comes to her aid—man has discovered the art of grafting and budding by which the virus or sap of strange families is imparted to the weaker ones invigorating them by degrees to perfection.

With regard to the live stock now in the island, I regard their *condition* as most lamentable; and it is to be hoped that ere many years have passed over our heads, we shall see the result of introducing new blood to this country. Immediate results cannot be expected, but by care and attention a gradual improvement must take place.

I have formed these conclusions after much thought, and if you consider them of any value you have my permission to make whatever use of them you please,—Yours truly,

BITA.

Central Provinces, 28th October, 1870

RICE.

THE use of rice as a breadstuff is probably coeval with the human race. Like that of the other cereals it extends beyond the reach of record. Under the name of *oruz* in Arabic, *oruza* in Greek, *oryza* in Latin, *riz* in French, *reis* in German, and *rice* in English,—it has been known to history for two or three thousand years, being mentioned by Theophmstus twenty-two hundred years ago, and by Horace, Pliny, and Celsus at a later date. Its native place is probably the steaming river bottoms of India, whence it travelled eastward and northward to China and Japan, and westward to Egypt and to us. When it reached Egypt we know not; early enough, however, as many think, to give rice to that singular exhortation of the royal preacher of Israel, twenty-eight hundred years ago, in which, alluding probably to the mode of sowing rice on the swollen surface of the Nile, he says, "Cast thy bread upon the (face of the) waters: for thou shalt find it after many days." Eccles. XI. 1. After being introduced into Italy from Greece, as we learn by the form of the name, and being domesticated for centuries in all the southern countries of Europe, it was carried, in the year 1895, to the then infant colony of Carolina; where it was soon cultivated to such extent, and brought to so high a degree of perfection, that the rice raised upon the southern seaboard of the American colonies, now the United States, has been ever since known in Europe as Carolina rice. As an article of food it surpasses in importance every other cereal in present use. Wheat may be more nutritious, rye more hardy, maize spread over a wider range of temperature—but rice feeds the greatest number of human mouths. Among the swarming millions of the tropics, and of China, it occupies the same place as wheat in the warmer parts of the temperate zone, and rye in the colder. It has been estimated that, if the human race were divided into families according to the predominent use of the several grains, the rice-eaters would occupy the first place in number; while wheat and maize would contend for the second, with a fair promise of victory to the maize; and the fourth place would be held by rye, oats, and barley. Indeed, besides being "the staff of life" in the most populous parts of the earth, it is now so extensively used among all the other grain-eaters of the race, that it is questionable whether a greater amount of it is not consumed as a breadstuff than of all the other cereals combined. *Its Characteristics.*—Among botanists it is known by its Latin name *oryza*, of the class Hexandria, and order Digynia. There is but one species, though there are many varieties; for the wild rice, so called, of the North American ponds and lakes, is not a rice, but a reed—not an *oryza*, but a *zizania*. Food chemists tells us that it contains "less of the nutritive principle than wheat." This, however, is in some measures compensated by the fact that of all the cereals it is the most compact—a merchantable bushel of maize, or Indian corn, being rated at 56 lbs. and wheat at 60 lbs., while rice, which rarely sells by bulk, and therefore has no established standard like the others, seldom weighs less than 65 lbs. to the bushel, and oftentimes more. Its compactness is shown also in its resistance to being crushed, having almost a gravel-like hardness: and also in the fact that skilful boiling will cause it to expand and double perhaps treble—its former bulk. But, however weighty in the scales, it is exceedingly light upon the stomach. In general wholesomeness, in delicacy of flavour, and in the variety of uses to which it is applicable, it is probably not surpassed by any other grain. To the strong stomach of the day labourer it is as well suited as the coarse bread of the Indian corn, rye, or oats; while for the delicate appetite of the invalid, or for the tender organs of the babe, it is a safe substitute for sago, arrowroot, tapioca, or cassava.—*Food Journal.*

SUNFLOWER OIL.

From Lieutenant E. Boddam, Honorary Secretary, Mysore Agri-Horticultural Society, to the Secretary to the Chief Commissioner of Mysore, dated 8th November 1870.

IN an article in the *Gardeners' Chronicle* of 8th October 1870, I observe there is mention of extensive cultivation of the sunflower in Russia and Germany. The most profit from this plant is gained from the seed, which contains 40 per cent. of a sweet oil, only second in value to olive oil. Russian husbandmen were the first who bestowed their attention on this useful oil. The German farmers have since taken up the cultivation.

The oil is not only used in house-keeping but as a lubricator for the delicate machinery of textile fabrics, which has increased throughout Europe the demand for the expensive olive oil. From the stalks of the plant the Russians manufacture a valuable potash and the residum is used for fattening cattle, made into oil cake. From the leaves manure is got. Sunflowers grow most readily in this climate.

AGRICULTURAL MACHINERY.

WE find the following letter in the *Gazette of India*:—

From T. C. Hope, Esq., Collector and President, Local Fund Committee, Surat, to the Revenue Commissioner, Northern Division, dated 11th October 1870.

I have the honour to report on the disposal of the machinery which was purchased by the Surat Local Fund Committee at the Broach Exhibition. It was in the first instance all sent to Bulsar, but eventually two or three articles were transferred to Soopa, as affording a better chance of disposal.

The churns worked well, and were at once bought by the Bulsar people,—an experience contrary to that recently reported by the Collector of Ahmedabad. The flour mill and chaff-cutter were also readily disposed of, and appear to have been very good of their kind.

The Crosshills' clod-crusher was tried at Bulsar before a large assemblage with two pairs of bullocks, and completely pulverised in one hour clods of the largest size which covered a field of ten "wussas" (or 12 goontas) in extent. Manual labour would have occupied two days, and cost Rs. 6 or 7 to produce the same result. The machine was at once bought by the patel of Waguldhura.

The threshing and dressing machine was similarly exhibited and approved of by the public, and was purchased by seven cultivators, who intend to use it jointly.

The sugar mill and portable steam engine to drive it could not be tried till the sugar-cane season at the close of 1869. It was then set up at Umulsar. Great difficulties were at first experienced in obtaining cane to crush, as the prejudices of the cultivators were very strong in opposition, and a very low rate was adopted. The result was that the juice was expressed at the rate of 36 maunds per hour, and altogether 564 maunds of juice were expressed and packed in 99 jars of the usual size. The sum received from the people for the work was Rs. 33, at 5 annas 4 pies per jar. It was evident that under special arrangements for fuel the work could be done cheaper, and that the juice would bear a much higher charge for expression. The juice itself also was remarkably clear, and of course obtained rapidly and simply, without the ruinous waste and delay which are inseparable from

the native process. The engine and mill, which I consider to be most complete and satisfactory in every respect, were sold for full price to a party of influential persons resident in the district.

The chain pump was during the first season let out to some cultivators in the Bulsar talooka for Rs. 250, and worked exceedingly well. In fact it is the best pump which has yet been seen in these parts. But the price is such as to place it beyond the reach of ordinary cultivators, and I regret that I have not yet got a purchaser for it.

The centrifugal pump is also still on hand. In 1869 it was attached for a short time to the steam engine of the sugar mill, and raised water well; but of course it could not be profitably worked by so large an engine. It was afterwards set up in the village of Moonsar, in Soopa, with the bullock gear belonging to it, but never could be got to work satisfactorily. Mr. Jones, the Municipal Engineer, was good enough to examine it, and reported as follows :—

"I found the pump fixed at a well, the depth of which was about 22 feet to the surface of the water.

"The pump and bullock power were fixed by the maistree in a very intelligent manner. I at once had two pairs of bullocks attached, and found that they could not get up the required speed to cause the water to flow. I then had the bullock power taken apart and examined, and found all correct. I again attached the third pair of bullocks, but with no effect, and again four pairs; then the speed was increased, and the water commenced flowing, but unsatisfactorily. I then had the bullocks taken away, and applied 40 men, when the proper speed was obtained, and the pump worked very satisfactorily, throwing a large quantity of water. I find that it requires horse-power 2·125 to work a centrifugal pump of the same diameter, which is 4" with a 22 feet, lift; in addition to which it requires two pair of bullocks to work the power independent of the pump. These pumps are very effective when driven by steam power. Although my experience with pumping machinery of every description is very great, I never saw an attempt made to work a pump of that class by bullock power from that depth. It may be done for a lift, say of 8 or 10 feet, and then not effectually, as the least loss of speed on the part of the bullocks, the water instantly would stop flowing. Any attempt to raise water above 10 feet with that pump and bullock power will prove a failure."

The pump must therefore await some purchaser who can apply steam power.

The fibre machine, I regret to say, has never worked at all. It was sent out from America in the first instance without plans and explanation as to how to set it up and use it. Afterwards, Mr. Ansell, of Bassein, and the American Consul, Mr. Kittredge, were so good as to give me some information; but it never could be successfully applied. Some parts appear to be wanting. The result is the more to be regretted as the aloe grows plentifully in Pardee talooka, and would thrive all along the coast. The waste of stems of plantain trees throughout the district is also enormous

The accompanying statement will show that as the account at present stands there has been only an expenditure of Rs. 671-9-3 finally incurred by the local funds, and that three machines only are on hand. Speaking generally, from these experiences and that of the Broach Exhibition, I should say that there is little chance of introducing English machinery until makers at home are content to charge prices not, as at present, out of all proportion to the intrinsic value of the article and the means of Indian purchasers. If the Ahmedabad College could comprise a department of agricultural implements and practical mechanism it might perhaps effect much good.

In conclusion, I have much pleasure in mentioning the interest taken in the whole subject by the then First Assistant (Mr. Mulock), by Azum Keshawlal Hiralal, mamlutdar of Bulsar, who sold most of the things, and by Azum Keshawlal Nuthoobhai, then acting mamlutdar of Soopa, who set up and worked the sugar mill and engine, and eventually found purchasers for it.

P. S.—It may not be out of place to append a report from Mr. Mulock, showing that Norton's tube wells, of which, I regret to say, four were purchased at a cost of Rs. 603, have proved a total failure.

From W. B. Mulock, Esq., Assistant Collector, to the Collector of Surat, dated 12th April 1870.

In reply to your No. 276, I have the honour to report that the first trial I made with the Norton tube wells was at Umulsar. I sunk the whole length of tubing, but failed to find water. This well was then drawn, and is now in the Soopa tannah. The second well I sunk at Chiklee, and in an hour and a half from the commencement of the driving of the tube, I had a flow of water for six or seven days. I had men continually working the pump, hoping the water would get clear and the working of the pump easier, but I found the water to the last was muddy, unfit for drinking, and the pumping was a matter of great difficulty. It was as much as a strong-bodied man could do to fill a common country earthen pot, and then it required fully five minutes hard pumping.

The pump portion of the well is most defective and weak. I found two of the pumps broke, bent, and cracked, from the strain required to keep up anything like a flow of water.

I am of opinion that wells such as Norton's will never be much used by the natives of this country; and I have been most disappointed in the results of my experiments. The exertion required to use them is too great, the water too muddy, and the supply too meagre.

The well might now be used by the Local Fund Department, to discover the depth of water and its quality before sinking a proposed well.

Memorandum by A. Rogers, Esq., Revenue Commissioner, N. D., dated 19th October 1870.

The Collector will oblige the Revenue Commissioner by stating the names of the manufacturers of the implements and the price of the latter in each case in pounds sterling. He presumes the value given in the statement is in rupees, and that 5 per cent. was taken off by the Committee of the Broach Exhibition.

Memorandum by W. Ramsay, Esq., First Assistant Collector and President, Local Fund Committee, in charge Surat, dated 5th November 1870.

The First Assistant Collector in charge has the honour to append a statement giving the particulars required. The value given in Mr. Hope's statement is in rupees. A discount of 5 per cent. was allowed by the Broach Exhibition Committee, as shown in column 2 of Mr. Hope's statement. There is no record of the value in pound sterling.

Accompaniment to Surat Collector's No. 930, of 5th November 1870.

Description of Implements.	Names of Makers.	Price in £ Sterling.
Patent double Cylinder Portable Steam Engine, 10 H. P., with spare fittings complete.	Clayton, Shuttleworth & Co.	370 0
Horizontal Sugar Mill, 16 in. by 24 in., rollers, 30 to 56½ in., with connecting gear to a steam engine and four spare pinions.	W. & A. McOnie & Co., Glasgow.	190 0
Threshing Machine F. 3, with a cap and poles suitable for four bullocks, fitted with a patent drum, and spare parts complete.		75 0
No. 3, Dressing Machine driven from Threshing Machine, or by hand separately, with spare parts complete.		20 0
Two Two-wheeled Carriages for removing the above from place to place.	Ransomes and Sims, Ipswich.	19 0
Flour and Dressing Machine, No. 2.		12 10
Crosshills' Clod-crusher, 5 ft. 6 in wide, with travelling wheel and pole for bullocks.		23 10
Chaff-cutting Machine		6 10
Atmospheric Churns..... ..	Clifton & Co.	2 8
Berney's Patent B. B. Centrifugal pump on carriage complete, with four bullocks driving gear.	S. Owens & Co., London.	118 0
200 Gallon Patent Chain Pump for 30 ft. lift. with driving and improved four bullock driving gear.		168 0
Tropical Fibre Machine, with rollers complete.	J. W. Quincey, New York.	105 0

Remarks.—The pound sterling given in the preceding column has been calculated at Rs. 10 a pound, the prices given in the printed Exhibition catalogue being in rupees.

The Foresters' Gazette.

CALCUTTA, 15TH FEBRUARY 1871.

FORESTS IN BENGAL.

THE report on the forest administration of Bengal gives us an insight into the great timber-wealth of the country. The estimated area of valuable forests on Government land in Assam alone is over 4,000 square miles,—the forests of the lower Dehing river by themselves cover 600 square miles, and contain "the

most excellent timber in Upper Assam"—possessing almost everywhere facilities for transport by water. The Government is not, however, so jealous of its treasures as might be supposed, for private companies cut down without hindrance or remonstrance such timber as they require, and they have the misfortune to require a great deal and the judgment to choose the finest. Thus the Upper Assam Tea Company have a saw-mill in active operation in the neighbourhood of Debrooghur, and the Dehing Saw-mill Company is working unrestrictedly the "exceptionally fine *poma* forests on the Sessanuddy." The Lieutenant-Governor of Bengal, therefore, while fully recognizing the value of these agencies for the supply of timber to meet all local wants, is of opinion "that it cannot be permitted that the system hitherto in force of uncontrolled use of the State forests by private companies should continue." The subject is certainly worth consideration.—*Pioneer.*

BENGAL STATE FORESTS.

In a recent issue the *Pioneer* drew attention to an opinion expressed by the Lieutenant-Governor of Bengal regarding the use of the timber growing in the State forests. His Honor's words are—"That it cannot be permitted that the system hitherto in force of uncontrolled use of the State forests by private companies should continue."

Government, no doubt, has the same right as private individuals to do what it pleases with its own property, and some sort of control over the use of the timber in its forests is necessary to prevent waste; at the same time, in determining the extent of the restrictions to be imposed on the cutting of timber in Assam or other north-eastern districts, it will be necessary to consider what claims the saw mill companies have, not legally, but morally, to its use. These companies have been called into operation, and derive their support from the tea planters of the province, so that were Government to prohibit entirely the use of these forests, the injury would fall not only on the proprietors of the mills, but on every planter who depends on them for the necessary supply of tea boxes. In the event of the mills being compelled to close, it would entail an additional expense on most plantations on account of wood cutters, sawyers, &c.; this of itself could hardly be regarded as a hardship, but we must bear in mind that not every owner of a tea garden possesses suitable wood on his grant for box-making purposes, and many would have either to depend on obtaining logs from their more fortunate neighbours, or importing at considerable expense what they required from Calcutta. People in taking up land for tea planting looked not so much to the quality and amount of timber on it as to its advantageous locality with regard to communications, &c., presuming, no doubt, at the time that as necessity for saw-mills arose, their introduction would follow as a natural consequence,—an exception which has been fully realised. In considering this matter, the Bengal Government will, doubtless, take into consideration what the tea planters have done for the province, and compare the Assam of the present day with what it was twenty years ago. Although the State derives no direct benefit from the produce of the gardens, indirectly the planters contribute a considerable quota to the general income of the country, while the requirements of factory coolies have greatly enhanced the land revenue of a province which few years back was comparatively an unproductive wilderness. It can hardly be supposed that this immense area (4,000 square miles) is to be preserved, unless it be that the idea of an Assam Valley Railway is again attracting attention, and that the authorities are anxious to provide a supply of timber for sleepers. Even then there need be no difficulty in granting reasonable facilities to the saw mills for supplying their wants, for the proportion of hard wood such as railway companies require, used in tea factories, is very small compared with soft timber that the planters cannot do without. There is quite sufficient in the State forests of Assam, we should imagine, for all parties. At the same time, it is evident that rules of some kind are necessary as much for the sake of the planters as the Government. If the estimate of the forests on the lower Dehing river is correct, some 600 square miles, there should be timber enough in them to supply all Assam with its increasing demand for tea-boxes for many years to come. The proprietors of the Dehing Saw Mills could hardly afford to sink such a large sum of money as would be requisite to purchase this tract at the upset price at which waste lands are sold; but if they were restricted to the use of the soft wood trees, and compelled to plant yearly a certain number of saplings or seeds, such an arrangement would satisfy, we suppose, both Government and themselves. With reference to the harder kinds of wood made use of on tea plantations, it is solely wanted for building purposes, and not in such large quantities as to threaten the destruction of the forests; but if this description of timber is to be preserved for some ulterior object, the authorities can easily control its local use, by ruling that all parties in want of it should submit a list of their requirements to either the Conservator of Forests or the Commissioner of the district. To this there can be no reasonable objection. The demand for hard wood will decrease as the increasing prosperity of the tea-planters enables them to construct masonry buildings in place of *kutcha* ones.—*Englishman.*

INDIA RUBBER TREES.

In connection with an interesting report from Mr. [illegible] sistant Conservator, for working and preserving all India forests in the province, the Government of India proposed that the India rubber tree should be declared a reserved tree on all Government lands, if this could be done under the present state of the law; and also that restrictions should be placed upon the sale of the raw produce in the vicinity of the forests. In anticipation of an amendment of the law, and with a view to carrying out the wishes of the Government of India, a set of rules for the management of these forests has been drawn up by the Commissioner of Assam and the Conservator in consultation, and has been submitted to the Government of India for approval.

Mr. Mann in his report had laid particular stress on the alleged wholesale destruction of India rubber trees in Durrung. Special inquiry was made on this point, the result of which was to establish that Mr. Mann's statements in regard to it were exaggerated.

While the above questions respecting India rubber forests in Assam were under consideration, the attention of Government was also drawn to the India rubber forests in Cachar, in connection with a suggestion made by the Board of Revenue that the Deputy Commissioner of the district should be authorized to grant leases of the produce of those forests for one year, the Forest Department being meanwhile called upon to make arrangements for taking early possession of the forests.

The proposition of the Board was not agreed to by Government as it was thought that it would expose the trees to indiscriminate injury. A settlement of the question in the manner suggested by the Government of India in respect to the Assam forests was preferred, and to this end the Conservator was requested to report after his intended visit to the Dacca division, on the final arrangements which should be made for the protection and utilization of the forests in Cachar.

The Political Agent at Munipore having complained that the Deputy Commissioner of Cachar had prohibited the importation of India rubber from Munipore into Cachar on the strength of an order from the Board of Revenue, an inquiry was made, which showed that no order had ever been issued by the Board on the subject. Further inquiries were being made at the close of the year with a view to ascertain under what circumstances the orders of the local authorities complained of were issued.—*Examiner.*

PALMS IN TINNEVELLY.

The palmyra forests of Tinnevelly form a distinctive feature in the scenery of the province. No traveller has ever yet visited this part of the country without expressing surprise at the long lank lean trees, starting out of the red sand soil; or without having his ideas of "forests of palms" very decidedly corrected. And yet uninteresting and unromantic looking as is the palmyra, there is no tree in the Indian forest so thoroughly useful to man. Its young root is as edible and nutritious as a carrot; from its leaves are manufactured mats, fans, beautiful basket-work of every description, sandals, hats, umbrellas, sieves, thatch, water buckets, and the most lasting paper used by the natives. The juice is a pleasant nutritious drink; and from it is produced an excellent sugar, and superior sugar candy. The fruit when roasted is a wholesome food, and the pulp is in hot weather a most grateful refreshment. From the fibre of the leaf stalk is manufactured an excellent cordage; the timber of the trunk supplies the natives with a durable wood for building purposes, the refuse of the leaves is their ordinary firing, and the huge root of the old tree, when covered with a sheep-skin, forms an excellent *drum!* Thousands of people subsist on the produce of this unsightly palm; a considerable portion of the revenue of the province is derived from the tax upon it, and no small portion of the time and the patience of the magistrates is wasted upon the quarrels and disputes of which it is a most fruitful source.

There are about five millions of palmyras bearing tax, and the sum thus realised by Government grants is one lac and a half a rupee, or about one rupee per thirty trees. Proprietorship in palmyras consists of four classes, viz.,—1. The ryot who is owner of the trees and the land upon which they grow. 2. The palmyra-climber who holds a puttah for tree-growing on the land of another. 3. The climber who holds a puttah for trees growing on land belonging to Government, lying waste, but capable of being cultivated; and 4. Climbers who hold puttahs for trees on land belonging to Government, but which cannot be cultivated, such as road-sides, &c. From this diverse proprietorship, from the manner in which the tax is assessed, oftentime being in excess of the land tax, and from the practice of inspecting and assessing the tax *once* in three years, the proprietors are subjected to considerable inconvenience, and the Collector and his assistants to very much labour. The present Collector is desirous to remove all incumbrances, and he has accordingly drawn up a plan which meets not only his own ideas of what is needed, but which the people hail as a most decided boon. The proposed plan consists in taking the present assessment of the proprietors as the true one, and adding to it a very small sum on account of seedlings; these two sums together constitute the tax upon palmyras for *thirty years*, that being the period fixed by Government for the periodical settlement of revenue; the pro-

prietor having it in his power, if he pleases, to redeem the trees by twenty years' purchase money. In the proposed plan the rights of the various classes of proprietors are carefully provided for, and that part of it which prevents the proprietor of trees, which grow upon the land of another, from planting or cutting down, is fair and judicious, and will knock many a litigious scamp on the head. We may add for the information of some of our readers that the palmyra is of two sorts,—the male which yields juice *only*, and the female which yields *juice* and *fruit*, and for doing which generous act it is taxed exactly double the amount levied on the male champions of woman's rights to the rescue!—*Madras Paper.*

Official Gazette.

CALCUTTA, 15TH FEBRUARY 1871.

THE BOMBAY COTTON CROP.

GUZERAT.—The last return received from Major Moore describes the state of the cotton crop in the Collectorates of Guzerat and in part of Kattywar, during the week ending the 1st instant. The weather experienced generally throughout the districts was cloudy and showery, but the cotton crop suffered no damage therefrom in the Collectorates, except to a slight extent in the districts of Surat and Broach. In Ahmedabad, Sanund, and Dholka, the state of the crop is reported as favourable on the above date. The new crop of *laria* and *jaria* cotton was yielding gradually. With regard to the crop in Surat and Broach Major Moore remarks as follows :—

"SURAT.—The ryots still continue to say that, under present conditions, no more than three-fourths of an average crop will be realized. It is true a slight blight has made its appearance in some places, causing some of the flowers and pods to fall, but this seems to be a yearly occurrence. It appears that all premature pods have been more or less attacked by caterpillars. Strange to say, but still true, this pest attacked the cotton pods on the different soils as follows:—1st, the red, clayey soil; 2nd, bessur or mixed soil; 3rd, black soil; and 4th, the gorat or brown soil—in fact, the last-named is as yet quite free from it. Since the last three days cold weather has set in, and the ryots think the previous rain will not much affect the crop. The plants are in good condition.

"BROACH.—The cotton crops have perfected pods from 70 to 80 per cent. The rain that fell in showers from the night of the 27th to the 29th December, and the cloudy weather that prevailed, have damaged the crop slightly, the flowers and pods of some of the plants having fallen off. The first picking will be finished at the end of the current month."

In the eastern division of Kattywar at the date of the last advices (December 27) the crop was estimated at eleven annas in the rupee, or one anna less than last reported. On account of the cloudy weather the flowers still continued to fall off. In some of the villages in Rajkote and Gondul, the first picking had commenced. In the former district the crop was estimated at fourteen annas, and in the latter at ten annas in the rupee; while in the district of Limree it is stated that ten and a half annas will probably be realized. For the district of Broach a later report has been submitted by Mr. Stormont, who writes under date the 10th of January as follows :—

"Although the crop in the early part of this district is fast approaching to its harvest, it is now apparent that general picking will be a fortnight later than was calculated upon at the beginning of the season.

"The crop, then, as regards the time of its ripening, has been slightly deceptive, but it is highly satisfactory to find at the eleventh hour that with respect to quality and quantity, the expectations of those who judged from experience will be fully realized.

"The boll-worm luckily has not done anything like the amount of damage which was talked of a few weeks ago, and from this alone we might rest assured that the earlier exports will be much freer from stain this season than was the case last.

"Certainly much was to be feared from the mixing of our first pickings of kappas with the remnant of last year's crop, which had become dirty and discoloured from storing; but to the credit of our ginners, they have managed to prevail on merchants to have this old stuff cleaned separately. Some of the factories are now engaged in this, and it is to be hoped they will go on until the whole accumulation is cleared out.

"Connected with the experimental crops there is nothing particularly worthy of notice since the date of last report.

"The picked-seed experiment, or as it may be called the *Hallet system* applied to cotton, is on the whole rather promising. The produce of this selected seed is all of fair quality; much of it is really good. At the same time it must be granted that some of the ryots' crops are quite equal to the latter.

"When passing through this district a few days ago, His Excellency the Governor was pleased to inform me of a circumstance connected with this system, of which I was not previously aware, namely, that it was not before the eleventh successive selection that Mr. Hallet considered his experiment complete, and gave out the seed to general growers, the wheat having only then developed into a distinct and superior variety. We cannot therefore expect to be able to see any decided difference until it has gone through several seasons. The small field of last years' indigenous is doing remarkably well; a fair yield has already been gathered from it, and a good deal more will follow. Of course it remains to be seen whether the cotton will be approved of when submitted for opinion."

From information just received it would appear that the heavy rain which fell on the 15th and 16th in Bombay and over a large part of the Deccan, did not generally extend to Guzerat, although in some of the districts south of the Myhee the weather was cloudy, and a few light showers fell on those days.

KHANDEISH.—The rain reached Khandeish, however, and Mr. Wilkinson thus reports upon it (January 16) :—

"I regret to inform you that heavy rain commenced falling since yesterday, and still continues with no apparent prospect of a break. Fortunately little cotton remains unpicked; for such as is still in the fields can hardly escape destruction. At the same time, though much of the cotton is well housed, much is left exposed in the ginning yards, or on the roofs of houses; in the latter case, usually for want of space to store it under cover. To such cotton much injury must result.

"The rubbee crop will, it is to be feared, also suffer.

"I trust this rain may not extend to other districts, where the crop is more backward and as yet unpicked; but it has every appearance of being general."

SIND.—Since the publication of the last weekly notice, the following reports of 2nd and 9th January have been received from Mr. Strachan for the district of Halla, in the Hydrabad Collectorate :—

"January 2.—I have this time little of a pleasing nature to say about the cotton plants in this district. Twice during the week we have had the temperature as low as 29, or three degrees below freezing point. It is perhaps needless to add that any late sown field, or green cotton plant which happened to be in a flourishing state is done for for this year. I believe the only exception is our field of Broach plants. These we have kept safe by giving them a copious watering last week, a proceeding I had some faith in from what I observed at Landi about this time last year. There is nothing else damaged.

"Cotton has been moving towards Kotree faster during the past seven days than it has done during any previous period of the present season. I hear of no sales further than a few seers exchanged in the bazaar for flour and ghee. The bazaar rate in Halla at present is Rs. 14 per maund of 80 lbs.

"The area under cotton in the Hydrabad talooka is nearly 6,534 acres, which will probably give about 13,000 maunds of clean staple. A considerable portion of this will, however, be required to supply native weavers, as there is still a good demand for their work among the middle class Mussulmans. The turban is the only part of a Sind cultivator's dress which is made in Europe, and even some of the Bunyas prefer cloth of their own making to that imported from England.

"January 9.—There is but little left to be said about the cotton fields here. In the majority of cases, the main picking was finished several weeks ago, and the cold will now bring the picking of late fields to a rapid conclusion. For at least 16 miles on either side of Halla, there is no field of green cotton plants, with the exception of some plots on the experimental farm, presently to be treated on. Since last week I see people picking what few pods are yet to be got on their fields, and turning the cattle on to feed among the plants.

"The Sind native plants on the experimental farm, which looked so well a fortnight ago, have not a single green leaf to-day. The leaves of the Broach native are also slightly hurt, and its bolls considerably more so. Hinganghaut is much damaged. Egyptian is also considerably scorched. The few plants of Sea Island which are still alive do not seem to have sustained any injury as yet. Peruvian is quite fresh. American is finished for this season. Bourbon has suffered considerably more than either Egyptian, Sea Island, or Peruvian. These latter seem to be the hardiest of exotics, so far as the effect of cold on them is concerned.

"The cold weather seems to agree well with the tobacco. It is progressing well, and will yield some very large leaves. Wheat is not making rapid progress; the cold appears to retard it a good deal.

"I do not think that cotton is going any faster down to Kotree by land this week than it did during the previous one; but I believe a good many boats laden with cotton are moving down the river. The price here is unaltered since the date of my last report."

S. J. HARRISON,
For Cotton Commissioner.

Bombay, 19th January 1871.

Planters' Gazette.

CALCUTTA, 15TH FEBRUARY 1871.

THE ESTATES.

THE news of the month from "The Estates" is the unpleasant intelligence of a new raid upon the south-east frontier by the tribes inhabiting the hills.

"The tea planters," says a contemporary, "clear forests on the Cachar frontier and plant tea under promise of protection from the civil authorities, who, as the district is well within the theoretical frontier, consider themselves amply justified in promising it. But the Looshais look upon this forest as their old hereditary hunting ground, in which they are free to roam and track the elephant for his ivory, and the deer for sport and food. In fact, their inroad is the old well-known protest of savagedom against the encroachment of civilization."

A correspondent of the *Pioneer* pronounces the season too late for any considerable expedition to be undertaken. "When once the rains begin, and in 1869 they began in March, an advance would be utterly impracticable. The forest is like the frontispiece to Lindley's *Vegetable Kingdom* with the addition of an undergrowth, which no elephant could break through. November is the proper time to commence military operations, and then only after a careful preparation of appliances, especially in the way of tents, medical stores, and carriage for the sick. Besides the infinite difficulty of their country, the Looshais are not, in a military point of view, a despicable enemy. They are courageous and possess fire-arms. But while evidently persuaded of the necessity of a Looshai campaign, and counselling a thorough preparation for it, the correspondent betrays his conviction that the Looshais, from their own stand-point, are not without some justification of their present raids."

Toulmin, on the other hand, complains that "the Government has endeavoured for years past to make friends with these fiends but all to no purpose, so that now the only plan that remains open is to exterminate them, else the unwarlike coolies will fly back to Calcutta from fear, and leave the tea gardens to lapse into jungle again, and all the European life and money that has already been expended in Cachar will go for nothing."

THE RAID IN CACHAR.

(The Indian Daily Examiner.)

IN 1861 Major Graham estimated the numbers of the Looshai tribes at 12,400 Howlongs, 10,800 Syloos, and 2,580 Rutton Poeas. But there is another tribe who have been mentioned in connection with the recent raids who are more powerful than any of these. There is the Shindoo tribe, whose *locale* is Burma north of Akyab, and who have been notorious as raiders into the latter district and Chittagong. The Shindoos have always been considered powerful, and are much feared by the other tribes. They extend within the nominal British boundary and for a great distance beyond it, but beyond that little is known of them, except that they are independent as regards the Burma King and the other tribes. The impression is that in the recent raids there have been implicated not only Howlongs, but also Syloos and Shindoos. These marauders are now making the best of their way back to their own wild haunts laden with plunder and bearing off many captives; for though but few tea factories may have suffered, we may rest assured our native subjects on the frontier have not escaped so lightly. The country of the Looshai chief, Sookpilal, who is now considered to be friendly, is due east of the Dacca division and of Hill Tipperah. It is within our nominal frontier and conterminous with it. Immediately to its south, but still north of the east and west ridge of hills which separates Cachar from Hill Chittagong, is the country of the Syloos, which probably extends far eastward of the frontier. South of the Syloos, and both within and without the British limits, are the tracts of the Howlongs, lying east of and adjoining those of the Rutton Poeas in Hill Chittagong; and south of the Howlong tracts, and stretching past the Blue Mountain, lie the tracts of the Shindoos, reaching to the Koladyne and Upper Akyab. If these tribes are to be hunted up and punished, it is evident that a double expedition will be required—one starting from Cachar or from Hill Tipperah and scouring southwards to the central ridge of hills; another moving in a north-easterly direction from Chittagong to the haunts of the Howlongs and Shindoos. Indeed, to do the work as completely as it is desirable it should be done, a third force from British Burma should, if possible, operate in the neighbourhood of the upper waters of the Koladyne river.

(The Dacca News.)

THE position of our tea planters on the outskirts of the Hylakandy Valley has always been regarded as unsafe. Frequent representations have been made that every border garden should be supplied with arms and ammunition and in some cases with men to use them, but remonstrance and argument have failed to effect. Government could not be convinced that our pet tributaries, for whose superior civilization in the future we are supposed to be in a manner pledged, are beings whose minds are blank to everything like appreciation of truth and honesty. Now to the planter, who has imbibed a contempt for everything and everybody falling short of his standard of civilization, a Looshai attack, however formidable, would present itself as quite capable of successful assistance were timely provision made to meet it. With efficient fire-arms, and perhaps the assistance of a compatriot or two, he would, in a majority of cases, rather enjoy the excitement of beating off the foe, and would regard with confidence his ability to do so, but to the wretched, helpless coolie, the weak emaciated hospital habitat, whose hardest work for many weeks has been the deglutition of invalid fare, a garden invasion by a tribe he dreads and hates is a different affair altogether. Paralyzed by fear, he is simply an impediment to all who have the courage or the will to protect themselves. His terror becomes infectious, and, inoculated with his abject cowardice, such of his companions as might be induced to make a show of defending themselves sink into a torpid state of alarm out of which there is no rousing them. They have not even the comfort of numbers to give them confidence. Parties of twos and threes fly for dear life to the nearest tope for shelter, and where the friendly refuge of jungle is impracticable, they hang about the out-offices and manufactories, and by their shrieks and prayers distract the attention of those who might by a judicious combination of forces prove their best protection. Government might reasonably be expected to obviate such scenes by affording adequate protection to the exposed gardens, as well to the coolie as the planter, and we can clearly see that unless both *are* protected, one of our chief centres of industry must be abandoned to lapse into jungle.

Mr. D. H. MACFARLANE, in a letter to the *Friend of India*, charges the local Government with having neglected certain warnings addressed to it of the impending raid.

(To the Editor of the Friend of India.)

SIR,—In your notice of the Looshai raid in your issue of last week there is an extract from a letter published by me, the irony of which you acknowledge while denying its justice. I am not the author of the ironical passage, and do not propose to discuss it, but, with your kind permission, I will make a few remarks upon the portion of your article immediately following. It says: "Why did not the planters complain earlier if they foresaw what was coming"? The answer is, that they did do so. In November 1869, and on the 11th of the same month, my firm, in reply to an appeal for protection, received from the Government of Bengal a letter, in which the following passages occur. A copy of this reply was the only answer given to the Landholders' Association when they made a similar representation:—

"I am directed to state that the Lieutenant Governor does not clearly understand the ground upon which the panic apparently existing in your tea gardens in Cachar as to an anticipated raid from the Looshais is based. * * His Honour does not suppose that your manager or his labourers can have any direct communication with the Looshai country, and he should doubt whether they have any more reliable means of ascertaining the intentions of the Looshais than the local officers, who do not see any ground for sharing the manager's apprehensions. * * If anything is likely to bring down an attack, it is, in the opinion of the Lieutenant Governor, the panic of those who might be expected to show an example of courage and self-reliance to the people under them. * * The Deputy Commissioner will no doubt supply a *guard of armed police at the cost of the gardens on application.*"

It is a pity that irony should be imported into a question involving valuable lives and property, but there is plenty of it in the above extracts. Recommending an example of self-reliance to an isolated European, at the head of three or four hundred Bengalee men, women and children, surrounded by impenetrable jungle, and exposed to sudden attack, perhaps at night, from merciless savages, is indeed bitter irony, and has been felt as such.

I am able to state that while the Government of Bengal was denying that any cause for alarm existed, and snubbing those who asked for protection, it was making representations to the Supreme Government urging the necessity for punishment, as a preliminary to conciliation, and expressing its opinion that no security could be looked for until an example had been made. The answer of the Government of India was that it objected to

primitive measures upon principle and the result is, that a district which is being converted from a wilderness into a valuable province is overrun by hordes of savages. I am informed, and I ask to be contradicted if my information is incorrect, that the starting of this very body of raiders was communicated to Government, by the officials at Chittagong, and that no precautions were adopted in consequence. I am unable to agree with you that the Government of India has been trying a "policy of conciliation upon sound principles" while that policy has preceded an exhibition of strength. It must be borne in mind that this is not the first attack, and that no punishment has ever been inflicted, but that the expedition organised for the purpose returned baffled. I note with satisfaction that you consider "it has become an important question, however, whether Government is justified in leaving the tea gardens at the mercy of these savage tribes." This is hopeful, for, apparently, the justice of so leaving them has hitherto had your approval. I ask the favour of your publishing this, as my name appears in your article and I am much interested in the future of this question,—Your obedient servant,

3rd February. D. H. MACFARLANE.

(*Friend of India, February* 8.)

THE latest news of the raid is more alarming than the first telegrams of the outbreak led one to suspect. The almost simultaneous attack at three different places, in Cachar and Sylhet,—Tipperah, Chittagong and Munipore, shows that the raid was planned and organised with more skill than the wild tribes have hitherto had credit for. Their subsequent determination and partial success in fighting their way along the Dullasur and up the Sonai streams, and the attack on the Monairkhal stockade, prove that the mere love of plunder, and the wish to procure skulls which characterised their former raids, has been supplemented by some stronger impulse. What this is—whether some offence real or supposed—time may tell. It is now supposed that the tribes concerned in the affray are Hoolongs and Syloos who reside far south of Cachar on the Chittagong Hill tracts. If so, they must either have cut their way with some of the tribes with whom Mr. Edgar is now said to be on good terms through the intermediate tribes of Kookies, or have obtained the promise of a safe passage through their territory. From many causes it is difficult to say how far the tribes who profess friendship to our Government are interested in the raid. It is not unlikely that the savages offended at our encroachment on what they suppose to be their lands, and encouraged and emboldened by conciliation may, unless sharp measures are adopted, yet make common cause against our rule. Such a thing has occurred and may be repeated. In fact, what is needed at present is a sharp retaliation as the basis of future negotiations, which we trust will not be abandoned.

CINCHONA.

[*Resolution of the Government of India, 2nd Feb.* 1871.]

EVER since the introduction of the cultivation of the cinchona plant in this country, the Government of India has watched with the deepest interest the progress of the experiment, feeling convinced that its success would be fraught with the most beneficial results to the whole population of India. The advantages to be derived from the successful cultivation of cinchona cannot be over-estimated, as the object is to secure to the country at large the greatest medical boon that could be afforded to it,—that is, to place within the reach of the masses of the people, at the lowest possible rates, the only effective specific that science has yet discovered for the commonest of Indian diseases.

That the cinchona plant, C. succirubra, at any rate, can be grown to any extent in British Sikhim has now been indisputably established by the results that have already been achieved at the Government plantations. And the Governor General in Council fully believes that at little present cost, and with a certainty of considerable future revenue, forests of cinchona may be reared in Sikhim which, by furnishing large quantities of quinine, may hereafter prove a blessing not only to India, but to the civilized world.

Already the Government plantations in Sikhim yield a considerable supply of excellent bark, and year by year a rapid increase in this supply may be looked for; the Governor General in Council, therefore, thinks that the time has come for a preliminary decision as to how this supply can best be utilized. This view of the case is confirmed by a very interesting report submitted by Mr. Clarke in regard to the experimental manufacture of amorphous quinine at Darjeeling. His Excellency in Council is of opinion that the best mode of settling the many doubtful points connected with this important question is the appointment of a commission to enquire into and report on the whole subject; and in communication with His Excellency the Governor of Madras and His Honour the Lieutenant Governor of Bengal, he is pleased to nominate the gentlemen named in the margin to form the proposed Commission.

Dr. Campbell Brown *President.*
Mr. Clarke, Dr. Simson, Mr. Broughton, } *Members.*

His Excellency in Council is well aware that any conclusions that may now be arrived at will doubtless need considerable modifications, when a larger experience affords better data than at present exist. He is at the same time of opinion that it is essential to adopt without delay some regular system, the best that can be devised in the existing state of our knowledge, for dealing with the yearly increasing produce of the cinchona plantations.

The Commission will have to consider, among other matters, whether on general as well as economical grounds, it would be best—

(1) To send home the whole of the bark which bears a marketable value; or

(2) To extract by a single process all soluble matter from the bark, and send home the gross proceeds of the first precipitation; or

(3) To proceed further with the manufacture in India; and, if so, how much further; whether (a) only so far as is necessary to separate the several alkaloids from the resin, coloring matter, and other foreign elements which the first precipitate will contain; or (b) as far as the manufacture of the pure sulphate of quinine.

Should the Commission recommend the second or third alternative, they will have to consider what processes will, under all the circumstances of the case, be most likely to prove appropriate.

A certain percentage of the total yearly yield of bark will, owing to its extreme poverty in alkaloids, always be unfit for the home market; and it will be for the Commission to decide how this bark may be most profitably dealt with here.

It is also believed that a valuable febrifuge can be readily extracted from the leaf of *some* species of the cinchona; and this point also, as well as many other kindred questions which will suggest themselves as the enquiry proceeds, will appropriately form subjects for the consideration of the Commission, whose sittings should be in the first instance in Calcutta, but who may later, if it be considered desirable, be deputed to visit the plantations themselves.

The Commission will carry on their enquiries under the orders of the Lieutenant Governor of Bengal, and will submit their final report to that authority.

Ordered, that a copy of this resolution be forwarded to the Government of Bengal for information and guidance.

CINCHONA IN MYSORE.

MR. BROUGHTON, the Government Quinologist, has sent the following interesting report on the cinchona plantation of the Bababuden Hills to the Secretary to the Mysore Government. We may remark that a plantation was also formed in 1867 on the Bilgirirangana Hills, which are connected with the chain of the Neilgherry Hills and belong to the jagirdar of Yelandur, the descendant of the famous Devan Purnaiya. In 1868-69, there were 1,380 trees in the plantation, and the number now is 2,388. They are reported to be thriving very well. The permanent establishment, consisting of an overseer and two coolies, only costs Rs. 48 per mensem, half of which is defrayed by the jagirdar:—

"In consequence of the orders passed in Proceedings of Madras Government, Revenue Department, in August, September and October last, I have the honour to state that I visited the cinchona plantations of the Bababuden Hills on the 4th and 5th November, and have the honour to report concerning them as follows:—

The plantations are situated in the side of a ravine in the hills at a height of about 4,500 feet on timber land. The only kind cultivated is *cinchona succirubra* or that which produces the red bark of commerce. The more valuable, but less hardy species of *c. calisaya*, and *c. officinalis*, have also been tried, but the few wretched, stunted specimens of these clearly shew that it would be useless to attempt their cultivation on the site.

The soil consists of a thin layer of vegetable mould of a few inches in depth, covering a red and very rocky subsoil. The fragments of rock are frequently of large size.*

The whole of the natural jungle of the upper Bababudens contains the same species of trees as the Neilgherries; but they are far less luxuriant and more stunted in size than on the latter range. The nature of the vegetation on the Bababudens appears to me to indicate a climate which is found on the other mountain ranges of South India, at an elevation of a thousand feet higher. I regret that there exist no thermometric registers by which this circumstance can be investigated. It is, however, well known that many other circumstances besides mere elevation determine the climate of a mountain range.

The amount of rainfall on the site of the plantations is also not known. But indications abound that it is much less than occurs in the Ecuador ranges, noted by Spruce, and also less than that of the Neilgherry plantations. Even at the time of my visit, many of the water courses were dry; and they were fewer in number than is the case in those ranges in South India

* In 1867 through the kindness of a friend I had an opportunity of examining both soil and subsoil chemically. I then stated my conviction that they were less suited to the growth of cinchona than those of the Neilgherries.

more exposed to the influence of the monsoons, and where the trees of red bark are known to flourish.

The result of the cultivation of cinchona is of course best seen by the state of the oldest trees. About 30 acres of the land allotted to the experiment are now planted with about 30,000 plants. Of these, 5,000 are four years' old. The latter appear perfectly healthy, but are certainly less vigorous and of smaller size than trees of the same age which I have seen on the Neilgherries, and also in Wynaad, and the Sheveroys. Also from specimens of bark which have been sent me, I am convinced the trees of the Bababuden Hills are inferior in size to those grown at Poermade in Travancore, the Pulney Hills, Coorg, and at Darjeeling in the Himalâyas. The want of vigour is shewn in the size of the leaves, which are smaller than ordinary is the case.

I made measurements of the dimensions of these trees. The mean height was 8 feet 1 inch. The mean girth 65 inches. The mean height and girth of trees on the Neddiwuttum plantations on the Neilgherries, are 9 feet 7 inches, and 9·7 inches respectively.

I carefully examined the appearance of the bark yielded by these trees. It is a good deal varied as is usual with plantations of red bark. But at least a third of the trees had bark which would not be considered as of promising appearance in the English market. There would, however, be no difficulty in procuring specimens of bark of capital appearance. The bark was thinner than is usual with vigorous trees of four years' old. I carefully weighed the amount of dry bark yielded by six trees, selected in order to get a true mean. Of branch bark I obtained 22 grammes. Of trunk bark 100 grammes per tree. The *mean* yield of a tree of similar age grown on the Neilgherrry plantations is 321 grammes of branch and 326 of trunk bark. In both cases the trees are grown at the same distance apart on the land.

I have in the above compared the yield of the trees with similar ones on the Neilgherry plantations. But a comparison with trees of *c. succirubra*, grown in many other parts of South India would, I think, yield very similar results.

I submitted the above mentioned specimens of trunk and branch bark to analysis. The following table gives the results expressed in per centages of dry bark :—

	Trunk bark.	Branch bark.
Total alkaloids	4·50	1·48
Quinine	0·86	0·42
Cinchonidine and cinchonine	3 64	1·06
Quinine sulphate obtained crystalized ...	0·67	0·30
Chinchodine ditto ditto ...	2·35	0·60

Other determinations were made in addition to the above. The trunk bark of good appearance from a single tree gave me 3·43 per cent. of total alkaloids. An analysis of the mixed bark of three trees collected early in October yielded 4·16 per cent. of total alkaloids. But the above statement may be fairly taken to express the mean yield at a time of the year favorable to the occurrence of alkaloids in the bark. The above analysis shew that, as a source of alkaloids, the bark of the Bababuden plantations is of satisfactory quality. It is, however, inferior to the bark from trees of the same age on the Neilgherries, which yield in total alkaloids—branch bark 22·8 per cent., trunk bark 6·49 per cent. Though it thus yields a less amount of alkaloids than is usual with good India grown bark, it fully equals the yield of ordinary red bark from South America.

As the object in cultivating cinchona is the production of febrifuge alkaloids, the gross amount of the latter yielded by a tree of four years' old grown on the Bababudens, may be instructively compared with that yielded by a tree of the same age grown on the Neilgherries. The following statement gives this comparison. The amounts are in grammes, and in both cases express averages :—

	Tree grown on the Bababudens	Tree grown on the Neilgherries.
Branch bark	0·32	7·34
Trunk „	3·44	21·15
Total.....	3·76	28·49

The foregoing results and considerations, I submit, justify me in stating that the cinchona plantations on the Bababuden Hills cannot, when compared with those of the rest of India, be regarded as a success. A tree grown on these plantations yields scarcely a seventh part of the amount of febrifuge it should give, while the cost of growing the tree in both cases is probably nearly the same. I regret that I am unable to arrive at a more encouraging conclusion as a result of my inspection of these plantations.

The plantations are in admirable order, and every thing that conduces to the health of the trees appears to have been done. No skill or pains in mere cultivation can compensate for the defects of situation, soil and climate. The comparative failure of the cultivation must be ascribed to the latter causes, and not to any want of skill or attention in its management.

It is obvious from the above that I cannot recommend otherwise than that all increase in the extent of the plantations should at once cease. But I strongly deprecate any abandonment of the plantations now existing. They represent a considerable amount of expenditure and the best must be done to utilize them. They should be kept clear from such weeds as interfere with the growth of the young plants, the older trees being sufficiently advanced to take care of themselves. The water courses should be looked after, and all that is necessary done to prevent injury from external causes. There is no doubt that the future growth of the trees, slow though it be, will eventually furnish sufficient bark to repay in part the outlay on the plantations. The greater part or nearly the whole of the expenses necessary to the establishment of the plantations has already been disbursed, and a small further outlay will suffice to keep them in the necessary order.

In case the Government of Mysore still desire to extend the cultivation of cinchona on the Bababudens, it will be necessary to sacrifice the advantages of the elevated site in order to obtain the more requisite conditions of a better soil and more abundant rainfall. A plantation situated on the lower slopes of the hills, and on the side exposed to the South West Monsoon, would fulfil these conditions. I have no doubt that the trees of the red bark would flourish on such a site equally well with those grown in Coorg or Wynaad, which are little inferior to those of the Neilgherry plantations.

I am ignorant with what intention the cinchona plantations of the Bababudens were first started. It would appear from the very considerable cost of carriage from those remotely situated hills to the coast, that there will always exist a disadvantage in exporting their produce as compared with more accessible plantations. If the intention be to obtain an indigenous supply for local use, the quantity of trees at present planted (when they have arrived at a sufficient size) will meet any possible demand for the medicine in the immediate district. The present size of the plantations will not, however, I should imagine, justify the establishment of a manufactory for any except the simplest possible form in which the febrifuge can be prepared for use among the natives. This simplest form undoubtedly consists in an acid extract of the bark. This, from experiments made at my desire by the medical authorities in this presidency, is shewn to be a perfectly effective though nauseous febrifuge. But at the present slow rate of growth, and small yield of the trees, four or five years must elapse before the question of the direct utilization of those plantations can be fairly considered.

If the Government of Mysore print this report, I have the honour to request that a copy may be supplied to the Government of Madras."

CINCHONA PLANTATIONS AND BOTANICAL GARDENS OF OOTACAMUND.

[*Proceedings of the Madras Government, Revenue Department, 21st December* 1870.]

Read the following papers :—

No. 401. From J. W. Breeks, Esq., Commissioner of the Neilgherries to the Secretary to Government, Revenue Depart. Madras, dated Ootacamund, 28th May 1870, No. 25.

I have the honour to forward the Superintendent's annual report on the Government Cinchona Plantations and Botanical Gardens of Ootacamund for 1869-70.

I have lately seen the plantations at Dodabetta, Neddiwuttum Pycarah, and Mailkoondah, and the three former retain their high character, and do great credit to Mr. McIvor's horticultural skill, and to the zeal and industry of all connected with plantations. I regret I cannot speak so satisfactorily of the Mailkoondah plantation, which I shall refer to more particularly by and by.

During the year the Superintendent reports that 254,367, plants were planted out against 153,145 in 1868-69, and 17,526 plants were propagated against 19,703 in 1868-69.

Since the receipt of Government order, dated 9th November 1869, the Superintendent has devoted his attention to the propagation of the pitayo variety and the newly discovered variety of *cinchona officinalis*.

The Government will observe that 1,200 acres, the area originally fixed as the limit to which the cinchona plantations were to extend, have now been planted up as follows :—

	Acres
At Dodabetta	375
Neddiwuttum	450
Pycorah...	300
Mailkoondah	75
Total...	1,200

The Superintendent estimates that adjoining the tree plantations of Neddivatum, Pycorah, and Mailkoondah, about 1,000 acres suitable for cinchona are still available if wanted.

Up to 31st March 1870 the total expenditure on account of cinchona on the Neilgherries amounted to Rs. 5,57,699, which may be sub-divided as follows:—

			Rs.
Superintendent and Office			65,860
Propagation and Nursery			54,498
Dodabetta	Establishment.....	38,371	
	Buildings, &c.....	22,486	
	Plantation work....	67,689	
			1,28,56
Neddiwuttum	Establishment.....	79,274	
	Buildings, &c.....	27,958	
	Plantation work....	94,692	
			2,01,924
Pycorah	Establishment.....	11,746	
	Buildings, &c.....	6,188	
	Plantation work.	46,692	
			64,696
Mailkoondah	Establishment.....	9,005	
	Buildings, &c.....	3,778	
	Plantation work....	29,392	
			42,175
		Total.....	5,57,699

This gives a total expenditure of Rs. 464 per acre.

I believe the Government of India have in Sikhim about 1,250 acres under cinchona, the total cost of which, up to 31st March 1870, has reached Rs. 3,34,518-10-5. It would be interesting to have the acreage and expenditure verified, so as to institute a comparison between our plantations and theirs. The information would aid towards forming some conclusion as to the probable cost per pound of bark at which each species can be grown in different parts of India.

It is very probable that the Sikhim plantations, from climate and other reasons, will be unable to compete with ours in the growth of the *officinalis* and such species; while they will outstrip us in the rapid and cheap growth of the *calisaya* and *succirubra*.

4,000 *succirubras* and 2,000 *condamineas* have been mossed. Under Mr. Broughton's hands the value of this process will in due course be effectually tested by periodical analysis.

Up to 31st March last Rs. 42,175 have been spent upon the Mailkoondah plantation. The plantation consists of two clearings in the great forest which covers the hills to the south-west of the village of Mailkoondah. The clearing on which the jail and the Superintendent's cottage have been built is at a higher elevation than the other, and may contain 20 or 30 acres. The Superintendent's cottage has tumbled down; the few acres planted seemed to be eaten off by the sambar; I saw nothing but here and there a few cinchona sticks without leaves.

The jail walls are cracked in every direction, and the approaching monsoon will, I fear, bring the building to the ground.

The lower clearing is about 1½ miles from the jail, and is situated on the slope of a spur of the Koondah hills.

Here the *succirubra* seemed to be doing fairly well; the trees were about two feet high, but suffer greatly, I was informed, from the violence of the monsoon winds. With reference to my remarks in paragraphs 4 and 5 of my letter to Government, dated 18th October 1869, I am still of opinion that it is not worth while incurring further expense on this plantation.

I am disposed to recommend that the Government should cease all further outlay whatever on the plantation, and endeavour to sell the upper clearing with its buildings and materials as they stand.

The lower plantation, if the Government thought proper, might be left as an experiment to see how the cinchona trees will fare when left entirely to themselves in a clearing in the heart of the forest.

The Botanical Gardens have received some important contributions from Messrs. E. B. Thomas and Deschamp, Colonel Denison and Major Beddome. Some improvement has, I think, been made in the general up-keep of the gardens under the immediate direction of Mr. Jamieson.

It would be desirable, in future years, to keep the report of the Botanical Gardens altogether distinct and separate from the cinchona report, so as to admit of more detail as to the number of hands employed in the gardens during the year, the nature of the work performed, the introduction of new species by exchange or otherwise, and the stock of plants available for distribution and sale, &c.

A statement of the year's receipts and disbursement should also be given. Without such a detailed report it is impossible to institute a satisfactory system of exchange with other gardens in other parts of the world, nor can we say whether the utility of the Ootacamund gardens is properly maintained, nor can the public know what facilities exist of stocking their gardens with useful and ornamental plants.

(Signed) J. W. BREEKS, Commissioner.

Ootacamund, 28th May 1870.

REPORT ON THE GOVERNMENT CINCHONA PLANTATIONS AND BOTANICAL GARDENS, OOTACAMUND, NEILGHERRIES, FOR THE OFFICIAL YEAR 1869-70.

DURING the past year we have completed planting the sanctioned extent of our cinchona plantations, namely, 1,200 acres; a few additional acres are reserved for planting with the new varieties recently introduced and the lanceolate-leaved variety *officinalis*.

During the year twelve cooly, seventy-six bullock, and twenty-one cart-loads of fresh bark were supplied for manufacture to Mr. Broughton, the Government Quinologist. At present we are supplying that gentleman with about 2,000 lbs. of fresh bark weekly. We may therefore calculate the yield this year of fresh bark from the plantations to be upwards of 100,000 lbs., or about 45 tons.

The past season has been very favourable for planting operations, and the growth of the plants very satisfactory.

The plants permanently planted out in August and September 1862 have attained heights varying from 20 feet to 25 feet, the circumference of the stems, at one foot above the ground, measuring from 25 inches to 32 inches.

The number of plants planted out during the year were 254,367, making the total number 1,148,424. The number of plants propagated were 17,526 against 19,703, the result of the last year. Our propagation has lately been principally confined to the *pitayo* varieties and the new variety of *officinalis*.

The number of plants distributed to the public during the year were 7,755, making the total number 178,605. Private planters now prefer seeds and a large quantity of these have been distributed.

With the foregoing observations I shall proceed to the details of this report, which are arranged under the following heads:—

I. Condition and growth of plants.
II. Propagation.
III. Cultivation.
IV. Results obtained by private planters.
V. Cinchona, new varieties, remarks on.
VI. Formation of alkaloids.
VII. Establishment.
VIII. Progress of operation.
IX. Botanical Gardens.
X. Tea plantation.
XI. Fresh-water fish.
XII. Appendix A., Accounts from commencement to 31st March, 187 .
XIII. Do B., Meteorological observations at Neddiwuttum
XIV. Do C., do do at Ootacamund.

I. Condition and growth of plants.—The red bark (*cinchona succirubra*) continues to be the most luxuriant of all the species we have introduced. The grey barks also maintain in a very luxuriant growth, while the crown-barks and our new varieties of yellow bark rank third. The new lanceolate-leaved variety of *cinchona officinalis* ranks fourth in its rate of growth. These facts are important in determining what species will be most profitable in cultivation, as the most hardy and luxuriant species, although yielding a bark somewhat inferior, may nevertheless be the most profitable plant to grow, in consequence of the greater produce of bark in the same space of time; and this more especially when the species is hardy and not liable to be injured by wild animals, even in situations where they entirely destroy the crown-barks. We have collected this season a large quantity of seeds, and again raised some very interesting hybird varieties. Cinchona are particularly easy to hybridize, and in this way varieties may be obtained possessing the more highest degree of excellence as regards the quality of the bark, the rapidity of the growth of the plant, its ability to endure extremes of seasons, &c.

To develop a variety in this way, such as will meet all the requirements with regard to rapidity of growth, hardiness, and value of bark, will occupy some years; but the subject appears to be one well worth undertaking, and, if carefully carried out, could not fail in securing a plant much superior to any of our original species. About 50 acres of grass-land has been planted out this year with *cinchona officinalis* and *cinchona succirubra*. These plants continue to grow nearly as well on the grass-land as they do on the forest-land. One thousand five hundred plants of *cinchona condaminea* have been planted out at three feet apart, in order to test what effect close planting may have upon the bark. When plants are placed close together, if not thinned out in a few years, the stronger-growing will overtop and destroy the weaker plants. During the year 4,000 plants of *cinchona succirubra* and 2,000 of *cinchona condaminea* have been mossed in order to test the value of this process when applied on a large scale. All our species of cinchona, with the exception of *cinchona lancifolia* and the *pitayo* barks, have produced abundance of seeds; these have been extensively distributed, and large number of plants are now produced from seeds. The weather during the past year has been most favourable for planting operations; we have had rain during every month of the year, except February. Our frost has not been severe, and done no damage whatever to the plants.

As suggested by Mr. Broughton a number of trees have been manured with guano, sulphate of ammonia, and stable-manure, in order to ascertain what effect these manures have upon the secretion of alkaloids. The bark of the *cinchona pahudiana* has very much improved in appearance. The *cinchona lancifolia* received from Java flourishes well in this climate, and promises to be a very valuable species; this plant has somewhat the habit of *cinchona officinalis*, but is of slower growth.

I. Propagation.—During the present year our stock of plants for filling up failures has been entirely raised from seeds; some of these have been successfully grown when sown in open beds and shaded with fern only. The more valuable species are now propagated by cuttings, such as the lanceolate-leaved variety of *cinchona officinalis*, *cinchona lancifolia*, and some of the more valuable of the yellow barks. The number of plaints of these kinds were, on the 31st March, as follows :—

Lanceolate-leaved variety of *C. officinalis.*	1,563
Cinchona lancifolia	279
Pitayo barks	123
The varieties of yellow bark	52,395
Total...	54,360

II. Cultivation.—The system of cultivation described in previous reports has been carried out without variation in our operations of this season. All the species of cinchona have been found to thrive best when planted in the open; when the plants are first planted, they are protected for about a year with turf, wood, or fern. The plants originally planted as an experiment under the shade of living trees have made unsatisfactory growth, especially where the shade has been dense. During this season we therefore found it necessary to destroy the forest trees by depriving them of their bark.

IV. Results obtained by private planters.—Cinchona cultivation, as a private speculation, has, during the last two years, made very little progress in this district; the value of estates, whether of tea, coffee, or cinchona, have fallen greatly in the market, and become almost unsaleable: thus there is no inducement to speculators to invest their capital in these undertakings. Among the plantations which are still maintained may be mentioned Deva Sholah, the largest private plantation in Southern India, and next in extent to this the Ossington estate, which contains nearly 400 acres of promising young cinchona plants. Among smaller estates those of Mr. James Morgan, Dr. Colvin Smith, Colonel Scott, Captain Jennings, Colonel Fyers, and Mr. R. F. Phillips, deserve mention. A large quantity of our cinchona seeds have been sent to private planters in the Himalayas and Ceylon, where private plantations appear to be making considerable progress.

V. Cinchona new varieties.—Perhaps the most valuable variety in our possession is the lanceolate-leaved sort of *cinchona officinalis*, from which Mr. Broughton has procured the unprecedented quantity of quinine, 10·13 per cent. of the weight of the bark. This variety is being propagated as rapidly as possible, and plants have already been distributed to private planters on the Neilgherries, also to Mr. Clark, Acting Superintendent Cinchona Plantations, Bengal, and to Mr. Thwaits, Superintendent Cinchona Plantations, Ceylon. These plants have yielded a few seeds, from which we have raised a number of seedlings; but as the seeds may or may not possess the properties of the parent plant, they have been kept separate. To perpetuate this plant in a manner so as to secure all its qualities, it can only be increased by cuttings, layers, or grafting.

The *pitayo* barks received from Mr. Cross during last year have now been increased to 123, and we trust that during the present season we will be able to increase the varieties of this valuable species to at least 1,000 plants. Some of the varieties of this species have the appearance of a hybrid between the red and crown-barks; they are all rich in alkaloid, and appear to be hardly and well suited to this climate. The new variety of *cinchona calisaya*, presented to the Indian Government by Mr. Howard in the autumn of 1867, has now been increased to 1,300 plants; it is one of the most robust and free-growing of all the varieties of calisaya, and in consequence is a great acquisition to our collection. Of the plants raised from the calisaya seeds procured from Mr. Money, three of the varieties are very free-growing and hardy. Mr. Broughton has procured from the bark of these young plants 4·53 per cent. alkaloids. Among our crown-barks we have this year discovered a very interesting and apparently a new species, with soft downy leaves and a rough corky bark, but deficient in alkaloid; this plant was raised from the original seeds introduced by Mr. Cross, through Mr. Markham, and must have been gathered by accident. The hybrids raised from the seeds produced here have not attained a sufficient age to pronounce authoritatively upon the quality of the bark. The plants, however, are highly ornamental; some of the varieties very robust and free-growing, and no doubt may ultimately prove of value.

VI. Formation of alkaloid.—This subject has been fully treated in the able reports of Mr. Broughton, the Government Quinologist, and it only remains for me to notice the very interesting fact that the yield of alkaloid in our barks still continues to increase with the age of the trees. Another fact noticed in my report of the 27th April 1867—namely, that trees with abundant and luxuriant foliage always yield more alkaloid than trees with spare foliage," also that "trees with foliage freely exposed to light and air while their stems are under dense shade are rich in alkaloids"—seems to be fully established by subsequent experience, and indicates a course of inquiry which may prove both interesting and profitable.

VII. Establishment.—I have much pleasure in being able to report the willing co-operation and the zeal with which my assistants have carried out the various duties entrusted to their care. Mr. Jamieson, the Deputy Superintendent, has now been seventeen months in the country, and has, during that time, had charge of the gardens and the propagating establishment. Mr. Dawson, Assistant Superintendent in charge of Neddiwuttum, has carried out the various works connected with this plantation to my entire satisfaction. Mr. Rowson, the Assistant Superintendent in charge of Dodabetta Plantation, has taken a considerable interest in carrying out the operations entrusted to his charge. The head overseer, S. Narrainsawmy Naidoo, had been placed in charge of the hooker and wood plantation under Mr. Dawson. In the office establishment, Mr. McNair, the office manager, has given every satisfaction in the performance of his duties.

VIII. Progress of operations.—No new buildings have been erected during the past year. The principal work performed being the completion of the roads, drains, and pitting of the Napier estate at Neddiwuttum, and finishing the planting at Dodabetta; the establishments have been principally occupied in filling up failures and maintaining the plantations.

IX. Botanical Gardens.—During the present year no new works have been undertaken in the Botanical Gardens. Some very interesting plants, however, have been introduced and cultivated. The quinoa, a plant of great economic value, has been successfully cultivated in the gardens, and the seeds thus produced were distributed by the Commissioner to the native cultivators, and the plant is now pretty extensively grown throughout the district. The dry Burmese paddy or rice, the seeds of which were kindly furnished to me by Captain Seaton, the Conservator of Forests, British Burmah, has been grown in the garden, but not successfully, the climate being apparently too cold. Among economic plants which grow luxuriantly may be mentioned the jalap, scammony, rice paper plant of China, and the New Zealand flax. Our plants of the ipecacuanha still continue stunted and of unsatisfactory growth; I therefore took the opportunity of forwarding by Mr. Broughton two plants to Mr. Ferguson, the Assistant Conservator of Forests of Nelamboor. We are indebted to Mr. E. B. Thomas, late Collector of this district, for seeds of numerous European trees and shrubs, as also for plants of the true olive, currants, and other fruit-trees; to Major Beddome we are indebted for numerous new ferns and orchids; to Colonel Denison, for a fine collection of ferns and rose cuttings; and to Mr. Deschamps, for a very select collection of ornamental flower-seeds. The various species of Japanese trees and shrubs introduced in 1867, continue to grow well. Many of the more valuable and handsome species have been propagated to a considerable extent.

The following table shows the distribution of plants and seeds from the garden for 1869-70 :—

Months.	Fruit trees.	Timber trees.	Flowers & Shrubs.	Packets of Seeds.	Amount.		
					Rs.	A.	P.
April 1869	2	200	246	90	124	4	0
May ,,	...	604	194	98	129	14	0
June ,,	40	650	338	187	202	4	0
July ,,	80	412	449	187	198	6	0
August ,,	10	72	156	487	147	5	0
Sept. ,,	...	220	286	272	127	6	0
Oct. ,,	108	301	595	234	247	12	0
Nov. ,,	7	2	655	113	142	0	0
Dec ,,	...	158	390	54	127	8	0
Jan. 1870	...	25	38	20	15	18	0
Feb. ,,	12	,,	639	16	16	2	0
March ,,	...	2,040	135	79	106	7	1
Total Distribution.	259	4,684	4,121	1,837	1,585	1	1

X. Tea plantation.—The tea plantation has not been further extended, but a large number of the more valuable varieties of the Assam and Chinese tea have been raised from cuttings, as only by this method of propagation can the qualities of the parent plant be perpetuated.

XI. Fresh-water Fish.—The experiment of acclimatizing and breeding European fresh-water fish has been most successful; the trout, tench, (the common sort and also the beautiful golden German variety) rudd, carp, gold and silver fish, are all increasing rapidly and making very satisfactory growth; we may there-

fore shortly hope to be able to stock the rivers of the district with these valuable fish.

Concluding remarks.—The extent of land having been planted, to which the Government limited their operations in cinchona cultivation, the principal work now to be done is to maintain the plantation, to plant out annually a few acres of our recently introduced and more valuable varieties, and to collect the harvest of bark. In concluding this report I beg to tender my gratified acknowledgments to the Madras Government for the liberal support they have given in bringing this national undertaking to its present satisfactory condition; to Mr. J. E. Howard, for his valuable contributions; and to Mr. Clements R. Markham, of the India House, for the active interest he has taken in the development of cinchona cultivation.

(Signed) W. G. McIvor,
Superintendent Govt. Cinchona Plantation

Ootacamund, 16th May 1870.

TEA.

INSECTS NOXIOUS TO THE TEA PLANT.

The Secretary called attention to a communication from Mr. E. L. Edgar, of the Cossipore Tea Estate, Cachar (introduced in the proceedings of November 1869), respecting certain insects which were then doing much harm to his plants. Dr. John Anderson, Curator of the Indian Museum, had examined these insects, but having no available means for determining them, he (the Secretary) had forwarded a second supply to Mr. Grote, who had referred them to Mr. F. Moore, of the Indian Museum (London), and the following is the report on them, received through Mr. Grote, by the last mail:

"I have to thank you for your note of the 21st with its enclosed insects which infest the tea plants in Cachar. The pretty bug, I find, is a variety of the *Pœcilocoris Hardwickii*, which insect, I believe, had been observed by Pemberton as infesting the tea plants of Assam many years back. The small beetle is a very common and well known species of 'Phytophaga' belonging to the family *Cryptocephalidæ*, having been named by Fabricius as *Physancheenia pallens*. I should be glad if you will kindly intimate to the Secretary of the Agricultural and Horticultural Society of Calcutta that I should be very glad to have specimens of noxious insects for examination that may from time to time come to them, and would be much obliged for a copy of all MS. or published papers that the Society may have giving information on such subjects.

TEA CULTIVATION IN SYLHET, CACHAR, AND ASSAM.

We are indebted to the *Bengal Times* for the following particulars relating to the tea districts:—

Of gardens there are twenty in Sylhet, occupying an area of 28,144 acres, of which 2,956 are under tea cultivation. During 1869, these gardens turned out an aggregate of 362,962 lbs., against 250,905 lbs. during 1868, showing thereby an increase of 112,056 lbs. Of imported labourers an average monthly number of 235 was employed, and of local labourers 1,070.

In Cachar the number of gardens in which work is being carried on is 122, comprising an area of 244,488 acres, of which 24,151 acres are under tea cultivation. The total out-turn of tea in these gardens during the year was 4,234,794 lbs., against 3,630,351 lbs. of the preceding year, giving an increase of 604,443 lbs. Average monthly number of imported labourers employed in tea manufacture, 11,087; of non-imported, 15,908. Amount of cash drawn from the district treasury by supply bills, money orders, and notes cashed, Rs. 20,04,647, against Rs. 19,84,957 drawn during the preceding year.

In Assam there are altogether 315 tea gardens, comprising a total area of 246,584 acres, of which 107,321 acres are held in grants under the old rules, 115,179 acres in fee-simple under the new rules, and 24,084 acres under cultivation leases, or rent-paying pottahs. Out of the entire area, only 28,954 acres are under tea cultivation, the total out-turn during 1869 being 4,946,139 lbs., against 4,306,927 lbs., in the preceding year, which shows an increase of 639,212 lbs. The average monthly number of imported labourers employed on the gardens during the year was 27,492, and of local labourers 17,486.

We observe from the latest reports that there is a growing disposition among the English trade to use the lower kinds of Indian tea to a greater extent as compared with the higher sorts, the result being that the former show a relative advance in price. As the impression seems to be that the difference in quality between the various gradations of leaf from Pekoe downwards is less than that of the corresponding prices that have hitherto prevailed, the tendency is likey to go still further. The advantage seems to be in favour of the planter; and, no doubt, the circumstance will have considerable influence on the existing system of plucking.

The *Produce Market Review* seems to be of opinion that the system of sifting and sorting will ultimately be abandoned. The position of the market at home appears to be very strong, as notwithstanding an increase of 32 per cent. in the supply, the deliveries have nearly worked off the surplus, and prices are still firm. The quantity afloat on the 14th December was, we see only 1,247,735 pounds as compared with 2,517,916 pounds last year.

INDIAN TEA.

The *Produce Market Review* of the 10th December has an article on the subject of Indian tea in reply to our late remarks on the necessity of the tea-planting interest adopting some direct means of pushing their produce in the home market. The answer is of course, to the effect that the trade at home have no interest in the matter, but to meet the wants of their customers. Tea-drinkers in England will not buy Indian tea unmixed. "The public taste runs upon a neutral flavoured tea, with no predominant taste, and the great strength, unmistakeable flavour, and pungency of Indian kinds, are greatly disliked by most tea-drinkers, simply because they are accustomed to a very different thing." No doubt there is much truth in this; and it is precisely the truth that is in it, upon which we base our advice, and now reiterate it. English grocers are interested solely in meeting the tastes of their customers; they are not interested in forming new tastes. Indian tea-planters are deeply interested in the latter process, and consequently their interests are not identical with those of the trade at home, and are not likely to be forwarded by them in this special direction. Although it is true that the vast majority of English tea-drinkers prefer a mixed to a pure Indian tea, it is not the whole truth. It is admitted that pure Indian tea is largely consumed by Anglo-Indians, who have the same opportunities of drinking pure China tea, or mixing it with Indian, as their countrymen at home. The circumstances that have led to the formation of the taste in the one case, and prevented it in the other, are accidental, not essential; and it is therefore not impracticable, and would probably not be very difficult, to create it in England, if any one were interested in taking the necessary steps for that end.

The process would, no doubt, be a slow one; but it is not necessary to Indian tea-planters that it should be otherwise. It will be a long time before they can supply all English tea-drinkers with the produce of their plantations; in the meantime, there is no reason why they should not do their best to forward a change which would vastly increase the demand for it.

TEA PLANTING ON THE NEILGHERRIES.

Having devoted a life to the science of horticulture, four years and upwards of which have been confined to the cultivation, &c., of the tea plant, I have now great pleasure in presenting to the public the results of that experience, in the hope that I may be useful in assisting others to acquire the elements of tea-planting on the Neilgherries.

James McPherson.

Coonoor, April 30th 1869.

Introductory.

The plateau of the Neilgherry mountains presents a varied, but upon the whole one of the most equable and enjoyable climates in the world. The variations of temperature are due to the variation of altitude (the tea-growing zone alone presenting a variation of 2,500 feet, or thereabouts); the difference of climate is due to the predominating influence of either the S. W. or N.E. monsoons, while the general equability may be attributed to the situation of the hills between the 11th degrees of N. latitude, to the vicinity of the Arabian Sea and the Bay of Bengal, and to the absence of disturbing causes, such as the rush of cold currents of air from higher ranges of mountains, examples of which are so common on the Himalayas, the Alps, and other similarly elevated but less isolated tracts than the Neilgherries.

It is now proved in a satisfactory manner by actual experiment, that tea will flourish on these hills at elevations ranging from 5,500 feet up to 8,000 feet, or thereabouts, a zone which probably comprises within the Koondah, Dodabet, and Kotagherry ranges, upwards of 100,000 acres of waste land more or less suitable for tea cultivation; on the Koondah's magnificent virgin forests exist the soil of which would undoubtedly grow the tea plant luxuriantly; this region is not, as yet, practicable, however, from the almost absence of roads or labour, and the utter absence of markets for supplies.

The Dodabet and Koondah ranges are more particularly under the influence of the S. W. Monsoon, and as this occurs from about the beginning of June to the end of August, the plantations on those ranges receive the benefit of the rains during the natural growing period of the plant.

The Kotagherry range, on the other hand, receives comparatively little of these S.W. rains, they being under the influence of the N.E. monsoon (the Dodabet range being the line of demarcation); the plantations on the Coonoor and Kotagherry side have the advantage of a drier season for their period of crop so that upon the whole few disadvantages can scarcely be said to exist

in a greater degree on either side of these hills, if soil and cultivation be equal.

Fortunately, the appliances which may be introduced to aid the manufacture, will render the tea planter quite independent of a week or fortnight's bad weather, should such weather overtake him during the picking season, while the advantages remain to be taken possession of accordingly as the balance may be given in their favor.

I do not think any good would be done by comparing the climate of the Neilgherries with that of the tea countries of China; suffice it to say, that the tea plant flourishes here, and, if I may depend upon the testimony of competent judges, it is even more luxuriant than in the Chinese tea districts themselves, wherever the cultivation is equal.

If it be true, as the Chinese affirm, that the tea plant is not indigenous to China, but was originally introduced from another country (perhaps from Northern India), and that it has gradually naturalized itself on some of the Chinese hills, the fact of its greater luxuriance when re-introduced to a more genial climate and richer soil is readily understood. We will suppose that in the course of ages the Assam species gradually extended itself, and that age after age it accommodated itself to a less forcing soil and climate, there cannot be a doubt but the result would be a decrease in the luxuriant habit of the species, and that the great variety observable in the China plant exhibits the decrease of luxuriance in a more or less marked degree, influenced again by the variety of the conditions under which the plant has subsequently been cultivated. These suppositions seem the more reasonable when we observe the great tendency of the whole of the varieties to sport, and be influenced by the conditions under which they are placed. As an example of this, I may mention that in 1865 I very carefully selected the seed from a tree which I had remarked for its great luxuriance, and had them separately planted in rich soil; the whole of these seeds grew and varied in general appearance; some scarcely exhibited any serration on the edges of the leaf, others again were very deeply serrated, but not a single instance was observed of decreased luxuriance of habit. Again, plants taken from this same nursery, of the same age, size, and general luxuriance, and planted upon adjoining portions of jungle and grass ground, exhibited in one year the most marked difference in habit, appearance, and size, so that there can scarcely be a doubt but that differences of soil, climate, and cultivation largely influence the character of the plants, and, in a lesser degree, the quality of the produce.

If we acknowledge then that the plateau of the Neilgherries, in so far as climate is concerned, is suitable to the growth of the tea plant, and that by a careful selection of soil the luxuriance of the plant may actually be increased, it will be proper to consider the description of soil which is most eminently suited to this increase of development and luxuriance. As a rule vegetables are found to develope a maximum of foliage in the richest soils, and in cultivation all vegetables which are grown for their leaves are planted upon the best ground, or, if the soil is naturally deficient in quality, efforts are made to supply it with the necessary amount of manure to supply that deficiency. In all new countries, however, it is always expedient and economical to select the best possible ground, in the first instance, for any description of cultivation; pioneer planters generally have much to contend with in the want of experience, the want of roads and labour, in the difficulty of procuring the actual necessaries of life, in finding a market for their produce, in the apathy of the Governments to encourage their first efforts, and if in addition to this, they are obliged to be content with an inferior soil, unmistakeable ruin will be their reward.

It cannot be supposed that any Government would willingly allow any part of their dominions to remain in a state of profitless undevelopment, or fail to encourage a contrary state of things, yet, we find, on the Neilgherries a splendid field for English energy and capital almost, if not entirely, neglected, the natural resources of which are now worked at a loss to Government (I allude to the forests,) while in pursuance of this policy, the only ground in convenient localities which would be likely to leave a margin by its goodness for the inexperience of the pioneer planter is rigidly reserved.

The soils of the Neilgherries vary considerably, but for the purposes of the tea planter, and for the sake of brevity, they may be divided into forest, fern, and grass lands. The first named of these are undoubtedly the most suitable for the growth of the tea plant, yielding as a rule from twenty-five to thirty per cent more leaves per annum than the best grass lands. When we take into consideration the great amount of humus these soils contain, and which has been in the course of deposit and decomposition since the existence of the forest, it is not at all remarkable that the tea plant should thrive better on a soil which presents a larger amount of matter in a fit state for absorption by the roots, or that tea plants should desire to secure such land in such localities as present a minimum of the other serious disadvantages he has at present to contend with. But it is most assuredly very remarkable that the Government should object to give up these lands for purposes of cultivation when they hold them at a loss, and when examples are so evident of the actual increase of wood in such localities as are most thickly inhabited by Europeans.

Looking at the matter in a financial point of view, it certainly does seem extraordinary that the Government should work the Neilgherry Sholas, &c,, at a loss of nearly 1,500 rupees per annum (vide Col. Morgan's report for 1867-68), while the sale of the land would produce a fair price in the first instance, and a revenue of 2 rupees per acre per annum afterwards, and moreover bring into the districts English energy and capital.

Certainly, the policy is difficult to understand, especially when it is seen that Australian plantations are so sure to renew the necessities of the fuel consumers so rapidly and so profitably.

I recollect Dr. Cleghorn thinning out a small portion of the Australian plantation near Coonoor, and it would be highly interesting to know what the thinnings from the portion of ground realised; the ground I allude to was probably about an acre in extent, and the thinning was not by any means a heavy one, in fact three times the amount of wood might have been taken out with the greatest benefit to the remaining trees, and this after a growth of only ten years. I mention this circumstance as a proof of the absurdity of the supposition that the Neilgherries need ever be short of fuel or trees.

This plantation near Coonoor is as good an example as I can give to the contrary effect, and I doubt not if it were properly thinned it would produce at this time very nearly Rs. 300 per acre from the thinnings alone. So much for the replanting of wood if the necessity should arise.

The fern lands on the Neilgherries are often of very good quality, but they are not very abundant, as the Budagha people seem to have monopolised them for their cultivation.

The grass lands, are, however, very abundant, and they are often of excellent quality; in many instances you find six feet or more in depth of an excellent loamy soil; it cannot be disputed however that, as a rule, they will require both digging and manuring before they can at all compare with the forest lands for the purposes of tea cultivation. I purpose giving my ideas as to the best method of working these grass lands under the proper head.

It must not be supposed that grass lands are invariably well suited for tea; in many instances there is only a very shallow deposit of soil, supporting a scanty herbage, and generally overlying a bed of laterite, or decomposing primitive rock; where the grass lands are of this shallow and consequently poor description, the tea planter had best avoid them; he should select only such grass lands as have at least an average depth of three feet of good sound loamy soil; let him before he applies for such land carefully examine them, and dig pits to the required depth at some fifty yards apart over the whole extent of the ground under examination, and the more especially if the ground is composed of ridges with an exposed aspect; these exposed ridges are very frequently of a poor quality, and they must if possible be avoided.

The finest blocks of grass land are found in the sheltered valleys with high ridges above them, and probably owe their greater depth and richness to the gradual washing down by the rains of the particles of soil and detritus from the surrounding heights.

Peat swamps will not, as a rule, grow tea, and they will not grow it at all if there be the least stagnation of water. I have tried the experiment under various conditions, with reference to its bearing on irrigation, and I invariably found that the tea plant, when exposed to the least excess of water at the root, whether in a swamp or elsewhere, turned jaundiced and eventually died. The conformation of the hills themselves prevent any excess of water on their sides, so that under ordinary circumstances no care will be necessary in this respect.

The Neilgherries are very abundantly supplied with water of the finest description, almost every valley has its stream; but for tea plantation purposes water is unnecessary, except for domestic use, the maintenance of cleanliness in the factory, and an occasional supply to the nurseries and gardens.

CULTIVATION AND MANAGEMENT.

In entering upon the cultural portion of this little work, it will perhaps not be out of place to explain that the endeavour is made to arrange the various operations treated upon in such order as they would actually occur in practice, under the majority of circumstances.

Having then secured a block of land in accordance with the necessity, or in accordance with such hints as are contained in the introductory chapter of this work, it will be advisable in the first place to trace the

ROADS.

If the block of land be situated in a valley (and blocks of land are generally situated in valleys of some sort on the Neilgherries), the roading should commence at the uppermost "saddle," and should be carried down the valley at a gradient of 1 in 20, or at the utmost 1 in 18; parallel roads should then be formed at the same gradient, at distances of 100 yards apart, or as nearly at that distance as the nature of the ground will admit; the extreme ends of these parallel roads may then be connected by a zigzag at one or both ends of the estate, and

if this work be properly conducted in the first instance, much future expense and annoyance will be spared the planter; it will not be necessary to widen the roads to their full width in the first instance, a four feet trace will in all probability answer the requirements of the estate for some years, but it will be advisable to form catch-drains at such distances above the trace as to ensure the ultimate width of the road not being encroached upon by the planting, as well as for the protection of the trace itself. Should it be advisable, of course, one or more of these roads may be opened out to their full width, selecting such for widening as are most convenient to the best sites for building, endeavouring at the same time to combine the advantage which will arise (if the road happen to have crossed a stream during its course) by conducting the water along the road side.

BUILDING SITES.

In selecting building sites on a tea plantation, it should be borne in mind that only two distinct groups of buildings are necessary; the bungalow, offices, and factory, will occupy one group; and a writer's house, coolie lines, and cattle sheds, may compose another. These sites must be selected with due regard to the health, ease, and comfort of all parties. If the estate roads have been managed in such a manner that one or more of them will act as water-courses, and it passes through tolerably unbroken ground in its course, it will be easy to select convenient sheltered sites; if it can be managed, the bungalow should have a good stream of water rising above it as well as the stream conveyed by the road; a stream rising near the bungalow may be generally kept pure, whereas it is sometimes difficult if it rises at a distance.

Having determined upon the sites, it will be best to excavate them at once; the bungalow will be next to the road, and the factory on a terrace immediately behind it, or if the nature of the ground admit, the group of buildings may be arranged as a parallelogram or square, which will be a most convenient arrangement if well planned and executed. If this group of buildings can be placed above the semi-circular sweep of a road, and the excavations can be made to form the base of the semi-circle, the arrangement will be at once unique and convenient. I regret that I am unable at present to give plans of the various arrangements which may be suggested in this pamphlet. I may mention, however, that an arrangement of the last named description has been effected on the tea estate near Coonoor, and that it proved most convenient; if the building sites can be arranged in this manner, the factory site may be occupied by a temporary hut or bungalow, and when this is complete, steps should at once be taken to form the nursery below the road, and in unison with the general arrangement of the building sites and gardens; the area of the whole enclosure, including building sites, gardens, and nursery, may be one, two, or three acres, according to the size of the estate. If the excavations and nursery work can be done by contract, it will be best, as it will do away with the necessity of being in a hurry to build temporary coolie lines; if there happen to be a Budagha village in the neighbourhood of the estate, little difficulty will be experienced in procuring contract labour, as these people generally prefer working on that system. If the ground be forest, the trees had best be stubbed, the ground dug, and the roots, stones, &c., carefully cleared out; the ground will then be ready for the formation of the Nursery.

(To be continued.)

COFFEE.

CHICORY, when grown as a substitute for coffee, is harvested in the same way as potatoes. Some manufacturers prefer buying the roots fresh from the field, as there is considerable art in cleaning and kiln-drying, so as to retain the aromatic and bitter principles unimpaired; and this is generally the best plan for the grower, as it enables him to turn the crop at once into cash. Chicory, when grown as a forage plant, yields, under good management, four or five cuttings for soiling, the last about this time It is better adapted for mixing with other forage crops, as sewage grass, globe turnips, vetches, than to be given alone. For this purpose it is peculiarly well adapted for all kinds of stock at this season, to prevent that low state of health generally experienced.

COFFEE IN SHADE.

SIR,—"Van Tromp" says that he has been 30 years in Ceylon and knows every district from its infancy, and nearly every estate in the island, and "that it (coffee under shade) will be a permanent paying spec *I do deny emphatically.*"

As to coffee thriving or not thriving under a few trees here and there it is no criterion to go by,—coffee cannot thrive under straggling trees—and, as I said before, shade will not answer anywhere and everywhere, *proper locality* being a first requisite. But as "Van Tromp" has been all round the world and in India, no doubt he must have heard of the estate so well known as "Cannon's Estate" (to which by-the-bye parties in Ceylon sent over to procure seed coffee). He cannot, however, be aware that every acre of this noted estate *is under shade,* and has *paid well* as is well known, for, now I believe, upwards of 40 *years.* Let "Van Tromp" go and see it and others, and then I think he will alter his opinion.

OLD HAND.

MANURING COFFEE ESTATES.

To the Editor of the Madras Mail.

SIR,—Referring to your recent article on manuring coffee estates, and the use of guano and nitrogenous manures, it may be well to use them with caution. A gentleman recently returned to England after having been for 8 years director of large coffee estates in Ceylon, has stated that guano and similar manures exercise immense influence. The first season, the crop being enormous, the second year the crop may also be good; but in the third year the plants are forced (to use his expression) off their feet, and have to be grubbed up and thrown away. He mentioned one plot of 150 acres which had recently perished from the use of guano, and proprietors there are so convinced of the injurious consequences that they prohibit its use upon their estates. The only concentrated manure now used are the phosphates or crushed bones and cocoanut cake, crushed in the same manner as we crush linseed cake. These answer perfectly.—Yours faithfully,

E. BODDAM.

Bangalore, 22nd January 1871.

COFFEE MANURING.

DEAR SIR,—Your Dolasbagey correspondent (in your last overland issue) reports—"I saw a field, manured with crushed bones last year, almost entirely snuffed out. A couple of trees were put to each plant, at a distance of 5 to 6 inches, was the quantity too much, or was it placed too close to the roots, which were almost entirely destroyed!"

I consider the dose supplied an excessive one. Half a lb. to one lb. per tree is the quantity generally applied, 4 lbs. a tree (a jar of bone dust weighs 2 lbs.) is 4,800 lbs. to the acre of 1,200 trees, or about 80 bushels.

(80 × 60 lbs. = 4,800 lbs.) per acre,—an enormous amount. In a letter now before me, from a practical Aberdeenshire farmer, who has paid much attention to manuring, I read—"I have never seen 50 bushels per acre of bones applied."

Over-stimulating the tree is as bad as starving it (besides costing more.) I have much faith in small doses more than I had a year ago. From this bungalow I look upon two fields; one field of low elevation, rather poor soil, lightly manured; the other field with better soil, and at a better elevatoin, was more heavily prepared. This field has borne a better crop than the lower and less heavily manured field, (which, however gave 9 cwts. an acre), but it is suffering much more from crop. I believe even so small a dose as ½ lb. of bones may be applied with great advantage.

Mr. Carey of Le Vallan estate, favoured the public, two months ago, with his opinion of four different manures. I trust that other planters who may have tried the four different manures specified, viz, bone-dust and poonac, bone-dust and wood-ash, bone-dust and pulp, super-phosphate of lime, will follow so good an example, and tell us from time to time what crops per acre they raised, by such applications, and also how the trees looked after crop.—I am, &c., A MATALE PLANTER.

Matale, 19th December, 1870.

MANURING COFFEE ESTATES.

WE are glad that a correspondent lately brought to notice the need or a discussion as to the manures suitable for the coffee plant. We do not pretend to any great extent of knowledge in the matter, but in order to open the ball, we may venture to offer the following notes, based chiefly upon Johnston's "Chemistry of Common Life":—

As he well puts it, the whole art of manuring consists in adding to the soil, those things in which it is deficient at the right time, in a proper chemical condition, and in the requisite proportions; for it is plain that if the same plant be grown too long a time in the same soil, one or more of the substances needed for its growth will become scarce. He states with reference to granite and trap formations, which are to be found on coffee estates, the former predominating, that if the two kinds of rocks be submitted to analysis, a remarkable, but almost constant, difference is discovered in their comparative composition. Besides silica (sandy or quartzose particles) and alumina (clay), the granites contain a copious supply of potash, (white substance obtained from the incineration of vegetables), and soda, with occasionally minute quantities of magnesia, lime, and oxide of iron. The traps, on the other hand, abound in all these ingredients nearly equally, and experience has shown that the presence of all in-

step the mineral substances in which granite i
cient, such as lime, and fertility will gradually ensue. A minute chemical examination shows besides that their usefulness to

plants is dependent also upon the presence of a large number of chemical substances, both of mineral and organic origin. Sulphuric acid (oil of vitriol), and phosphoric acid (obtained from bones), should also be found in all healthy soils; besides a soluble substance resulting from the decomposition of vegetable matter, the composition of which is analogous to that of cellulose (tissue of vegetable bodies), pectine (vegetable jelly), sugar, &c., yielding carbon 39·5 and hydrogen 7·9. Nitrogen is also present as an ammoniacal salt. This substance has the property of rendering a large proportion of silica and carbonate of lime soluble, thereby permitting their absorption by the plant. The advantage of opening up the ground before rains is on account of the nitric acid contained in the air being washed down by the rain.

As nearly every one knows, the carbon obtained through the pores of the leaves of a plant from the carbonic acid absorbed during the day becomes the chief ingredient of starch and the woody fibre; they also absorb ammonia and watery vapour, the latter mostly when heat or drought has made them droop. The water which fills the vessels of the plant is, however, principally sucked up by the roots. Shade is, therefore, advantageous on estates for the retention of moisture in the soil.

The ingredients of the coffee berry are a volatile oil, produced while roasting a variety of tannic acid which is altered during the roasting, and the substance is called theine, or caffeine. In roasted coffee the volatile oil rarely amounts to more than one in 50,000, yet, upon this the aroma and consequent estimation in the market depends; it being a fact well known, that coffee grown in dry climates is more highly prized than in wet. Also by some chemical change in the bean, it gains aroma by being kept. Raw coffee contains about 5 per cent. of a stringent acid, or coffee tannic. The theine contained varies from ½ lbs. of a lb. to 1 lb in the 100. The composition of theine is represented by carbon 19·80, hydrogen 5·80, nitrogen 28·83, oxygen 16·29; it contains, therefore, three-tenths of its weight of nitrogen, a proportion which exists in only a very small number of other known substances, and forms four-fifths of the common atmospheric air. There is also 13 per cent. of nutritious gluten chiefly found in the dregs. The average composition of the coffee leaf is, water 12, gum and sugar 15½, gluten 13, theine ½, fat and volatile oil 13, tannic acid 5, woody fibre 34, ash 6¼. It has to be noted that the latter contains little or no manganese or iron as tea does.

All this goes to show that the value of crushed bones as a manure consists in their containing both lime and phosphoric acid. They would evidently be rendered much more valuable to the planter were they obtained by agents fresh from the slaughter-houses, and dissolved at once by sulphuric acid. The value of pulp and vegetable mould is also obvious, and they should be stored. The leaves of the castor-oil plant are valuable for this purpose. Cow-dung, manure and guano are also excellent, as containing ammonia, and should be carefully covered up with layers of soil two or three inches in depth to every 2ft. of manure to prevent the escape of the volatile gases. So far as our knowledge goes, it tends, however, more to leaf than wood, or fruit, as shewn from its being so useful for the produce of grass and vegetables. Therefore an admixture of lime or gypsum is obviously needed, which should be sprinkled over the ground. Bone manure will also be improved by an admixture of guano cow-dung, and water, as it will gain in ammoniacal salts.

COFFEE PROSPECTS.

THE *Madras Standard* says :—"The accounts received from the Mofussil from time to time respecting the prospects of coffee have lately not been very encouraging. From Coorg especially, the advices are far from satisfactory, and some of the planters are becoming disgusted with the failure of the crops, and are unable to resist the attacks of the borer. Money has been lavishly expended, and in very few instances have the endeavours of the planters met with success. But in Wynaad matters appear to be quite different. We learn from a Mofussil contemporary that the coming coffee crop in the Ouchterlony valley, like the crop expected in the Wynaad, will, it is said, be remarkably good. From the Guynd estate alone upwards of 300 tons are expected. This estate yielded 269 tons at the last picking, which, after disposal in the English market, left £10,000 clear profit. The crop from the whole of the Ouchterlony estates in the valley of that name, it is estimated, will amount to 900 tons. If every coffee estate in Southern India were to yield a profit of at least one-half of that realised by the owners of the Guynd estate, we should not hear so frequently of the failures of coffee companies, and their sale to pay the expenses of liquidation. Estates in Ootacamund and in Wynaad have always thrived and yielded largely, while the Coorg plantations, though very extensive, and in many cases properly superintended, have yielded no returns."

CEYLON.

Sale of Land.—At a recent sale of Dickoya lands in Kandy, the *Observer* says, 1607 acres, in nine lots varying from 157 to 226 acres sold for £5,495, or a little over £3 8 s. per acre. No one expected that these blocks would realize more than an average of £2 per acre, and the prospect of the immediate extension of the railway to Nawallapittia has evidently been equal to the balance of £1 1s. in the minds of the purchasers.

Manures by Railway.—Apart from the immense benefits of cheap, regular and safe intercourse and traffic derived from the railway, we place below figures which show how this great and beneficial work is helping coffee planters to resuscitate old properties and keep new ones in vigour. The quantities of manure carried up in the past three years have been as follows :—

1868 :—tons 2,664= cwts 73,280
1869 :— „ 6,891 = „ 137,880
1870 :— „ 8,700 . „ 174,000

Total :—tons 19,255 = cwts 385,100

What this means our planting friends can judge, for a large proportion of the substances included in this return are rich in concentrated fertilizing properties—just the ingredients to vivify into useful activity the masses of more or less inert matter such as pulp, grass, &c., to be found on or near coffee properties. All admit that every cwt. of coffee up means two cwts. of coffee down. We believe it means a great deal more, and that with increased facilities for manuring, the average yield of estates will ere many years elapse, be raised from five cwts. per acre, the low figure now adopted, to seven or eight, and why not ten? The low crop of this season in many districts is owing to exceptional circumstances —and we must remember that some time must be allowed for the effects of higher cultivation to become apparent. At the risk of being deemed visionary, we have no hesitation in committing ourselves to the valuation that by the time the railway extension to Nawallapittia has been at work as long as the main-line now as has been, the increase in yield on the Dimboola and Dickoya coffee estates, together with the process of utilizing for the cultivation of flax, castor-oil plant, sunflower, olive, mulberry &c., the vast tracts of land now deemed too high for coffee, will enable Sir Hercules Robinson's immediate successor to announce ere his term of office expires, that schemes of railway extension to Dimboola via Rambodde; to Dickoya, from Nawalapittia; to Oonah by either of these routes or via Oudapusalawa, and in other directions have passed from the regions of the fanciful to the domain of the practical and paying.

COFFEE AND SLAVERY IN BRAZILS.

THE mail just to hand has brought us our files of Brazil papers which extend to Nov. 5. It appears from these that whilst receipts from the interior had fallen off during September, they had slightly rallied towards the end of October. The exports had been mainly to ports in the United States, shipments to Europe having been on a much reduced scale. A market report of October at Rio Janeiro is to the following effect: *Coffee.*—Since the departure of the English mail shippers have showed more disposition to do business, and we have to report sales of 80,800 bags: 50,500 for the United States, 22,700 for the Channel and North of Europe, 800 for the Mediterranean, 3,200 for the Cape of Good Hope, and 1,600 bags for various ports. Receipts from the interior are slightly increasing and the stocks to-day may be estimated at 5,000 bags.

The exports from 1st July to 30th of September this year have been 607,760 bags, against 684,671 in the same 3 months last year, showing a decrease of 76,880 sacks.

In November, we are told, that owing to increased arrivals from the interior, averaging 9,500 sacks per diem, and a stock of 95,000 sacks in the market, buyers were timid in operating, though sellers were willing to make a concession of 400 rs. to 200 rs. on the last quotations.

The sales during the fortnight had been 89,000 bags: 65,000 for the United States, 16,000 for the Channel, 4,000 for the Mediterranean, 25,060 for the Cape, and 1,500 for various ports.

From Santos the total clearances for 3 months had been 75,375 bags, against 111,070 during the same period last year. A market report from that quarter says.—"Sales since my last have been 12,400 bags at an advance of fully 100 rels upon quotations then given. It is probable that a larger business would have been done, but for the sudden advance in rates of exchange at Rio and their since instability, receipts show no increase and stock is about 14,200 bags, most of which is in one hand. All holders are very firm, demanding prices based on 5$500 to 5$600 for old and 5$800 to 6$000 for new terreiro superior. Entries of new are in small isolated lots."

The same papers contain some particulars relative to certain settlements of mixed races at outstations of the interior, for the cultivation of coffee, which will no doubt be interesting to many of our readers :—

One of these—the colony of Martyrios—comprises 22 Brazilian, German and Portuguese families, consisting of 59 persons over 10 years of age and of 35 children under that age, in all 94 persons. The 22 families cultivated in 1869, 42,400 coffee trees, equal to 718 to each person 10 years of age and upwards, producing to each labourer 190 bushels of fruit, or 510 to the family, which last, at the 600 rels paid for each bushel, gathered, amounted to 306$ per family. The goods supplied to each family amounted to 65$113, on the average.

Another settlement of Cresciumal consisted of 45 German families, comprising 134 persons over 10 years of age, and 85 under that age. The 46 families took charge of 113,823 coffee trees, or 2,529 per family and 844 per labourer: these collected 19,108 bushels of fruit.

The Brazilian colony at Cresciumal consisted of 16 families and 102 persons, of whom 37 were over 10 years of age. They cultivated 23,966 coffee trees, being 1,497 per family. Their harvest was 0,557 bushels of fruit, or 273 per family, three famalies having taken no part in the fathering. The earnings per family would be 163$800.

The most curious portion of this statement is the paragraph which tells us that a bushel of cherry coffee produced about one-third of an arroba of berries, or about 11 lbs.

The emancipation movement is making wide-spread progress through the Brazilian empire: each journal contains a list of freed slaves, and we learn from present files that the Brazilian Cabinet had resigned, it is stated, on this identical question, on which their successors appear resolved to act. Should this prove to be their policy, we may expect some disarrangement of the coffee production of that country, although we must not forget that depressed as was the cotton industry of the Southern States by emancipation, they are now producing as large a crop as was ever shipped from America.

WOOD ASHES IN AGRICULTURE.

[illegible] the attention of coffee planters and other agriculturists in Ceylon :—

Much has been said of late years of the virtues of ashes, says the *Albany Country Gentleman*, for farming purposes, but we are confident the half has not been told. Our experience with them extends back a quarter of a century, and every year's experience has strengthened our conviction that ashes are the cheapest fertilizer we can purchase. We formerly paid ten cents a bushel for them, and though the price has doubled, we are satisfied that the commercial is still below the intrinsic value. We have tried lime and plaster, and on some soils and some crops found them useful, and on other soils and crops we have lost our money and labour in the use of these mineral manures; but ashes have never failed to pay well on all soils and all crops. Of course, they do better on sandy and loamy soils than on clay, as the latter, being formed chiefly of granite rocks, naturally contains more potash, but there are few, if any, long cultivated fields from which the inorganic matter is not so far exhausted that ashes will not prove beneficial. This condition is the result of our experience. Now let us consider briefly the teachings of science on this point.

If we burn any vegetable or seed, we find the greater part goes into the air, but a small portion, varying from one to twelve per cent., remains behind in the form of ash. Thus, the grains of wheat burned leave 1·18 per cent. ash; oats, 2·58; potatoes, 2·65; carrots, 5·09; turnips, 7·05; wheat straw, 3·51; oat straw, 5·74; red clover dried, 7·48; carrot leaves dried 10·42. This inorganic part as ash must be derived from the soil. It is of an earthy nature, and can be found only in the earth. The inorganic part, which when burned vanishes into the air, may be obtained from the air again, but it is plain enough that the plant must find its mineral food in the soil. This food diminishes with every crop that grows, with some faster than others, as may be inferred from the varying quantity of ash from different plants; but in all our old pastures and cultivated fields that have been long cropped without suitable return, the inorganic food will be found deficient. Hence the wonderful effect that phosphate or sulphate of lime sometimes produces. England is now transplanting from Egypt the bones of the mummies to be worked up in the first place into turnips, thence into the carcases of shorthorns and South Downs, and, finally, into corpulent Englishmen. If no crops are taken from the soil, the slow disintegration of the rocks and stones, and the decomposition of vegetable matter, will gradually replenish the exhausted mineral elements; but this is a slow mode, requiring many years to accomplish what one good dressing of ashes will speedily effect.

The great advantage which wood-ashes have over other mineral manures is, that they contain not one or two, but all the inorganic constituents of plants. Plaster does well on some soils, and fails on others, because in the first case, sulphate of lime is deficient, and in the other it is not, and after a time, even where it does good, its effect ceases, not because the land has become "plaster-sick," but plaster surfeited, and some other plant food is required. We have known some farmers who, having experienced magical effects from plaster, concluded they could sell their hay and keep up their farms by plaster alone, but we have never known the experiment to succeed for a course of years. The truth is, that in the ash of most plants we find ten or a dozen elementary substances, and plaster only furnishes two of these, namely, sulphur and lime. These are necessary, and so also are phosphorus, potassium, sodium, magnesium, chlorine, silica, aluminium, and iron, and these can all be found in wood ashes, either combined with each other, or oxygen. The analysis of the ash of hard wood shews that all these elements can be cheaply furnished, if we can buy hard wood-ashes at 20 or 25 cents per bushel. The following is Johnston's analysis of the ash of beech :—

Potash	15·83
Soda	2·68
Lime	63·33
Magnesia	11·29
Oxide of iron	·79
Phosphoric acid	3·07
Sulphuric acid	1·35
Chlorine	·14
Silica	1·32
Total	100·00

Our practice has been to leach the ashes and make soap of the soluble alkalies, and use the leached ashes on our land. These are more valuable than is generally supposed, for only a part of the potash and soda is leached out, while the phosphate of lime and other valuable compounds, being comparatively insoluble, still remain.

Leached ashes can commonly be bought for half the price of the unleached, and for agricultural purposes they are worth nearly as much per bushel, as by leaching they are condensed some 15 or 20 per cent. Potash is the main ingredient that leached ashes have lost, and generally only four-fifths of the entire amount of this soluble ingredient. [redacted] the same money we are confident more valuable matter can be furnished to the soil in purchasing leached than unleached ashes. If the land is particularly deficient in potash, or if it is desired to raise potatoes, or any other crop requiring a large per cent. of potash then buy unleached ashes. But if phosphates or sulphates are wanted that will continue their fertilizing influence for a series of years, then, by all means, buy leached ashes.

Besides giving back to the soil the mineral elements which are soonest exhausted, and thus furnishing direct food for plants, ashes also serve another valuable purpose in aiding the decomposition of the particles of the soil, and bringing them into a soluble condition. Even the hard flint stone succumbs to the influence of potash and soda; as every one must have observed who is accustomed to use soda in a glass goblet, the polished glass is soon roughened by potash or soda, the silica being decomposed. Hence the wonderful effect of ashes in stiffening the straw of oats, wheat, and other grains, by rendering the silicious sands soluble.

We have time to mention only one more benefit from the use of ashes, and this is, they furnish the alkalies which will absorb the ammonia wherever decomposition is going on, and then, by the aid of the oxygen of the air, form nitrates of potash and soda, two very valuable compounds in agriculture. In order to secure their formation, however, we must have the decomposition of some bodies that will furnish the ammonia; and this leads us to say that ashes will act with most force when the soil is enriched with ammoniacal manures. If we wish to find nitrate of potash (saltpetre), we look for it in the soil under barns or horse-sheds, where the urine has settled, and where the rain has not dissolved the nitre. From the rich soil of such localities our fathers leached their saltpetre from which they made their gunpowder. Unless nitrogenous manures are used in connection with ashes, they will fail after a time to exhibit much virtue, but when the land is properly enriched, ashes operate with full force, and their effects continue for many years.

COLONEL MEADE AT MUNZERABAD.

Munzerabad, Dec. 29th 1870.

HERE we are close on the end of another year, but it can scarcely be called the festive season as far as planters are concerned, it being the busiest and most anxious time of the whole year barring the blossoming period. This year, however, the visit of the Chief Commissioner, and the favorable manner in which he received a deputation of planters, and listened to an exposition of their wants, has raised the spirits of many, and whatever the future may bring forth, the present feeling of the planting community must be one of congratulation at the change in the head of the Mysore Government.

The Chief Commissioner arrived at Sucklaspore on Christmas Day, and on Monday received a deputation of planters, composed of the president of the association, Mr. J. S. Middleton, the honorary secretary, Mr. George Anderson, and the following members, viz., Messrs. R. Anderson, Major General Ottley, A. Nelson and W. P. Stephenson.

The president read an address setting forth the delight the planters of these parts felt in being able to address the Chief Commissioner personally on the subject of their many wants, the way of assistance from Government.

In addition to the address the secretary read four papers written by various members of the association which it was thought better, on account of their length, not to embody in the address. The first paper written by Mr. Anderson set forth the present unsatisfactory nature of the planters' titles to their land. The second by the president, Mr. Middleton, was on the subject of Forest Conservancy, some of the new rules appearing to the

planters of these parts not adapted to the peculiarities of the country. Paper number three, by Mr. A. Wilson, was on the subject of roads, more roads, and improved roads; and paper number four by Mr. Stephenson on the subject of cardamoms generally, and the proposed terms on which the at present useless cardamom forests of Mysore are to be granted for cultivation.

In reply to the address, Colonel Meade was good enough to say that he was equally pleased with the planters themselves in being able to meet them, and talk over their wants, &c., and this he could assure them the Government of the country had a great desire to encourage them in every way. In reply to Mr. Anderson's paper on the subject of our titles, he said he certainly considered some improvement in the wording of our title deeds was required, and he would see that it was speedily attended to. The Forest Conservancy question, he stated, was one which he could not deal with so readily as that of the puttahs for land, Forest Conservancy being an imperial question, and one which concerned not only the country at large in the present day, but the welfare of future generations. There were, however, some minor rules brought into force last year, which had been found not to work satisfactorily, and orders had been given for their discontinuance. This remark applied especially to the cutting of watties and canes, the stoppage of which had proved a great hardship to the poorer classes. Colonel Meade said he fully agreed that it was very hard that a planter should have to pay for timber growing in his own jungles which he might require for building purposes, but he could promise nothing definite without first consulting with the Conservator of Forests.

In reply to the appeal for more roads and better ones, the Chief Commissioner at once said it was out of his power to do more than was being done, the whole available funds being required for the new Mysore State Railway. The subject of cardamom cultivation received a long discussion, but no definite reply was obtained, Colonel Meade admitting that it was a subject with which he was not very conversant, but that he would retain all the papers on the various subjects, and give them his early and best consideration.

On the whole, the feeling of those who composed the deputation was one of great satisfaction at the manner in which they had been received and the clearness of the views entertained and expressed by the Chief Commissioner, and there can be very little doubt, even if the planters do not get all they ask for, that a great deal of good will be done by the Chief having been able to see for himself some of the many disadvantages the community labor under.—*Madras Mail.*

THE BRITISH CUSTOM-HOUSE TREATMENT OF COFFEE.

COFFEE is probably the most anomalous article in British productions, trade or home consumption. It is so solely on account of its fiscal treatment by financial officials. In contravention of all Acts of Parliament, either sanitary or for taxation, the Treasury—the power for carrying out the edicts of the legislature—has systematically superseded the law of the land, "made a law unto themselves," and stamped coffee with fiction and fraud, from the time it leaves the hands of the growers. There have been five different and contradictory "Treasury Orders" on coffee between 1832 and 1863, viz., in 1832, 1840, 1852, 1853 and 1863. The anomalies resulting from these have been as follows. While all nations, in advancing in population and civilization, have seen their consumption of coffee as well as of tea increasing; *e.g.*, Russia, France, Holland, Germany and America, Great Britain alone exhibits a mere nominal increase of about four or five per cent. in her home consumption between 1840 and 1869. In 1840, the duty was 6*d.* on British and 9*d.* on foreign; on 1869, it was 3*d.* all round. The supply—importation was some 31,000 tons in 1840 and 77,000 tons in 1869. The population would shew more than 15 per cent. advance in 1869, as against 1840. The bonded value, or cost, in 1869, would be much in favor of the consumers as compared with the three years, 1840 to 1842. In face of this combination of advantages, the home consumption has first fluctuated, and then retrograded and stagnated. The Treasury Order, August 1840, in direct contradiction of the Act 43, George 3, cap. 129, cut away the basis of a safe, stable, wholesome progressive trade. It left the article upon such a false foundation, that directly the fiction was publicly assailed in 1848 to 1850 (by the *Lancet* and other sanitary authorities) the home consumption dropped, in three years, from 37,000,000 lbs. to 31,000,000 lbs. Within 16 months,—3rd November 1852 and 28th February 1853—two totally contradictory Treasury Orders were issued upon "mixture" with coffee; one prohibiting, the other allowing the sale. The British public have so positively declined "the mixture as before," that notwithstanding increase of population, of supply, and decrease of duty, they have refused to swallow it, to the extent that instead of drinking the 37½ million pounds of 1854, they could only be dosed with 29,108,932 lbs. in 1869, instead of a natural increase, which should have accrued to the extent of 42,000,000 lbs. or 43,000,000 lbs. The proverb says "give a dog a bad name, and you may as well hang him at once"; the Treasury and Excise have given coffee a bad name, and have strangled its consumption in Great Britain. They have branded it to the British people as an unreliable article, and nothing can contend against the set prejudices of a nation, in food, dress, habits, or religion.

Let us look at another anomaly. In the Parliamentary Committees of 1855, 1856, and 1859, on the laws affecting adulteration, bread and coffee were prominent; the evidence on the one was scarcely more frightful than that on the other, and yet coffee is allowed to remain under the Treasury Orders, which, if applied to bread, would read as follows:—"That no objection be made to the mixture of alum with bread," or, "provided it was labelled." The same anomaly exists in the Excise treatment of any mixture (by the same vendor) of anything with tea, pepper, or tobacco. Take another anomaly. A Sheffield tradesman may be severely punished for putting his neighbour's mark upon his own spurious goods, but the "trade mark" of the Ceylon planter is guaranteed, protected, and encouraged, when it is placed upon chicory! What does the "law of copyright" mean when it is precisely reversed for the industry of the artist, and the industry, enterprise, and capital of the British colonist and planter? There may be a reason why the natural rights of the skill of Sheffield, of the brains of Paternoster Row, of the fine arts of Pall-Mall, should be secured to their authors, and protected by law, while the very germs of national enterprise in Ceylon and India are chained under chicory consumption and piracy; the latter industries are taxed in support of the national revenue, while the former are free; the Colonial involves expatriation, hazard, and risk; Sheffield, Fleet Street, and Piccadilly dwell at home, do what America asked to do in 1768—"send members to Parliament," and make themselves heard and felt. There was an attempt by the Government, under the Treasury Order, 28th February, 1853,—"if labelled mixture of chicory and coffee,"—to deal fairly with this question of false article and piracy of name, but the integrity was more in appearance and honest in intention than in any practical effect; it was an attempt to marry black and white, to tie the false to the real article, to "label" a libel, to ticket a thief the same as a cabman; it was the worst form of a "ticket of leave." A reference to the vast advance in the consumption of tea, from 38,000,000 lbs. in 1840, to 115,000,000 lbs. in 1870, only tends to prove the natural consumptive powers of the nation for temperance beverages, *if* popular and enjoying confidence. It cannot be supposed that home dealers and grocers would embark capital, machinery, enterprise, and organization (as they have done in tea and light wines), to push a trade, subject not only to the varying purposes of the legislature, but to the vagaries of an executive not responsible to tax-payers. We know that for 25 years, the tea trade, *induced* by tea-hawkers, bakers, confectioners, publicans, and others, has been of rapid extension and growth; but, whoever heard of a coffee-hawker, or bought coffee of a licensed victualler? One measure alone can remove the prejudice and stagnation settled upon coffee, namely, an entire repeal of the duty. A development of the consumption, and an adoption of the article as a more general British beverage, may create a basis for future taxation in times of need and pressure. No healthy revenue has been obtained by duty on coffee during 30 years.—*South of India Observer.*

INDIAN FIBRES.

ALOE FIBRE.

[*From Lieut.-Colonel E. Boddam, to the Secretary to the Chief Commissioner of Mysore, dated 16th December* 1870.]

The Chief Commissioner having mentioned his wish for utilizing and spreading the aloe plant abounding in this province, I addressed Dr. Masters, the Editor of the *Agricultural Gazette of London*, asking his assistance in procuring any information about the aloe fibre and its uses. Dr. Masters has very kindly got an article on the subject written by Mr. J. R. Jackson, Curator of Museums at Kew, which I now send you a copy of. It will also form an article in the *Gazette* edited by Dr. Masters. I do not think the aloe we have in Mysore can be the one found so valuable by the Americans, but have no doubt it could be easily introduced, and would grow without trouble. There is another very handsome aloe thriving in great abundance at Morrison's farm, self-grown, which has a very much longer fibre than the common aloe; but I do not know whether it has ever been utilized further than as an ornamental hedge or centre plant in a garden bed. I propose to get it experimented on by Dr. Henderson at the jail.

MEXICAN ALOE.

[*Memo by Mr. J. R. Trench, Curator of Museums, Kew.*]

No tropical plant is better known to the gardener than the American aloe (*Agave Americana*), and no indigenous plant is perhaps more important in Mexico, supplying, as it does, the favorite beverage of the natives, some particulars about which

will be found in the *Gardeners' Chronicle*, p. 1243, 1866, and p. 209, 1867. We now wish to refer to it more especially as a fibre producing plant.

The well known thick leaves are composed of firm pulpy matter in which are embedded numerous strong fibres, when extracted and cleaned they form the "Mexican fibre" of commerce, quantities of which are regularly imported into this country for use in the manufacture of brushes. There is no question as to the strength and durability of this fibre; and the ease with which it is bleached, and its whiteness after bleaching, are strong recommendations for its use for certain articles of trade. For ropes and brush-making it is well adapted, and in its native country, as well as in other countries where it has been introduced, it has always found a use amongst natives either for cords, ropes, fishing-nets, hammocks, the rigging of ships, and even in the construction of bridges. It is said that the roots as well as the leaves yield a strong fibre. The fibre is extracted by steeping the leaves in water and afterwards beating them, and scraping off the fleshy matter, washing the fibre, and finally bleaching. Numerous varieties of the plant exist in Mexico, some of which are useful only for the juice they yield; others for their fibre; while others yield neither fibre nor juice, and are used only for hedges. The fibre yielding forms of agave are known in Mexico as "Henequin" or "Zenequin" to distinguish them from the maguey or pulque yielding. The chief cultivation of the best sorts is confined to the peninsula of Yucatan; the inferior varieties are found in the valleys of Mexico and Puebla, and especially upon the plains of Apam, as well as upon the mountains in the vicinity of the town of Tula, in the state of Tamaulipas. The leaves of the fibre yielding sorts [illegible] and of a darker green than those

[illegible] entirely wild, and the "Yaxqui and Sacqui [illegible] vated on an extensive scale. The leaves of the "Yaxqui" are of a more vivid green color than those of the wild varieties of the plant, and their fibre is of a more elastic and finer quality, whilst that of the "Sacqui" is of inferior quality, but more abundant. The first named variety of the plant is commonly known under the name of "henequin verde," or green henequin, whilst the latter is called "henequin blanco," or white henequin, and constitutes the great agricultural wealth of the two districts of the peninsula of Yucatan. The plants are propagated by transplanting them so soon as the offshoots or suckers are two years old, and at five years old they begin producing fibre, the leaves being cut off at stated periods. The plant can be cultivated in almost every kind of soil, but flourishes most in arid, stony places, usually attaining an age of 14 or 15 years. Although this particular form of the plant would appear to be an exclusive production of the peninsula of Yucatan, it has still been found to thrive very well in the island of Cuba and in the higher districts of the state of Orizaba.

Agave fibre under the name of "Ixtli," and known in Yucatan by that of "iosquil," was turned to various uses by the ancient inhabitants of the central provinces of the Mexican empire, where it is still twisted into thread for shoe-making purposes, twine, thin ropes, lassoes, &c., and woven into sackcloth. The only part of the Mexican empire, however, where this branch of industry is pursued upon any very extensive scale is Yucatan, producing very considerable commercial activity, and especially since about the year 1840, when it was discovered in the United States that agave fibre cables possessed the great advantage over those of hemp of being more flexible and more serviceable in high latitudes, which discovery increased the demand for agave to such a degree as to cause it to rise in value from about four or five reals per arroba (the current price until then) to eleven reals, a price which it commanded during several years; the average price being now from about seven to eight reals, and the supply often not equalling the demand, owing to the tedious nature of the process, until then observed, of separating the fibre from the rest of the leaf by hand, a good workman not being able to clear more than 100 leaves per day. Great efforts were made to cause machinery applicable to the purpose to be invented, rewards being offered, both by private associations and by the State for any machine which would prove to be efficacious. Agave leaves being sent from Mexico to Great Britain and the United States to be operated upon, since a machine which had been invented and introduced into Mexico in 1833, by Mr. Perryne, an American, had been found to be useless, owing to neither the form of the combs nor their motion corresponding to the peculiar shape of the plant's leaves. No better success attended a machine introduced by another American, Mr. Hitchcock, in 1847, nor that subsequently introduced by Mr. Thompson of Boston; until at last, Don Jose Maria Millet, a native of Madrid, the principal city of Yucatan, obtained an exclusive privilege from the Minister of Public Works for a machine of his invention, by means of which he was able to clear about 6 arrobas of fibre per day, the services of only two men and two boys being necessary to work the levers, by means of which the wheels and combs were set in motion. One of these machines has been taken to the city of Mexico to be applied to the extraction of the agave fibre produced upon the plains of Apam, where so many of the leaves of the agave are now wasted, and left scattered about the plantations.

Whilst the cultivation of the agave fibre may be said to extend throughout the whole of Yucatan, there are near upon 40 estates upon which it is exclusively produced; and it is affirmed that the annual commercial movement, including the price of freight, transport, &c., connected with the production of this article, in the peninsula of Yucatan, involves a circulation of from 400,000 to 450,000 dollars annually.

MARKET REPORT.

LONDON, 14*th January* 1871.

COFFEE.—On Tuesday full prices were paid—460 casks, 50 barrels 80 bags Plantation Ceylon, at auction, selling readily from 61*s.* to 70*s.*; 220 half-bales Mocha realised from 84*s.* to 88*s*; 140 bags Singapore brought from 59*s.* 6*d.* to 63*s.* 6*d.* Afloat, two cargoes of Jamel have been sold for the Mediterranean at about 51*s.* Yesterday- 350 casks, 20 barrels, 500 bags Ceylon at auction realised from 56*s.* for small up to 80*s.* for fine bold plantation; 500 bags African went from 49*s.* 6*d.* to 50*s.*; 800 bags washed Rio brought from 59*s.* to 66*s.* 6*d.*; 500 bags La Guayra were partly disposed of from 58*s.* to 60*s.*; 750 bags Bahia were bought in at from 52*s.* to 55*s.* 6*d.*

TEA.—3,168 packages were sold on Monday, nearly all being "without reserve." The bulk of the sale consisted of black-leaf kinds ex recent arrivals. Inferior to good common brought 1*s.* 1½*d.* to 1*s.* 1½*d.* per lb., and good to medium 1*s.* 4*d.* to 1*s.* 6*d.* per lb.—the latter description being about private contract rates. An invoice of new Moyune green tea sold at full prices. The deliveries in London, estimated for the week ended January 9 were 1,782,237 lbs., which is an increase of 1,016,991 lbs., compared with the previous statement.

INDIGO.

CALCUTTA, 31*st January* 1871.

Since our last report there have been three public sales at which 1,360 chests were sold, exclusive of rejections from previous sales. Prices have been fully maintained, and at yesterday's sale the little Indigo of middling and good quality which was offered sold decidedly dearer, the effect no doubt of the news of an armistice having been signed between the Germans and French, added to the fact of there being so very little of European manufacture remaining.

The crop will apparently fall somewhat short of 95,000 maunds, quantity sold 89,000 maunds.

Exports of Indigo from 1st November 1870, to 28th January 1871:

	Chests.	Mds.	S.	Ch.
To Great Britain.....	13,526	51,437	30	8
„ France.....	216	777	5	4
„ Trieste.....	2,738	10,329	26	12
„ Foreign Europe	244	930	33	2
„ America	1,498	5,801	24	4
„ Gulphs & Levante.....	1,275	4,995	37	14
Total.....	19,497	74,272	37	12

William Moran & Co's Circular.

TEA.

Owing to the receipt of telegraphic advices from London reporting a slight fall in prices there, our market during the past week has shewn rather less animation, and the tendency has been towards lower rates.

At auction good and fine teas went a shade easier, whilst common and medium kinds quite maintained their former position. Of the 2,387 packages printed, 164 were disposed of privately before the sales, 1,878 passed the hammer, and the rest were either withdrawn or had not arrived in time for sampling. Sales by private contract have comprised 609 chests, of which the following parcels only deserve mention, *viz*:—

Nahore Garden, Darjeeling, 230 chests, sorts at Rs. 1 0 per lb. all round.
Berenag Tea Estate, Kumaon, 336 „ „ As. 0 14½ „ „

We are sorry to have to state that serious disturbances have occurred in Cachar in consequence of Looshais, a savage hill tribe, having made a most determined raid on some of the out-lying gardens of the district. One European and several coolies have been killed, and but for the presence of detachments of Police others would, no doubt, have shared the same fate. At Monierkhal (tea garden, 20 miles sought of sudder station, Silchar) there was a desperate fight from six in the morning until eleven at night. Four attacks were made and each repulsed; at least 100 Looshais were killed and wounded. The disturbances it is feared may create a panic amongst the coolies belonging to the several gardens and thus cause a considerable exodus of labour. The Looshais, it will be remembered, gave the Cachar planters a good deal of trouble in 1868-69, when they set fire to some factories, besides killing a number of coolies. Prompt measures will, no doubt, be taken by the authorities to punish the raiders, and it is to be hoped the necessity will now be seen of posting a permanent force in this district sufficient for the safe protection of life and property against such hostile neighbours.—*Ibid.*

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No. 478.

FORT WILLIAM.

HOME DEPARTMENT.—PUBLIC.

The 26th January 1871.

NOTIFICATION.

THE Governor General in Council is pleased to direct the publication of the following advertisement in substitution of the one published under Notification No. 145, dated 11th January 1870.—

ADVERTISEMENT.

The Government of India, after communication with various Agriculture and Horticultural Societies in India, and with persons interested in the subject, has arrived at the conclusion that the only real obstacle to the development of an extensive trade in the fibre of Rhea or China-grass is the want of suitable machinery for separating the fibre and bark from the stem and the fibre from the bark, the cost of effecting such separation by manual labour being great.

2. The demand for the fibre is now large, and, no doubt, might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown.

3. The requirements of the case appear to be some machinery or process capable of producing with the aid of animal, water, or steam-power, a ton of fibre of a quality which shall average in value not less than £10 per ton in the English market, at a total cost, all processes of manufacture and allowance of wear and tear included, of not more than £15 per ton. The said processes are to be understood to include all the operations performed, after the cutting and transport of the plant to the place of manufacture to the completion of the manufacture of fibre of the quality above described. The machinery must be simple, strong, durable, and cheap, and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation.

4. To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offers a prize of £5,000 for the machine and process that best fulfils all the requirements named above.

5. Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named.

6. Owing to the delay that has taken place in maturing the preliminary arrangements, the Government of India has decided that the competition will not be held until the 1st April 1872, thus affording a much longer time than was originally intended for the preparation of machines and their transport to the locality appointed for the competition. The Government Rhea Plantation at Saharunpore, in the North-Western Provinces, has been fixed as the place where the public competition will be held, and the Government of India will provide one or more small steam-engines to work the machines during the public competition.

7. All machinery, &c., intended for trial must be brought by the competitors, at their own charge, to the Saharunpore Rhea Plantation, and kept ready before the 1st April 1872, to be there worked under their own supervision, or under that of their representatives, for a sufficient length of time to enable the judges appointed by Government to determine whether all the conditions named have been complied with. The prize machine is to be transferred to Government at five per cent. above cost price; the patent right in any such machine to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of five per cent on the cost price of all machines manufactured under the patent during its currency.

8. Arrangements have now been completed for the supply of dried Rhea stems to intending competitors, both in this country and in Europe, to enable them to form a correct idea of the nature of the plant which their machinery will be required to deal with. Persons in Europe desirous to obtain small supplies of dried Rhea stems for the above purpose, should apply to the Secretary of State for India. Intending competitors in this country, desirous of obtaining supplies of the article, must submit applications to the Secretary to the Government of India in the Home Department, in the Form A. hereto annexed, prior to the 1st of March 1871; and those who are desirous of testing their machinery on the fresh Rhea at the Government Rhea Plantation at Saharunpore during the year 1871, must submit their applications to the same authority in the Form B. hereto annexed, prior to the 1st April 1871. The former will have to pay the expenses that may be incurred in packing and despatching the stems. The latter will have to provide all labour and motive power necessary for, and to pay all expenses connected with, their experiments. the fibre turned out by their machines during such experiments to become the property of Government.

9. In order to enable the Government to arrange for the provision of a sufficient stock of fresh Rhea stems for the purposes of the formal competition in April 1872, it is necessary to ascertain beforehand the number of machines that are likely to take part in it; and intending competitors are, therefore, requested to submit, prior to the 1st May 1871, and in the Form C., also hereto annexed, notices of intention to compete.

FORM A.

APPLICATION FOR DRIED STEMS OF THE RHEA.

To the Secretary to the Govt. of India, Home Department.

Name of applicant	Profession or occupation.	Address in full.	Quantity of dried stems applied for.	Locality to which it is desired that the stems be transmitted.	Name of nearest Railway station to locality entered in preceding column.

On hearing from the Superintendent of the Government Rhea Plantation, Saharunpore, the amount of the expenses to be incurred in packing and despatching the quantity of stems above applied for, or such lesser quantity as may be allotted to me, as also the cost of carriage of such quantity to *(here insert the locality to which it is desired that the stems be forwarded)* or to the nearest Railway Station, I promise to remit the total amount so required to the said officer, and I acknowledge that the packing and transmission of such stems will be entirely at my risk.

(Date)

(Place) *(Name in full.)*

FORM B.

Application for Permission to make Preliminary Experiments for testing machinery at the Government Rhea Plantation, Saharunpore.

To the Secretary to the Govt. of India, Home Department.

Name of applicant.	Profession or occupation.	Address in full.	Brief description of machinery proposed to be tested.	Date on which applicant, if permitted, proposes to commence testing his machinery.	Approximate amount of green stem which applicant expects will be necessary for testing the machinery.

I acknowledge that, if permission be granted to me to test the above-described machinery at the Government Plantation, such permission will be subject to the following conditions:—

1*st*.—I am to provide all labour and motive power necessary for, and to pay all expenses connected with, testing my machinery.

2*nd*.—I am bound to conform to such rules in regard to time and place of conducting my experiments, hours of working, and the like, as the Superintendent of the Plantation may lay down for my guidance.

3*rd*.—I shall receive only such quantities of green stem, and at such time or times as, with reference to the other claims upon him, the Superintendent may find convenient to allot me.

4*th*.—All fibre, &c., turned out by my machines during these experiments with stems furnished by Government will be the property of Government.

(Date)

(Place) *(Name in full.)*

FORM C.

Notice of machinery intended to compete for the Government Rhea machinery prizes at the trials to be held at Saharunpore in April 1872, *and subsequent months.*

PARTIES INTENDING TO COMPETE.			Number of different kinds of machines which competitor desires to take part in the trials.	Brief description of each kind of machine.	Motive power required to work the machine.	Date by which the machines will be ready at Saharunpore for trial.
Name in full.	Profession or occupation.	Residence in full.				

In proposing to enter the above-noted machinery for the Saharunpore competitive trials, I do so under the full understanding that—

1*st*.—I shall be bound to conform to all rules and regulations in regard to all matters in any way connected with these trials that may be laid down by Government, or by the judges appointed by Government to preside over these, and that, failing to do so, I shall forfeit all claim to any prize, reward, or recompense from Government, and entirely disqualify my machinery for the competition.

2*nd*.—All fibre, &c., turned out by my machinery during the trials with stems furnished by Government will be the property of Government.

(Date) *(Name in full.)*

(Place)

Offg. Secty. to the Govt. of India.

Printed for the Proprietor at the *Perseverance Printing Press*, Bombay.—Published by Messrs. WYMAN & Co., Calcutta.—15*th Feb.* 1871.

THE

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A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH MARCH, 1371. [No. 8.

Advertisements.

No. 478.

FORT WILLIAM.

HOME DEPARTMENT.—PUBLIC.

The 26th January 1871.

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2. The demand for the fibre is now large, and, no doubt, might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown.

3. The requirements of the case appear to be some machinery or process capable of producing with the aid of animal, water, or steam-power, a ton of fibre of a quality which shall average in value not less than £10 per ton in the English market, at a total cost, all processes of manufacture and allowance of wear and tear included, of not more than £15 per ton. The said processes are to be understood to include all the operations performed, after the cutting and transport of the plant to the place of manufacture to the completion of the manufacture of fibre of the quality above described. The machinery must be simple, strong, durable, and cheap, and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation.

4. To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offers a prize of £5,000 for the machine and process that best fulfils all the requirements named above.

5. Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named.

6. Owing to the delay that has taken place in maturing the preliminary arrangements, the Government of India has decided that the competition will not be held until the 1st April 1872, thus affording a much longer time than was originally intended for the preparation of machines and their transport to the locality appointed for the competition. The Government Rhea Plantation at Saharunpore, in the North-Western Provinces, has been fixed as the place where the public competition will be held, and the Government of India will provide one or more small steam-engines to work the machines during the public competition.

7. All machinery, &c., intended for trial must be brought by the competitors, at their own charge, to the Saharunpore Rhea Plantation, and kept ready before the 1st April 1872, to be there worked under their own supervision, or under that of their representatives, for a sufficient length of time to enable the judges appointed by Government to determine whether all the conditions named have been complied with. The prize machine is to be transferred to Government at five per cent. above cost price ; the patent right in any such machine to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of five per cent. on the cost price of all machines manufactured under the patent during its currency.

8. Arrangements have now been completed for the supply of dried Rhea stems to intending competitors, both in this country and in Europe, to enable them to form a correct idea of the nature of the plant which their machinery will be required to deal with. Persons in Europe desirous to obtain small supplies of dried Rhea stems for the above purpose, should apply to the Secretary of State for India. Intending competitors in this country, desirous of obtaining supplies of the article, must submit applications to the Secretary to the Government of India in the Home Department, in the Form A. hereto annexed, prior to the 1st of March 1871 ; and those who are desirous of testing their machinery on the fresh rhea at the Government Rhea Plantation at Saharunpore during the year 1871, must submit their applications to the same authority in the Form B. hereto annexed, prior to the 1st April 1871. The former will have to pay the expenses that may be incurred in packing and despatching the stems. The latter will have to provide all labour and motive power necessary for, and to pay all expenses connected with, their experiments the fibre turned out by their machines during such experiments to become the property of Government.

9. In order to enable the Government to arrange for the provision of a sufficient stock of fresh rhea stems for the purposes of the formal competition in April 1872, it is necessary to ascertain beforehand the number of machines that are likely to take part in it ; and intending competitors are, therefore, requested to submit, prior to the 1st May 1871, and in the Form C., also hereto annexed, notices of intention to compete.

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Name of applicant.	Profession or occupation.	Address in full.	Quantity of dried stems applied for.	Locality to which it is desired that the stems be transmitted.	Name of nearest Railway station to locality entered in preceding column.

On hearing from the Superintendent of the Government Rhea Plantation, Saharunpore, the amount of the expenses to be incurred in packing and despatching the quantity of stems above applied for, or such lesser quantity as may be allotted to me, as also the cost of carriage of such quantity to *(here insert the locality to which it is desired that the stems be forwarded)* or to the nearest Railway Station, I promise to remit the total amount so required to the said officer, and I acknowledge that the packing and transmission of such stems will be entirely at my risk.

(Date)

(Place) *(Name in full.)*

FORM B.

Application for Permission to make Preliminary Experiments for testing machinery at the Government Rhea Plantation, Saharunpore.

To the Secretary to the Govt. of India, Home Department.

Name of applicant.	Profession or occupation.	Address in full.	Brief description of machinery proposed to be tested.	Date on which applicant, if permitted, proposes to commence testing his machinery.	Approximate amount of green stem which applicant expects will be necessary for testing the machinery.

I acknowledge that, if permission be granted to me to test the above-described machinery at the Government Plantation, such permission will be subject to the following conditions :—

1*st*.—I am to provide all labour and motive power necessary for, and to pay all expenses connected with, testing my machinery.

2*nd*.—I am bound to conform to such rules in regard to time and place of conducting my experiments, hours of working, and the like, as the Superintendent of the Plantation may lay down for my guidance.

3*rd*.—I shall receive only such quantities of green stem, and at such time or times as, with reference to the other claims upon him, the Superintendent may find convenient to allot me.

4*th*.—All fibre, &c., turned out by my machines during these experiments with stems furnished by Government will be the property of Government.

(Date)

(Place) *(Name in full.)*

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Name in full.	Profession or occupation.	Residence in full.				

In proposing to enter the above-noted machinery for the Saharunpore competitive trials, I do so under the full understanding that—

1*st*.—I shall be bound to conform to all rules and regulations in regard to all matters in any way connected with these trials that may be laid down by Government, or by the judges appointed by Government to preside over these, and that, failing to do so, I shall forfeit all claim to any prize, reward, or recompense from Government, and entirely disqualify my machinery for the competition.

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(Date)

(Place) *(Name in full.)*

Offg. Secty. to the Govt. of India.

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Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH MARCH, 1871. [No. 8.

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ACCORDING to the *Pioneer*, it has been suggested that sugar-mills worked by steam should be set up in various places in the North-West Provinces, the specimen purchased by the Surat Local Committee at the Broach Exhibition having proved so great a success. The results of the Surat experiments are valuable, says our contemporary, inasmuch as they prove, contrary to the received idea—that the natives of this country will gladly adopt agricultural improvements when brought within their reach.

THE same journal sums up the results of Dr. Clarke's observations upon the growth of the Cinchona plantations in Bengal and Madras respectively, as follows :—

"Limiting his comparison to the trees of three years "growth, Dr. Clarke shows that the best trees of *C. succirubra* "at Rungbee are nearly twice as high and bushy as those "on the Neilgherries, and this too with far less attention "having been bestowed upon them. He estimates therefore that "any quantity of *succirubra* can be grown at Sikkim at *half the* "*cost* that it can in Madras. With regard to *C. calisaya*, at "present the most valuable cinchona under cultivation, the "superiority of Bengal is still more striking, for there the tree "reached in three years the height of eighteen feet, while the "best specimens on the Neilgherries were shrubs of about seven "feet. Bark of an inferior quality might, according to Dr. "Clarke, be grown in Bengal in almost any quantity at 3*d.* per "lb., and this Madras can never hope to accomplish."

THE state of the land tenure question in the North-West Provinces is anything but satisfactory. We are told by Mr. Elliott that "the tendency of our rule has been to increase the inse-"curity of the cultivator's tenure, and that in two ways—(1), "the agricultural population has increased so that competition "for land has become keener; (2) the zemindar, having no "longer occasion to call on his cultivators to take up arms for "him, enters the market more untrammelled, and accepts the "best cultivator with no *arriere pensee* as to whether he is as "good at quarter-staff and broadsword play as he is at ploughing. "On the other hand, we have deliberately set ourselves by law "to oppose this increase of insecurity, by bestowing a new secu-"rity on the old cultivators, a legal prohibition against ousting." Exact enquiry in 20 selected villages as to the issue of this struggle shews, we regret to say, that the hereditary cultivator (*mouroosee*) is steadily disappearing before the encroachments of the zemindar. A comparison, says Mr. Elliott, of the amount of change among the *mouroosees* with that which has occurred among the *ghair mouroosees* (non-hereditary cultivators) would almost justify the hypothesis that not one of the old cultivators would have been left, but a complete sweep have been made of them (at the cost of how much suffering and distress of mind no one can calculate) but for the action of Act. X of 1859."

"The conferment of occupancy rights under this Act has been no dead letter; whether for good or for evil, it has held its own against the numerous influences which war against permanency, and has given us a large class of tenants who may fairly be compared with the yeomen of our own country."

AMONGST the experiments which are being made in modern agriculture at home, the *drilling* of wheat, in place of sowing it broadcast, is one of the most interesting. Mr. Mechi, under date of September 1870, writes :—

"I continued my experiments this year by drilling, last Octo-"ber, 1 peck of wheat on half an acre, and my usual quantity "of 1 bushel per acre on the rest of the field. The two half acres "were carefully kept separate, and the produce of the thinner "sown was at the rate of 49 bushels per acre, while that of the "thicker sown was at the rate of 52 bush. per acre, showing an "advantage of 3 bushels per acre in favour of the thicker sown. "About the same result took place last year, proving that "1 bushel per acre drilled is the quantity for my heavy land. "During two years 1 peck dibbled beat all the wheat on the farm, "producing 7 qr. 2 bush. and 7 qr. 1 bush. per acre. But a good "deal depends upon season, and nature and condition of the "soil. This season has been particularly favourable to the thick "sower, for the wheat did very little branching or tillering in "the spring. Consequently, owing to this and the dry season, "which prevented the formation of heavy flag and much straw, "the crops were generally standing and unlaid. It is because "they were standing and the sap fully elaborated that we hear of "very heavy yields—say 7 to 8 qr. of wheat per acre on heavy "and rich land. Last year, under different circumstances, the "thick-sown crops were laid prematurely, and produced wretched "results. The conclusion we must draw is, that seasons influ-"ence results as regards thick or thin sowing, but, as a rule, "great mischief arises from sowing too much seed."

Seven to eight quarters (3,360 lbs. to 3,840 lbs.) per acre. The agricultural statistics of the North-West Provinces 1869-70 lately published shew an average yield of 540 lbs. per acre!

THE Report of the Commissioner of Agriculture at Washington for December contains some valuable information with respect to the cotton crop of 1870. The Commissioner estimates the yield at 3,800,000 bales, amounting to 1,767,000,000 lbs., or 82 per cent. of the crop of 1859, the heaviest cotton year when the yield was 2,154,820,000 lbs. The following table shows the detailed estimate, giving for each state the number of acres cultivated and the estimated yield per acre :—

States.	Acres.	Bales.	Yield p. acre.
North Carolina.....	451,714	... 170,000.....	175 lbs.
South Carolina	601,764	... 220,000.....	170 "
Georgia	1,330,991	... 495,000.....	173 "
Florida	140,909	... 50,000.....	165 "
Alabama	1,437,272	... 510,000.....	165 "
Mississippi	1,644,512	... 725,000	205 "
Louisiana	920,700	... 495,000.....	250 "
Texas	900,937	... 465,000.....	240 "
Arkansas.....	711,734	... 375,000.....	245 "
Tennessee.....	626,184	... 215,000.....	190 "
Other States.....	218,823	... 80,000.....	170 "

The same report gives some interesting information concerning other crops. Sugar-cane in Louisiana is set down for an increased production of about 30 per cent. this year. A similar rate of increase is reported for Texas, and more moderate increase for Florida and Georgia. So much cane, however, is used for increased planting, thus extending the acreage, that the product of sugar and molasses does not increase in proportion to the cane growing. Of Indian corn the crop of 1870 is said to exceed 1,100,000,000 bushels, showing an average product of 28 bushels per acre on 39,000,000 acres this year, as compared with 23½ bushels per acre, or a little more than 37,000,000 acres last year. The tobacco crop is large, the estimate being about 300,000,000 lbs. The flax crop shows a somewhat better yield than last year.

THE average prices of corn at home throughout the year ending Michaelmas last were as follows :—

Wheat .....45*s.* 11*d.* per Imperial Quarter
Barley .....34*s.* 11*d.* „ „
Oats .....28*s.* „ „

As the imperial quarter contains eight bushels, and the average weight of a bushel of wheat is 60 lbs, 46*s.* per quarter is about equivalent to 10½ seers per rupee—a price lower than that at which the staple was procurable throughout Northern India during the famine. In the famine tract itself, the price of wheat from October 1867 down to August 1870, a period of nearly three years, was as follows :—

1867.....Average 7 Seers per Rupee.
1868..... „ 6 „ „
1869..... „ 6 „ „
1870..... „ 7½ „ „

For months together prices were ruling at 4½ to 5 seers only, or double the cost of bread at home. Bajira was almost as dear as wheat. The fluctuations in price during the year at home, were,—

	Highest Price.		Lowest Price.
	s. d.		*s. d.*
Wheat, Aug. 6, 1870	54 11	Feb. 26, 1870	40 7
Barley, Nov. 13, 1869	38 9	July 9, 1870	30 3
Oats, Aug. 6, 1870	28 8	Feb. 12, 1870 / „ 19, 1870	19 10

The nett imports of wheat into England during the two years ending Sept. last, were,—

	1869.	1870.
Wheat	6,976,427 qrs.	8,678,414 qrs.
Wheat flour	4,277,183 cwts.	5,277,846 cwt.

equivalent to about 8,200,000 quarters of corn in 1869 and 10,200,000 quarters in 1870, against a total consumption in the country of about 21,000,000 quarters.

THE loss to the country at large, says a contemporary, "by the "general disregard of the system of making small money advances, "known as *tuccavee*, to peasant proprietors in order to make them "carry out small improvements on their estates, is incalculable." The system of making advances of this description by Government is very ancient in this country, and has been acted upon by ourselves at intervals almost from the commencement of our rule. As Mr. Strachey pointed out in Council lately, the system, though in an undeveloped form, is identical in principle with that which has been carried out on a large scale in many parts of England and Ireland, under the "Land Improvement Acts." There is certainly no country in the world to which a system of this kind is more properly applicable than India.

At home we have private companies incorporated under special Acts of Parliament for making such advances. Thus the Lands Improvement Company of Great George Street advance money, unlimited in amount, for all purposes of agricultural improvement, including the erection of cottages and farm buildings, to the owners of settled and other estates, and to the clergy in respect of their glebe lands; the outlay is liquidated by a rent charge upon the land, redeeming principal and interest in twenty-five years. No investigation of title is required.

The General Land Drainage Company of Whitehall Place advances in the same way for works of drainage of any extent, irrigation, enclosing, wood grubbing, road-making, farm-houses, farm-buildings, and labourers' cottages, on all descriptions of property, whether freehold, entailed, mortgaged, trust, ecclesiastical, corporate, or collegiate, and grant loans for the purpose to landowners who desire to execute the works by their own agents.

Tenant-farmers may also, by arrangement with their landlords, procure the execution of improvements on their farms at an annual cost of from to 2 to 6 per cent, on the outlay which may be charged on the estate, and paid off by a rent charge in thirty-one years, or at the option of the landowner in a shorter term. No investigation of title is required and no legal expenses incurred. The Company undertake also the erection of cottages for agricultural labourers on favourable terms.

The final object of the Indian Bill is to give the assistance of the State for the purpose of carrying out works of permanent agricultural improvement, for the most part such as wells and small drainage works and the reclamation of waste land. "There is also another class of works at the present time for which advances of this kind are to be made. Northern India has been gradually covered with a system of canals for irrigation, but the State can only construct main channels for these works. It rests with the occupiers themselves to take water or not as they please, and there is frequently extreme delay after the main channels are made in taking the water. Government believes that there can be no object to which advances can be more advantageously devoted than this. In making loans for these works, there will be no risk as the loan will be given on the security of the land itself."

We cannot keep too vividly in mind the words of Mr. Strachey "that the one great source of wealth in India is the land. The "whole present and future prosperity of this country, and the "future financial position of our empire in India depend upon "the development of the vast agricultural resources of the country. This measure will be a fresh recognition of the fact that "the Government of India is not only a Government but the receiver, as representative of the public, of that portion of the "rent of the land which has belonged from time immemorial to the State, and in its capacity as 'chief landlord" of the country, "duties devolve upon it for the improvement of the land and for "the advancement of agriculture far beyond the ordinary 'duties of a Government, and similar in kind to those duties "which a good landlord has everywhere to perform."

THE SEWAGE QUESTION.

THE especial question,—"What is the best method of disposing of sewage and excreta?" appears to have been exhaustively reviewed by Mr. J. P. Blackburn at the late meeting of the Social Science Association at Newcastle, who stated his general conclusion that "there is only one outlet for the world's refuse, and that is vegetable production. No filter, nor chemical or mechanical contrivance can compete with the soil as a medium for purification; it abstracts not only the suspended matters, but also those in solution, then retaining them until appropriated by the plant, and this cleansing power is never being renewed by the plants, which are constantly withdrawing the deposited impurities and rebuilding them into vegetable structures. * * *

"I think it may be presumed that water has long been decided on by sanitarians as providing the best means of bearing away all the refuse of our towns, which will have to be taken on to the land in some form or other. * * * Dry manure is of very inferior quality. Irrigation, which implies taking the sewage straight from the outfall to the land, holds out great hopes of success, both as regards utilising the manure and preventing the pollution of our river; to do this with the least waste and offensiveness, the sewage should be delivered on to or absorbed by the soil in a fresh state before decomposition has commenced. * *

"As to the money value of sewage, chemists have estimated it at 8*s.* 4*d.* per head per annum, but in practice we have not yet approached this; the gross return has not been more than from 4*s.* to 5*s.* a head, but it must be remembered the whole system is completely in its infancy, and further experience will bring with it considerable amendment.

"As examples of what is being done in England, I may mention the farms at Barking, Croydon, Norwood, Bedford, as furnishing instances, out of some twenty or thirty, of what is being done; also Mr. Hope's farm, near Rumford, which from present appearances promises to be a most important example. My own farm on the Government land at Aldershot is an instance of reclaiming land by sewage, and which is about the most barren soil in Great Britain; fair crops of grass, potatoes, and cabbages are grown on part of it, but its natural poverty

makes extraordinary demands on the sewage. Looking at these farms as means of purification, they may be considered a success, as shown in the analysis of the effluent waters made by the Rivers Commission; their inquiry as to the effect of these farms on the health of a neighbourhood was equally satisfactory. The economic use of sewage is really a national question.

In the discussion which followed the reading of Mr. Blackburn's paper,

DISCUSSION.

Mr. Goodwin thought Mr. Blackburn's communication an excessively valuable contribution, more especially so as it was not from hearsay that his conclusions were derived, but from his own practical experience. He thought that it must be admitted that at all those places where irrigation had been tried it had been successful to a certain extent. It was, however, so serious a matter that every part of the question must be discussed and calmly reviewed.

Mr. Arthur Trevelyan said he had heard nine papers read at the British Association meeting on this subject of sewage, and the ultimate result seemed to be that the wet sewage system was a failure as a general rule.

Dr. Fairgus said he had studied this question closely, and had come to the conclusion that the system of carrying excreta by water was a great mistake. The refuse was carried away and poured into the rivers, and, taking the Thames as an example, the result was utter pollution. Four and half millions had been spent on a scheme of sewage, and the river just named had been almost choked up, the depth being reduced from 20 feet to 10 feet, while at the same time the people were literally poisoned.

Mr. Rawlison, interrupting Dr. Fairgus, stated that he was appointed upon this very subject some little time ago and took evidence on the question. He could therefore state that, as to the pollution of the river, it was quite true, but the statement as to the decrease in depth and the injury to health was quite erroneous.

Dr. Fairgus reiterated his statement that disease had been created by the pollution, and he would also suggest that the best plan was to keep the excreta out of the sewers altogether. It only decomposed in them, and made them a gigantic store-house for the most noxious gases. Taking Croydon as a good specimen of the places where irrigation was carried on, he maintained that the result was a failure.

Mr. Hirst said that great advances had been made at Bedford in the disposition of sewage by irrigation, the experiments there having been crowned by perfect success. He regretted, however, that the system had not been in operation sufficiently long to enable him to give statistical proof of that success. The produce of the land under sewage irrigation was abundant in quantity and excellent in quality. The rye-grass produced on sewaged soil amounted to something like £21 per acre. The cabbages surpassed any he had ever seen; their size led to their being sold in quarters; and he had partaken of a lettuce from the sewage ground weighing 5lb., and excellent in taste As regards the smell, he considered it insignificant, and not detrimental to health; and the fluid, after draining through the land, became clear and fit to drink. The dry-earth system would answer in the case of small communities and isolated houses, but would be found impracticable on a large scale. One form of it was tried at Leicester some years ago, but great difficulty was found in disposing of the soil; the farmers would not buy it. Of course, the farmers were deceiving themselves as to the value of the manure, but still the fact was so.

Dr. Stevenson Macadam contended that the perfect solution of the problem was still in the future. The filtration method did not really attain the ends in view. The chemical method was of no practical value, because no available chemical had been discovered to precipitate the fertilising ingredients and free the liquid from impurity; and the irrigation process had not, as far as he was aware, been tried with success in any large town. In the often-quoted case of Edinburgh, just so much sewage was taken up as the piece of land under sewage irrigation needed, and no more; the rest of the sewage ran waste to the sea. The experiments made by Dr. Elliot, at Carlisle, were designed only for the benefit of a small piece of land; they were not conceived with a view to the disposal of the whole of the city's sewage. *His opinion was that the chief aim If a town should be to get rid of the sewage in the most expeditious way. of the town were near the sea, let it run into the sea by all means, for sewage could not be regarded as an article saleable with profit.* Its variable character was against its sale. The fertilising properties of Edinburgh sewage, for instance, varied every hour; at one time it gave him 188 grains of organic matter to the gallon: at another period earlier in the morning, half-past one, it yielded only 27 grains; at half-past three it yielded but 23 grains; and at half-past five it yielded only 8 or 9. His experiments with the earth-closet system supported this view also. An experimental dry earth-closet was set up in a Scotch town, and used by 40 or 50 people during twelve months. The earth was prepared so that it might be very fine, and during the year it was passed through the closet four times. The cost of the experiment, including interest upon the cost of the building, and the preparation of the earth, £62, and the wages of an attendant, estimated at 3s. per week, amounted to £21, and the value of the manure produced did not exceed £6 or £1 per ton on the spot. He had inspected in Liverpool, in the lower part of the town, a novel system of water-closet, suitable for poor districts. The closet was half filled with water, and each morning the scavenger, by opening a little door, sends the excrement into the drain, swabs down the closet, and again half fills it with water. This worked well and overcame the difficulty attending all systems in their adaptation to poor classes; they were perfectly healthy, and the daily visits of the scavenger prevented their becoming a nuisance.

Dr. Farr did not think the water system by any means free from faults. Unquestionably a nuisance was created by employing sewage to carry off the excrement, and he could not agree that the sewage did not smell when cast upon the land. Sometimes gentlemen had noses and did not smell, just as some had eyes and did not see. No doubt good management would reduce the smell to insignificance, and prevent injury to health, but as managed in Edinburgh the system was deleterious to health. He was inclined to think that further investigation would prove that no uniform system could be adopted for the whole country, but they had attained one thing by discussion so far, and that was an acknowledgment of the fact that if the sewage were not returned to the earth the country would gradually become impoverished.

Mr Michael reminded the section that sewage comprised not only feculent matter, but house slops, and generally a quantity of liquid which could not be got rid of by drying. The process sought for must therefore be a process for carrying this fluid; and *after 12 years of laborious investigation, the highest scientific and engineering authorities, appointed by Parliament because of their eminence and impartiality, uniformly reported in favour of utilisation of sewage by irrigation of land.* In the course of his dealing with the question professionally, he had been concerned in three investigations of the utmost importance: the case of Blackburn, when it was proposed to use a thousand acres of land in the experiment; the case of Reading, where the same number of acres would be experimented on, and the case of Merthyr Tydvil, where they proposed to take 600 acres. The evidence given by the witnesses in these cases was diametrically opposite upon the same set of facts. Some doctors said irrigation in a certain case produced fever, and others said irrigation had nothing to do with it. The Commissioners had uniformly reported that, beginning with Edinburgh and going throughout the land, they were absolutely without evidence of a single case of disease produced by the irrigation of land from sewage; and it came out in cross-examination that one of the strongest alleged cases of fever having been produced by utilisation of sewage arose from the milkman having adulterated the milk he supplied to the orphanage, where the fever broke out, with impure water and a tadpole found in the milk, proving the adulteration. In another case opponents of sewage irrigation visited Mr. Blackwood's farm, and declaimed against the drainings from the sewage as black and stinking, but it was found they had sampled the sewage itself before it was applied to the land. Weighing the system by the evidence, it was found to be the very best possible system, but it must be carried out under three conditions to be harmless: the storm water must be kept out of the drains; sewage must be delivered fresh; and it must be filtered, that the solid portions may not be passed on to the land. Under these conditions the system will be innocuous and health secure. The public seemed to think that a sewage farm was a stinking quagmire; but as a matter of fact the land was put under sewage only eight times a year, and the effect was decernible only in the character of the crops. The Commissioners had decided against the "A. B. C." and the line methods, and Parliament now seemed willing to grant compulsory powers to local authorities to get rid of their sewage by land irrigation,—the only method which fulfilled the conditions of nature without deleterious effect.

Mr. Holland pointed out that if sewage was taken to the land in a dry state it must be wetted before it could be appropriated by the land, and argued from this that the land might as well have it wet at first as at last; sewage in that case would do naturally what farmers now do artificially at great expense. As regards the smell, he had gone about with a good nose deliberately to see whether the air bore any taint from the sewage cast on a field, and could discover no taint whatever; the land absorbed it utterly.

Mr. Ikin, of Leeds, remarked that in the West Riding they were placed in very peculiar circumstances. Parliament had forbidden them to pollute the rivers with the refuse dye; and the creation of cesspools was the only course at present left open to them, the "A. B. C." method having proved a dead failure. He therefore asked the practical philosophers of the Social Science Congress to tell him what the people of Leeds must do to overcome their difficulty—to be content with cesspools, or to take their conduits 30 or 40 miles into the country.

Mr. Allendale condemned the water system as a gigantic mistake. It was an accepted principle that 3lbs of foul matter covered by 20 gallons of water would increase the nuisance, and the conclusion was irresistible that excrement should be removed in as solid a form as possible.

Mr. Headlam, M. P, whatever was the best system in the abstract, it would be necessary, to deal with the subject very much as it was found. It would, for instance, be absurd to attempt to upset the water-closet system of London or Manchester. The simplest plan was to get the sewage on the land as soon as possible. He had not the very highest opinion of the value of the sewage. The first thing was to get quit of it, and if farmers would pay for it, so much the better. But, although alive to the necessity of dealing with the sewage in towns where the water system was established, he would strongly advise the compulsory establishment of the dry-earth system in new villages.

On the motion of Mr Michael, seconded by Dr. Farr, it was unanimously resolved to recommend the Council to consider the desirability of appointing a committee to investigate the question, "What is the best method of disposing of fluid excreta?"

THE NEW DEPARTMENT OF AGRICULTURE.

(*The Observer.*)

THERE is no doubt that a great deal might be done towards improving the condition of the peasantry, by introducing an improved system of agriculture, but the proposed method of dealing with the question will, we fear, prove utterly ineffective. A man who had been trained in the practice of scientific English agriculture, and who had also a real and detailed knowledge of the art as practised in this country, would, doubtless, be able to suggest many valuable reforms; but special previous training, as well as patient local study, are necessary conditions of usefulness, and no such qualifications could be hoped for in such a department as is proposed, consisting, as it must do, in its upper ranks, of civilians and military men. It may be said that a central bureau will at all events collect statistics, but it must be remembered that accurate information on such a subject can only be procured by specially trained men. It is to Arthur Young, Lavoleye, and other similar writers, that we owe what we know of agriculture in Europe, and till men of the same class are to be found in India, there will really be no statistics to collect If the State is to exercise any beneficial influence on Indian agriculture, it will not be by the creation of new Secretariat Offices, but by employing a certain number of skilled scientific agents who must be willing to spend months, if not years, in patient local study before they can hope to have anything to teach. When this has been done, it will be time enough to think of model farms and agricultural schools. In the meantime, the newly organized department may perhaps do the work which it takes over from the Home and Financial Offices as well as it has hitherto been done; but if the despatch in which its objects are described may be taken as any indication of the spirit in which it will act, there is much reason to fear that the preparation of showy reports will be preferred to solid unpretending work.

(*The Englishman*)

The criticism of the *Observer* and of the press generally seems to us to ignore one very important advantage which will be secured by the creation of the new department. India will have,—what she has not had before,—a department whose interest it will be to treat all questions connected with the material development of the country on their merits, and which will, at the same time, possess ample powers to adopt in all such questions whatever course of action may appear to it best calculated to promote that object. The policy of the new bureau will be progress, and its reputation will entirely depend upon its success in aiding progress. With such a role marked out for it, private enterprise will be its natural ally, and will approach it with a confidence that has hitherto been wanting.

One of the most important objects of the department will, no doubt, be the collection and utilisation of statistics, and we must say, we do not believe it can efficiently discharge this function, without special machinery and a considerable increase of existing expenditure. We agree with the *Observer* that we can have no useful statistics without employing carefully trained enquirers to collect them. But this is no reason why we should not have a "new secretariat office," whose special province it should be, among other things, to direct such enquiries, and apply the information obtained.

(*Indian Daily Examiner.*)

Our conviction is that the new department if it seeks to improve and extend agriculture by district officers will miserably fail. It must have a subordinate staff of its own, trained for their work just as our forest-rangers have been trained; otherwise we shall have no more than the doubtful benefit of another Secretariat For the administration of commerce, the present staff of the Customs Department should amply suffice.

(*The Pioneer*)

WE confess that, while admitting the convenience and necessity of adding to the Secretariat staff, so far as the progress of agriculture is concerned, we look forward to the measure without any hope at all. When all the various subjects enumerated by the Government of India have been made over to the new office the head of the department will find little time to take up a new line of duty for himself, and if agriculture is to be improved, he must take up a new line. The idea that any real good can be done by collecting unreliable statistics and writing reams of reports is puerile. The work to be done requires a man of practical experience who will go about the country, see what is required; know how it ought to be done, and have power to do it. Now, even if such a man was at all likely to be made a Secretary, the duties of the office would be incompatible with this kind of work. He would find himself thrown into the middle of a mass of work handed over to him from other departments. Desk work for eight or ten hours a day would leave him little time for original enterprize. The administration of land revenue, settlements, surveys, all laws and customs connected with agricultural industry, all questions relating to commerce, the opium and excise revenues, the forests, the salt and inland customs, and all matters connected with the census and emigration, are a few of the subjects to be entrusted to the new Secretary. The list of them reads like an enumeration of nouns substantive in the *propria quæ maribus*—so utterly unconnected are they and so devoid of any logical relation to each other. The new Secretary, will be "not one, but all mankind's epitome," if he is able to do justice to half of these matters. But where are we to get a man who, besides doing all this, will be able to take up the entirely new work of promoting the agriculture of India in a practical and efficient way?

The Government wants two things. It wants a minister of agriculture, and it wants help in the Secretariat of the Foreign and Home Departments. Sometimes it is possible to combine two things. But all combinations are not happy, and the combinations of multifarious and incongruous duties generally fails.

(*The Same.*)

IF we were asked for our advice it would be to give the Secretariat the help it requires in the shape of an efficient Under-Secretary, and to appoint a director-general or minister of agriculture without any second intention. Two great questions await the man whoever he is: the first is the supply of fuel, the second is the supply of money to the agricultural classes. We have in India some of the most laborious, patient, and skilful farming in the world. But so long as all the farm-yard manure is consumed for fuel, so long will it be impossible to succeed in improving agriculture. The peasantry, too, are crushed beneath the exactions of the usurers. Three-fourths of the farmers in these provinces are compelled to borrow their seed at ruinous interest; as large a majority borrow money to pay their rent. Thirty-seven per cent. is a common charge for interest. We should like to know what all the preaching and statistics in the world can do to remedy this state of things. The watch word of the new Minister should be "money and manure."

THE AGRICULTURE OF INDIA.

CENTRAL PROVINCES—HOSHUNGABAD.

(By A. C. Elliott, Esq.)

Use of manure and irrigation.—Rotation of crops.

THE large crops, khureef and rubbee, as a rule, are neither manured nor irrigated. Opium, tobacco, pan, rice, sugar-cane, melons, and all the small market garden crops which Kachies sow, are manured; and all except rice, tobacco, and melons are irrigated, but they are considered as a kind of fancy agriculture, and the true cultivator, the *kirsan*, looks on them with contempt, as little peddling matters, and what stirs his ambition is a fine large wheat-field (*gohalie*), 80 or 100 acres in extent, as flat as a billiard-board, and as black as a gond. I have already said that the rubbee and khureef lands are separated by a broadly-defined mark, so that the simple system of alternating the two sets of crops, which is current in Upper India, is impossible here. The khureef crops are always sown on a system of rotation, but not the rubbee. Year after year, for thirty or forty years, the same field will be sown with wheat, and probably this is the only soil in the world which could bear such a strain on it, without manure, rotation, or fallow. When the land begins to be exhausted, gram will be sown on it, and then wheat again for a year or two, and then it will be let lie fallow. Formerly, when the uncultivated land was larger in extent, the practice of throwing a field into fallow and breaking up another in its stead was more common than it is now, but this practice is still pursued with second-class sorts.

Exhaustion of the Soil.

The local word for a field being exhausted is *ruseed*, and in old reports and returns this is a phrase of constant recurrence. There are great numbers of villages against which in the second and third five-years-settlement books the remark is written—"Soil good, but quite exhausted;" "Soil thoroughly worn out." Yet these same villages and these identical fields have gone on being cultivated from that day to this, with only such fallows as could be allowed by breaking up uncultivated land in place of the field thrown out of cultivation—a resource which has been diminishing every day. In 1830 Major Ouseley wrote of the Sobhapore talooka as producing only one-third of what the Babai talooka did; but if this was accurate, a very strange revolution must have taken place: either Sobhapore must have increased in productiveness, though cultivated without intermission, since it now produces as much as, or very little less than, Babai; or else Babai must have fallen to a third of its former produce, which view appears untenable. Considering these things, it would hardly be unreasonable to deny the *ruseed* theory altogether; and this for some time I was inclined to do. I believe, however, that there must be some truth in it, though the form in which it is expressed is much exaggerated, and requires modification. It stands to reason that land, even the black soil of the Nerbudda Valley, must deteriorate if it is cropped year after year without anything being returned to it. There can be no doubt that when this soil is newly broken up (after the first year) the produce is for two or three years greater than it is afterwards. In the Taptee Valley at present the wheat stands breast-high in some of the new villages, and the ear, is very large and full, and the crop nearly double the average of the Nerbudda Valley; and no doubt, when the Nerbudda Valley was first broken up, the crops were the same, and as long as half the first-class land was uncultivated, and a new field could be broken up for every one thrown into fallow, they are not likely to have deteriorated much. But this was an exceptional time, and when once regular cultivation set in, and the majority of the

land came under the plough, a certain amount of deterioration followed. The old rate of produce in the golden age, or fifty years ago, is supposed to have been ten-fold, and judging from the Taptee Valley, which is in the same condition now, I do not conceive it can have been more than twelve-fold. I reckon the average now to be six-fold, and my belief is that it fell very rapidly from twelve-fold to about eight, and then rather slowly to six or seven; that it was at that stage when the land was reported "very much exhausted" in 1830, and that it has fallen very slightly, if at all, since then. I have formed this opinion from what I have seen of the Taptee villages, which are so modern that their history can be known with certainty, and also from enquiries into the produce of fields newly taken up from fallow, which for a year or two produce a little more than their neighbours, and then fall to the general level. Lighter soils get exhausted sooner; sandy and gravelly fields will often bear only four or five years cropping with the khureef; second-class rubbee fields will last longer, but must be thrown up at last; but the true black soil, if properly cultivated will, I think, go on producing at the rate of six-fold for ever, and will not fall below it. Of course this is a question which can only be thoroughly tested by experiments, and by accurate knowledge of the history of certain fields; and unfortunately Major Ouseley left no records (or at least none can be found) of his many experiments in agriculture. But I believe bad cultivation will mostly be found responsible for faults laid at the door of the soil, and I have never yet seen a field obviously inferior to its neighbours, whose inferiority could not on enquiry be traced either to omission of one of the required ploughings, or to unseasonable sowing (the cultivator having been ill or absent at the proper sowing time), or to *kans* having got into the land and not having been eradicated. Manure is of course the natural remedy for exhaustion. The village of Kolamree, near Hoshungabad, was recorded as one of the most "exhausted" villages in the district thirty years ago. I inquired for and took the most exhausted field in the village, and manured and cultivated it two years running.

The first year (1864) I raised a crop of four maunds of gram and one and a half of barley. The gram was a good crop, eight-fold the seed; but the barley was a failure and wanted water.

The second year (1865), which was not on the whole a favourable season, the crop was eight maunds of wheat, or eight-fold; there was only one field in the village equal to it, and that had been taken up from fallow the year before.

Deduction from analysis of Soils.

The opinion which I formed from observation and enquiry as to the exhaustion of the soil is supported by Mr. Waldie's analysis and report. He says,— "The soil consists of trap-rock in process of disintegration and the two columns of soluble and insoluble in acid shew the progress of decomposition of the rock. The chief peculiarity of the soil will be the constancy and regularity of its supply of mineral constituents to vegetation, from the gradual decomposition of the rock by the carbonic acid and oxygen of the atmosphere, with water, and the changes of temperature.

"These are the agents, comparatively feeble in their chemical powers, by which nature very slowly produces the same effect which the chemist does speedily in his laboratory by the most powerful acids and alkalies. Trap-rocks and many others besides consist of a congeries of minerals in small crystals, which undergo decomposition irregularly, some of these minerals being more easily decomposed than others. They consist mainly of silica, which is a weak acid, combined with various bases, and the process of decomposition separates the silica from the bases. A small portion of both silica and bases is dissolved by water and washed away, but the greater part remains, and the result of the whole may be stated comparatively thus:—

"Bases—*viz.*, alumina, oxide of iron, lime, magnesia, potash and soda		·12
Carbonic and phosphoric acid, in combination,...	:	
Silica, partly in combination, partly in mechanical mixture, which had originally been in combination with these bases	10·5	
		12·6
"Water and a little organic matter		
Mineral constituents of the original rock, which have not yet undergone decomposition		67·7
		100·

"The decomposition of the above 67 per cent. will be favored by everything that promotes its exposure to the agencies specified above, such as ploughing and loosening the soil."

In other words, 67 per cent. of the soil is trap-rock simply ground to powder (by the action of ice or of water), but not decomposed, and unable to yield any of its virtues to promote vegetation, except by the slow process of decomposition year by year. Only on 24 per cent. of the soil does the cultivation tell at all, and from this portion our wheat is produced. Not till the whole of the soil is decomposed, and all its resources drawn on by the cultivators, can there begin to be any fear of exhaustion. At present my view is that the annual exhaustion of the 24 per cent., is compensated for by the annual decomposition of the sixty-seven per cent., and thus the vegetative power of the soil is unaltered, and the same crops can be produced year by year. If larger crops are raised the balance will be disturbed; and the object of scientific agriculture must be either to increase the rapidity of decomposition of the 67 per cent., or else to strengthen the 24 per cent. by manures, &c.

Cultivators' leisure Time.

One result of this system of agriculture is that the cultivator has very little to do all the cold weather. If he has khureef crops he will be occupied till about the middle of December in cutting and storing them, besides his other work, and he will then have two idle months, till the middle of February. If he have no khureef crop, as is often the case, then after the sowing is over he has to make and fence his threshing-floor, perhaps to fence his field, or part of it, to fetch and stock firewood, and to cut his hay. This will take him till the end of November, and he then has two and a half months on his hands till the harvest begins. Many cultivators let out their carts on hire, especially of late years, since the demand for export of cotton and wheat, and import of rails for the railway has raised the rates of hire to an average of one rupee per day. The Deswalies, Jats, and Bishnoees are the castes most given to this work, and in January a whole Jat village will be deserted by its cultivators, who are all gone on *bahara*. Many castes, however, prefer to sit quietly at home, loiter out to their fields about 9 A.M., loiter back about noon, and sleep the rest of the day.

Number of cultivators, and area held by each.

The cultivated land of the district is divided in the following proportion:—three-fifteenths are held by the zemindars, eight-fifteenths by *mouroosee* cultivators with occupancy rights and four-fifteenths by tenants-at-will. It is obvious from this that the zemindars' seers are very large indeed. Except a few who are non-agriculturists, or who are much impoverished, probably none own less than four ploughs, and many own ten or twelve. The greatest agriculturist zemindar in the district, Toolsheeram Shookul, of pergunnah Hurda, owns no less than 150 ploughs, and occupies actually 4,500 acres of cultivated land. Including the sub-proprietors, lessees, and *malik mukhoozas*, there are probably 1,000 persons whose land is returned under the head of seer, and they hold on an average 140 acres. The average holding of occupancy cultivators is thirty acres, and of tenants-at-will seventeen acres; and on an average there are 104 cultivators to 100 ploughs.

Farm Servants and Laborers.

The laborers are of two classes,—those who are permanently employed as farm servants all the year round, and those who are employed by the day, or for some special work. The regular farm servants are the ploughman and herdsman. The ploughman is sometimes employed for six months only, from May to October, but generally for all the year. A zemindar with six ploughs will probably employ four men all the year round, and two for six months only; a cultivator with two ploughs will employ one all the year and one for the ploughing season only. Every cultivator has a herdsman, who receives pay according to the number of cattle he has to look after, and if a boy, gets less than if a man. There is also a village herdsmen, or *narkhia*, who looks after the cattle of the village artizans and laborers, and others who cannot keep a herdsman alone. These men who are in permanent employment are very well off. The ploughman, for instance, gets two and half *pucka manis*, or thirty maunds of wheat, which at present prices (Rs. 24 the *pucka mani*) comes to Rs. 60 or Rs. 5 a month. Besides this he has certain perquisites in gleaning, and presents of blankets, shoes, tobacco, &c., according to local custom. His wife can go out weeding or harvesting, and she gets also a small perquisite when the winnowing is done. Such a man is exceedingly comfortable and well-to-do. The other laborers lead more precarious lives, especially those who are not employed as ploughman for six months even. In the rains there is weeding to be done, and khureef crops require watching, especially *jowar*; but in the villages which have no khureef the laborer can get nothing to do except watching the grass *beers*, or preserves. In October he gets from Rs. 2 to Rs. 3 for fifteen or twenty days work in sowing; then he can get odd jobs in fencing and bringing wood; then he is employed in watching the crops. In jungle villages, near the hills, watching (*rakhwalie*) begins the moment the wheat blade appears; but in the open parts of the valley it is hardly required till the ear is full, and ready to be eaten as *oombis* —*i. e.*, broiled—when trespassers and thieves have to be kept off. Then follows the harvest, when there is abundant employment for all, and every able-bodied man can earn five seers a day, while wife and children earn from two to four seers. This, with the gleaning, supplies the laborer with food for two or nearly three months till the rains begin. In jungle villages,

where there is much fencing and watching to be done, a laborer can in this way get a constant series of jobs which pay him fairly well; in the open valley there is less work of this kind, but there is a greater demand for grass and wood, and the laborer can live by supplying these things. His great ambition always is to become a cultivator. He can generally pick up a calf and heifer somehow or other, and he keeps them for next to nothing till he has a pair of young bullocks; then he borrows food-grain for a year and sets up on his own bottom as an independent cultivator if he gets land given him, or sometimes he has already made enough money by hiring out his bullocks for carriage, and can dispense with the necessity of borrowing. The high wages given by the railway have recently enabled many laborers to accumulate enough capital to become cultivators, and thus a competition for land has set in of late with a severity unknown before.

Laborer.	Wages in Hoshungabad	Wages in Hurda.
Ploughman. *Poruskhia* or *Bursoodia.*	For whole year, 5 *kucha manis* of wheat and gram mixed; a blanket every other year. His wife gleans free of charge, and he gets other little perquisites. If for half year only, he gets half of this.	6 *kucha manis* of *jowar* and wheat, or 5 of wheat alone. The same perquisites.
Sowing, *i. e.*, *oraya.* Feeding the drill.	Two rupees for as long as the *narie* or sowing plough works—18 or 20 days generally. It is work for women or boys.	3 rupees for the same period.
Weeding.	Used to be from 2 to 3 pice a day, now it has risen to 6 or 7 pice, or even more, always paid in cash. The weeder is not expected to begin work till about 9 A. M. By contract a circle of five yards radius is weeded for 2 pice, or Rs. 1-15 per acre.	
Watching *(rakwalie).*	In the open plain, one man will watch 50 or 60 acres for the month, after the ear forms, till it ripens, at night only. The cultivator and his family will watch by day. He gets Rs. 3 for one month; for *jowar*, about 10 or 12 *kooroos* per *murwa*, or watch-post.	In open country, about 12 *kooroos* for one month's watching of 40 to 60 acres. In jungly country, about 1 *kucha mani* for four months' work, watching an area varying from 20 to 5 acres, according to the quantity of jungle and of depredation.
Reaping.	For wheat, the reaper either (gets *bissole*) one sheaf in 20, or, *(kheda)* two sheaves a day, or *(oodra)* by contract, 8 kooroos for 5 acres.	Wheat, contract rate, 12 *kooroos* per 10 acres; *bissole* rate, 1 sheaf in 20; daily wages, 3 *pie* of wheat.
Winnowing.	For *jowar*, 3 to 4 *pie* of jowar; for *tilli*, 2 *pie*; for *kodon*, 4 *pie*. For supplying the baskets to the winnower, a coolie gets 1 *pie* for each *mani* winnowed. For rice, 1 *pie* in 9, when the coolie treads it out as well as cuts it.	For *jowar*, 4 *pie* a day; *tilli*, 4 *pie*; general rate, 3 *pie* a day.
Cutting Hay.	Re. 1 for 3,000 large bundles, or 4,000 small ones.	Re. 1 per 3,000 small or 2,000 big bundles.
Cotton cleaning.	Used to be Re. 1 per maund of clean cotton; now 1¼ pice per seer of *kupas*, or 15 annas per maund of *kupas*—say Rs. 2-13 per maund of clean cotton.	Rs. 10 per *pucka mani* of *kupas*, or Rs. 2-8 per maund of clean cotton.
Herdsman *(Churwaha, Parkhia).*	4 *manis* for 12 months, 2½ for 6 rainy months, and 1¾ for 6 remaining months; 1 blanket every second year.	4 *manis* per 12 months, and perquisites

Acreage of crops.

The tables below shew the entire sowings of the district, the average produce, according to my estimate, and the value of it at present rates. It will be seen at a glance that wheat is by far the most important crop sown, and in fact its acreage is sixty per cent of the whole cultivated area. Hoshungabad is pre-eminently a wheat-growing district. The question of average produce is, I need hardly say, a very difficult one, because not only do different fields differ immensely in the amount of their produce, but the same field differs immensely in different years. Irrigation, manure, and high cultivation, all tend to reduce this difference, by counteracting the effects of the season; but here drought has its way unchecked, and where the extremes differ so widely there may reasonably be much disagreement as to the mean. Before the assessment hardly a soul would allow that such a crop as fourfold, or four maunds to the acre, was known; but now that they have noting to gain they are more reasonable. Still in the eastern pergunnahs very few will allow an average of more than fivefold. I think this is correct as a statement of their net produce, but then the reapers receive one-twentieth of the crop gleaners are reckoned to glean a

Crop.	Acreage.	Produce per acre *(kucha manis.)*	Total produce *(kucha manis).*	Market rate per *kucha-mani.*	Total price.
				Rs. A. P.	Rs.
Wheat ...	4,54,464 5½	1¼	5,68,580	12 0 0	68,16,960
Gram ...	83,106 3½	1 11/24	1,21,199	10 0 0	12,11,990
Birra (Wheat & gram) ...	13,415 5	1½	17,887	11 0 0	1,96,757
Ulsi (Linseed)	3,588 1	5/6	2,990	16 0 0	47,840
Teora ...	6,539 13	2 1/12	13,623	8 0 0	1,08,984
Peas ...	563 7	2 1/12	1,163	10 0 0	11,630
Masoor ...	1,069 2	1¾	1,783	9 0 0	16,029
Toor (Urhur)	1,760 4	½	880	10 0 0	8,800
Barley ...	7 7	2	15	8 0 0	120
Koosum ...	328 17	⅓ oil. 1/6 flowers	109 55	13p.md. 28 do.	1,990 1,540
Total Rubbee...	5,64,842 15	.....	...	...	84,22,640
Jowar ...	42,375 2½	1	42,375	9 0 0	3,81,375
Tilli ...	17,941 5	¼	8,970	19 0 0	1,70,430
Cotton ...	24,680 2	⅔ maunds (clean). *k. manis.*	16,454	20 0 0	3,29,080
Rice ...	15,167 10¾	3	45,502	12 0 0	5,46,024
Kodon ...	28,660 9¼	5/6	23,885	5 0 0	1,19,425
Kootki ...	39,571 9	1	39,571	6 0 0	2,37,426
Moong ...	2 10	¼	1	11 0 0	11
Oord ...	37 18	¼	19	11 0 0	209
Sawa ...	1,087 16	1	1,087	8 0 0	8,696
Hemp ...	1,013 15	2 maunds.	2,026	5 0 0	10,130
Mukka	2,730 8	2 k. *manis.*	5,461	9 0 0	49,140
Bajra ...	577 8¼	¼	289	8 0 0	2,312
Mondge	84 17	1	85	5 0 0	425
Kungni ...	91 8	½	46	4 0 0	184
Rajgira ...	444 3	½	222	12 0 0	2,664
Total Khureef....	1,74,466 2¼	.....	.....	...	18,57,540
Tobacco ...	2,983 12½				
Sugar-cane ...	1,437 16				
Opium ...	822 17				
Beetroot ...	421 15				
Jeera ...	15 0				
Dhunna ...	7 10				
Ganja ...	104 3				
Pepper ...	598 4				
Pindi ...	99 14				
Garlic (lahsan)	49 15				
Garden vegetables ...	1,120 7				
Melons ...	2 0				
Castor Oil ...	503 15				
Al ...	269 15				
Pan ...	87 5				
Total Garden Cultivation...	10,214 12½	.....	(say	about)	15,00,000
Groves ...	1,690 11	.....	.....	...	
Grand Total...	7,49,522 16¾	.....	..	...	1,17,80,180

quantity equal to the seed grain in the western pergunnahs, equal to half the seed grain in the eastern pergunnahs, and the unmuzzled oxen take a large bite out of the gross produce while treading it out. It is therefore fair to reckon that if the net produce stored away is fivefold after all these deductions, the average gross produce is sixfold. This is what I have taken as the average all over the district. The Rajwara pergunnah perhaps produces less—not that the black soil is inferior but that there is more second-class black soil there. Seonee and Hurda produce more, for the zemindars allow of a net return of sixfold. But on the whole I think sixfold is a fair estimate.

I have not attempted any estimate of crops so varying and so dependent on skill and labor as sugar-cane and garden cultivation.

MODERN AGRICULTURE—EUROPE.

STERILITY IN SOILS.

Read by Mr. R. H. Goddard before the Hexham Farmer's Club.

Of course, the terms "fertility" and "infertility" are only relative; at different times and in different places their signification may alter much, and therefore it may be necessary just to state the meaning we wish to place upon them. Simply, and without attempting a laboured definition, a soil may be said to be unfertile when its produce is below an average, even when ordinary care has been bestowed upon it in preparing it for and getting in the seed. The causes of infertility may be divided into two classes: those that are natural and those that result from the course of management, or rather mismanagement, pursued.

Among the natural causes of infertility we shall find some that at first sight we should say were beyond our power to remedy—situation as influencing the climate, for instance; but it is surprising how much climatic influence may be modified. High-lying land may be protected and materially sheltered by plantations judiciously placed, but the effect that high farming alone has is wonderful. I was over an estate some time since, and had frequent opportunity of observing two farms—one lay in a hollow slightly falling to the south, and sheltered on all sides; the other consisted of poorer land over 100 feet higher, and with a much worse aspect. Any one would have classed the first as an early and the other as a late farm; the latter was taken into hand by the proprietor, well farmed, and the corn top-dressed; the other was badly farmed, and the consequence was they changed places, and the corn was safely staked on the exposed land, while on the other it was still standing in the field.

Again, the temperature of a district will be affected by the rain-fall and by the facilities existing for passing the water off the land; undrained land, where the water is retained by beds or bands of clay, and rendered stagnant, will be found colder than the same will be when properly drained. In both these particulars large woods or forests have an injurious effect; they both increase the rain-fall of the district and prevent the water from evaporating from the surface, or being carried off by the wind. Cases have been recorded where springs, never known to have failed, have become dry when neighbouring plantations have been removed, and have remained so until a fresh growth has covered the land. The removal of large forests is calculated to make a country both warmer and drier, and for this reason in naturally humid climates much wood is not a thing to be desired.

Other natural causes of infertility may be found in the soil itself, and before passing to these it may be as well just to glance at its composition and functions.

We know that the soil is the source from which plants derive all their inorganic, or mineral, as well as a portion of their organic constituents, and therefore what we find in the plant we may rest assured of finding in the soil.

The ashes of all plants seem to contain variable quantities of the following substances: potash, soda, lime, magnesia, oxide of iron, silica, phosphoric acid, sulphuric acid, and chlorine, all being found in compounds more or less complex, none of them being uncombined.

Now, by careful experiment it has been found that plants cannot thrive if any one of these substances be wanting in the soil, and consequently that a soil cannot bear a productive crop unless all the constituents wanted by the plants are present in sufficient quantity and in such a form that the plant can absorb them. Potash, for instance, might exist in the soil in the form of felspar or mica, but not being present in a soluble form, the plant would not derive any benefit. Thus we see that it is not merely necessary that all the constituents of the plant should exist in the soil, but also that they should exist in an available form; and it is for this reason that analysis cannot give us always a correct idea of the comparative fertility or infertility of a soil; for, though it will reveal the absence of any substance, it cannot always show whether they are present in such a form that the plant can make use of them.

We see, then, two causes which might render an otherwise fertile soil unfertile—viz., the absence, or the comparative absence, of some necessary constituent, or its presence in an unavailable form.

Again, infertility may be due, not to a deficiency of anything, but to the presence of something in the soil which has an injurious influence upon vegetation. If organic matter be present in an active state of decomposition it prevents the healthy growth of plants, and vegetable acids are produced, which often have a most injurious effect; these are often found inland, where an excess of water keeps the air from permeating it.

Decaying matter absorbs oxygen, and for this cause a large quantity of it is not a desirable thing. Iron, too, present in its lowest form of combination with oxygen has a very deleterious effect, and it is often found in peaty soils or in a subsoil of blue clay.

But one thing which may be said more than any other to affect the fertility of a soil is the presence of stagnant water, no matter whether it comes from above or rises from below, and this for many reasons. The temperature of the soil is cooled not only by the constant evaporation from its surface, and the growth of the plant retarded, but all the pores of the soil being filled, the atmosphere has not the power to penetrate to act upon the substances there and prepare them for plant-food. It not only acts directly as a poison on the plant, but, by keeping out the air, tends to promote the increase of protoxide of iron and organic acids. The herbage found upon wet grass land is sufficiently characteristic.

On tillage lands the furrows, often bare, or at best covered with spindly corn, shows the injury produced; but who can estimate the harm done by working such land in a wet state, as is often almost necessary, or the amount of manure wasted by its being washed off the land!

Land naturally fertile may be rendered unproductive by over-cropping all that is readily available for the use of the plant may thus be removed, but the soil itself aids and assists those who give it an opportunity to recover. The soil is not a dead, inert mass, as we are apt to think; it is highly complex in its structure, and its insoluble parts are perpetually being acted upon by atmospheric and other causes, which prepare them for the plant. Tillage, besides, being necessary in suiting the mechanical condition of the soil for the reception of the crop we destine for it, is thus instrumental in preparing its nourishment by enabling the air to gain access to all its pores, and to effect those chemical changes which are necessary. Too much importance cannot be placed upon all tillage operations being efficiently carried out. We sometimes find lands worn out by over-cropping, possessing a good depth of soil which has never been turned over. Deep ploughing brings this to the surface, it becomes mixed with the impoverished soil, and materially assists in its improvement. Lime, too, may be advantageously applied to land in this state; it seems to act upon the constituents of the soil, and helps to render them available for the use of the plant. Thus we may say that it assists the soil to elaborate from itself what otherwise we should have to bestow. I have heard of land being overlimed, and can easily imagine, where it had been continuously applied and then discontinued, that the soil would feel the lack of the stimulus it gave, unless supported by an increased supply of manure. But this should be no argument against the application of lime; for by increasing the crop it gives the material for the manufacture of that manure which is necessary to sustain the land at its increased standard of fertility. Rain and dew have a great influence, and a considerable manurial value. In their fall they bring with them from the air ammonia and nitric acid, which are absorbed by the soil if of a clayey, loamy, or peaty character. The quantity, though not large in itself, yet becomes important when we consider the amount of rain and dew constantly falling; and the effect upon the crop of any nitrogenous manure we all know. They bring with them, too, carbonic acid absorbed from the air, and many things insoluble in pure water are thus to a certain extent made soluble.

Water charged with carbonic acid in contact with bone-earth or insoluble phosphate of lime can even take a portion of this into solution. Drainage is, I think, the first improvement on poor and wet lands, and not merely for the reasons stated above, but because so much manure is wasted or washed away when applied to land undrained. Draining is necessarily an expensive process, and it is of the utmost importance to do it thoroughly, so as to avoid any risk of having to do it over again.

I have seen a great deal of drainage rendered inefficient by attempting to keep in the old furrows, which are seldom at regular distances, often varying from eight or ten to fourteen yards. Out-falls are often left in such an unprotected state that they become stopped, and a great portion of the labour and expense rendered useless. Every farmer should, for his own interest, see that they are gone through at least once a year.

There are great varieties of soil: we speak of clayey, sandy, peaty soils, and there are endless modifications of these. Either of them pure would be absolutely unfertile, not merely from its chemical, but from its mechanical condition. Nothing could thrive in an absolutely pure clay, even if it possessed all that the plant required; we therefore endeavour to modify soils

which contain an overwhelming amount of either clay, sand, or peat by the admixture of what will alter its texture and improve its composition.

There are soils so situated as to have the means for improving them in close proximity.

The poor sandy land of Norfolk has been wonderfully improved through the application of the marl, which lay almost close to the surface, and this has been used to an enormous extent through Kent, Berkshire, Lincolnshire, and Cheshire; in fact, wherever the marl was to be found, and the soil seemed to repay its application. Peat land in Lincolnshire has been thus improved, trenches being dug, sometimes to a considerable depth, and the sub-soil laid upon the surface.

Perhaps the most wonderful instance of the improvement of a barren soil took place in the north of Scotland, on the estate of I think, the Marquis of Tweedale. The soil was a useless peat. The proprietor having discovered a good soil underneath, made canals thoroughly intersecting the land; into these the peat was thrown and floated away, and the productive soil was rendered available for cultivation.

No matter how fertile a soil may be, it cannot be continually cropped without adequate manuring, and it is of great importance that all lands should be provided with sufficient and suitable accommodation for the manufacture of manure. The position of the land with regard to obtaining manures from other sources has a great effect upon the degree of fertility to which it will be raised. Proximity to a large town, or direct and speedy communication with one, affords great opportunity for improvement. Perhaps there never was a time when greater facilities were available for making improvements general. The theory and practice of draining is better understood, we have more efficient implements of tillage, while steam is lending her mighty power to enable us to plough and to sub soil in a way which could not before be done. Supplies of manure are now being brought from the other side of the world to take the place of what is not returned to the soil. Never was there a great amount of attention bestowed upon this subject, not merely in obtaining from abroad but in manufacturing at home. We hear of refuse from our manufactories of all sorts being brought to the aid of agriculture, while even the primeval ocean seems to be rendering up its deposits. The potash which is largely obtained from the salt mines of Germany must have been deposited there from the sea, to which it had been carried down in the constant washings from the land. Thus we see that we derive benefit from what was robbed from the ancient lands, and we know not what changes may yet take place to render available for future generations the vast quantity of alluvium and sewage constantly being carried to the sea.

Geologists hold that the same causes which have resulted in the formation of the land we now inhabit are still at work. We have streams and rivers carrying to the ocean, to be deposited in its bed, the elements of future soils, which only need the action of those volcanic agencies which are so actively at work in some parts of our globe, and to a less extent even here, to raise them above the sea, and thus render them available for cultivation.

Though this may be the case, and though the sewage now descending into the sea may not be ultimately lost, if one takes a broad view of the thing, still we personally should be benefited if the difficulties could be overcome of collecting, concentrating, and rendering it economically available.—*South of India Observer.*

THE INFLUENCE OF ARBORICULTURE.

By Mr. Andrew Gilchrist, Stonehaven, read before the Scottish Arboricultural Society.

If it were impartially and judicially examined, the influence of arboriculture would be found to be one of those important subsidiary rills which have done much to swell the rivers of success that have attended the efforts which have been put forth by agriculturists generally to improve and fertilize the soil. Doubtless many persons are still unacquainted with the importance of judiciously-managed plantations on agricultural lands. The great book of nature is always spread out before us, and if we only look at it aright we cannot fail to become acquainted with many facts that are well worthy of being observed and recorded. In fact, there is an evident danger in remaining in ignorance of the influence of trees; for they do in no small degree contribute to the production of our food. If we fail, therefore, to acquaint ourselves with a knowledge of the influence of trees, we not only run the risk of losing the benefits of their influence, but at the same time we are exposing ourselves to the injuries which their entire absence or sudden removal is capable of producing.

It is a well-known fact that many of our agriculturists are slow to acknowledge the benefits of arboriculture, and instead of appreciating its influence, they receive any statement made in its favour with incredulity; and, indeed, not a few of them sneer at the presence of plantations near their farms, as being more likely to produce an excessive stock of vermin than to aid them in realizing an abundant crop in harvest. We are quite certain that the high degree of good that all kinds of crops derive from the proximity of plantations far more than compensates for any little injury that may be sustained.

To be thoroughly impressed with the paramount importance of shelter, as derived from arboriculture, let us examine a field that is only partially under its influence. Beginning our observations at a portion of the field beyond the influence of the trees, we find only a very meagre crop; but the more we come within the range of its influence, we find that the corn becomes taller and the head much heavier. Consequently, that which is sheltered yields a greater quantity, and a much finer quality of grain. This is the case also in regard to either a crop of grass or turnips. If they are grown with suitable shelter, there is a larger produce, and their feeding qualities are increased to a greater degree. Indeed, the difference between a sheltered and an unsheltered crop is so great, and shows so plainly how very effectually the influence of plantations promotes the growth of all kinds of crops, that even the most uninitiated (if he approach the matter impartially) cannot fail to become convinced that shelter is a powerful agent, and that if plantations are judiciously placed, they will greatly help to develope the resources of every description of land. Although the range of its influence is much more limited, the effects of shelter may be observed on a field which is protected by a high wall; or, as is frequently seen, the conformation of the land provides a certain amount of shelter, by the hills with which it is intersected, breaking to some extent the force of the wind. If a crop of corn is examined in such a situation, it will generally be found strongest and most luxuriant where it grows within the influence of the shelter of the hills; while beyond, where the force of the blast is unbroken, the crop gradually becomes shorter and thinner, yielding an inferior quantity and quality of grain.

If, therefore, the shelter derived from a hill, or even a stone wall, tends to promote an increase of crop, how much more valuable must the shelter produce by the proximity of plantations whose beneficial influence extends over a far wider range! Moreover, a mass, or even a belt, of timber affords more shelter than any hill-side; for plantations not only break its force, but they, as it were, absorb the wind, and cause it to percolate through among the trees. It is thus deprived of its force, and entirely prevented from eddying; whereas a hill completely obstructs the course of the gale, and, consequently, produces an eddying current so destructive in laying grain crops. Besides, when the passage of the wind is thus resisted by a hill, it generally takes a direction similar to the form of the hill, and its force is not lessened to any extent, but sweeps along the plain with as great, if not greater, fury. It is in consequence of this that shelter from a hill does not extend over the same area as shelter derived from plantations. A mass of trees may be said to soften the wind, and cause it to fall mildly on the adjoining fields. Therefore it is that the shelter supplied to crops and stock from plantations is superior in every respect to any natural or artificial erection or eminence.

Mr. John Lockart Morton, the eminent civil and agricultural engineer, says: "It is well known to practical men that without shelter crops grown on the richest land generally prove deceptive in the yield. To the unpractised eye they may appear of superior quality; but, except in pet seasons, they never stand the miller's test. Take, for example, one of our cold moorland districts where a crop out of every five or six is frosted, and where even the best harvest is far from being remunerative to the farmer. When suitable hedges are formed in such a locality, sheltering strips of wood planted and properly managed, the productiveness of the soil will soon be greatly increased. A field of cereals exposed on the one side to an extensive unhedged moor, and sheltered on the other by enclosed fields, uniformly sustains the severest injury from wind and frosts on the open sides. Often, too, in fields infested with wire and grub worms, from 10 to 15 yards next an ordinary sized hedge running transversely to the wind will be found comparatively unharmed. An advantage so very palpable is certainly not the only one which a field so situated will receive from superior fences on every side. In upland pasture, also, how often do naturally nutritious plants assume a stunted form, or die outright, through want of shelter! If a piece of the barest pasture field is covered with a little brushwood in growing weather, a tender herbage speedily appears, apparently different from all surrounding it. When grazed upon badly sheltered land, however good the soil may be, it is only the lighter and hardier animals that become fat; and even they, in cold seasons, are very imperfectly fattened. So much of the carbon of the food is required in such cases to maintain animal heat, that half the day is spent in gathering herbage for this purpose. In exposed districts cattle are also more liable to diseases, such as catarrh, irritation, congestion, and inflammation, than under better circumstances."

Such is the evidence that this gentleman of extensive practical experience and accurate observation gives in favour of the influence of arboriculture; and our own, although considerably more limited, experience goes to substantiate the same thing. On an estate in the county of R——, the most of the land was high lying, and, consequently, very much exposed to cold cutting winds. The system of farming carried on was chiefly on dairy principles. The farmers were so much impressed with the bene-

fits arising from arboriculture that they each gave off ground to the extent of several acres from their farms, to be planted for shelter, and continued to pay rent for the ground so occupied by trees for more than one lease! Numbers of them also enclosed several portions of land in the corners and exposed parts of their fields, in which they planted trees at their own expense. These plantations subsequently became valuable shelter to the adjoining fields, and under their influence the cattle were able to remain unhoused, and gather their food in cold rainy days without any risk of injury. Previous to these belts and sheltering clumps being available, the cows had not only to be kept and fed in the house during cold stormy days, but even in ordinary weather the greatest attention was neccessary to prevent the cows from standing about, or, to use the farmer's own words, which are more expressive, "hangin' aboot the dykesides and no' eatin',"—lest they should take a "*shivering*" from the cold, which generally results in a falling-off in the animal, and consequently a reduction in its produce. In fact, it not unfrequently happened that the animal died from the effects of cold rains. One of these farmers had to stock his farm twice with milk cows before the plantations formed on his farm had attained a sufficient height to afford any shelter to his adjoining fields. After the benefits of the plantations began to be felt, he never lost an animal from cold, he was besides enabled to keep a much finer and heavier breed of cattle; and there was an evident increase in the quantity of grass that grew in the district. On the same extent of land there were two, and in some cases three additional cows kept, while at the same time there was an increase in the produce of each cow, unquestionably proving that the grass had become more succulent and nutritious. Moreover, when under grain crops, there was also an obvious increase in the productiveness of the soil, the yield of both straw and grain being considerably greater per acre, and this was observed to be the case more especially on those fields that were most under the influence of the plantations. Another good effect of the additional warmth was that the crops became much earlier ripe, and were generally secured without suffering so much from inclement weather.

The results of all these improvements in the crop and stock of these farms, after the plantations had acquired a height sufficient to check and mitigate the wind, indubitably proves that when the climate is ameliorated by the influence of plantations, the soil becomes more fertile, and in consequence yields a richer return. Plants derive a great part of their nutriment from the air, and from the gases that are evaporated from the soil; and it is well known that a cold withering wind sweeping over a district, instead of accelerating the formation of dew, and increasing the latent heat of the earth, or promoting the evolution of gases, does the very opposite, by neutralizing the effect of the sun's heat, and lowering the temperature of the soil. But where a suitable shelter is provided there is a greater degree of that genial warmth, both in the air and in the soil, which is so essential to all kinds of vegetation, as well as for the healthy development of animals, and it also proves that those diseases in animals which are known to result from exposure in a trying and changeable climate can be thus averted. Another good effect of shelter on animals is that it causes them to thrive better and fatten much faster. This arises from the fact that when animals are properly sheltered, there is less carbonaceous food required to keep up the necessary animal heat; but when unsheltered a great part of the carbon in the food is consumed for the above purpose, and consequently there is a less quantity available for fattening.

In a report "On the General Principles of Reclaiming Land," Mr. Thomas F. Jamieson writing of shelter, says: "If the position be bare or exposed, it will conduce much to the value of all subsequent operations that, before anything else is done, a good-sized plantation be formed on those sides from which the cold and stormy winds blow. It will add an inch or two to the height of every stalk of corn, and to the girth of every ox within the influence of its enfolding wings. Let the land for grass parks, and it will put a pound or two more of rent on every field which lies within the bosom of the wood. We have been able to keep the ploughs at work on the south side of a plantation above 100 acres abroad, when on the other side they could not go for frost. The error will rarely lie in planting too largely; let there be at least 100 yards in breadth; but should there be a general absence of woods or shelter in the district, the extent should be greatly increased. The bleaker and more bare the locality, the broader and thicker should the plantation be. We have already shown from our own experience, as well as from the experience and observation of others, how very effectually the shelter produced by the influence of trees promotes the congeniality of the soil, and rendered it more productive even when it has been under cultivation for a considerable time. But the beneficial effect of shelter is perhaps more apparent on land that has been newly reclaimed from its natural condition. The soil of all newly trenched land being left in a loose and open state; and this, along with the effects of the draining off of the surface water, leaves the soil, even of a moderately-sheltered field, more liable to suffer from drought. A newly-reclaimed field, under the influence of a plantation, will yield a far heavier crop than one (even with a better soil) without shelter will do. The soil of the former is moistened by the plantations, and the wind mollified; and thus it is prevented from parching the soil. But the soil of the latter is not nearly so moist; and because it is deficient of shelter, it is consequently more liable to become arid, both from the effects of scorching winds and the effects of the sun's heat. Experience and observation will prove this to be the case. In fact, we could give several examples of the superiority of the crops that are produced from a field that has been suitably sheltered a short time previous to being reclaimed. In some instances we have known a field of the above description yield a crop the double heavier than that which was grown on a field of better soil treated in a similar way, but not benefited by shelter."

Dr. T. Anderson, Professor of Chemistry to the Highland and Agricultural Society of Scotland, in an address delivered "On the Chemical Principles involved in the Reclamation of Waste Lands," says: "Belts of planting should be formed along the sides of reclaimed fields, particularly in the direction of the prevailing winds; and where the soil is of a non-retentive kind rows should be planted along the line of all the fences. I am aware that this latter statement is at variance with agricultural practice in Scotland, where a determined warfare is waged against trees, on the plea that their roots exhaust the land of substances which would otherwise be absorbed by the crop, and that they serve to shade the soil. I do not doubt that this opinion is in many cases well founded, particularly where the trees are of the shallow-rooted species, which derive their nutriment from the surface soil, but comes more succulent, and the heather, like a tender exotic planted on a cold exposure, looks as if it felt a little out of place, and gradually disappears. In proof of this, we may mention an instance that came under our observation in the county of———. The line of march between two estates went through a track of moorland, each property having a portion of moor, which was mostly covered by heather, with little or no difference in the quality of the soil or sub-soil; there was, however, a difference in the exposure, the one portion being more elevated and lying exposed to the north-east wind. The proprietor of this most exposed part had, some 40 years ago, planted the most of his ground with a crop of larch, which, except at the northern extremity, and in some damp places, had grown very fast. Some years after planting, the heather began gradually to disappear under the trees, and after the plantation had been several times thinned, grass began to grow luxuriantly. When the trees on the lower portion of the ground were thought to be strong enough to resist the effects of cattle, part of the lowest lying ground was fenced off, and the trees thinned to a good distant apart. The proprietor then turned in a lot of cattle to graze; and this was continued for a number of years, and the situation yielded fine pasture, the trees being gradually thinned out; and it is now under a regular rotation of cropping, having been trenched after being pastured for a number of years. And, although at a higher elevation, and with a soil hardly so deep as those fields that had been previously reclaimed, it continues to grow as good crops."—*South of India Observer.*

PREPARATION OF BONES AS MANURE.

THE following useful remaks on the various modes of preparing bones as fertilizers occur in the *Queenslander*:—"The usual mode of making manures from bones is to select a good wooden floor of a barn, well covered overhead, or to make a floor of thick planks, laid tight. On this first throw the bones. If not in dust, it would be well to sift them, and place the coarser part on the floor, putting the finer portion aside for mixing in afterwards. By this means the rough bones come first in contact with the sulphuric acid which is used for reducing the mass into a paste, and are more effectually divided, while the finer parts can then be added to dry up. No metal (except lead) should be used on the floor, or where the acid can reach. Water equal to one-fourth or one-sixth the weight of bone is then to be poured on the bone, well stirred in with a spade, and left for two or three days to heat and ferment; it would be well to use the water boiling. Then add the sulphuric acid, mixing well with a wooden spade or board; the mass effervesces, or boils; stir twice a day well for two days, so as to turn the whole over; let it stand for two or three days to dry; add the fine bone, and mix well. If not dry use some absorbing substance, as sawdust, dry peat, or dry earth, in small quantities, and mix well. Do not use for this purpose lime, ashes, or marl, as they would destroy the superphosphate and spoil the whole work. Made in this way from bone ash, this fertiliser will yield 30 per cent. of soluble salts, of which 26 per cent. is superphosphate of lime. The manufacturer will say that there is 35 to 37 per cent. of superphosphate present but if so he over-estimates; indeed 26 per cent. of soluble superphosphates is more than any farmer wants; it is too soluble, and will pass out of his ground too soon, especially in wet weather; 12 to 15 per cent. is a better proportion for the farmer for then he has a proportionally larger amount of insoluble bone phosphate in store for future use in the soil. On this account it is better for the farmer to use raw or steamed bones than bone ash; he has a sufficient, though a smaller, quantity or superphosphate present. This fertiliser will not suffer from

exposure to air, but it must be protected from rain or wet; it ought to be put into casks when not used immediately. Bone fertiliser made as directed will be of a whitish color if made from raw or steamed bone, and gray black if made from bone-black of the refinery; but the color of a superphosphate is of no consequence, and no test of its quality; neither is its smell; it ought to have no smell, or a faint acid odour, if any. If calcined bones, or bone ash of the sugar house, be the material used, every 100 lbs. will require 87½ lbs. of vitriol; when these have fully acted on each other, the mass would give—superphosphate of lime, 26 lbs.; gypsum, 66 lbs.; sulphate of magnesia, 1½ lbs.; soda, 2¼ lbs.; and the balance of the 187 lbs. would be wasted and undissolved bone earth. If the farmer uses steamed bones, a quantity of vitriol intermediate between the two proportions named will be needed, say 66 lbs.

MEMO. FOR PREPARING SUPERPHOSPHATE.

By Lieut. Colonel E. Boddam, on special Duty, Mysore.

PLASTER and puddle a floor of clay and let it dry. Lay thereon a ton of bone dust, say 7 or 8 qr; it should not be coarse, but need not be literally dust, if boiled or burned so much the more favorable for the efficiency of the after operations. Pour water upon the heap for a day or two as long as any is absorbed, then flatten it down and lay a lot of ashes around the edge. Pour on gradually 6 or 7 cwt. of sulphuric acid,—4 or 5 of the ordinary carboys. It should be poured into jugs and thrown from the jugs into the bones. The slowness of this plan, as well as its safety, is a recommendation. It will boil and fume and effervesce, and the person operating had better stand windward of it. Before night it will be quiet, and if still very wet, it should have the ashes closely packed around it. They may be mixed with the heap in a day or two, and it will be fit for the drill in a fortnight.

RATIONAL CULTIVATION.

AN interesting paper on the above subject has been read before a meeting of the Victorian Agricultural Society, by Mr. Mitchell, who commenced by stating some of the practices pursued by farmers in the colony, which were not rational. He said the growth of the same crop year after year on the same land, "wheat after wheat," for instance; the production of successive grain crops without any manure, and with only an occasional bare fallow when the land becomes foul; burning straw instead of converting it into manure by the aid of stock, and restoring it again to the land; the laying down of land to grass after it has been exhausted by the growth of grain—these are some of our practices that are not rational, because opposed to the laws of nature—rotation and restitution—which govern the growth of plants and the continued fertility of the soil.

Necessity of Rotation and Restitution.

Rotation, I have said, is a law of nature that governs the growth of plants, it compels change of soil or situation. No plant will thrive continuously on the same spot. This applies as well to oak and pine forests as it does to wheat, oats, or any of our cultivated crops. The necessity for rotation or change of crop is caused partly by exhaustion in the soil of elements essential for the healthy growth of the plant, and partly in consequence of the excretory matter thrown off by the roots, rendering the soil unfit for its further growth. Yet one plant, by its death and decay from these causes, makes the most suitable preparation for the healthy growth of some other plants belonging to a different order. In this way the great globe we inhabit has been converted out of barren rocks into the thing of beauty we now see it, and become fitted for the sustenance of man. It is upon this law that the modern practice of British agriculture is founded, and no system of cultivation can be deemed rational if it does not embrace some rotation of crops. I need only instance the well-known success of wheat grown after peas, beans, or clover, to illustrate the advantages of rotation. At one time it was supposed that by attention to a proper rotation of crops—one crop preparing the ground for another—the farmer could go on producing crops, without any manure, to the end of time. Increased knowledge has dispelled that illusion. We now know that, in conjunction with rotation, we must also have restitution or compensation, if we would maintain the fertility of the soil, and avoid barrenness. Restitution and rotation should be the watchword, the creed, not merely as a matter of faith, but the every day practice of all who desire to cultivate rationally. We cannot go on ploughing and sowing, reaping and mowing, taking all away, and giving nothing back to replace the mineral substances removed from the land. We cannot, I say, long continue this system of robbery, even with some sort of rotation, without being brought face to face in the long run with one of these two alternatives, restitution or barrenness. The time, of course, will vary with the quality of the soil, but the end must come. How little this inexorable law of restitution seems to be understood, or if understood, how much we, by pursuing our present exhaustive practice, seem to disregard it. Yet it is no light matter, but one fraught with serious consequences to any community where a system of spoilation is carried on, instead of rational cultivation.

The other day I met with the following statement bearing on this subject, in the leading columns of one of our daily journals, in an article commenting on mining leases. In making a comparison between the charge for a mining lease and the cost of agricultural land, the writer proceeds to say:—"Agricultural land rightly passes at a small charge from the Government into the permanent possession of the cultivator, because, by the labour of him and his successors, it will continue for generations without number to yield the prime necessities of life, food and raiment, to the inhabitants of the State, because, in fact, cultivation makes of it the commissariat, without which the State could not exist." Now, this holds good only where rational cultivation is carried on; under an exhaustive system there is absolutely no difference between agriculture and mining. The miner works out his claim, and the farmer works out his farm. The former abstracts the "metallic treasure," wealth's representative, and the latter abstracts, by means of his crops, the real worth of any nation, the fertility or producing power of the soil, thereby destroying "the commissariat, without which the State cannot exist."

Exhaustion caused by "Settling" on small portions of Land.

Our State looks on with indifference at a condition of things that must, in the course of a few years, seriously affect its own existence. Nay, not only does the State look with indifference on the present system of spoilation without making any attempt to introduce a more rational one, but it actually, by "settling the people" on too small portions of land, renders an exhaustive practice compulsory on the part of the poor settler. With the frightful example of America before our eyes, and none of her vast resources in the shape of rich agricultural land at our back, we fail to profit by the lesson. There, in America, such is the distance grain has to be transported over country rendered more or less barren by spoliation, that unless the price of wheat rules at from 55s. to 60s. a quarter in Britain, it will not pay the farmer in the "far west," where the work of destruction is still going on, to harvest his crops, and they are allowed to shed on the fields. Nearer home, we read of an exodus of farmers from already exhausted districts of South Australia coming to Victoria to take the benefit of our recent Land Bill, and, of course, to pursue the same system here that has led to the necessity of their leaving South Australia. But to come home within our own colony, we are told, by the *Hamilton Spectator*, of farmers in the western district, who, having exhausted their own freeholds, are now renting land on a short lease at a high rent, for the purpose, no doubt, of carrying on the same exhaustive practice. Meantime, they have laid their own farms down to grass, to recover the lost fertility. Delusive hope! If it be the mineral constituents of which the soil has been exhausted, there is but one way of restoration, and that is by restitution. However, "the convenience of the arrangement," it is said, "is quite mutual, for the land-owner will get a far higher return by letting his land for 15s. to 20s. per acre, than he would by keeping a couple of sheep to the acre, and the tenants will be able to make larger annual gains." From this it would appear that the American system, when "the settler subdues a piece of land, flogs it to death and abandons the carcase and then repeats the operation on a new subject," a system that has been condemned by thinking men in all countries, is in full force among us; indeed, some, it would appear, have already managed to compass the death of the first victim, and are seriously setting to at the second. With our "limited area of good agricultural land," this is surely an unwise course to pursue, and must be attended by disastrous results. But then "the land-owner gets a far higher return, and the tenant larger annual gains." Here we have the true secret—an insane desire to convert the fertility of the soil, at all hazards, into hard cash—to sell the birthright of mankind for a few pieces of glittering ore! Curious anomaly of human law this! We will not allow a poor miserable wretch to destroy his own miserable life, but we make no attempt to prevent the destruction of that which maintains life. With lettings like that in the western district, and the Government selections of 80-acre lots, how can we expect any attention to be paid to the natural laws of restitution and rotation, or any attempt at rational cultivation?

Profit the Proof of Rational Cultivation.

Having pointed out some of our farm practices which I conceive is not rational, and endeavoured to shew you why I think so, I shall now pass on to the question—What is rational cultivation? "The object of farming is gain. Whether an agriculturist grows bread to strengthen man, wine to gladden his heart, oil to make him of cheerful countenance, or opium to poison him; whether his barley be made into wholesome ale or deleterious gin, he has but one concern—does the cultivation pay?" This being the case, and the object gain, the system that enables the farmer to obtain the largest quantity of healthy produce at the smallest cost, and realize the greatest amount of profit, but—pray, you mark this well—"without permanently lessening the fertility of the soil"—any system that will fulfil these conditions may be pronounced a rational system of cultivation. The ferti-

lity contained in the soil is the farmer's capital; when he sells his crop, he sells part of this capital. If he does not restore to his land, in the shape of manures, the fertilizing substances taken away in the crop sold, his land will be permanently so much poorer. He is then living partly on capital, instead of on interest alone. This is an erroneous and too common practice. By following it, the capital originally contained in the soil is year by year diminished, and the farmer, with diminishing crops of grain, as a matter of course, obtains less and less of interest, not only, mark you, on the capital in the soil, but also on the capital he employs to work his farm. True, the farmer may, by this unwise course of practice, when his land is in its virgin freshness, manage to save money, but such savings cannot all be regarded as legitimate profit, because he has simply been transferring part of his capital out of the soil into some bank. Should he farm the same land long enough, his bank account will dwindle away again, for "the spoilation of land leads to poverty." Now, by following the opposite, that is, the rational course, and restoring again to the soil annually, in the shape of manures, those elements of fertility carried away in the crops sold off the farm, the farmer will retain his capital in the soil intact, and will always obtain undiminished interest on both the capital in the soil and that employed in working the farm. Does some one inquire—Will this rational system, this constant manuring, will it pay? Well, all I can say in reply to such a question is, if it won't, we have no business with the land. Why disturb the squatter? Why destroy his rational and profitable employment of the land in the production of wool and tallow, if we take it only to pursue an exhaustive system that must, in the long run, end in rendering it useless for cultivation, and unfit even for the production of wool and tallow? The fact is, if we, as farmers, are to continue to cultivate, we must cultivate rationally. It is a case of "Hobson's choice, that or none." We must also make it pay, for that is one of the conditions. How, then, are we to set about it? It is not my intention to attempt to lay down any course of cropping. Every one must decide this matter for himself, according to circumstances, climatic conditions, and local requirements. In one part of the colony it may be dairy stock in conjunction with grain growing; in another, sheep; in a third, the purchase of phosphatic manures, and the ploughing in of an occasional crop of green manure. So that it becomes simply impossible to point out any specific course whereby to attain the desired end. But this I may say, that whatever system may be adopted, it must be based on the laws of restitution and rotation.

Beginning at the Wrong End.

In colonial agriculture generally, the natural tendency seems to be to begin at the wrong end. Instead of starting from grass and the depasturing of stock, the production of grain is made the starting point. By the continued production of grain alone, the land becomes exhausted, and thereby unable to produce grass except of the most worthless and innutritious description. Now, the rational course would be to start from grass as a basis, and, in conjunction with this, through green crops, stock, and manure, advance to grain; then, in the course of any rotation, back again to grass. The laying down of cultivated land to grass, after a course of cropping, may be likened to putting it to bed; of course, the more comfortable we make it the better it will rest, and consigning it for a time to "nature's sweet restorer, balmy sleep," which, if I may be allowed a slight liberty with poetic diction:—

> Swiftly on dewy pinion flies from fields
> Of woe, too often cropped with golden grain,
> And lights on slopes unruffled by a plough.

The bare fallow is like poking up the fire to make it burn away all the faster. But a green crop put in with plenty of good muck, and fed off on the land, is the true "roast beef of old England," and will be followed by plenty of bread and cheese and beer. As I have said before, if we take care of the grass, the grain will take care of itself. To do this we, must take care of the muck, and to get muck we must have stock of some sort. By means of stock the farmer can collect together part of the capital contained in the soil of his grass land and apply it to his arable land for the time being. By thus concentrating his fertile capital, he will secure a larger and more certain return for his outlay on the labour of cultivation. In this way the fertility of the farm will be made to rotate on the farm itself, along with the rotation of crops, and if restitution is made for loss suffered by produce sold, this system may be carried on to the end of time.

The first step, however, towards the initiation of such a course of practice, is the sub-division of farms into fields; the next, keeping stock and taking care of the muck; after that, rotation of crops, and last but most important of all, restitution. Under present circumstances, as regards population and cost of labour, not less than three-fourths of a farm should be under grass, "bush grass," of course, in the first instance. The larger the farm the larger should be the proportion of grass land. That a system of rational cultivation will not pay in this colony I deny. The truth in this matter is not left without witnesses. For, although an exhaustive practice is the prevailing one, and tenant-farmers can hardly be expected to follow any other, yet I know several farmers who cultivate their own freeholds on a rational system, and who make it pay too. It is also a cheering sign of the times that many are now impressed with the necessity of some change, and anxious to adopt a more enduring system. Spoilation, it has been found, will not continue to pay.

INDIAN FIBRES.

THE RHEA PLANT.

[*Resolution of the Government of India in the Home Department, dated the 26th January* 1871.]

ARRANGEMENTS have now been completed for transmitting to the Secretary of State, for the use of would-be competitors in Europe, five tons of dried stems of the rhea and two tons of semi-prepared fibre in that state to which it is readily reduced by existing machinery.

Dr. Jamieson reports that rhea cultivation is being vigorously pushed forward at Saharunpore, and it seems probable that by the 1st of April a few tons of dried stems will be available for distribution to parties in India desirous of making experiments with the same. These stems will be distributed gratis, but applicants must pay for the carriage of the same from Saharunpore to the locality at which they wish to receive them, as well as for all packing expenses.

Regard being had to the delay which has unavoidably occurred, and must still occur, in furnishing would-be competitors in Europe and India with specimens of the plant for experimental purposes, His Excellency the Governor General in Council has resolved to postpone the commencement of the regular trials until April 1872. During the whole hot weather and rains of 1871, however, considerable quantities of the fresh stem will be available at Saharunpore, and during this period intending competitors whose machinery is in a sufficiently forward state, and who may be desirous of testing the same on the green plant, will be afforded all practicable facilities for doing this at the Government plantations, so far as the material available will permit. During these preliminary experiments the owners of machinery must provide such motive power as may be necessary to test their machines to their own satisfaction, but during the regular trials the Government proposed to place one or more small steam engines at the plantation to work the machines which may be allowed to compete.

Persons desirous of obtaining supplies of the dried stem for experimental purposes in this country must submit applications in the Form A. prior to the 1st of March 1871, and persons desirous of testing their machinery at the Government plantation at Saharunpore during the hot weather and rains of 1871, must submit their applications in the Form B, prior to the 1st of April 1871. Applications in either form are to be addressed to the Secretary to Government of India, Home Department.

It being essential, in view to the provision of a sufficient supply of the fresh rhea stem for the trial of the machinery, to ascertain beforehand the number of machines that are likely to take part in the competition, it has been decided to fix the 1st May 1871 as the date prior to which notices of intention to compete for the Government prizes should be submitted. Machines, in regard to which notice has not been given prior to that date, will only be admitted to the competition after a sufficient supply of stems has been allotted for trial of those machines in regard to which the requisite notice has been duly filed prior to the 1st May 1871. Notices of intention to compete should be in the Form C, and should be addressed as in the case of applications A. and B.

RICE CULTIVATION.

BLIGHTED PADDY.

THE following letter from the Commissioner of the Presidency Division, regarding the blighted condition of paddy crop in the vicinity of Diamond Harbour, has been received by the Agri-Horticultural Society:—

"1. The accompanying *dhan* has been made over to me as a specimen of a very serious blight which has affected a considerable portion of the standing rice crop to the south of Diamond Harbour.

"2. I should be very much obliged if you would be so good as to favor me with any remarks which the knowledge and experience of yourself, or any member of your Society can suggest as to the nature and cause of the blight.

"3. It is so far, as I understand, the result of the last heavy rains, which led to a considerable rice tract being submerged for a short time."

The Secretary said he had been favored by Mr. Wood Mason, the Officiating Curator of the Indian Museum, with the following report on this blighted paddy:—

"The specimen of paddy just received infested by a species of ustilago-smut, in common parlance. Many species are known of this genus of parastic fungi, which are determined partly from characters furnished by the spores, partly by the habit of the fungus, &c. They generally grow in the interior of the organs of plants, as in the case before me, in which the usual great deformity of the grains, absorption of the tissues, and their total replacement by aggregations of the spores of the fungus, have taken place. The interior of some of the grains presented a whitish gummy, interlaced ill-definedly thread like mycelium which doubtless grows, in the manner described by Fulasne at the expense of the surrounding tissues and sap of the infected organs, and at last becomes converted into a more or less coherent mass of spores; these are of a dirty green colour on the exterior of the deformed grains, beneath the outer coating the aggregated spores are bright orange red; the central portion has a vesicular appearance and is white in colour.

"Now for a few words about the causes of this blight. Amongst these may be placed 'seasonal influence unfavourable to the healthy development of the paddy plant,' careless cultivation or absence of proper precautions in the choice of the seed. According to certain observations made some years ago, it seems probable that there are very few corn grains of any kind upon which it is impossible to discover several sporules of a fungus; a bad season comes in which, to take the present case, the plants are too long or too deeply covered by water, they get into an unhealthy condition, and the dormant germs start into life. This is as probable an explanation as I am able to offer. In animals certainly a lowered physique produces greater susceptibility of disease; this same more than probably holds good with regard to the vegetable world. In further corroboration of my explanation, I may mention the sudden occurrence of forms of animal parasitism to *sick* people.

ACCLIMATIZATION OF CAROLINA RICE.

The following report by Lieut.-Colonel J. Ashburner, Deputy Commissioner, Upper Godavery District, No. 2,210, dated Sironcha, 13th December 1870, *on the result of an experiment on the cultivation of Carolina Paddy, is published for general information :—*

I HAVE the honor to report, for the information of the Chief Commissioner, the result of an experiment made in this district on the cultivation of Carolina paddy, with a view to its introduction by distribution to the ryots of the district.

In the early part of this year I made application to the Board of Revenue, Madras, to favour me with a small quantity for trial; they kindly forwarded me 20 lbs; this I had sown under careful superintendence, and the result I shall briefly lay before you.

Of these 20 lbs. on receipt, about 5 lbs. were found to be in the condition of rice and unfit for planting, 6 lbs. of the paddy in preparation failed to germinate, and 3 lbs,, immediately after being planted, were completely washed away by a heavy fall of rain, so that but 6 lbs. were left to carry out the experiment.

Preparation before Sowing.

The paddy was steeped in water for 16 hours, removed, and then tied closely in a bundle covered with teak leaves. This was watered twice daily for six days, and then but once daily for three days: the package was examined on the seventh day and germination was found to have proceeded sufficiently far to render it fit for planting.

Selection of Soil.

A site was selected close to the bund of a tank, and 3,334 square yards in extent. The soil was rich and loamy, approaching "cotton soil" in character, but containing a pretty large admixture of sand; a good supply of water was at all times attainable.

Preparation of Soil.

The ordinary preparations were made, the ground was well ploughed to the depth of 18 inches, and was well cleared of weeds, five maunds of cowdung were spread and mixed with soil, then the ground was watered and again ploughed.

Seeds.

Nothing was done before sowing, further than to immerse the sprouts in a solution of assafœtida to prevent its being injured by worms or insects.

Transplanting.

Carried out in the usual manner, the roots at the time were found to be about a foot and a-half in length.

Watering.

Water was supplied from the tank as before mentioned; after transplanting, the water was allowed to reach to about one-third the height of the plant, but this was found not to suit, as the plants seemed unhealthy and of a yellowish colour; the water was then withdrawn and allowed in sufficient quantity merely to keep the ground thoroughly moist. The appearance of the crop improved directly the excessive water was withdrawn.

Harvesting.

The head plants arrived at maturity before the sub-plants, and were larger, but no seed was shed till beaten out after cutting.

REPORT OF EXPERIMENT MADE IN THE UPPER GODAVERY DISTRICT.

No. 1, TUMMUNDAL VILLAGE.

Taluk and Village.	Nature of soil or Settlement Tarrair.	Extent in square yards.	Quantity of manure used.	Seed sown in pounds and ounces.		Date of Sowing.	Date of transplanting.	Date of reaping.	Yield. Grain thrashed. In pounds	Yield. Straw. Weight in pounds.	Yield. Straw. Length of straw.	Rainfall in the district.*	Remarks.
				lbs.	oz				lbs.	lbs.			
Sironcha.													
Tummundal	Brown soil mixed with one-fifth of sand 1st Class.	3,334	Cow-dung about five maunds.	6	6	1st July 1870.	17th August 1870.	22nd November 1870.	2,464	896	3 feet.	30·31	Carolina paddy transplants.
Do.	Do.	5,277	Do. six do.	308	0	20th July 1870.	.....	15th November 1870.	2,480	906	¼ feet.	20·24	Country paddy sown broad-cast in an adjacent field, water supply, &c., just as Carolina paddy seeds.

* From 1st July to Harvest.

The yield of paddy amounts to 2,464 lbs., or a proportion of 24 lbs. to each ounce of seed planted.

Ten ears to each plant was about the average; they weighed about half a pound.

The straw of rice is of no value in this district; it weighed 899 lbs; 6 lbs. out of 15 (or 40 per cent.) of the paddy when kept moist before planting failed to germinate.

The total amount expended was Rs. 44-11-0, exclusive of expenses of conveyance from Madras.

The cost appears high for so small a piece of land cultivated, but the proportionate cost would diminish with an increase of the area of cultivation.

The yield at the present bazaar rate (eight seers per rupee 2nd quality) would realize Rs. 77.

The accompanying return shows a comparison with paddy sown in the adjoining field, with the same advantages of soil, water, &c.; at a glance it will show the enormous advantage to be gained by the introduction of Carolina paddy; the only point remaining to be proved is whether the Carolina paddy grown in this district will deteriorate year by year owing to climatic or other influences.

It is not proposed to distribute any of this year's yield out of the district, but to devote the whole of the seed in hand to the requirements of the Upper Godavery district, and it is intended to distribute it freely to those cultivators who are willing to undertake its culture before next sowing season, on the understanding that one-half of the produce realised from the seed thus distributed shall be repaid to the Local Funds Committee, when no difficulty will be raised about distributing this very remunerative description of paddy elsewhere on payment of expenses.

The cultivators who have seen the progress of the crop and the success of the experiment are of course very ready to substitute the use of the Carolina seed for their own country produce, and it is intended to frame written directions in the vernacular as to its cultivation for distribution throughout this district; and as the chief point of difference in the culture consists only in transplanting the young plants in place of sowing the seed broad-cast,—which mode will likewise greatly benefit the country produce,—it is hoped that the present experiment will in every way be beneficial to the agricultural interests of the district, even if a wider field of improvement be denied to it.

Taking all the circumstances of the experiment into consideration, I consider that a decided success has been attained, and that should similar success be achieved next year by the ryots with the paddy proposed to be issued to them, I think there can be no question as to the desirability of introducing Carolina paddy wherever it can be grown with equally satisfactory results.

The success in this instance is mainly owing to the very great care and interest taken by Saiyad Ali, head clerk in my Cutcherry, in carrying out as far as possible the suggestions made by the Superintendent of the Government Experimental Farm, Madras. I consider he deserves very great credit for such unremitting attention to a work so foreign to his regular duties, and for carrying out vigilant superintendence, attended with considerable personal inconvenience. My thanks are also due to the Board of Revenue, Madras, for their promptness in supplying the Carolina paddy and full instructions for its culture.

P. S.—A comparative statement showing relative return of Carolina and country paddy is appended, which seems unmistakeably to prove the wonderful return in the present experiment.

IPECACUANHA.

MEMO. BY DR. ANDERSON.

"I estimate that I shall be able to take out to India, in January 1871, not less than 50 plants of the true ipecacuanha, all of which will have been obtained in Europe principally in exchange for rare plants and seeds from the Botanical Gardens, Calcutta. In the correspondence sent to me along with the copy of the despatch of the Government of India, I observe that it is assumed that only one form of the flower (they are dimorphic as regards the relative length of stamens and pistils) exists in Europe, and therefore all the plants procured from Europe will prove to be sterile. I hope this is an error, and I believe it is because it is supposed in India that only one plant was introduced from Brazil, from which all those in Europe has been artificially propagated, whereas the ipecacuanha plants were brought into Europe on two distinct occasions, first, I think, in 1832 or 1833, and again some years afterwards, and there is every reason to believe that each importation consisted of several plants.

The plants flower regularly in stoves in England, but no one has recorded the condition of their flowers. I shall endeavour to obtain information regarding the nature of flowers as the plants I have procured come into blossom, so as to distinguish and mark plants having different forms of flowers. I had also acted on the suggestion first made by Mr. McNab, that living roots packed in sphagnum might survive the voyage from Brazil. I discussed this proposal with Mr. McNab in Edinburgh in October, when we examined the fresh roots cut from his large plants. I had at the end of June mentioned the introduction of the ipecacuanha into India to Dr. Christison, Professor of Materia Medica in the University of Edinburgh, and he then wrote to a friend* in Rio de Janeiro, who had long resided there as a medical practitioner, and requested him to obtain information of the habitat of the plant, and, if possible, procure living plants and seeds for me. Drs. Balfour and Christison have since then addressed this gentleman a second time, and have described to him the method of packing the roots recommended by Mr. McNab. In December, I requested Messrs. Veitch and Sons, of the Exotic Nursery, Chelsea, to procure living plants in Wardian cases, roots in moss, and seeds of the true ipecacuanha from Rio de Janeiro. Messrs. Veitch and Sons at once wrote to their agent in Brazil, and he has replied that he will have no difficulty in sending plants and seeds to England. In consequence, last week, I entered into an agreement with Messrs. Veitch and Sons to supply me with a good stock of the *cephælis ipecacuanha* from Brazil. The importation is to consist of live roots packed in moss, and some planted it soil in Wardian cases, and live plants and seeds are also to be sent if they can be obtained. The cost of this importation is not to exceed £25 sterling, including charges for collecting in Brazil and transit to England.

In accordance with the permission given me to communicate with Mr. John Bramley Moore, who has expressed his willingness to assist in procuring roots and plants of ipecacuanha from Brazil. I have called upon that gentleman, but have not had yet an interview with him.

There can be no doubt, I think, that the attempts to introduce the true ipecacuanha from Brazil into India will succeed only by establishing a nursery in England where roots and plants should remain until they become large and healthy enough to be sent to India. I do not think so small rhizomes as those of the ipecacuanha could survive the long and trying voyage from Brazil to India, even by the shortest overland route, however well they may be packed. Plants received at Calcutta from England, and packed in sphagnum, generally reach in bad order, from fermentation having taken place from the great heat the plants have been exposed to probably in the Red Sea.

It is most likely that a considerable percentage of ipecacuanha roots in sphagnum, and plants in Wardian cases will arrive alive in England from Brazil, but not possessing sufficient vitality to enable them to withstand the risks they would be exposed to during the very trying voyage to Calcutta. Seeds, too, may retain their vitality until they reach England, but not much longer; for, like the seeds of most species of the *coffee*, to which tribe *cephælis* belongs, they soon lose their germinating power. I therefore recommend that Dr. Hooker should be requested to allow all transmissions of ipecacuanha plants, roots, and seeds to be received at the Royal Gardens, Kew, and to be kept there until they have properly recovered from the effects of the voyage, or until the seeds have germinated. As I am occupied at Kew assisting in the publication of the "Flora of British India," I shall be able to observe the state of the plants, and to arrange with Dr. Hooker for despatch of the plants to India as opportunities may occur. If any of the roots packed in moss are found to be in very good order, a few of the best may be selected, repacked, and forwarded to India by the overland route. If a large quantity of seed is obtained, part of it also might be sent to India, the remainder being sown at Kew.

I may mention that this plan is approved by Dr. Hooker, who also agrees with me in thinking that roots or plants of ipecacuanha sent direct to India from Brazil could not survive so long a voyage.

With reference to the plants of ipecacuanha now in England which I have secured for transmission to India, I think they should not be exposed to the risks of so long a voyage, unless some one conversant with the management of plants can be found to take care of them. Should no one be found willing to do so, no time will be lost by keeping them in England till my return to India in January next, as their multiplication by cuttings and root divisions can be carried on most successfully in this country, and it has been arranged that this should be done. If, however, any officer returning to India who understands the treatment of plants can be found to undertake the care of a small Wardian case of ipecacuanha plants one or two despatches might be made to Calcutta or Madras before next January. I strongly recommend that the experiment of cultivating the ipecacuanha plant should be entrusted, in the first case to the Superintendent of the Calcutta Botanical Gardens and to Mr. M'Ivor at Ootacamund, instead of sending them to other places where there are no horticultural appliances, and where the plants cannot recover from the damage they inevitably receive on the voyage in spite of all the care that may be taken of them.

The plants have thriven at Calcutta and at the lowest levels of the cinchona plantations in Sikhim, and also at Ootacamund. There were 20 plants at Calcutta and Darjeeling last November

* Dr. Gunning.

—all the produce of one plant I received in 1866—and 13 at Ootacamund on the 9th of November last, the produce of three plants obtained by Mr. M'Ivor from Kew in 1866-67. These four original plants are the only ones from which cuttings have been made in India, all others having perished on the voyage or soon after reaching the country.

Localities in India adapted to the growth of the ipecacuanha plant will be found in districts possessing no well-marked or very long, dry, cold season, as the plant cannot withstand cold or drought. Sikhim is the most western province of the Himalaya in which the plant will grow. The plains of North-West India are also too hot and dry, and I do not think the plant will withstand the cold or the dry season of Lower Bengal without shelter. Assam, Cachar, Chittagong, the moist parts of Burmah, and the Tenasserim Provinces are districts in the East in which the cultivation would succeed. The Western Ghats, from latitude 20° N. southwards, and the tropical valleys of the Neilgherries, Anamallay, and Pulney Hills, and the Wynaad, in the Bombay and Madras Presidencies, will also be found.

AGRICULTURAL STOCK—INDIA.

ALLIGAUM CATTLE FARM.

THE Alligaum Cattle Farm is doomed, and it is about time, unless an entirely different system of management is allowed to be introduced. Hitherto the farm has never had a fair chance; so far to the contrary, that its history reads like a romance. The farm was started for the purpose of providing good and wholesome mutton and beef for the Commissariat, so as to make the army independent of the scraggy and unwholesome meat issued by the contractors in the bazaar. Alligaum was chosen as the site by the late Superintendent, Colonel Neale, because the head quarters of the Stud had formerly been located there. A worse locality could hardly have been selected, as there is no grass there, and insufficient fodder at any season, except during the rains. The late Superintendent, during the whole time he was at Alligaum, devoted his attention exclusively to sheep-breeding, this being more to his taste than the less romantic but more profitable employment of carrying out the intentions of Government by improving the meat for the troops. The consequence was, that whilst Colonel Neale was there, no beef was ever issued from the "Cattle" Farm! So the farm failed. Nor is it wonderful that it did fail. For six months in the year there was, as we have said, neither grass nor sufficient fodder of any kind to keep the animals; and, besides, in order to carry out Colonel Neale's ideas of breeding, a large number of expensive Merino rams from England and Australia were imported at a great expense, most of which, as might have been expected, died from heat and the effects of the climate. The lambs were small, delicate animals, difficult to rear, and by the time they were fit for slaughter, had cost six times as much as mutton could be bought for in the market. The whole of the expense on this account, as also of the farm establishment, was put against the meat supply, and by meat supply is meant one ration of mutton per week! The consequences have been that the farm, instead of paying its own expenses, has necessarily proved a failure, and a heavy debt has been incurred.

So much for the past. Let us think for a moment what ought to be done in the future if an admirable scheme is to be made anything but a ridiculous farce. In the first place, instead of as now paying Rs. 5,000 a year to the Forest Department, the cost of which has been charged against the one ration of mutton, some of the waste lands, which pay no revenue to Government, but which are covered with grass, should be taken up for grazing or to supply fodder. The grass, if cut whilst green and before the sap is out of it, would make excellent hay, and in places where there are nullahs and water, good grazing could be found all the year round. There should also be a reserve stock of both sheep and cattle for four or five months' consumption; and after due trial, every beast unfit for slaughter should be got rid of. By turning the grass into hay, which can be done if it is cut when in blossom, little or no corn would be required. Miles of this land might be taken up about the ghauts and near the railway, so much that indeed there is no reason why both Poona and Bombay should not be supplied with good, wholesome, and cheap animal food. Being near the railway, the beasts could be slaughtered where they were fed, and the carcases sent in by rail. If this were done, no more would be heard of the unwholesome diseased bullocks brought by the butchers to the Bombay markets. In a word, the farming and husbandry of the grazing lands should be carried out on the system that prevails in Australia.

The position of the Alligaum Farm is, as we have already said, the worst that could have been chosen. It is 14 miles from the railway, with no road thereto; the whole country is black soil, nearly impassable in the rains. The farm is on the wrong side of the Bheema river, and when sheep were required in Poona, they had to be sent a-five days' march by road, a journey which generally took off most of the fat that had with such difficulty been put on. Fat when they left Alligaum, they were lean before they got to Poona.

As to the paramount necessity that exists for sup meat to the markets, people have only to read Dr. H Report, and reflect that, unless Government initiates a new system, the Native butchers and contractors must continue to purchase the cattle and sheep that live in the outskirts of villages and feed on the filth and garbage they find there.

Under the system now to be introduced, the whole of the rations of beef and mutton will be supplied by the farm and from the waste grazing lands. The expenses of the farm and establishment will thus be charged on the seven days' ration issued per week, in place of on the one or two days' mutton rations. This will greatly reduce the cost of the meat supply generally, and as the breeding portion of the Farm has been abolished, there is little doubt but that the Government farm will now prove a success, ensuring the issue of good and cleanly fed meat to the soldiers at a reduced cost to the State. We may mention that a precisely similar experiment was tried by the energetic Deputy Collector of Poona on a large scale at the identical spot some 27 years ago; and it, after immense labour and expense, proved an utter failure, as every attempt at sheep-breeding with imported sheep in the plains of India must unavoidably prove.—*Times of India.*

GRINDING HAY AND STRAW FOR FEED.

THIS matter is beginning to be seriously debated in the system of advanced agriculture. Like other new things, it makes but slow progress in the agricultural mind at first, but the advance of the age in using steam-power on farms, points out the possibility, and, indeed, likelihood of as great an advance in this as in any other direction.

Advocates of the system of grinding hay and straw for feed naturally argue in this way:—The nourishment in the fibre of hay and straw is only attainable by the breaking down of the fibre of the material, and thus opening to the action of the stomach of the animal the cells of the plant, which contain the starch, the sugar, and the oily particles which have been carried into the stem of the dried plant by its natural growth. These broken cells are then acted on by the juices and liquids of the mouth and stomach, are dissolved and assimilated into the system of the animal. Hence the more perfect the crushing and comminution of the stem, the more easily do the animal's digestive organs take hold of the nourishment which the stem of hay and straw contains, and therefore the more the fibres are so crushed and divided, the more nourishment is obtained from them. Then, again, in proof of this theory, they show that grass (which is only undried hay) is much more congenial to the animal than hay, that he lives better on it and fattens quicker, and that therefore the consumption of grass is more profitable than that of hay. This, they affirm, is because the grass, being softer and more easily crushed, is more thoroughly broken down by the mastication of the animal than can be the case with the dried vegetable, and being altogether in a softer state nearly, if not quite, the whole of the nourishment it contains is at once available, which is not the case with hay.

To prove this, examine the excrement from a grass-feeding animal. Wash it in a fine sieve until all the colouring matter and the animal additions which it has received in the stomach of the beast are removed, and you will find it to have been ground infinitely finer and more completely than excrement from a hay or straw-eating animal treated in a similar manner. The fibre from the grass-fed animal is nearly as fine as the stuff from which they manufacture brown and coarse paper, while the fibre from the hay-eating animal is quite as coarse as the material which the paper-makers use to make what is called straw-board. These are facts demonstrable any day by every farmer who chooses to try them, and they consequently cannot be denied.

Admitting, therefore, for argument's sake, that the finer the particles to which hay and straw can be reduced before it is placed in the stomach of the animal, the more nourishment is derived from it, and, consequently, the more profitable it becomes, we come to the consideration of the question: Can this be more easily attained by the natural grinding and mastication of the animal, or by artificial means?

Many will argue that mastication of cattle food is most natural and therefore best. In reply to this, the answer is: True in many cases, but not in the fattening of cattle. In this operation we want to avail ourselves of every particle of fattening matter in the food in the shortest possible time. Animals can assimilate more than they do in a natural state, and the farmer's object is to make them do so. He wants to reduce his operations to certainty, not leaving them in any way to chance. Young animals grind their food quicker and more perfectly than old ones. Some animals, from greediness of disposition or other natural causes swallow their food before it is thoroughly masticated; and although in the case of ruminants it is all brought to the mouth a second time, and even oftener, and remasticated after having been softened in the stomach or paunch, yet it is of necessity only masticated in sufficiently fine particles to pass to the second stomach and other digestive organs, and it by no means follows that even the ruminants grind the food as fine as the wants of the farmer require. His object is to make all feed alike. He

pays as much for a beast which does not grind his food well, as for one which does—for the lazy chewer as for the more active and industrious one. He wants all the beasts in his byre finished off at one time, and that each and all shall have taken from the hay the last attainable particle of fattening matter. And to make this certain, he applies the help of science in the construction of a machine to break down and comminute the fibre of the dried plant, having recourse to steam for the power necessary to effect that object.

If this is the case with hay, how much more must it be with straw, whose fibre is harder and more intractable, and whose fattening matters are more sparse and difficult to get at! And if it be true with respect to ruminants, it is of ten times more force with horses, the object in feeding which is to spare the animal all the labour possible, and give him the greatest amount of time in which to rest and recruit his faculties, and where before anything it is necessary that he should be furnished with the least cumbersome and the most easily digested food which is attainable.

It is a well-known fact that hay cut too short in the chaff-cutter gives horses indigestion, and therefore now a days inch and half-inch chaff is preferred; but as the chaff-cutter, though cutting the substances, does not abrade and tear them, it cannot act in the setting free of the hidden nourishment which the hay and straw contain.

Having arrived at the point that grinding hay and straw may be advisable, the next thing to be seen is how it is to be done, and here we must call in the assistance of the farm machine maker. The operation ought to be effected at one movement—that is, the material should be reduced at once to the necessary fineness. It should be taken from the stack and fed without change to the machine, as a straw-cutter is fed. It ought not to be necessary first to cut it and then to grind it.

The value of boiling hay and straw has been long known; but besides the labour of this course, there is an objection to the constant feeding of animals with hot slops of any kind, for if you begin you must go on to the end of the beast's term of fattening, or he will go back instead of improving.

Steamed straw is now a staple upon old-country farms, and when beasts are purchased for fattening they are at once fed with steamed straw, and are found to do infinitely better than they will do on straw that is given either dry and whole, or chaffed. The steam-engines now used on all farms of any consequence in Britain afford by their waste steam the means of steaming straw without extra expense, except the carrying it to the steaming trough and the removal of it from thence to the cattle-byre.—"*Vectis*," *in the "Canada Farmer."*

Official Gazette.

CALCUTTA, 15TH MARCH, 1871.

THE EXPERIMENTAL FARMS.

IMPROVEMENT OF COTTON CULTIVATION IN SIND.

MR. W. STRACHAN, Superintendent of Cotton Experiments in Sind, has addressed the following Report to Dr. G. F. Forbes, Cotton Commissioner, Bombay, dated Camp Halla, 25th November 1870:—

As the season is now well advanced, and all arrangements for the current year's experiments completed, I do myself the honour of forwarding a report on the arrangements now being carried out for the improvement of cotton cultivation in Sind.

The arrangements which I have now to report are those which have been made for the purpose of carrying into effect the proposals submitted in connexion with the establishment of the Halla farm. I have also to mention the different means adopted for the improvement of cotton cultivation, for the permanent introduction of suitable exotics or a better class of indigenous plants, and the improvement of agricultural products generally.

The soil and situation of the farm are both as good as can be wished for; the soil may be considered a fair sample of Sind cotton land; from the surface to the depth of from two to several feet, it is a mixture of fine sand and clay; immediately under that is pure sand, very fine, and of an excellent, sharp, fertile nature. Generally speaking, the whole area occupied by the farm is of this description of soil, more or less charged with fertilizing matter, and fit for any purpose from brick-making to the producing of good mangoes.

The site of the farm is about 34 miles north from Hyderabad, the nearest European station, in a very central district of the Halla Deputy Collectorate, in north latitude 25° 45, east longitude 68° 20, and in the immediate neighbourhood of Ghottana, the chief place of business in this part of the country. It is watered by two canals, the Sangra and Mahmood Gharra, both of which are moderate-sized rivers during the flood season, and seldom fail to give a plenteous supply of water for at least nine months in the year.

The varieties of cotton and extent of land sown therewith are as follows:—

Exotic.		
Sea Island	...	0·75
Egyptian	...	0·75
American	...	1·09
Newly imported native seed.		
Hingunghat	...	0·89
Broach	...	1·18
Native seed selected from last season's experiment at the Mulleer.		
Hingunghat	...	4·06
Sind Indigenous	...	4·14
Dharwar Native	...	0·12
Peruvian newly introduced	...	
Bourbon	...	
Hybrids, &c	...	
Unselected Native	...	12·50
Total Acres	...	25·48

This part of the arrangement is not so complete as I could have wished to have seen it, or as I expected I should be able to make it, at the time I sent in the estimate for the establishment of the farm. You are, however, already aware why so little cotton has been sown this year, so that I need not at present recapitulate the reasons; and on account of the delicate state of my health from frequent severe attacks of fever during the time of sowing, I was unable to stand the exposure which measuring the land at that time would have necessitated; I had consequently to guess the extent of the plots which were to be sown with the various kinds of seed, and measure afterwards; hence so many fractional areas.

A plot of about 37½ acres was sown with bajree in July and August, which has now been harvested. The grass or *kirby* is very short and of small bulk: it will hardly be sufficient to feed the cattle till we get in next season's crop. Grain has turned out better, but this is only a late crop; it will, however, do something more than clear the cost of working, and if the cold does not come too early, about half the area sown with cotton will do the same. We have commenced ploughing, and will sow during the cold weather about 10 acres with different kinds of grain, oilseed, &c., and I believe we might do worse than sow some lucern and other fodder crops for the cattle. Something of that sort appears to be much wanted here for cattle during the cold weather and early spring.

These 37½ acres were under cotton last year; and for how many years previous the land may have been under the same crop I have not been able to ascertain. The old cultivators say it was always under cotton since they knew it. The greater portion of the farm is in a similar state; it will, consequently, be a season or two before we can get a rotation system fully established. We shall however have space for a fair commencement next spring, and it can be gradually worked so that the whole area of the farm will produce one crop of cotton in the course of three years; but I cannot complete the arrangements for this till after I get the rest of the land, which I hope will be made over to me in anticipation of the sowing operations of next season; for I am fully convinced that to make anything either of cotton or grain, advantage must be taken of the proper time for putting the seed into the ground. Everything is against a late crop, work it how you will; the season is limited both for a supply of water and favourable weather to ripen the produce; labour becomes costly when weeding is required, and when the flood season is over, watering is carried on at a great disadvantage.

Though the first sowing of cotton was not made till the 4th of July, the plants have in some cases come well up with their earlier sown neighbours, but it is hardly possible that even the best of them can equal in yield those sown in May and June. It is however satisfactory to know that the ground is suitable; and now that we have the farm, we have a command over the matter, which we could never have obtained with land taken yearly. We shall be on equal terms with the zemindars so far as crops indigenous to the country are concerned, and if they pay the zemindars. We ought to lose nothing by them. With exotics the case is different; it is uncertain whether they will pay any one to grow them; and another thing which makes the return uncertain is the extensive application of systems of culture which have not yet proved suitable to this country; and loss from these causes may occur. But all such matters can be dealt with in such a way that they will get a fair trial without incurring any heavy loss in a case of failure. A few acres will give as correct an idea whether a plant will thrive under certain conditions of soil and climate, as would a large area; and the same with regard to new system of culture, a few acres will show whether there is a likelihood of their supplanting existing modes; and should either succeed well on a small scale one year, there would be good reason for trying them on a large scale; and under favourable circumstances we should have every reason to expect a favourable result. Except I get instructions to the contrary, I will shape my arrangements for conducting the farm in accordance

with what I have just now stated. It matters not on what plan the seed is sown, or a land prepared, or what kind of seed is used. The important point is to become acquainted with the details necessary in working out any new system, and the extra expense it will incur, and to ascertain whether the plants from the new seed will live or not,—and this must be done before experiments on a large scale are undertaken.

Of the different varieties of cotton sown, *Sind-native* was the first commenced and last finished. The first sown are very fair plants; the one shown in the first appendix to this Report will give you a fair idea of their size. There are some of them as high above ground as the one referred to, and with quite as long roots. They are at present bent to the ground by the weight of the pods, and we have picked over 10 maunds of them. The late sowing was finished in August. Some of the plants are of a fair size, and well set with young bolls; but they are far behind those sown in the early part of July.

Sea Island was the first sown exotic variety. The seed sown in the lines three feet apart germinated very badly Part of the plot was resown, but did no better than the first sowing, and till lately the plants have been in a very backward state. The few that are still alive are from three to five feet high, and look better since the commencement of the cold weather. Green fly on the leaves and white ants at the roots, have left but few living plants in this part of the field; and I do not know whether the few which have survived will yield seed fit for sowing next season. Every plant which I have dug up has its roots more or less injured by ants, and every day some more of them are dying.

Egyptian was the next exotic sown, and it germinated very well. The young plants were strong and healthy till they reached the height of about 9 inches, when they began to assume an unhealthy appearance. Since then till within a fortnight ago they have had a constant struggle for existence. Some weeks they looked pretty well and threw out new leaves and fresh wood, but the leaves seldom reached their ordinary size before they got a brown scorched appearance. They have been subject to all the enemies from which the Sea Island has suffered. At present they have a fine healthy appearance, but have as yet yielded no cotton.

American new seed and *American-Dharwar selected* were sown about the 16th of July. They came up well, and the plants have proved by far the most promising of all the exotics this season. I consider the plants fully as good as any I sowed during the season of 1868-69 in the black soil plains of Bunkapore, where I believe the best Dharwar cotton grows. The bolls with which the plants are well loaded are of no mean character as you will have observed by the few I sent you some time ago. At present they do not look so well as Egyptian, but up to the commencement of the cold weather they were very healthy.

Neither *Bourbon* nor *Peruvian* has done well this season. Perhaps with early sowing they might do better, but I will sow sparingly of them (unless I receive instructions to the contrary) till I see more to warrant trying them on a large scale; and I am of the same opinion with respect to Egyptain and Sea Island, not that I would have the experiment with them abandoned, but I think half an acre would be ample space for each till they show themselves worthy of more room.

You will observe that, comparatively, I have again sown a considerable area with *Hingunghat*. It seems to do very fairly here, and the plants are about the same size as the Sind indigenous sown at the same time. It is much of the same character as the Sind plant, but of a rather less robust habit. The cotton is longer and finer than the Sind staple, but there is less of it on the seed, and the bolls are not so large, while the seed is only about two-thirds the size of Sind seed. During the sowing time I showed some of my best selected seed to some neighbouring cultivators, who told me it was only fit for feeding cattle, for it would not grow. They however like the cotton, and if the yield be as good as the Sind plant gives, in the course of another season they may consider Hingunghat seed fit for sowing as well as feeding cattle.

The *Broach* seed you sent for trial here has done wonderfully well. I like it better than Hingunghat, and it seems to be a stronger grower than the Sind indigenous: it branches more freely than either of them. It and Dharwar-native are of one habit, but the Southern Maharatta plant does not keep pace with it in growth. The natives here do not like either it or the Dharwar on account of the smallness of their bolls. They say the cotton may be better, but the yield will not be so good as that of their own plant. It is also later than Sind and Hingunghat this year; but this is the first season it has been in Sind, and the season here is a long time earlier than at Broach, so that we may expect it will be earlier when it gets acclimatized. The Hingunghat which Mr. Harrison sent me this season is not so far advanced as the plants from acclimatized seed, though sown before them, but I do not know whether in its own country it ripens earlier or later in the year than our harvest time.

I cannot boast of a large area of hybrids. Small however as the plot is, it is a very interesting one. The result of my last season's work has turned out more curious than I expected it would last harvest time. Still I am just where I began with respect to the hybrid I tried most to get—namely, one between some of the exotics and native. What I have obtained are merely crosses between different varieties of the same species, such as American and Bourbon, Bourbon and Egyptian, and a few more of a similar nature.

The cross between Bourbon and American is nearly intermediate. The habit is more Bourbon than American, but otherwise it partakes as much of the character of the one as the other, so far as outward appearance goes. I have not seen the cotton. I have three plants of this cross. The rest are true Bourbon to all appearance.

That between Bourbon and Egyptian is also an intermediate breed; but I need not enlarge on the subject for I have only one plant, and though it is healthy to-day and promises a good yield, by to-morrow the white ants may have devoured every one of its roots. Bourbon was in this case again the seed-bearing plant, and all the rest of the batch are true to that character.

The other crosses are between American, Egyptian and Sea Island, but there is nothing particular to remark about them. They do not seem to differ much, if at all, from the seed-bearing plant. Some of them have yielded a few bolls, the seed from which I will take care to have sown early next year.

I have another small experiment, a very interesting one too; it consists of a collection of plants from seed selected from all the cotton plants which seemed to differ in any way from the common native, and a similar collection of exotics. I did this with the view of ascertaining whether they would keep true to the character of the plants from which the seed was picked. The native kinds have done so in most cases, where the difference was in the colour of the flower or habit of the plant; but when the difference was in the colour of the cotton they have varied—that is, the plants from seeds which were covered with a brown kind of cotton when I picked them, have produced white cotton this year. The white flowered variety of Sind-native has come true to the seed in every respect, and so have the plants with deeply cut leaves, slender, somewhat pendulous branches, and staple rather longer than the generality of Sind cotton. I picked most of them from natives' fields.

Of a similar collection of exotics picked both in Dharwar and at Mulleer, the result as yet has been of a no less constant character with regard to the habit, but in several cases the health of the plants has suffered. One example will give an idea of the whole. Among the Egyptian plants at Landi from Dharwar selected seed, I found five or six plants of a low branching habit with smaller leaves than the generality of Egyptian, and large green seed like newly introduced American with a smaller quantity of cotton on it. I sowed about 1 lb. of it this season; it germinated well, but the plants have since nearly all died off, and the best of those which are still on the ground are not over 18 inches high; some of the seed is green, white, brown, and some with no fuzz at all, and with so little cotton on it, that the seed is quite visible through the fibrous covering when the pod opens.

Whether the above be the effect of self-hybridization, or of the plants under unfavourable circumstances degenerating, I am unable to say, but should you consider the matter worth the trouble, it could easily be proved I think in this way: let some Egyptian seed, such as we have sown this season, be planted in a district where no other exotic variety would be grown near it, and destroy any mongrel which might appear before it flowered. The seed obtained might be considered pure Egyptian, and if hybridization be the cause, no plants such as I have described would be found the second season, as the Egyptian does not seem to be affected any more by native pollen than the native is by pollen from it. The expense in doing this here would not be much, and if carefully followed up, it might throw some light on the subject of hybridization and selection. The plant figured in Appendix No. 2 will give an idea of the one I speak of; another figure shows, as explained in the note appended thereto, the seed cleaned, and with the cotton on it. There are several plants again this year among the Egyptian of exactly the same appearance.

The measures being carried out for the improvement of cotton cultivation are similar to those reported last year. I have got a machine which works well for sowing the cotton in lines, but have not succeeded so well in getting a hoe to assist in cleaning the fields of weeds and stirring the soil. I made two during this season on the same principle as that used in Dharwar, but the weeds here are chiefly perennial deep-rooted grasses, which spring up immediately after watering the fields, and the roots are so tough, that they double over the blade of the hoe and choke it. I have given up all hope of succeeding on the plan of the Guzerat or Dhawar implement, and commenced to make one with several blades, shaped like an isosceles triangle, which I think will be got to work: at any rate the weeds will not choke it, and that is the only drawback with the other tool.

The Collector of Hyderabad has given me a cultivator for trial, and my choice of several winnowers. I have not had an opportunity of trying either of them, but I am preparing to do so with both. As I will have discontinued watering the cotton plants in the course of another week, I shall have plenty of cattle to work the grubber with which I intend to go over all the weedy land on the farm during the cold days. With what Colonel

Phillips has given me and those you have on the way from England for the farm, my stock of implements will be pretty complete when they have all arrived, and it is to be hoped success with them may be equally so.

I mentioned in some of my former reports that I thought the salt soil, which is so plenteous in some parts of Sind, would be a good manure for cotton. Since then I find it is extensively used for that purpose by the native cultivators, who tell me it is next best to cow manure. I have not used any of it yet, but will have to do so next season. The salt in this neighbourhood is the common table salt (chloride of sodium), and it must be pretty pure as well as plenteous, for I see people extracting it for the market over half a mile from the outskirts of the farm. This however is from drifted soil, which forms like snow-drifts in sheltered places and round bushes, and is the kind the cultivators prefer for manure. The percentage of salt in the natural soil has been found insufficient to pay for working it, but it is in some places too high to admit of the ground being cultivated.

A quantity of farm yard manure was used, and also some of the Ceylon and Australian fertilizers you sent me. This foreign material I applied according to your instructions in the first instance, and lately some of it in a liquid state, not for the sake of giving direct nourishment to the plants, but as an antidote for white ants, and I have since observed its good effects in this respect. Fewer of the plants in the part of the field manured with it as directed by you have been killed by those destructive insects, that is the case where none of it was applied.

Six bags of this new cotton manure were sent up to the Collector of Shikarpoor for trial in his districts, but the season there is earlier than here, and it arrived too late to be used to advantage this season. Major Wallace however promises to see it get justice next year.

On referring to the few diagrams appended you will observe that all the varieties of plants have sent their roots well into the ground. There is one thing peculiar to all the induced varieties, both native and exotic; the root of the Sind plant strikes boldly into the soil to a depth of nearly three feet, while all the others more or less incline to throw out lateral roots, and not send their tap-root so far into the earth. Whatever may be the reason of this, it is not the hardness of the soil, as I believe is the case in Guzerat. Though we do not plough deeper than they seem to do, or go to half the trouble which they take in preparing the land previous to sowing, we have a more manageable material to deal with, and the frequent watering it gets here soften it to a depth to which no plough could penetrate. After the land here is newly watered, a person would sink over the knees if he tried to walk over it. The difference of soil and climate has possibly something to do with the peculiarity just noticed. The Hingunghat, which has been three seasons in Sind, has sent its tap-root down in a more perpendicular direction, and with fewer branches than plants of the same sort from seed introduced this season; and the tap-root of the Broach variety has almost entirely disappeared here, as you will observe by the plant under that name in the Appendix No. 1. The Bourbon and Peruvian plants are too young to be taken into account: the height of them are not over 2½ feet high.

We will have a good quantity of selected Sind seed this season; and, I think, from the appearance of the Broach plant, that we might safely sow a good many acres with seed of it next season, and also distribute some to any cultivator who wishes to try it. I believe several people will want to try some of the American seed; so that if you think it desirable I will dispose of what I can spare of my acclimatized seed to the zemindars who may wish to have it; but to do this I would require a few maunds more of new seed, both of American and Broach, in time to sow about the month of March.

The information which the experiments here this year will furnish us with, may not be considered conclusive on account of the small area sown, and the late date on which the sowings were made. They will however give clear enough information as to what plants attention may be chiefly directed to, with the view of their being permanently introduced; and the two systems of conducting the farm now under trial will be more decisive than I thought they ever could be. I will have more to say on this subject soon.

The tobacco seed you last sent has done well, here and at Hyderabad. I have just received a few notes regarding Bourbon cotton and tobacco from Mr. Patton, Deputy Collector of Hyderabad, which I beg to transmit to you as I received them. He says:—

"I send you a few particulars of the Bourbon cotton. You are aware as a further experiment I sowed about an acre and a half in the Government Nursery with acclimatized Bourbon seed, which I collected from my last experiment in the Commissariat Garden, in the month of June last, after the water entered the canal. I gave the experiment no particular care—such as preparing the land by ploughing or manuring, but let it have all the chance that a Sind zemindar gives his indigenous cotton—to prove that exotic cottons really do not require so much care as is generally believed, and which deters people from growing them. I am glad to say that the plants grew up strong and healthy, with no more than three waterings in the month, and are now from four to five feet in height, and as full of pods as they can be. I notice in this experiment that the plants are not so woody as those were in the Commissariat Garden, and are free from white ants, which destroyed several of the plants last year in the same place, and they have also flowered much earlier. I am now picking. A zemindar who cultivates largely near the Government Nursery is convinced of the superiority of the Bourbon. I hope next season to give him a quantity of picked seed for next year's operations. I am quite sanguine regarding the out-turn being more than the usual proportion.

"The Havannah tobacco seeds you gave me in August were sown, and germinated freely and vigorously, but owing to proper precautions not having been taken, many of them were burnt up in the very hot days in October, but I can yet show a fair bed; some of the plants are now about 2½ feet high, and the leaves are something enormous. I must tell you that I manured the beds with horse litter.

"The seeds of Shiraz and Havannah I got from you since your return from Bombay are promising well, and I will shortly be able to make a good show. The plants get a few slight waterings, and the earth is stirred up occasionally. They are quite free from insects."

I may mention when I first saw the part of the Government Nursery where this experiment with Bourbon is carried on, it was covered with jungle bushes. It has done much better at Hyderabad than at Halla. The tobacco which I sowed in August is also doing well; only a few plants came up at first, but during the last fortnight they have come up by the thousand. I shall have as many as will plant several acres.

The Divi-divi seed germinated well, but got over-watered one night through a rat making a hole in the main water-course. I have only about a score of good plants now. I have had them transplanted lately, and they are doing well.

The packet of silk cotton seed I will sow after the cold days are over, in the end of February. I observe in the correspondence which accompanied this seed, that *calotropis gigantea* is mentioned as a cotton-producing plant. The natives here give it the same character as Dr. Forbes Watson does; the staple is too short and weak to make thread of, but the inner bark yields an excellent cordage material, which is much used here for making fishing lines and nets, both on account of its strength and for its power of withstanding the effects of water. We have any quantity of it here. All we want in order to make it an article of export, is an increased demand and a quick process of preparing the fibre.

I have now given you a detailed account of what has been done towards establishing what I think may justly be said to be the first experiment ever undertaken in the cotton districts of Sind for the improvement of *cotton cultivation*, and vegetable products generally. I believe attention has been directed to the improvement of cotton here since 1846, and about 16 years ago Mr. Price, the American planter, was conducting his experiments with exotics throughout the province, but the object chiefly aimed at seems to have been the introduction of a better variety of cotton. The process of sowing and the after culture appear to have been left to the choice of the cultivator. Any attempt at varying the mode of culture is of a more recent date, and the improvement of the indigenous plant does not seem to have been tried. In the arrangements now being carried out, neither of these objects has been overlooked, and present appearances give fair promise of future success. The most difficult problem we have to deal with seems at present to be the improvement of cultivation. To alter or improve an established system of culture is at all times an object hard to accomplish, and especially so where the existing modes are so well rooted and so inexpensive as they are in Sind. It is an easy matter to say the Sindee is a bad cultivator, very much easier than to cultivate to better profit by any means one can take in hand. It is however hardly possible that the present undertaking will fail to accomplish some of the objects for which it has been set on foot, and *if it* should only open up the way for private enterprise, in the same way, for instance, as the experiments in Dharwar and Guzerat have in a great measure been the means of doing, the little money which will be expended on it will have been well laid out.

The Planters' Gazette.

CALCUTTA, 15TH MARCH, 1871.

THE ESTATES.

COFFEE appears to be one of the few articles of produce, the prospects of which have been improved by the war. A home journal reviews the course of the market as follows:—

"Early in 1870 there was a considerable rise in price, with an active market. When however the new crops began to arrive in April, and stocks had considerably increased, a fall set in. This reached its lowest point rather suddenly, immediately after the

declaration of war in July, and before it became known that the tide of invasion would roll over France and not over Germany, our best coffee customer. Only a few timid holders were however willing to take the panic prices which ruled till the first battle of the war. The bulk of the importers withdrew from the market altogether at that time, and for weeks hardly any auctions were held of coffee in Mincing Lane, at a season in which under ordinary circumstances they would have been very numerous. The market soon righted itself to some extent, for a high war duty enacted, but not then yet actually levied in France, led to a temporary demand here for coffee to be sent to French ports in time to come in there at the old duty. As the war proceeded it became clear that one of its main effects with respect to coffee would be to curtail very largely the usual supply from the Brazils to Europe carried on to a great extent in German bottoms, and thus to direct a large proportion of the exports from that country, which would under ordinary circumstances have come to Europe, to the United States, where stocks were fortunately much smaller in proportion than in Europe. Later on it became evident that an enormous use and even wastage of the commoner kinds of Coffee was being caused on the Continent by the war. To armies at times badly provided with animal food, coffee in large quantities became a necessity; hence our exports from London were maintained at their usual extent, while the price of Brazil and native-Ceylon, both in small supply, and of all common coffee rose considerably in value. Colory kinds and particularly Plantation, being exceedingly abundant here, while the main demand was directed to inferior grades, continued at comparatively moderate prices till the end of the year.

Good old Native Ceylon Coffee in Jan	1870, at	51	Shillings.
Feb.	,,	57	,,
April	,,	57	,,
May	,,	50	,,
July	,,	45	,,
Oct.	,,	47	,,
Nov.	,,	50	,,
Dec.	,,	53	,,

"The Americans are supposed to have imported in 1870 about 300,000 bags Brazil more than in 1869, although the supply in 1869 was larger than in 1870. As we stated this time last year, so now we can affirm with greater emphasis, that the bright feature for the coffee market of the future is the rapidly increasing use of the berry in the United States, where the consumption seems capable of a future great extension. It is this fact mainly which has enabled us to record below a large decrease in the previously somewhat unmanageable European stocks. The imports in London were in 1870 about 69,800 tons against 69,050 tons in 1869. The deliveries 69,200 tons against 63,900 tons; and the stock on the 31st December 1870, 24,350 tons against 23,700 tons at the end of 1869.

"The stocks of coffee in the principal European ports on 1st January, were—

		1871.	1870.
United Kingdom	Tons	25,000	24,650
Holland	,,	32,250	34,400
Antwerp	,,	2,500	6,500
Hamburgh	,,	5,000	17,500
Trieste	,,	3,450	4,150
Havre	,,	1,600	18,750
Total	Tons	69,800	105,250

"There is a certain quantity, not now very important, of duty paid coffee at Havre, in addition to the above returns."

THE TEA GARDENS.

THE one topic of interest throughout the north, in connection with the tea gardens is the Looshai raid, upon which the Landholders' Association have addressed the Government in a memorial which will be found below. The *Indian Daily Examiner* has some remarks upon the subject of great value. Our contemporary says:—

"There is no use in concealing that our position on the eastern frontier is a very anomalous and questionable one. We have marked in our maps, as British territory tracts of country that have not been either ceded to or conquered by us. We claim the whole region up to the great mountain chain which constitutes the western boundary of independent Burmah, yet have no better right to do so than arises from the geographical position of the region itself, and from the fact that Burmah has abandoned all sovereignty over lands and tribes which Burmah never reduced to orderly submission to her rule. Cachar came to us by lapse and with a wholly undefined southern boundary. The country beyond it, though in the maps marked as British territory, is held by tribes some of whom have long been nominally tributary and subject to Tipperah and Munipore, but none of whom acknowledge our supremacy. With Tipperah itself we have but dealings through the medium of a political superintendent. We have never overrun it with an expedition. Mr. Aitchison in the 1st vol. of his "Treaties," says: "Independent Tipperah is not held by gift from the British Government or its predecessors, or any title derived from it or them, never having been subjected by the Mogul."

Since then we have obtained no new claims to Tipperah; yet in every recently published Government map, and now in every Government document in which mention of the state is made, the prefix independent appears no longer, but has substituted for it the word "Hill," Hill Tipperah and not independent Tipperah being now the approved nomenclature. We do not allude to these things in a spirit of cavil or of reprehension. The tribes must succumb before the advance of civilization, or rather be absorbed by its ever onward rolling wave; and such absorption is a very different thing from the "annexation" of old established states in the heart of Hindoostan. But we do want to attract public attention to the fact that the whole eastern frontier districts are as yet practically wild land, without the pale of civilization, and connected with which the greatest wonder is that there have not been during the last ten years many times as many raids as there have been. Those districts are to India what the most advanced backwoods or prairie districts are to the American Union. We have only had Cachar since 1832, and for years and years previously it was the scene of tribal fights and raids, and the battle-ground on which continuously met the armed men of Munipore and independent Tipperah to slay each other. Year after year from 1832 till about eighteen years ago Cachar was subject to raids by those very Looshais who, it is now evident, have been mixed up in the recent depredations. Such inroads had then but a small interest for the general public, for there were no European settlers in the district, and the Native sufferers, though doubtless commiserated, were powerless to noise their sufferings abroad. Nor must we flatter ourselves that our advances towards the Burman boundary are not disliked by the tribes, and have caused them no apprehension. So far back as seven years ago the Looshai tribes complained that the English tea-planters were encroaching into territory which was not British, and there have been occasions when projected punitive expeditions into the heart of the tribal regions have been given up simply lest such hostile operations should bring down the tribes on the widely detached tea gardens. It is necessary that public attention should be directed to these facts, not with the view of debarring enterprise and capital any right they are entitled to, or any degree of the full liberal measure of encouragement which should be theirs, but in order to a due appreciation of the difficulties that invariably have had existence in connection with the duty of our eastern frontier ward and defence.

The Landholders' Association, it is understood, intend to either go up to Government to claim for the owners of certain tea gardens in Cachar full satisfaction for the damage done by the hill tribes during the recent raids, or to take other measures towards that end. In fact, the tea planters want full money compensation, and for the present we have only to say that we wish they may get it. Whether they do or not, they will have lost nothing by asking Government for it. There is a plethora of money just now, and a portion of the surplus would be far better spent if devoted to the sustension of the tea interest in Cachar than to the construction of certain public works, the propriety of undertaking which at all is exceedingly dubious. But as some of the gardens in question are in pretty advanced localities there arises a question of peculiar interest to the general public, *viz.*, has Government within the last ten years or so been selling, under the waste land rules, areas of land for tea-planting purposes situated in localities so far advanced as to be conterminous with the tract of wild tribes who do not acknowledge British authority, and who regard the advanced planters of Cachar as invaders of their grounds? If former Governments of India have done this, then is there a case against the Goernment of Lord Mayo. An avowed object of the waste land rules was to induce the investment of British capital in the reclamation of lands which were then considered to be lying wholly unproductive to the State. Capital so induced has a right to efficient protection, and in case such protection has not been afforded, to compensation for injury sustained through the failure to afford it.

THE LOOSHAI RAID.

(Bengal Times.)

ALL that has occurred in the late raids could easily have been foreseen and prevented by the adoption of the simplest precautionary measures. The experience of 1869 might have taught Government the inutility of treaties based on principles of conciliation; but we live in days of enlightenment, when examples count for nothing, and rules are tested by results never anticipated, consequently never provided against. In the eyes of Government alone, cure is perferable to prevention. * * * What has happened this season is exactly what might have been expected as the result of paying no heed to warnings. We have said all along that planters who live on exposed frontiers should stockade their gardens, or be prepared for the visits of the Looshais, just as the American settlers were, and still are of the Red Indians. A Gorous blockade and a line of posts along the

frontier from which patrols should be constantly on the move appears to us the only feasible plan likely to do any good. We do not agree with those who are advocates for offensive operations against the savages. For if the country of the Looshais had been worth anything, and they had property the loss of which would have put them to much inconvenience, an expedition such as is proposed would no doubt have been advisable. But as it is, they have no valuables or even permanent habitation, their villages being usually built in about a couple of days. Would it repay the cost and trouble of an expedition against such people and such a country, even if it is attended with success; would it be politic or prudent to despatch troops to harass and worry them? In the present instance, moreover, it has not yet been ascertained to what tribe or tribes the raiders belong. It is our firm conviction that the expeditions which are now being organised will either return as in 1869, without fulfiling their object, or the unsupported detachments will come to positive grief.

(Indian Daily Examiner.)

We believe for some time past it has been under contemplation to station a political officer among these Looshais, and the occasion is eminently one which invites the revival of the project. He should be in all respects a civil as well as a political agent, analogous in function and authority to the Deputy Commissioner of the hill tracts of Chittagong, and should be charged with precisely the same responsibilities. A few years of quite assertion of British supremacy among the Looshais would effect vast changes in their modes of thinking and living; and from restless marauders and blood-thirsty robbers and thieves, they would sink down into honest cultivators and artizans. We would depute an able and zealous officer like Captain Lewin among them, whom they would understand and willingly obey. With his peculiar knowledge of their character and sympathy for them it is impossible that he should fail. For, it will scarcely be believed, Captain Lewin sees something good in these merciless barbarians. He says—"Let us not govern these hills for ourselves, but administer the country for the well-being and happiness of the people dwelling therein.

* * * *

What is wanted here is not measures, but a man. Place over them an officer gifted with the power of rule; not a mere cog in the great wheel of government, but one tolerant of the failings of his fellow-creatures, and yet prompt to see and recognize in them the touch of the nature that makes the whole world kin; apt to enter into new trains of thought, and to modify and adopt ideas, but cautious in offending national prejudice. Under a guidance like this, let the people by slow degrees civilize themselves. With education open to them, and yet moving under their own laws and customs, they will turn out not debased and miniature epitomes of Englishmen, but a new and noble type of God's creatures."

(Indian Daily News.)

Considering the repeated inroads with which the savages threaten the north-eastern frontiers from time to time, it is meet that they should be taught a lesson such as they will not easily forget. The lives and property of peaceful British subjects ought to be sufficiently protected from these inroads. Unfortunately the Government of India vetoed the proposal of the local Government to send out a strong force against the raiders in 1869 to ensure peace in the frontiers. The result is a repetition of the depredations by the Looshias in 1871 from the consequences of which both Europeans and Natives have suffered in life and in property. Under the present circumstances we hope the authorities will adopt sufficiently effective measures to prevent the recurrence of a state of things which is anything but creditable to the Government under which we live.

HISTORY OF THE RAID.

(Bengal Times.)

For some time back there had been rumours that Cachar would be attacked in several quarters by the Looshais, and since the 20th January or thereabouts, there was a talk of guards being strengthened at the different out-posts, but these precautions were neglected too long, and the sepoys, policemen, &c., did not actually start in effective numbers until one or two gardens had been cut up. The first garden that was visited was Alexandrapore; the attack was made in open day between 11 and 12 o'clock of the 23rd, two gentlemen being present on the garden at the time, Mr. Sellar, who is both proprietor and manager, and Mr. Winchester, a friend who was on a visit to him. They were about to sit down to breakfast when one or two coolies who had been working near the bungalow ran up and told them that the Looshais had come. They had scarcely been informed of this before the Looshais were on them and almost in the bungalow. Messrs. Sellar and Winchester immediately fled, as it would have been useless to stay in their unprepared state (not a single gun being loaded.) Mr. Sellar was lucky enough to escape, but his companion Winchester was not so fortunate, he was struck by a bullet and was immediately surrounded, hacked to pieces, scalped, and otherwise horribly mutilated. Mr. Sellar went on to Lotakandi (a garden about two miles from his) with his coolies. After Alexandrapore had been pillaged, sacked and burnt, a few of the Looshais went in to Cutliacherra, a factory about half a mile off, but the noise of the firing had put Mr. Bagshaw, and his assistant, Mr. Cook, on the *qui vive*, and all that the Looshai was able to effect was to chop up some sick women. However, two days afterwards, on the 25th, they came down in stronger numbers, but as in the meantime Bagshaw had got some policemen up to help him to defend the place, he managed to drive them off. Between the two gardens 27 coolies were killed, being horribly maltreated and mutilated before death. The details received on unquestionable authority are so disgusting as to be unfit for publication.

The next garden that was attacked was Monierkhall; this attack took place on Friday, the 27th instant. At 6 o'clock on the morning of the 27th, the Looshais came down in great force, but as a good look out had been kept, our party managed to get into the stockade in time. The Looshais, who numbered between 400 to 500 were repulsed 4 times between four A.M. and 11 P.M., the Europeans making capital practice at long ranges with breech-loaders and other rifles, the total number of available guns being about 49 or 50; out of these the guard numbered about 45 Brown Besses. There was no water or food in the stockade, and several sorties were made for water; also one to the bungalow for medicine and brandy for the little garrison, which were successful. The amount of loss on our side being 5 wounded—4 sepoys and the garden jemadar,- all of them likely to recover, none of their wounds being mortal. At 11 P.M. the Looshais retired, and as the guard began to run short of ammunition, some one was required to take the information down below. Messrs. Pearce and Shaw offered to go, which they accordingly did, with one of the sepoys who offered to accompany them. A small boat was on the river near the guard, to which they went quietly down, and the night being dark, they managed to get away. On arrival at Nugdeegram the sepoy went into the station to report the state of affairs, and Messrs. Pearce and Shaw walked to the nearest garden, whence they sent the news to the station. Messrs. Pearce and Shaw found Nugdeegram empty, that place having been attacked at 12 o'clock of the same day as Monierkhall, and 5 villagers killed. The next day, the 28th, 9 policemen or sepoys who were either going up to Monierkhall or had been sent to enquire into the matter were attacked by the same body, who had evidently stayed in the jungles near the place, and it resulted in 6 policemen being killed and their heads cut off; and one wounded; only two out of the 9 escaping.

ANOTHER ACCOUNT.

(Indian Daily Examiner)

Any one looking at the map of the north-eastern frontier will perceive that the Looshai region constitutes a break in the continuity of our frontier relations with the empire of Burmah. First we have Munipore, next there is a line of Burmese territory occupied by interior tribes of Kookies or Looshais, then the Looshai territory bordering on Burmah, and finally the boundary between hilly Chittagong and Burmah. Lower down is the British district of Akyab. In the terminal line between British and Burmese territory, the Looshai tract forms the only gap.

(Indian Daily News.)

The savages do not make their appearance by dozens or scores, they appear in hundreds and armed with guns, spears, and dhos, little knowing the might of the Government or the people they have to deal with, and the chastisement which it is in the power of the latter to inflict upon them. On the 21st of January last these savages once more descended from their mountain fastnesses. They visited certain villages in hill Tipperah, plundered and burnt the houses of poor people such as crossed their path. The people were powerless to resist such a furious and lawless body of armed men, consisting of a party of no less than 300 Kookies. The marauders took their position on Matrabhil. It was not long, however, before another party of hillmen descended and swelled the ranks of the marauders. The villagers in Sylhet and Cachar were alarmed when this state of things became gradually known. They were dismayed at the approach of men who had visited them about eight and twelve months before. The planters were equally apprehensive, as their lives and property were in jeopardy, and they resolved to repulse the attacks of the savages. On the 22nd January the raiders attacked the coolies and the establishments employed in catching elephants. These poor fellows were fired upon in their quarters on the banks of the Singla river. Though skilled in catching and taming wild elephants, they could not withstand armed men. They therefore fled in all directions. On the 23rd January, a party of the raiders entered Cachar via Alexandrapore, whilst another proceeded to the Chargola outpost in Sylhet. In the latter place the police re-

pulsed and dispersed them, as they were not sufficiently numerous to stand the fight, but in Cachar the fellows committed considerable ravages. They burnt a village near Alexandrapore, killed more than a dozen of the inhabitants, whose bodies were found lying about. They also destroyed the tea garden. Mr. Winchester and his little girl were shot just as they had finished breakfast. The manager, Mr. Sellar, was wounded, but he fled into the jungles and saved his life. Some twelve coolies of this garden were severely wounded, several of whom died of the injuries they received. The Kutlecherra garden would have shared the same fate but for the European gentlemen who got timely notice, armed themselves, and by the bravery with which they resisted the attacks of the savages and drove them from the position which they had taken. The villages around were struck with terror. But the 25th and 26th January passed off quietly. On the 27th the Looshais appeared in very large numbers, invested Monierkhall, and destroyed the village of Demiakhall. They met with little resistance, which emboldened them to proceed to Nugdeegram, a bazaar within ten miles of the sudder station. Here the police fought bravely, and killed a large number of the enemy. On the 28th the Looshais fell upon the sepoys who were proceeding to Monierkhall, killed several of them, and beat them back. The savages had about 30 men killed and wounded, but they took away all the bodies with them. On the 30th some 400 men attacked Vonpilal's village. After killing 22 men and capturing some women, they are said to have proceeded to Monierkhall. Up to the 2nd February no more raids have been committed. The raiders are said to cover themselves with a long *khesh* from the head to middle of the calf. They also have a pugri. They behaved very differently from the raiders of 1869. The sepoys allege that they have old mutineers amongst them. We had but a little force at Cachar to resist the enemy. This consisted of 250 sepoys and 222 armed policemen. 250 sepoys have since arrived in Sylhet on the 25th February. The Deputy Commissioner of the place, Mr. Edgar, has been doing his best to save the places visited after receiving intelligence of the approach of the raiders.

CINCHONA.

HISTORY OF THE INTRODUCTION AND CULTIVATION OF CINCHONA IN INDIA.

THE following history of the introduction and cultivation of cinchona in India is, we think, of sufficient interest to claim a place in our columns. The facts have been collected with care, and, our correspondent informs us, may be implicitly relied on.

The credit of having been the first to suggest the introduction of the Peruvian cinchonas into this country belongs to Dr. Royle, who makes a passing allusion to the possibility of success in their cultivation here, at page 240 of his "*Illustrations of the Botany of the Himalayan Mountains*," published in 1839. In 1851 and 1852 the subject was taken up warmly by Dr. Falconer at the suggestion of the Agri-Horticultural Society, and several papers upon cinchona were submitted to the Government of India, with a request that the consideration might be given to it which the importance of the subject deserved.

As the immediate result of this action on the part of the Society, the Court of Directors transmitted to the Calcutta Botanical Gardens six plants, five of which arrived in a healthy state. These were sent on to Darjeeling, where only three arrived alive, and these trees perished from the cold during the ensuing winter.

The next link in the chain of cinchona history in India was the publication of an essay by Dr. Thomas Anderson, in the *Annals of Medical Science* in 1855, strongly urging the introduction of this valuable plant and its trial on the Darjeeling hills; and in the following year the Society again stirred in the matter, which was also about this time taken up by the Indian Medical Board.

In July 1856, a committee of the Agricultural and Horticultural Society was appointed to arrange the details for the offer of premia for articles of raw produce, and for essays referring to the subject of quinine-yielding plants. And the Secretary addressed Government again in August 1856 in a long and forcibly worded communication, and received a reply in the following November to the effect that "the Honorable Court of Directors will be moved to send a properly qualified collector to South America to collect and bring to India a sufficient quantity of the best species of cinchona," &c., &c.

At a subsequent meeting in May 1858, the following minute, extracted from a despatch of the Honorable Court of Directors in reference to the above application, was communicated by the Government of India:—"We did not fail to take immediate steps for carrying out the recommendation of your Government on this important subject. We regret, however, that our measures have not yet been attended with the desired success. We hope that we may be able at no distant period to obtain a collection of both plants and seeds of the quinine-yielding cinchonas, and we will give you early intimation of the same, in order that the necessary preparations may be made for disposing of them to the best advantage on their arrival in India."

At the next meeting in June, the Government of India communicated the copy of a minute of the Right Honorable the Governor-General, Lord Canning, on the introduction of the cinchona plants into India, dated October 1856, in which the recommendation of the Society is strongly supported.

The delay in carrying out the suggestions of the Society was caused by the death of Dr. Royle, who was entrusted by the Board of Directors with the arrangements for procuring the plants from South America. But in 1859 Mr. Clement Markham was deputed by the Indian Council for the purpose of procuring seeds and plants of the various kinds of cinchona for transmission to India. India is greatly indebted to this gentleman for the energy and activity he displayed in his journey to South America, and afterwards to this country, but most especially for the able and complete arrangements he made for the despatch and receipt of plants and seed through the agency of his coadjutors, Messrs. Spruce, Putchell, and Cross.

Mr. Markham was successful in bringing a number of plants to this country, but unfortunately the *whole* of his introductions, as well as the cuttings derived from them, all perished in the Neilgherry plantations early in 1861, and for a short time India was without a single specimen of cinchona other than a few which had been brought out from Kew by Dr. Thomas Anderson, and which were then flourishing in Ceylon.

Shortly after the death of the last of Mr. Markham's cuttings, his agent, Mr. Cross, arrived at Madras, bringing with him a large and valuable collection of plants and seed from South America, together with six plants of *cinchona calisaya* from Kew originally introduced there by Dr. Weddle. This most valuable species not having been received in any quantity Government deputed Dr. Anderson to proceed to Java in September 1861, for the express purpose of procuring this particular description, and in this expedition he was eminently successful, bringing with him also four plants of *cinchona lancifolia*, another of the richest species, a variety of the well-known *crown bark*.

These, and subsequent specimens collected by Mr. Markham's agent, are the stock from which all the extensive plantations in India have been supplied.—*Pioneer*.

PROCEEDINGS OF THE MADRAS GOVERNMENT, REVENUE DEPARTMENT, 7th February 1871.

Read the following papers:—

No. 87. From J. Broughton, Esq., Government Quinologist to the Acting Secretary to Government, Revenue Department, Fort Saint George, dated Ootacamund, 31st August 1870.

IN the following pages I have the honour to communicate some results obtained, connected with the subject of the employment of the cinchona febrifuge in this country, also some statistical considerations having reference to the future yield of the plantations.

In the original instructions (letter from the Under-Secretary of State, dated 22nd Sept. 1866,) I had the honour to receive from the Home Government, I am told (in paragraph 3) that it was required "to ascertain the preparation of the febrifuge which will combine cheapness with efficacy in the greatest degree, (and in paragraph 4), and, finally, it will be expected from the chemist that he should, through his investigations, enable Her Majesty's Government to arrive at a decision with respect to the best and cheapest method of preparing the febrifuge for use among the labouring classes of the Natives of India. He will also be required to consider the questions connected with the manufacture of the cinchona febrifuge for the use of hospitals and troops in India."

In a report appearing in Proceedings of Madras Government Revenue Department, No. 240, of 13th December 1867, paragraph 10, I had the honour to propose a preparation which I then believed would combine the qualities desired in the febrifuge to be extensively used in this country. During the subsequent two years I prepared small quantities of this substance for medical trial in my experimental laboratory, and finding the results of its medical employment as encouraging as I expected from its composition, I commenced in January last to manufacture it on a larger scale in the small manufactory then just erected near the gardens at Ootacamund.

Up to the present date about 70 lbs. of this febrifuge have been prepared and supplied to the Medical Stores. As it consists of the alkaloids (mixed as they naturally occur in the plant) precipitated from solution in an uncrystallized but tolerably pure state, it has been appropriately named by Dr. Mackenzie "amorphous quinine," by which name I trust it may henceforward be called. The results of its actual medical use seem to have been very satisfactory. I learn from the Medical Inspector-General that he intends to submit these results to Government with his own opinion of the value of the febrifuge. On general grounds I strongly recommend the extensive adoption of amorphous quinine as a febrifuge that appears to meet the full

requirements of the case; but it is of course on the medical testimony to its qualities that the decision must finally rest. I now await the opinion and directions of Government on this point.

I find that the bark of *C. succirubra*, of which half of the plantations consist, exceedingly well adapted for the preparation of amorphous quinine. I have had occasion in several foregoing reports to point out certain disadvantages which attach to this bark for the preparation of pure crystalline salts of the respective alkaloids. These do not, however, in the least affect the manufacture of amorphous quinine, while the large total yield of the bark renders it particularly suited to the extensive and cheap manufacture which it appears to me should be established on the Neilgherreis. Hence in all plans and considerations connected with the preparation of amorphous quinine, I shall only consider the bark of *C. succirubra*. The bark of *C. officinalis* will find its best application in the manufacture of pure crystalline sulphates of the alkaloids either in this country or in Europe.

In order to produce as cheap a product as possible, it will be necessary to manufacture on the spot on which the bark grows. The cost of conveying the bark from Neldivuttum to Ootacamund, and the price of fuel at the latter place, entail so much expense that there can be no question as to the expediency of working up the bark on the plantations themselves. The irregular and defective supply of bark has been the source of the main difficulty in carrying on the manufactory at Ootacamund. I reckon that when working at Neddivuttum, with a rough but effective "plant," with bark of mean quality, and preparing 800 lbs. of alkaloid per annum, the cost of the same (including that of the bark) will be about one rupee per ounce. A larger outturn would still further diminish the price.

Having had in view for some time the eventual manufacture of considerable quantities of amorphous quinine, I have taken some pains to estimate the amount of that substance in the red barks of the plantations. My estimations were made last spring, and depend on data given in appendix:—

Number of trees.	Age.	Bark.	Quantity of alkaloids contained in lbs.
	Years.		
19,500	7½	Trunk	1,833
Do.	Do.	Branch	815
29,400	6½	Trunk	2,095
Do.	Do.	Branch	605
45,300	5½	Trunk	2,310
Do.	Do.	Branch	860
68,650	4½	Trunk	3,205
Do.	Do.	Branch	1,105
73,430	3½	Trunk	1,468
Do.	Do.	Branch	279
152,050	2½	Trunk	632
Do.	Do.	Branch	156
		Total.....	15,363

Thus at the present time the red barks alone of the Neilgherry Government plantations contain 15,000 lbs., or nearly 7 tons of a febrifuge, which I learn is equal or nearly equal to ordinary quinine sulphate in efficacy. I cannot, therefore, think that it is premature to endeavour to prepare sufficient febrifuge to supply the hospitals and dispensaries during the forthcoming year.

In 1867 a considerable number of our oldest trees of red bark were cut down in order that the bark might be sent to England for sale. From the stumps have sprung vigorous shoots that have at the present time attained a height of 1 to 15 feet. I recently collected a mean specimen of the bark of these shoots. Its analysis gave in 100 parts of dry bark—

Total alkaloids...	6·34
Quinine	1·37
Cinchonidine and cinchonine .	4·97
Pure sulphate of quinine obtained crystalized .	1·14
Pure sulphate of cinchonidine obtained crystallized	4·29

When it is considered that the shoots were but three years old, this analysis must be considered most satisfactory. It seems to justify the anticipation that coppicing will hereafter be an important means of croping the plantations. This method has the further recommendation of furnishing excellent fuel without the necessity of destroying the sholahs. It appears to me to be very necessary that a considerable number of trees of seven years old should be cut down in order that the method of coppicing should be tried and the expenses as compared with the plan of mossing be accurately determined.

I will assume that after a tree aged eight years has been cut down, that the shoots, after a lapse of eight years, will produce as much bark as the original tree—an assumption that will not, under any circumstances, entail a great error. The number of growing trees of red bark on the plantations is about 591,600. If an eighth part of these be annually cut down, the bark of 73,955 trees will be annually available. This amount will yield no less than 10,323 lbs. of mixed alkaloids—a quantity which must be in considerable excess of any possible demand for febrifuge in this Presidency. The same number of trees will yield 1,730 cwts. of dry red bark, of which about 1,400 cwts. would be fit for export. This latter amount would be about a seventeenth part of the quantity of bark annually imported from South America into England.

I conceive that the foregoing arithmetical considerations justify the conclusion that the extensive of cinchona planting by Government has already reached its limit. From the returns of the plantations here there is a gross total of one and a-quarter millions of trees planted. The returns of the plantations in Bengal give 1,465,999 trees planted. In Java the returns give 1,532,148. The private plantations on these hills contain at least a million trees, and as many more may be certainly reckoned for the private plantations in the Himalayan valleys. I do not possess definite information of the numbers planted in Ceylon, but they numbered at least 250,000 trees. In Jamaica 70,000 trees, principally red barks, are planted and flourishing exceedingly. At St. Helena, in 1868, 5,000 trees were planted, and it was expected in a year to have 20,000 planted. At Oratava in Teneriffe the cultivation is commenced with success. On the Organ Mountains in Brazil the same success is attained. The only place where the cultivation has apparently been unsuccessful is at Chiffa in Algeria, where the cold winds appear to have at length nearly extinguished the plants, originally supplied from this Presidency.

Altogether it may be estimated that seven millions of cinchona trees are under cultivation in various parts of the world, and that the number is increasing annually. It appears, therefore, that unless it be to supply an urgent local want, there can scarcely be further necessity for Government pressing cinchona cultivation in other parts of this Presidency. It is most desirable for the interests of the cultivation that the demand for bark be not exceeded.

It would be of considerable service if a probable estimate could be formed of the amount of febrifuge that would be consumed in this Presidency if the price were reduced to 1 rupee the ounce. I am informed that the mean annual consumption at the Medical Stores for the five years ending 31st March 1867 was 344 lbs. of quinine sulphate and 910 lbs. of cinchona bark, or in round numbers 475 lbs. of quinine sulphate altogether. I am informed* by some authorities that four times, and by others that ten times, the amount would be consumed if the cost were reduced. It appears to me that it would be well worth while to endeavour to procure some definite information on this point before manufacture be commenced on an extensive scale.

If pure crystallized sulphate of quinine be prepared in this country, the *C. officinalis* and *C. calisaya* will be the fittest sources. I have hitherto made no attempt to manufacture pure sulphates except on a small scale. The red bark, from the difficulty of purification, would be a comparatively costly source; and the trees of *C. officinalis* are scarcely enough developed to take their bark except at a loss. I propose eventually to make use of the small manufactory at Ootacamund for an attempt at the preparation of pure sulphate of quinine from the crown barks of the Dodabetta plantations; though whether this salt can be profitably made in this country there are at present no trustworthy experimental data to determine. The question will be attacked as soon as a supply of suitable bark is available; I am already in possession of fit apparatus for this purpose.

On the presumption that the report of the Medical Inspector General above mentioned, respecting the results of the employment of amorphous quinine will be found satisfactory to Government, I have the honour to propose the following request—

That I be permitted to expend all the savings I can effect out of my total sanctioned budget grant in converting, as far as possible, the now disused jail at Neddivuttum into a suitable place for performing at least the preliminary extraction of the bark on the spot, in order to avoid the cost of carriage of bark to Ootacamund.

I would also advise that a certain number of trees of those planted in 1863 be cut down when the season of maximum yield arrives, in order to test practically the method of cropping the plantations by coppicing. I would also recommend that a considerable part of the best bark thus obtained be sent to England for sale in open market, and the remainder be worked up in the alkaloid manufactory. As soon as a sufficient amount of our admirable crown bark is fit for cropping, I think that a supply should also be sent to the English market, as I am convinced that its good quality will give a reputation to the Indian cinchona bark.

In accordance with G. O., No. 426, of February 19th, 1869, a considerable number of trees were treated by Mr. McIvor's mossing process in order that the practical and financial consequences might be determined on a sufficient scale. I presume from the tenor of the various orders on the matter that Government intend that I should examine and report on the results of the

* I learned from the Medical Inspector General that the amount used last year was 700 to 800 lbs., and that the demand is annually increasing.

experiment. It appears to me that in order to arrive at a definite decision as to the practical value of the process, which will require an accurate consideration of the entailed expenses, the matter might be advantageously referred to a third person. I propose therefore that the various results be communicated to the Commissioner of the Neilgherries as they are obtained, who will thus be able to give Government an unbiassed opinion of the gross result, and who can be referred to on the occurrence of any difference of opinion in the conduct of the experiment. If Government think fit I will therefore report on this subject to Mr. Brooks instead of to Government.

APPENDIX.

Data of estimates concerning C. succirubra.

Trees of the planting of 1862 yielded a mean per tree of 3·9 lbs. of trunk bark containing 67·13 per cent. of water, and 4·6 lbs. of branch bark containing 70·79 per cent. of water. Trunk bark dry contained 7·55 per cent. alkaloids; branch bark 3·2 per cent of alkaloids.

Trees of the planting of 1863 yielded a mean of 3·6 lbs. of trunk bark containing 67·88 per cent. water, and 2·8 lbs. of branch bark containing 71·87 per cent. of water. Trunk bark contained 6·23 per cent. of alkaloids in dry bark; branch bark 2·63 per cent. alkaloids.

Trees of the planting of 1864 yielded a mean of 1·775 lbs. of trunk bark containing 60·78 per cent. of water, and 13 lbs. of branch bark containing 51·64 per cent. of water. Bark was allowed to get partially dry before weighing. Trunk bark contained when dry 7·33 per cent. of alkaloids; branch bark 3·07 per cent.

Trees of the planting of 1865 yielded a mean of 2·66 lbs. of trunk bark containing 73 per cent. of water, and 2·83 lbs. of branch bark containing 75 per cent. of water. Trunk bark contained 6·49 per cent. alkaloids when dry; branch bark 2·28 per cent.

Trees of the planting of 1866 yielded a mean of 0·84 lbs. of trunk bark containing 66·94 per cent. of water, and 0·66 lbs. of branch bark containing 73·68 per cent. of water. Trunk bark when dry contained 6·61 per cent. of alkaloids; branch bark 4·96 per cent.

Trees of the planting of 1867 yielded a mean of 0·68 lbs. of trunk bark containing 73·09 per cent. of water, and 0·37 lbs. of branch bark containing 65·67 per cent. of water. Trunk bark contained 2·21 per cent. of alkaloids, and branch bark 0·81 per cent.

COFFEE.

EXPORTS OF COFFEE, &C., FROM THE EASTERN ARCHIPELAGO.

ALTHOUGH the effect on the home markets is almost infinitesimal of the exports of our staple article of produce from the Straits Colonies and the isles of the Eastern Archipelago (always excepting Java) yet it is of some interest to have the aggregate figures shewing the total exports for a series of years as follows:—

Quantity of coffee exported from Singapore to Great Britian, 1863-1870:—

Piculs = Cwts.		Piculs = Cwts.	
1863.....	8,932=10,633	1867..	..20,527=24,436
1864.....	11,915=14,184	1868..	..24,794=29,516
1865.....	9,557=11,376	1869..	..20,474=24,373
1866.....	14,327=17,055	1870..	..16,972=20,206

From Penang no exports till—

1868.....350 piculs=416 cwts.
1869.....315 „ =375 „
1870..... 13 „ = 15 „

From Manilla to Europe, United States, and Australia:—

Piculs = Cwts.		Piculs = Cwts.	
1860.....	4,251=5,060	1866..	..15,803=18,822
1861.....	14,386=17,126	1867..	21,853=26,015
1862.....	13,737=16,353	1868..	..32,149=38,272
1863.....	8,096=9,638	1869..	..34,406=40,959
1864.....	13,874=16,516	1870..	..28,573=34,015
1865.....	33,503=39,884		

From Manilla, Yloylo, and Cube, the export for 1869 and 1870, of coffee is given as follows:—

		Piculs	Cwts.
Total to all countries.	1869.....	42,310	=50,369
	1870.....	34,120	=40,619

so that last year the Straits and Philippine ports only exported altogether 51,105 piculs or 60,839 cwts. of our staple, although in 1868 the return would seem to have been not far short of 85,000 cwts.

STIMULATING MANURES.

(*Ceylon Times.*)

SIR,—I was very glad to see in your overland issue a remark about the probable serious decrease in the coffee crop of 1870-71, the very bad feature being that though crops are so small the appearance of estates is so very poor. As a disinterested man, beyond my responsibility as a superintendent, I say that the manuring carried on during the last three years with artificial manures has been anything but beneficial. I have consulted many men whose experience and position amply qualify them to give an opinion, and we all agree that bones and other *forcing* manures are a mistake. In this way we allow that in a given time an estate may be made to bear heavily and give more profit by the application of these manures than it would if left alone, but we assert that the after effect of the manure is so bad, whatever the cause may be, that very soon there will be no estate at all left, or rather I ought to say, no trees left on the estate. Doubtless there are certain estates that do well with these manures, just as there are certain estates that do well without any manure. Isolated cases prove nothing; take districts with coffee under 3,000 feet and give us the experience of three years. This is a very serious thing. The fact is indisputable that stimulants are allowable only in certain exceptional cases. No doubt there may be exceptional cases in estates, but a general application of stimulants here, there, and everywhere cannot be right. I do not wish to forbode evil with all the gloom at present surrounding us, but I must ask you to give a word of caution to the over sanguine and inconsiderate. Unless there is a change quickly the day of reckoning is very near.

W. H. J.

Kandy, 27th January 1871.

A PREVENTIVE FOR WASHING AWAY OF SOIL FROM COFFEE TREES.

A MR. HAWKE, a planter, writes as follows to the *Ceylon Observer*:—"Few of the Ceylon coffee-planters, who have given their serious attention to the washing away of the soil from the roots of the coffee tree, would not readily admit that nine-tenths of the states that have gone out have been washed out, and that nine-tenths of the states that are now in a thriving condition are undergoing the same process of denudation and will sooner or later-share the same fate. During the past twenty years a great deal of my time and thought have been given to find out a remedy for the evil, and I have at last hit on a way of keeping up the soil for once and for ever, and am prepared to give occular, practical, and theoretical demonstration of the fact. For the purpose of testing the plan a stream of water (as much as would fall in rain in ten years) has been continuously running within 18 inches of the roots of the trees, and paradoxical as the operatin may sound, it is nevertheless true that I have been daily adding fresh soil to the roots." On this the editor remarks:—"We fancy the secret of preventing wash is a well planned and carefully executed system of drainage, which would enable rain-water to run off without carrying soil with it. There is nothing paradoxical in soil being deposited from a running stream, but our sanguine correspondent does not surely mean to say, that rain water would deposit fresh soil. We should like to have an independent account of Mr. Hawke's process."

THE TWO WS.

SIR,—Wash and wind are the planter's greatest enemies; and any man who can introduce a plan which will cure the one or moderate the other will be a benefactor to the planting public. Mr. Hawke has told you he can prevent wash on coffee estates. You have hardly given him fair play by throwing a wet blanket of suspicion on his scheme without knowing what it is. You fear he is too sanguine, and suppose that only draining will prevent wash. Better would it be to encourage him to develope his plan. Mr. Hawke may be sanguine, but he is ingenious. You may recollect he was the first to reduce to a system the making weedy estates clean, and to prove that 900 to 1,000 trees per man could be worked up to on a weedy estate, while most people were content to stick at 120. If his plan be a good one the knowledge will be well worth paying for: and every estate-owner whose land is liable to wash (and few lands are not so) would be too glad to remunerate him. But Mr. Hawke should first prove his plan practicable and a success.

TEST.

[If Mr. Hawke can tell what Tennyson would call "any thing worth the knowing," the old planter is not likely to be so nervously sensitive as to withhold it, because we did not go into ecstacies over a discovery of the nature of which we received not even an idea. We suppose Mr. Hawke will confide his scheme to the Planters' Association Committee.—Ed. C. O.]

THE COFFEE PLANTER OF CEYLON.

A CAREFUL persual of Mr. Sabonadiere's valuable manual gives us a more vivid idea than ever of the mistake which some people commit in supposing that any half-educated person will do for a coffee planter; that less of natural intelligence and acquired knowledge is requisite for the tropical agriculturist than for his brethren, who are destined for the walks of commerce or the ranks of the civil and military services of Government. We fear that much of the loss and disappointment which proprietors have had to mourn over owe their origin to the fallacious notion we have referred to. To make a good coffee planter, as to make a good anything else, a man ought to have a sound mind in a healthy body. A robust constitution is perhaps more to be

desiderated in this line of life than in those of commerce, banking, the Civil Service and the learned professions. A conscience guided by Christian principle, too, is here of the last importance. Why have so many, who began a coffee planting career so well, broken down, and why are the experienced planters who can be thoroughly trusted, and for whose services proprietors and agents eagerly compete, comparatively so few? Moral principle has not been strong enough to enable men to resist temptations to which a solitary life, distant from social amenities and religious restraints and privileges, has added force. Comfort is found in stimulants; the man "takes to drink;" that leads to habits and associations which deprive the victim of his own self respect and the respect of even the coolies it is his business to command. Rapidly or gradually the depths of degradation are reached and the once bright youth is a broken down loafer, mooning about, talking of his having been unfortunate, and that in Ceylon people are "down" on a poor chap who has not been "lucky." We will not fill in the details of a picture but too familiar to many of our readers. The waifs and strays of the planting community —who find asylums at the expense of their fellows are to be heard of, if not seen, in most large districts (some are shipped off by subscription) and if you listen to their story and believe it, you will lay at the door of *misfortune* what owed its origin simply to fault—to moral infirmity. Our readers will not misunderstand us as making an assertion more sweeping than we intend it to be: we are talking only of a *per centage*, though a serious one. But to be a good coffee planter it is not enough that a man should have a good constitution and industrious habits, with the power of controlling his appetites. He must have at commencing or acquire as he goes on a fair acquaintance with many branches of general knowledge and especially natural science. It is not necessary that the coffee planter should be learned in the classical languages or fluent in the modern tongues, but certainly facility in acquiring languages is of importance. The manager of a coffee estate in Ceylon, to be thoroughly useful and successful, ought to be well up in colloquial Tamil, at least. Mr. Sabonadiere attributes his own good relations with his coolies to his ability to communicate with them directly by a fluent use of their own language. We know what the prejudices against the "middleman" are amongst races far higher in the scale of civilization than the Tamil coolies. We cannot wonder, therefore, at the great advantage possessed by the Superintendent, who without descending a step to any thing that is degrading in the native level, is able with precision to convey his directions to the workmen in their own language and perfectly to understand the reports, written or oral, of his kanganies (overseers of gangs) and the representations of coolies who may consider themselves aggrieved. To be a good superintendent a man then must be a bit of a philologist. He must have a knowledge of law at least so far as the relations of master and servant are concerned and the relations of the planters with the owner of trespassing cattle. He ought to be well up in sanitary science, especially "the philosophy of smells." Mr. Tytler, of Doombera, indulges largely in a species of pride which we should wish to see generally prevalent. This gentleman will take visitors over his numerous sets of lines and defy them to "*feel* a smell," (as the Scotch, with strict accuracy, put it.) The planter ought to know and act on the conviction that while nothing is so deadly as dirt in the wrong place, nothing is more useful in the right place. Bone-dust and ashes are just like "lime manure" dirt. Each requires to be properly manipulated and utilized instead of being allowed to run to waste or worse. But not only must the European superintendent of a coffee plantation know how to combat the propensities of a race whose best friends do not claim for them the merit of cleanliness—he must not only know how to convert dirt from a source of disease into a source of fertility, but he must know at least enough of the principles of medicine and surgery contained in the "Medical Hints" which have been prepared for his use, to be able to treat or guide the treatment of disease and ordinary accident amongst his labourers. Even in the healthiest districts, fevers and bowel diseases will occur, coolies will cut their fingers or toes and get bitten by noxious reptiles. The superintendent must be ready to treat simple cases, and have intelligence enough to know where cases are beyond his control, and conscience enough to give such cases at once the benefit of those splendid and well regulated hospitals at Gampola and elsewhere—so palatial in their beauty and airiness that we can imagine patients feigning sickness in order to remain in them. [We shall not soon forget the favourable impressions resulting from a visit to that truly magnificent hospital which the Government of Ceylon has provided, mainly for the treatment of coolies, at Gampola. Mr. Keyt keeps it so that the only odours possibly perceptible is that of the flowers in the neat garden plots.] But it is in natural and chemical science that the planter must specially possess and be ever acquiring knowledge. Acquaintance with the principles of geology and mineralogy will enable the planter to form a fair idea of the soil he is called to work on. A knowledge of its constituents will enable him to judge what the soil requires for the continued and healthy growth of a plant ever severely pruned and handled into yielding the maximum of a most exhausting crop. [Big words, such as geology and mineralogy, ought not to frighten any planter. The well known planter who "hangs out" somewhere below Hunasgeria peak and who tells the Planters' Association that "choklat" coloured soil when friable is good for coffee and amenable to manure, is a geologist and mineralogist in his practical way, though he may not be able to classify the rock or name its main constituents.] But to know what the requisite applications should be and how the applications should be made, the planter above all, perhaps, should have a competent knowledge of the science which Liebig and Johnson and Voeleker and others have so greatly advanced in our day—agricultural chemistry. If able to try a few simple experiments, so as to test soils, but especially to enable him to judge of the quality of fertilizers imported and sent to the estate, so much the better. Bone-dust may be impure or almost inert, and even superphosphates may differ most materially in percentages of fertilizing qualities—just as spirits vary in the degrees of alchohol they contain. But there must be no slavish adherence to the results of mere analysis. Substances poor in fertilizing properties may yet be eminently useful from their mechanical and chemical effect in warming and disintegrating soil naturally stiff and poor. If we judged merely by Liebig's analysis of the course lemon grass (mana), which covers such vast savannahs in the hill country of Ceylon, we should contemptuously dismiss it as valueless. Its ashes yield only 3 per cent. of potash and 2 of chloride of potassa, against 81½ of silica (the latter the substance of which glass is made and which gives the straw of wheat and other corns and grasses its strong and shining covering). What help, therefore, can so wretchedly poor a substance yield to the planter? Just this, that if it could be procured in sufficient quantity within a reasonable distance, so as to render its application possible at a moderate expense, a complete thatching of it would probably warm the stiff cold clays of Ambeganoa and set free their fertilizing ingredients for the growth of coffee crops: crops which would compete with those gathered in Dimboola at its best. The application of phosphates to the warmed and loosened soil could be usefully and remuneratively made. What we here incidentally notice is well worthy the serious attention of planters. If grass for thatching soil cannot be procured, great benefit might be obtained by a similar use of other substances not likely to leave seeds of weeds or injurious insects behind them. Mr. Sabonadiere's experience has led him to the decided conviction that to all the other good effects of an application of mana grass is to be added the eradication of the "bug" blight from coffee plants. It is now nearly fourteen years since Mr. Wall (in a paper which we trust he will soon republish, corrected and expanded as the result of extended experience,) drew attention to the application of mana grass and the result in extirpating weeds on free soils, and, in addition, largely promoting (indeed creating) fertility in the case of old stiff soils. We quote as follows:—

"*Mana Grass* is most useful, both as bedding for cattle and a litter to be applied on the surface of the soil. When used for the former purpose, its chief advantages are its abundance, and the facility with which it may be cut and carried; for the latter purpose I have employed it very extensively, and with widely different results. When applied to free soils that abound in vegetable matter, as those of Hunasgeria, it is scarcely of any use except to keep down weeds or to kill running grass; but on the cold, wet soil of Ambeganoa its effect is almost magical, exceeding that of a heavy dose of cattle-manure. I have applied it to a cold, heavy, yellow soil, in which coffee-bushes could scarcely exist, and where their scraggy branches had only a few small yellow leaves on them, and the effect was most surprising. Not only were trees soon clothed with fine dark-green foliage, but even the soil appeared to be changed, and, to the depth of three or four inches, became friable and dry. How this change was accomplished, whether by the acids resulting from the decomposition of the grass, or by the protection afforded to the soil, I do not pretend to say, but I can speak confidently to the fact.

"*Effect*—The increase of crop obtained through the agency of this manure, in the instance above alluded to, was at least five hundredweight per acre.

"*Cost.*— The cost of this method of manuring is much less felt on a weedy estate than on a clean one, because on the former it almost supersedes the necessity for weeding. The principle item of cost is the carriage of the grass. I have, therefore, restricted the use of mana grass to places to within one hundred trees of the spot where the grass is grown. Under this system the cost of a heavy littering, in which each tree has a very heavy cooly-load of grass, is 35s. per acre. One such heavy littering, and two light ones of about 20s. per acre each, are sufficient for a year—that is, about 75s. per acre per annum for weeding and manuring. I am of opinion, that after two or three years of this treatment, the land would be able to bear several successive crops without requiring the assistance of litter.

"The effect of surface littering is much increased by the digging up of the soil previous to the application of the mana grass."

Mr. Sabonadiere, writing more then thirteen years after the above was published, shews how, when buried in trenches, mana grass is beneficial to *any* soil; the trench system, we may remark, obviating the one great danger of fire which attaches to the overground application. Besides incidental notices, Mr. Sabonadiere writes in the chapter devoted to manuring:—

"*Mana Grass* must be buried in trenches cut longitudinally across the face of the hill; the trees not only benefit from the decaying grass, but from the loosening of the soil. The benefit is most marked; and all patna lands planted with coffee should be treated in this manner. Mana grass has also a wonderful effect in improving poor coffee, when applied as a thick thatch to the soil six to nine inches deep. It thus not only prevents the growth of weeds and stops wash, but the decaying grass seems to give freshness to the soil; the trees make wood fast, and bear heavily. Thatching the ground as above is a successful cure for the black bug; this I can vouch for from personal experience: the cost is considerable, but the results quite justify the outlay."

This instance will shew what scope the planting enterprise presents for the intelligent and discriminating application of the laws of agricultural chemistry to substances within more or less easy reach of the planter as well as to imported fertilizers. But Mr. Sabonadiere's book shews us also how important it is that a planter should be botanist and horticulturist enough to have a fair acquaintance with the laws of vegetable life so as usefully to guide the operations of topping, pruning, handling, and even manuring. Entomology, too, must be studied, so as to enable the planter to have an intelligent knowledge of the history and habits of such "enemies of the coffee" as grub and bug. Then the planter must be a bit of an architect, so as to judge of the fitness for his purpose of the excellent plan and elevations for bungalows, stores, and pulping houses which Mr. Sabonadiere's book supplies; and he must be a very good bit indeed of a mechanical engineer to do justice to water-power (perhaps steam) machinery in the shape of wheels, pulpers, &c. Hydraulic science will claim much attention and pneumatics some, for whether a "clerihew" is set up or not, there must be floors of coir, or wire-netting through which the pulped and washed coffee can get fresh air to carry off damp and prevent fermentation. A knowledge of common mortar and of cements and asphaltes and of the best mode of applying them is useful. But it is difficult to say what knowledge of science and the arts would *not* be useful to the coffee planters; perhaps above all he ought to be a good financier, for it is clear that a coffee estate of 200 acres cannot be brought into cultivation (say in four years) at a less expenditure than £25 to £30 an acre—from £5,000 to £6,000 in all, after allowing for the proceeds of some crop in the close of the period. That fact must be faced, and borrowing as much as possible avoided. How to obtain money is about the only thing which Mr. Sabonadiere does not teach. On most of the other subjects we have indicated his book will greatly aid the neophyte planter; while experience (short or long according to the man's own intelligence and industry) will do the rest. We meant to enter more into details, but the reflections which a perusal of the work and our own experience and observation have forced on us, must suffice for to-day. We hope to have something more to say in our next issue with reference to the useful book which forms the subject of remarks already more extended than we contemplated. But the enterprise of which it treats is of paramount importance to Ceylon; and with the return of peace we trust this enterprise will become still more and important, and a good deal more profitable than it has lately been to those engaged in it.—*Ceylon Observer.*

TEA.

TEA CULTIVATION IN SYLHET, CACHAR.

We are indebted to the *Bengal Times* for the following particulars relating to the tea districts:—Of gardens there are twenty in Sylhet, occupying an area of 28,141 acres, of which 2,956 are under tea cultivation. During 1869, these gardens turned out an aggregate of 362,962 lbs., against 250,905 lbs. during 1868, showing thereby an increase of 112,056 lbs. Of imported labourers an average monthly number of 235 was employed, and of local labourers 1,070. In Cachar the number of gardens in which work is being carried on is 122, comprising an area of 244,488 acres, of which 24,151 acres are under tea cultivation. The total out-turn of tea in these gardens during the year was 4,234,794 lbs., against 3,630,351 lbs., of the preceding year, giving an increase of 604,443 lbs. Average monthly number of imported labourers employed in tea manufacture, 11,087; of non-imported, 15,908. Amount of cash drawn from the district treasury by supply bills, money orders, and notes cashed, Rs. 20,04,647, against Rs. 19,84,957, drawn during the preceding year. In Assam there are altogether 315 tea gardens, comprising a total area of 246,584 acres, of which 107,321 acres are held on grants under the old rules, 115,179 acres in fee-simple under the new rules, and 24,084 acres under cultivation leases, or rent-paying pettahs. Out of the entire area, only 28,954 acres are under tea cultivation, the total out-turn during 1869 being 4,946,139 lbs., against 4,306,927 lbs., in the preceding year, which shows an increase of 639,212 lbs. The average monthly number of imported labourers employed on the gardens during the year was 27,492, and of local labourers 17,486.—*Englishman.*

RAIN-FALL.

Between 1869 and 1870, the rain-fall was computed at different places noted below as per number of inches again their respective names:—Shillong from January to May 14·6 Nowgong, 22·50; Tezpore, 22·28; Dholebagaun, 32·41; Seebsaugor, 38·80; Samoogoodting, 10·75; Dacca, 19·11; Mymensing, 33·05; Sylhet, 75·30. From June to September the fall was, Shillong 58·40; Tezpore, 42·42; Dholebagaun, 59·07; Seebsaugor 62·40; Samoogoodting, 27·25; Dacca, 50·27; Mymensing, 60·70; Sylhet, 91·15. From October to December the calculation for these nine different stations runs:—6·60, 2·02, 12·51, 2·10, 3·25, 6·27, 5·72, 12·10; and for the whole year Shillong shows 81·93; Nowgong, 87·50; Tezpore, 66·72; Dholebagaun, 103·99; Seebsaugor, 103·30; Samoogoodting, 41·25; Dacca, 75·65; Mymensing 99·47 and Sylhet 178·55. The average temperature in the shade was at Shillong in May, maximum 74·9, minimum 63·5; in July 76·9 and 66·1; in December 65·1 and 43·8. Dacca gives in May 91·9 and 76·2; in July 88·8 and 78·9, and in December 78·8 and 55·0.

COOLIES.

At the close of 1868, Upper Assam showed a total of 12,258 imported labourers in employ; in 1869, there were 3,593 imported and 301 received from other districts; 53 returned from desertion, 22 from imprisonment, and 726 were engaged in the province, making a total of 16,953. Under Section 6 of Act VI (B. C.) of 1865, a number of souls was transferred, amounting in all to 212; owing to permanent unfitness 49 were released, by completion of service 7,418, transferred to other districts 210, released by cancelment of agreement 48, or in round numbers we may calculate upon 7,725 as the total balance. Against this we must set first, number of deaths during the year 1851, desertions 593, imprisoned 13—total 9,424 or a total of 7,529 remaining at the end of 1869. In Nowgong the close of 1868 saw 214 labourers remaining; imported during the year 179, from other districts 53, returned from desertion 4, from imprisonment 1, total 451. By completion of service 87 were released, and for the year returns show—deaths during the year 44, desertions 40, a total aggregate of 171; total remaining at the end of 1869—280. In Cachar we see the statistics are rather different. At the close of 1868, there were in Cachar 14,076 labourers remaining. In 1869 an additional importation was made of 3,134 souls. From other districts 498 were received, 47 returned from desertion, 52 from imprisonment, and 987 were engaged during the year in the province, making a total of 18,794. Under Act VI. of 1865, section 6, were transferred 529; by permanent unfitness 24 were released, by completion of service 5,545, by purchase 143, by cancelling of engagement 38, making a total of 5,750. By balancing this number with deaths and casualties we arrive at the total number remaining thus: died during the year 635, deserted 742, imprisoned 51; total 7,707, or grand total of labourers remaining at the end of 1869—11,087. Sylhet shows a residue of 610½ souls at the close of 1868; no re-engagements, 396 released by completion of service, 6 deaths during 1869, and 4 desertions, a total of 406, or a grand total of 204½ remaining at the close of 1869.—*Bengal Times.*

THE TEA GARDENS OF CACHAR, SYLHET, ASSAM AND DARJEELING.

We lately saw in one of the papers a statement showing the number of gardens in Cachar, in Sylhet, and in Assam, with the total quantity of tea produced in each of these tea districts and the area under cultivation. At the time of reading these statistics we worked out the average yield per acre and found Sylhet gave 123 lbs., while Assam and Cachar each yielded about 175 lbs. in 1869.

The quantity of land under tea in the Darjeeling district in 1870 on 64 gardens, some of which were too young to yield, was 10,800 acres. The crop was 1,912,800 lbs. giving an average of 180 lbs. per acre. This is satisfactory compared with the other districts. The figures given are, however, not official, being derived from a personal knowledge of all the gardens. Ten thousand workmen of sorts are employed including women and boys. If it had been sold in the Calcutta market, this tea would have brought 16 lakhs of rupees, not a bad result considering that 12 years ago, the country was almost uninhabited and waste. Not a bad result for the obnoxious interloper to point to when deprecating the steady hostility of the Government which is afraid to do anything for the European for fear of offending Baboodom. Would the Baboos have done anything like this unaided by the Government? We question if officialdom and Baboodom combined could have done it. The statement may be without any real foundation, that every pound of good tea made on the Government tea garden had cost 16 rupees, but our every-day experience shows that these State specs cannot shew such good results as those of private enterprise. The public dislikes to see Government spending money in pushing its speculations beyond their legitimate object of showing how far new things are practicable. When they are pushed beyond this limit, a little scrutiny will reveal the true incentive to be a desire for jobbery and as an extended

means of taking care of Dowb. Nothing should be watched with such jealousy as the continually renewed attempts to do by Government agency those things that are usually left to private enterprise in England. Such as railways, bullock trains, gigantic jail manufactories, printing shops, bakeries, steam companies, drug shops, banks, cinchona gardens, and tea gardens.—*Darjeeling News.*

MEMORIAL ON THE UNPROTECTED STATE OF CACHAR.

To His Excellency the Viceroy and Governor-General of India.

The humble memorial of the Landholders' and Commercial Association of British India, and of others interested in the cultivation of Tea in the province of Cachar.

SHEWETH AS FOLLOWS:—That your memorialists who, on the strength of pottahs granted by Government, have invested their money to a large amount in the cultivation of tea in the district of Cachar, view with deep distress and alarm the present raid upon that district by the hill tribes.

That your memorialists were beginning to hope that after years of struggling against obstacles and discouragements of all kinds, the success of their enterprise was almost attained, and that the cultivation of tea in Cachar would become a source of profit to themselves and of benefit to the redundant population of other districts. It is with the deepest disappointment that they find that from no fault of their own the whole interest has been imperilled, their hopes frustrated, and the value of their property depreciated to an extent which it will take years of peace and security to recover.

One European has been killed, and others have had to fly for their lives, a large number of coolies and villagers with their women and children have been murdered, and others carried into captivity. Those who have escaped have been subjected to great peril, and are in such a state of abject panic that the managers, from motives of humanity, have been obliged, at great expense and loss, to remove them to gardens remote from the scenes of massacre.

Bungalows, tea-houses, and coolie lines have been burnt, and your memorialists fear that, especially in outlying gardens, it will be difficult, if not impossible, to induce the labourers to return.

In addition to the immediate heavy losses inflicted on their property, your memorialists have great reason to fear that the costly efforts made for years past to render employment in tea gardens acceptable to, and to promote the comfort of, the coolie population will be rendered useless. The fear of losing their lives or liberty will deter coolies from going to Cachar, or from renewing their agreements if already there, and the additional expense thus thrown upon your memorialists will be most serious.

This is not the first attack of a similar nature from which your memorialists have suffered. Gardens were burnt, very many coolies murdered in January 1869, and in November of the same year, your memorialists petitioned the Government of Bengal, setting forth the losses they had sustained, and praying for efficient protection. No such protection was afforded, although your memorialists hoped that as the expedition organised for the punishment of former incursions had failed, and as the predatory habits of these tribes, and the very slight reliance to be placed on any treaties they might make, were well known, the Government of Bengal would have considered it a duty to protect the lives and property of its subjects on this exposed frontier.

Your memorialists respectfully but earnestly urge their conviction that had the protection prayed for in the annexed correspondence been granted, the present lamentable loss of life and destruction of property would not have occurred. Your memorialists now humbly but urgently pray that your Excellency in Council will at once pass such orders as shall for the future permanently protect the district of Cachar from further inroads, and the property of those who have invested their capital in it from destruction.

Your memorialists would further respectfully beg that your Excellency would favor them with early information as to the steps proposed to be taken to secure this object.

And your memorialists as in duty bound will ever pray.

(Sd.) T. M. ROBINSON, Chairman.
„ A. WILSON, Secretary.

Calcutta, 15th February 1871.

THE TEA TRADE OF INDIA.

IT is cheering to find here and there an exception to the utter stagnation of trade. Dealers in food should be doing a fair business. And just now for a word on tea. It is not strange that business generally should be dull in these war times, if business means enterprise and speculation. But dealing in the necessaries, and supplying the common comforts of life, is another affair. Breakfast, dinner, and supper are never dull. These cannot fail, whatever else fails. The world must have its tea and coffee, bread and meat. The suppliers of these are making money—and some of a good deal of money—in spite of telegrams, and at this very time. There is ill wind that blows nobody good; and while the general want of confidence paralyses shares, it quickens the price of food. What President Grant is reported to have said of Cincinnati pork and Baltimore flour is quite as true of food produced in England or in India. That we ought at this moment to be doing a good thing in tea and coffee there can be no manner of doubt. Now, if ever, tea plantations ought to pay.

It used to be said of indigo, before the days of John Peter Grant, that three good years in succession would make any man's fortune, at least in lower Bengal. Three to five fair years of tea-planting, assuming a good start, with no debt, ought to make a man comfortable for life. This is true, in spite of its seeming contradiction by the fact that you must hunt far and wide to find an Indian tea-grower who, up to this time, has made money by tea. We mean, unless he has had the luck to buy for a song, ground that cost somebody lakhs. Tea cultivation is young in India; and, child-fashion, is learning to stand by tumbling down. It is some day to be to Assam, Darjeeling, Deyrah, and all our high north, what coffee is to Ceylon, Coorg, the Wynaad, and all Southern India. Only let tea be tenderly handled by the assessors—not taxed till it is able to bear it—and given a road to market, and its success is sure. It is but a few years since the production of Indian teas, then in its first flush, was nipped by premature taxation, and then nearly killed by speculators "going it blind." Grown somewhat the wiser by our hard training in the idiot-school of experience, we now revert to the fact that the tea tree is indigenous in our northern hills, and insists on growing there rich and green while we are asleep. By the way, the indigenous kind is, like the wild pear, apple, or olive, not the best sort. Neither is the imported stranger, the China tea bush, the right thing. But wed the stranger to the native, and you have it. The Eurasian or half-bread, "the hybrid," as the planters call it, is better than either the China or the indigenous.

The fact that large and even splendid profits come out of tea, rightly managed and properly grown in India, stands stubbornly true. One obstacle that bars the realizing of such profits is absenteeism. The owner of the plantation does not live on it; perhaps can never so much as see it. He has made money by a profession which has nearly worn him out, and he can no longer stay in India. Capital and labour—always wide enough apart—are in this case separated by half the globe. The prime rule of all success, "mind your own business," is violated in tea, often by an over-ruling necessity. "Would you have a thing well done, do it yourself," is rarely possible in growing tea. Let the "manager" be ever so heartily bound to serve his principal,—it is not human that he should make money for his employer, as he would for himself and his own family. Thus you may knock off twenty or more per cent. of profits for absenteeism, then lose another twenty—say rather fifty—for bad roads, and the slowness of bullock-transit, and other difficulties of getting to a market. So these two troubles alone, to say nothing of those of cooly-labour and "protection," hail-storms, blight, and insects, including the borer beetle, (for tea has its borer, as well as coffee, though not yet so destructive)—all these help us to see why the tea planter is not coining money, or as one has said, "cording" it, as he would cord wood; and why three productive years, when there is more leaf then he can well manufacture, do not, at present rates of income, make his fortune. A few are making fortunes, particularly those who were lucky enough to be in at the death of concerns that, in the collapse of tea a few years since, had to go off to the highest bidder. They were happily in cash, and "alighted on a job lot" at a time when the holders were forced to realize. No discredit surely to the buyers, though they paid only a few thousand for what had cost lakhs. We do say that making money in this way is not, pure and simple, making money *by tea*. Still, that some tea-planters are making money "like smoke" in these awfully dull times there can be no manner of doubt, especially as the lateness of the rains has enabled them to go on plucking this last year to the end of November. Miserably slow coaches are the bullock trains by which the tea, boxed and loaded, must find its way from the hills or from the Terai to the railway. Tea is grown best of all in the Terai, and the *whole* of it may be one continuous tea-garden in due time. But what a shame it is that, being such light freight, there should be no way of passing it over the dead level plains, 130 miles or more, at a speed exceeding *one mile an hour*. The poor bullocks are said, when "the foot and mouth disease" (not the cattle plague and rinderprest) is hard upon them, to be tramping on, upon bare and bleeding stumps, and leaving their hoofs behind them on the road. But when *in full health* you allow them 124 hours to go from Silligoree to Caragola, 124 miles. Even at this rate there was a glut of tea delivered and piled high, at the Caragola ghat, and waiting for the steamer to bring it down to Sahibgunge, when we passed there recently. It seems absurd at first sight that a tramway should not be laid across the plains, with a light traction engine; but when we hear talk of *eighty* bridges across the net-work

of water-courses that overspreads the plains hereabout, we see the difficulty, and begin to understand why a railway to Darjeeling will be talked of and brooded over, for years yet before it is accomplished. What may our tea trade not become, if in the face of such difficulties it be true of well bought and well managed plantations now that they are paying handsomely? On a morning walk in the hills the other day we passed on the road over a hundred coolies each one with a hundred-pound box of tea on his back. These stout fellows were making a steep *ascent* of more than five miles up the north slope of the Lebong spur to the spot where the bullocks should relieve them of their loads, and take it southwards down to the Ganges. On one side of each box were clearly stencilled the words "Le Bong, the Tukvar." We heard good things of the yield of an estate not far from the one which produced this tea. We give the facts—if they be facts—simply by way of encouragement to other Englishmen who are rurally inclined, and may do as well. We heard that it was bought, a very few years ago, for Rs. 40,000. "It had cost lakhs." In four years it paid for itself. It last year cleared a net profit of Rs. 40,000; and this year had turned out sixteen hundred maunds, worth seventy rupees a maund. This gives to its fortunate owners an income, for the present year, of nearly three times the sum which they paid for the plantation. They paid £4,000, and there this year's tea should not bring them less than £11,200. It is quite possible that the firm of which we speak has other plantations that are not doing as well; so that there averaged profits of the year will not thus approach three hundred per cent. We refer to this case as an exceptionally good one. In fact we have not heard of another as "coming within gun-shot of it." Still, while thousands are content to make their business clear them, this dull year, ten, or seven, or even three per cent., it is refreshing to know that any department of Indian enterprise is making a hundred per cent. profit, or fifty. The tea trade, as a whole, should be doing well this year, and keep doing well hereafter. *First*; because the best teas of China are never exported; and such as are sent abroad, especially to England and America, are often adulterated, if not with deleterious matter, then with tea leaves kept for exportation, the virtue of which has been already extracted. *Secondly*; because Indian teas, fresh from the bush, and full of original virtue, are mainly used by dealers, in London and the West, to flavour China tea. *Thirdly*; because a sound competition among tea-growers is not a race in which only two or three can win. The demand grows with the supply. All the world increasingly drinks tea. It is to drink tea while the sun and moon endure. So there is room and verge enough. There is a chance not only for native zemindars, but for any number of English farmers and gardeners. Tea, therefore, should be a success. *Fourthly*; because it is a growth for both hill and plain. We see it flushing well within the frost-range, and where snows reach it at six or seven thousand feet above the plains; and down in the *Terai* where it is also doing splendidly, and perhaps best of all. Nearly everything in our Indian tea-growing thus far has been done by rule of thumb, and not scientifically nor by putting of heads together. We have our Board of Trade and our Chamber of Commerce, where "two of a trade" agree. The time must come when our tea-planters will also have their own staff corps of men wisely confiding in one another. Then Indian tea will grow and pay.—*Indian Daily News.*

TEA PLANTING ON THE NEILGHERRIES.

[BY JAMES MACPHERSON.]

(Continued from our last.)

Nursery.

THE nursery enclosure should, in the first instance, be fenced, and a hedge of berberry, roses, or other hedge plant put in at the base of the fence; from this time a few daily coolies will be necessary; if Budaghas can be had, it will be better, as it will allow more time to make arrangements for the building of good lines, in the first instance, should they be absolutely necessary. But to proceed with the nursery; the ground should be dug level, and then laid out in five feet beds with two feet paths; the beds may be either across, or up and down the hill as the nature of the ground may cause it to appear expedient. The beds must be neatly levelled, and raked, removing any stones or roots, and then as everything is in readiness and a stream of water is flowing down the road, everything is ready for the reception of the

Seed.

Good seed may now be had in abundance on the Neilgherries, especially from the first formed estates, and if the season be favorable, it should be at once procured; upon the receipt of the seed, as many of the nursery beds as will contain it when thickly spread, should have their surface beaten hard with a spade, or trod hard with the feet; the surface being finished quite level, the seeds must be strewn upon the surface of the beds one or two seeds thick, taking care that the seeds are strewn quite evenly over the surface; rotten fern or leaves must then be strewn over the seeds to the thickness of two or three inches, taking care that the whole bed is evenly covered; the thickness of the covering may be regulated according to the weather; in wet weather the covering material need not be more than one inch thick if it be well rotted and compact; in dry weather the thickness of the covering must be increased so that there is no possibility of the sun penetrating to the tea seed, as if such were the case the exposed seed would invariably turn rancid and spoil; if the seeds are laid down to germinate during dry weather, a good soaking of water should be given so soon as they are covered, and they will then require no other attention for a fortnight; they may then be examined, and at the lower elevations at any rate, many of them will be found to be germinating, these may at once be selected and planted in the nursery. Since first trying this plan, I have found it preferable to allow the seeds to grow through the mulch, and then transplant them just as the rains set in; they are not nearly so susceptible to injury at the more advanced stage, and consequently a much larger proportion of them grow. When the seed is germinating or the young plants are in a sufficiently advanced stage for transplantation, two men must be told off to each bed, with a notched lath, and a basket of seed; the length of the lath must agree with the width of the bed, and be two inches wide, with notches four inches apart, the seeds or plants must be dibbled in, opposite each notch, care being taken to keep the end of the lath on a line; by this means, the plants will be uniformly planted, and Mr. Ramasame's feet will be kept in the paths; it will be necessary to see that the young roots are well fastened in the soil; coolies are often very careless in this particular. When a sufficiency of plants are planted for the requirements of the proposed plantation, no further care will be required, beyond vigilantly keeping down the weeds, and perhaps an occasional watering. In many or most situations, however, the protection of the young plants will be a necessity, and this is best and most economically provided for by sticking fern pretty thickly over the beds; if weeding be necessary during the season of protection, the fern is easily removed and replaced by new; if frost occur during this operation, the greatest care must be taken to have all the beds carefully covered before night.

The planter will now be at liberty to arrange for the permanent bungalow and coolie lines, as the nursery plants will be one or two years before they are sufficiently strong to plant out.

Lines.

If possible, get the Budaghas to contract for these at so much per house if it be decided to build them in the ordinary manner. I am strongly in favor of rough stone, or brick and tile whenever procurable; it will be found the most economical in the end.

Bungalow.

The size and arrangement of this must be left to the requirements of the planter in nearly every instance. When a good bungalow is finished, the temporary affair which it has been recommended to erect on the factory site may be cleared away, and the factory may be built at once, or, what is perhaps better, the plan may be determined upon, with the view of erecting the building when actually required.

Factory.

From the moment that I became acquainted with the principles of tea manufacture, I was always struck with the feasibility of introducing the hot-water system as a heat-supplying medium. I have never yet heard of its being introduced successfully into a tea factory, but I am, nevertheless, fully convinced that it might be introduced with the greatest possible advantage. The boiling point of water is as great, or a greater degree of heat than is ever necessary, even for drying on the pans in the manufacture of green teas. Taking this fact as the text then we will next proceed to consider the application of the system in its economical, cleanly, and manageable bearing. Firstly, then, charcoal, which is now so serious an item in the cash account, would, if this system were introduced, be entirely superseded. The whole roasting and drying apparatus would be heated by one fire under one boiler; the drying apparatus might be so arranged as not only to dry the made tea, but to throw the waste heat through the green leaves, which would be strewed on shelves built above the pipes, and thus wither the leaves in wet weather, and provide against a serious difficulty during the prevalence of the south-west monsoon. Secondly; there would not be the least dust or smoke enter the factory; there would, if the arrangement were properly carried out, be the greatest economy of room, of building material, and of labour: the heat of the pipes might be regulated to a degree, and there could never be the least risk of burning the tea.

All descriptions of boiler, of every capacity, are now manufactured for the heating of hot-houses and other large buildings; the Crystal Palace and some of the largest churches and public buildings in England are now heated by hot-water, and a tropical heat may be maintained in them at mid-winter.

The description of boiler which is unique in itself, and which may be fixed without masonry, would be the most suitable for the tea planter, while cast iron four-inch piping with socket joints would be the cheapest, the most easily fixed, and from the large diameter, maintain the most uniform degree of heat.

The pans would easily be made to order with two or four-inch water-ways, and with connexions joining the one to the other, and the whole with the boiler and piping. This would be the only matter upon which the manufacturer of hot-water apparatus would require especial instructions. The maximum heat required would be determined and provided by the capacity of the boiler, and the length and capacity of the pipes.

The boiler would be placed in the shed at one end of the factory, which would also contain the store of firewood. The water, as soon as heated, would pass under the pans, and so round the factory through the pipes, until it returned to the bottom of the boiler to be re-heated.

The manufacturing room, under this system, would be complete; roasting-pans at one end, rolling-table (or rolling machine, perhaps) in the centre, the drying pipes round the outside, and, built above them, the shelves or racks for spreading out the green leaves during the night. As I before remarked, this latter arrangement would prove a great measure of economy, as the heat from the pipes would ascend during the night through any wet leaves that might be brought in during the rain, and would present this advantage over the Chinese method that there would neither be dust nor smoke.*

On small plantations, however, the old system will probably be preserved in (although I feel convinced that hot water would be equally well introduced to them), and under these circumstances the old plan merits a description.

The best factories under the present old-fashioned and primitive system must be fitted with iron pans set in brickwork and chunam, heated by a flue passing underneath the range, or, in some cases, by a separate fire for each pan: a rolling-table is in this room. Another room must contain the ranges of charcoal-drying fire, which are either fitted with bamboo drying baskets and sieves, or with brickwork "choolahs" surmounted by wire sieves in wooden frames. Other rooms are required for the spreading out of the green leaves, and for the storing of firewood and charcoal. Under the best circumstances, this arrangement is smoky, dusty, and higgledy-piggledy.

There cannot be a doubt but there is much room for improvement, both in the arrangement and also in the method of supplying the necessary heat to tea manufactories.

By such time as the bungalow, offices, and lines are complete, and the plan of the factory is decided upon, the plants in the nursery will be so far advanced that it will be necessary to prepare the ground for their reception; and as jungle and grass ground will require somewhat different treatment, it will be advisable to treat them under separate heads.

Jungle.

If possible, fell and burn by contract; the Budaghas readily undertake this work at so much per acre. If it can be managed, the felling should be pushed on as soon after the monsoon as possible, as the felling, burning, lopping and burning, pegging, pitting, and filling will now keep the planter pretty fully occupied until the planting season commences.

It will now be necessary to get in a supply of tools, which, for tea planting may be limited to mamoties, forks, axes, billhooks, planting bars, rakes, a couple of planting lines, and perhaps a pickaxe, and a spade or two; it may have been necessary to procure some of those before, but the Budaghas frequently find their own axes, and billhooks for their contract work. Pruning knives will not be required until the plantation is some years old.

If there be time, and it be determined to work the factory upon the old system, it will be a good plan, when lopping and burning, to burn the wood into charcoal, even if it is not required for immediate use; charcoal is not a perishable article, and, moreover, if a market be handy, it is always worth its money.

When the ground is cleared the pegs must be cut, and the pegging commences; the work should, if possible, be conducted during dry weather, as hempen lines shrink if they get wet, and as a consequence throw out the work. I consider the best distance to plant the tea plant is five-feet by five, and I unhesitatingly assert that anything closer is an utter mistake. I have measured tea plants which were only eight years old, which were nine-feet through; the roots of course had extended in an equal, or in all probability in a much greater degree, and it follows that soil which would grow the tea plant so luxuriantly as to cover ground in eight years when nine-feet apart, would choke ground in four years, if planted much nearer than five feet apart, and choke themselves in the bargain. On poorer soils, although it would apparently seem that a greater yield would be obtained in the first years of the plantation, yet the excess of plants must impoverish the soil to such an extent as to render manuring necessary sooner than would otherwise be the case. But to proceed with the

Pegging.

In the first instance, the lines should be well stretched, then pieces of strong cloth should be fastened to them at distances of five-feet apart; a line should be run across the hill horizontally, and pegs put down firmly at each mark; from the last peg in the horizontal line, the line should be taken up the hill angles, and a peg put down at each mark as before until the four sides of the square are complete; the ends lines must then be put down at the corresponding pe of the horizontal lines, placing a peg firmly at each mark on the lines, and so continue until the whole square of work is filled in, when another piece must be carried on in the same manner; great care should be exercised in this operation, and constant attention will be necessary if it be wished to have the lines perfectly straight. The pegs should all be firmly fastened, as they may have to remain some time before it will be convenient to commence the

Pitting.

The pitting should always be contracted if possible, of course taking care that the contractor performs his work in a prop manner; eighteen-inch pits are large enough for tea plant and when they are all made of that size they may be fi When the S. W. monsoon is fairly set in on the western, the N. E. monsoon on the eastern side of the hills, and the ground has become sufficiently moistened it, will be high time to commence

Planting.

In this operation, the people had best be divided into three parties, one small party of careful men at the nursery lifting the plants, a party of women and boys carrying the plants to the planting ground, and a good set of men planting; one man should not plant more than a hundred large plants (two years old) per day; if he attempts more the chances are that the work will be badly done: the only care necessary will be to see that the pits are sufficiently opened to admit the roots without crowding them, or bending them; rather than do this, it would be advisable to reduce the longest roots with a sharp knife, to such a length that the pits will admit them; care will also be necessary to avoid the planting too deep, or not deep enough; it will be a good rule to plant at such a depth as the plants were in the nursery. The soil should be firmly trod about them, leaving it two or three inches higher than the surrounding surface if possible, so as to avoid a wash down the lines of pits, which is almost sure to occur on steep ground, during heavy showers, if the surface of the pits be below the general level. If the roads have been formed at distances of one hundred yards apart or so, the rush of surface water will be intercepted before there can be any very great accumulation, but nevertheless on steep ground, and in heavy showers, the plants and soil run the risk of being washed out if the water is allowed to run over the surface of a pit.

Shading.

Shading is undoubtedly advantageous; a few ferns are easily stuck round a plant, and in localities where fern or other shading material is abundant, I would recommend its being done; it will not be necessary to cover the plant so as to exclude the light, but just shade sufficiently to counteract the influence of a week's bright sunshine, which sometimes occurs even in the middle of the monsoons.

Grass Lands.

The cultivation of grass lands should differ from that of forest in this particular, viz:—that the turf should be dug in the first instance; this work should not cost more than 8 or 10 rupees per acre; in fact these are the contract prices. It ought to be possible to do the work even cheaper. A labourer in England, even where the ground is stiff tenacious clay, is not paid more than half-a-crown per rood, or ten shillings per acre, and I have known men who would dig a rood per day *with the spade*. In digging grass lands, the steel fork is the best implement; the work would be very considerably lightened, however, if the turf could be "raced" with some instrument or other (a Budagha plough would be better than nothing), but a much lighter, and more convenient instrument might be used. If the turf could be cut through by a strong sharp piece of iron, fastened in a suitably shaped piece of wood, and drawn by one bullock, the hard work which is now necessary to tear the turf asunder, would be very considerably lightened. The great advantages of returning the turf to the soil to be rotted and form manure will readily be recognized, especially when it is remembered that many good farmers consider one load of green manure as equal to two of farm-yard dung.

Nothing can be more improvident than hoeing off the turf and leaving it to dry, or what is worse, burning it on the surface.

When the ground is dug the lining and pitting may be carried on as directed for forest land. It is a mistake to suppose that this digging is intended to supersede pitting; a hole *must* be made for the reception of large plants, and it would be found very inconvenient to be obliged to make holes in the planting season. Of course the effort should be made to make the pitting contractor allow for the seven or eight inches of loose soil. Trenching two spits deep will not be found very expedient, indeed it would, in some cases, do more harm than good, by bringing a worse soil to the surface than was there originally. I greatly question if any tea planter has ever done it, unless indeed he was convinced that it was necessary to improve his surface soil, and then I fear he would find it very expensive.

* See Appendix.

There cannot be a doubt, however, that it is a very great advantage to return the turf to the soil, and to open the latter to the influence of the sun and air.

Weeding.

If the estate has been allowed to get dirty during the planting season, the people should be set on to weed thoroughly, and bury immediately upon the planting being finished; once get the estate thoroughly clear and it may then be kept so for 6 rupees per acre per *annum*.

MANAGEMENT OF PLANTS, 1ST, 2ND, AND 3RD YEARS.

Every rampant shoot which shews a disposition to run away with an undue share of food from the rest of the plant should be decapitated, that is, it should have its extremity pinched out with the finger and thumb.

If this stopping or pinching be carefully attended to, no pruning will be necessary until about the fifth year of the plantation, and then only to reduce the plants to orderly size and shape; the pickings or pinchings will of course be made into tea.

Pruning.

The instances in which pruning is absolutely and severely necessary, have, as a rule, arisen from neglect; if the picking be properly managed, young plantations should not require the knife at all. It is only when the plants have attained such maturity that they are constantly picked, and the extremity of the shoots become raggy (if I may use the term) or stunted by continual stopping, that it becomes necessary to cut them back, and then it will be best to do the work every year, in such season as the plant is found to be at rest, January being, upon the whole, the best time.

The pruning knife should be used, and not the shears; every stunted extremity of a shoot should be cut away, taking care to leave the top of the shrubs with a level and wide top, as it is on the top of the shrubs that all, or nearly all, the young growth is produced.

Embellishment of Estates.

The estate may always be improved in appearance, and be rendered more valuable by introducing useful and ornamental trees; these may be planted along the margins of the roads, and also in clumps upon any stony or otherwise useless ground. The *Acacia* should not be planted within the plantation, but it might be planted on the upper hills, above the uppermost road; indeed on grass lands it will be absolutely necessary to plant it or the *Eucalypti* for a supply of firewood. For ornamental purposes, conifers, such as *Pinus cupressus*, &c., and also many of the indigenous trees, such as *Eurya cedrella, Elæodendron*, &c., would grow on the richer lands, at elevations suitable to them; then cinchona, peaches, oranges, &c., would form pretty and even profitable avenues along the roads; it will be absolutely necessary to securely fence any trees that may be planted, as the Sambur deer, if they do not eat them, which they generally do, are pretty sure to damage them in some way if they can get at them.

The lower sides of the roads should have a margin of grass planted along them, as it is decidedly ornamental, and moreover prevents the sides from being washed or broken away. On grass lands, the margin may be left when the road is made, and retained when the ground is dug.

Garden.

In situations where fruit can be grown, such as Coonoor, Kotagherry, &c., a fruit garden should be planted. Loquats, guavas, peaches, pears, apples, plums, oranges, limes, citrons, pomegranates, &c., are grown on the hills at elevations ranging from 5,000 to 6,000 feet, and there is little doubt but if more pains were bestowed upon the cultivation, grapes, nectarines, raspberries, strawberries, &c., might be grown in perfection.

Among various fruits which either are or ought to be here, are the cherimoyer, grenadilla, &c.

A vegetable and flower garden will, of course, be formed, but this is a matter upon which very especial directions would be thrown away; everything will depend upon the proclivities of the planter.

THE MARKETS.

LONDON, *2nd February* 1871.

COFFEE.—400 casks, 20 barrels, and 500 bags Plantation Ceylon at auction, have realised from 59*s.* to 90*s.*; 100 bags East India were bought in at from 64*s.* to 65*s.* Yesterday 200 casks, 60 barrels and bags Plantation Ceylon, at auction, went from 64*s.* for low middling to 84*s.* for bold; 2,200 bags native partly realised from 56*s.* to 58*s.* 6*d.* for good to fine ordinary; 420 bags Guatemala chiefly brought 62*s.* 6*d.*; 270 bags Costa Rico were bought in at 67*s.* 6*d.*; 200 bags La Guayra, at 64*s.*; 300 bags Bahia were partly disposed of at 64*s.* 6*d.*; 80 tierces, 250 cases, 340 bags East India went from 61*s.* 6*d.* to 80*s.* 6*d.*

TEA.—A sale of 5,292 packages was held on Tuesday. 4,346 packages found buyers, all being "without reserve." A chop of medium black leaf, "with all faults," brought 1*s.* 5½*d.* per lb. Several breaks of common black leaf, of recent import, sold at 11*d.* to 11½*d.* per lb.; prices rather in favour of buyers. Black leaf siftings, "with all faults," realised 3½*d.* to 3½*d.* per lb. Packages offered:—Congou, 3,143; Pouchong, 40; Souchong, 310; Twankay, 196; Hyson Twankay, 105; Hyson, 152; young Hyson, 115; Imperial 289; Gunpowder, 557; Japan, 385; total, 5,292 packages. The deliveries in London estimated for the week ended January 30 were 1,807,096 lbs., which is a decrease of 77,694 lbs. compared with the previous statement.

RICE.—4,000 bags low cargo Bengal have been sold at from 8*s.* 7½*d.* to 8*s.* 9*d.*; 2,000 bags Dacca and 700 bags white Bengal, just arrived, at 10*s.* ex quay terms. 6,900 bags Rangoon, of indirect import, sold, at and after auction, at 10*s.* per cwt. for the sound portion. Yesterday about 10,000 bags Rangoon sold at from 9*s.* 9*d.* to 10*s.* 10½*d.*

SILK.—M. Arles Dufour and Co., of Lyons, states as follows:—The present crisis, in paralysing the silk manufactures in France, has nearly entirely shut up the principal markets for raw silk. The consequence is that a rather large proportion of the produce of last year's crop remains unsold. In comparing actual prices with those of similar disturbed times, it must be acknowledged that they appear comparatively high. For European silk, this may be accounted for by the profits realised during a period of eight years of uninterrupted prosperity which have permitted producers to hold their stocks. The future of the silk trade seems now to depend principally on the duration of the war, as French manufacturers, who alone have no stocks of raw silks, will not enter the market again as long as peace is not restored.

CALCUTTA, 21*st February* 1871.

SILK.—The position of this article, does not seem to improve; on receipt of telegrams leading to the belief that peace is almost certain in Europe, we were calculating if not on a rise at least on a large business being done here; but contrary to all expectations more than four days have now passed without any revival having taken place, in fact, the market is quieter than a fortnight ago when nobody could forsee the termination of the war; this will prove that the general opinion at home is not favorable for the article, and there are good reasons for it, if we take in consideration the large unsold stock of Asiatic silk in London, the accumulation of European silk on the Continent, the good prospects of the approaching crop, and the total suspension of silk manufactory in France.

The only transaction of the week consists of 40 to 50 bales inferior Gonatea, and medium Cossimbazar bought up by a native speculator at what we consider extravagant prices, *viz.*, at Rs. 17·8 for inferior Gonatea and Rs. 20·8 per medium Cossimbazar.—*Wm. Moran & Co.'s Circular.*

CALCUTTA, 22*nd February* 1871.

INDIGO.—February sales commenced in London on the 13th instant; during the first five days 6,800 chests passed the hammer, out of which 3,200 sold; at the beginning an advance of 3*d.* to 4*d.* per lb. was realized, but for the latter days prices receded to par with a tendency to go still lower. It remains to be seen how the sales terminated. Here in Calcutta competition for the article is as brisk as ever, but unfortunately the crop 1870 is disposed of, and the season 1870-71 is closed.

Approximate Distribution of Crop, 1870.

Shipped To	Great Britain...	10,500	Chests.
"	Germany, Holland & Belgium ...	4,500	"
	Russia	3,000	"
	France...	1,500	"
	Italy & Switzerland	400	"
	United States...	2,100	"
	Persian Gulf, &c.	1,500	"
	Total season 1870-71...	23,500	Chests.

TEA.—Only one public sale has occurred during the week, at which 1,299 chests were offered. Of this quantity 1,180 chests were sold at auction and 94 chests afterwards, leaving 25 unsold. A Reuter's telegram arrived before the auction, quoting, "fine descriptions 1*d.* per lb. lower, and inferior almost unsaleable," but this market was in no way affected by the news, indeed prices for Pekoes showed a firm advance of half an anna per lb. on previous rates, and other kinds fully maintained their former position.—*Toulmin & Co.'s Circular.*

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The Centenary number of the *Calcutta Review* which has just appeared, exhibits a marked improvement upon its predecessors for some time past. It has not only increased in bulk, but contains a large variety of really able articles on subjects of general interest, European as well as Asiatic.—*Englishman, April* 1870.

No. CI.

From our advertisement columns it will be seen that an event important to the history of the *CALCUTTA REVIEW* has lately occurred. For the first time since that serial was set on foot a second edition has been called for. No. CI. is the notable number, and we hope that every succeeding unit in the century will deserve the same popularity.—*Pioneer, September* 6, 1870.

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THE

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Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, SATURDAY, 15TH APRIL, 1871. [No. 9.

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LETTERS TO THE EDITOR.

THE OOSUR PLAINS.

To the Editor of the
"Agricultural Gazette of India"

SIR,—There has been a good deal written about the Oosur plains of the North of India, but I do not think I have ever read of the following mode of reclaiming them which I find a common practice here.

To begin with : a number of trenches, or round holes, are dug in the soil and these are filled with water by the rainfall, some common kind of rice is then sown and a handful of grain gathered the first year The number of these holes is increased the second year, and the earth taken out of them serves to form small banks or ridges between the incipient fields. By degrees these holes are commingled and a considerable area is sown, the value of the crop increasing year by-year

Even when a complete field is formed, the cultivator digs fresh trenches in it, and continues to reduce the level of the soil by ploughing into these holes. In a few years a very fair crop of rice is produced, and the land becomes eventually fit for a rubbee crop of wheat or barley, that is, of course, if irrigation other than the natural rainfall is available.

The *reh* disappears as the rice creeps over the land. Some large plains in the vicinity of my camp now present this mode of annihilating the saline effervescence in every stage. The process is tedious and laborious, and is only carried out by the inferior classes of cultivators, but the land ultimately becomes very fair *mutyar*, and is then usually resumed by the landlord. There are two kinds of grass growing very scantily and feebly on the original Oosur : one is of a dull green, and the other shows a purplish tint. The cultivators prefer beginning their operations when the latter shade prevails. A considerable rainfall is essential, and I do not suppose it would pay to dig wells or bring water from a distance, which perhaps accounts for the system being unknown, as far as my experience goes, in the dryer climate of the Upper Doab.—Yours faithfully,

H. M. ROGERS.

Camp Belwana, Azimgurh, March 11, 1871.

ESTIMATE OF PRODUCE.

To the Editor of the
"Agricultural Gazette of India."

SIR,—I am not convinced by the arguments of the "S. O., N. W. P," who writes in your issue of the 15th February that the most reliable way in which the amount of produce can be ascertained is enquiry from tenant-cultivators. A curious instance of the unreliability of information of this kind occurs on the next page of the same issue, in the paragraph concerning "Seed and Produce" of the Hoshungabad Report, written by Mr. Elliott. I believe it is that officer who has suggested that one reason why the cultivator's estimates are always below the actual outturn is that he does not take into account so much of the produce as may be diverted in wages to reaper, ploughman, and similar claimants. I have a table before me showing the results of a considerable number of experiments in which the cultivator's estimate as well as the actual weight is recorded. In *no* case does the estimate exceed ⅓rds of the actual result.

As a matter of fact, the interests of cultivators may not be affected by their giving answers, but they may not unnaturally suspect the contrary. They look upon the settlement officer as a raiser of rents as well as of revenue. "If I tell the sahib," the tenant thinks to himself, "what my field really produces, "he may take into his head to have my rent increased ; at any "rate it is not for me to let the cat out of the bag ; my own "admission shall not be on record against me."

I will give two instances which have come under my notice during the last few days of the incorrectness of information obtained by questioning cultivators. I had made several experiments for the purpose of ascertaining the weight of *goor* which a measured area of sugarcane would produce. Having thus formed a very good idea of what the average outturn should be, I questioned a cultivator who had cut down just half his field as to the amount of *goor* he expected to obtain from the whole field. His answers were most openly and circumstancially given. He had received an advance of 16 Rupees at the beginning of the season from a money-lender, and in return he had engaged to supply six maunds of *goor* from his field at the end of the season. If less was produced he was to make up the deficiency in grain at the *rubbee* harvest with interest reckoned at six pice in the rupee per month. He had sent off 10 *bhelas* or sheaves, averaging 10 seers each, and the money-lender's cart was standing on the road into which he had just put the eleventh and twelfth, completing three maunds or half the bargained amount I measured the field with a chain and found that about one acre was cut down and one acre standing; the cultivator at this rate would not gain much by his bargain. Next day I happened to visit the town four or five miles off where the money-lender lived, and it occurred to me to send for him. The cultivator's story was true in every detail except one. Instead of having fulfilled half his bargain the day before, he had fulfilled the whole, and the money-lender had no further claim against him The two *bhelas* in the cart were the 23rd and 24th instead of the 11th and 12th.

A day or two after, I rode through a part of the district where settlement operations had come to a close, and which the cultivators knew would not again be visited by a settlement officer's camp. I passed some very fine cane-growing fields —several acres of them—cultivated by *koomees*, whose speciality is sugarcane. I was alone, the cultivators were chatty, and I asked them what the outturn had been, every answer given was below my average. One cultivator with much candour volunteered the information that in a very good season a larger weight than had yet been named would be produced. Still below my average ! I then taxed him with deceiving me, and knowing the fields were good ones from their appearance named a weight above my average as his outturn, telling him that I had made experiments in several fields, and knew all about it. In the usual unblushing manner in which a native acknowledges himself a liar, he admitted that I was right ; but I believe that after all the weight I named was too low, though the maximum given at first by the cultivator was only ⅓rds of the weight he afterwards admitted.

The objections of your correspondent to actual experiment are not very cogent. It is not difficult to pick out an average patch in most fields, and if there is much variation, two patches can be cut. He implies that the number of experiments which can be made by a single officer is very limited. This is true to some extent, but the remedy is easy. A continued series of experiments should be made by a succession of officers ; at present these experiments are made at the whim of each officer in the most

desultory manner. The results may or may not be systematised according to the interest he takes in the questions. They are not necessary for assessment, which, under existing rules, has nothing to do with amount of produce but only with amount of rent. The determination of rental assets does not depend on the productive powers of the land but on the average rates paid over similar tracts. The taking of these experiments should be made *compulsory* on all revenue officers, whether the settlement of the district is under operation or not year by year; and if this was done for a series of years it is impossible to deny that most valuable results would be obtained. I admit that the "S. O., N. W. P." may, by patient investigation extended over a long period, have gained results approximate to the truth; but no similar reliance could be placed on desultory enquiries made by wondering assistant collectors in other districts, and we want returns for each district.

I fully agree with your correspondent in acknowledging the value of the statistics which might be supplied from the Court of Wards' estates. For the sake of the estates as well as for the sake of the statistics, I confirm his recommendation that the estates should be placed under European superintendence. They would furnish a ready means for introducing improvements (not experiments) in agriculture, to the notice of the people in all parts of the country. I add a note for the benefit of anyone who prefers the system of experiment to that of enquiry. Accuracy in measurement, and simplicity in calculation, may be effected by adopting the following method :—

Take three spiked flag poles; connect them by a rope (tied high enough to clear any standing crops) at intervals of 33, 44, and 55 feet; place the 44 rope along the edge of the crop to be cut, fixing the two poles at each end of the rope in the ground; carry the third pole into the field until the 33 feet rope and the 55 feet rope are both taut. The angle at the pole where the 33 and 44 feet ropes meet is then an exact right angle. (This is a simple deduction from the fact that $3^2 + 4^2 = 5^2$:—the 11 is introduced because 11^2 is a factor in 4840 the number of yards in an acre.) Having marked the position of the ropes carry over the pole at which the 33 and 44 feet ropes meet to the opposite side of the 55 feet base until all ropes are taut. The rectangle thus formed will be exactly 1 30th of an acre. The number of seers in this area multiplied by 3 and divided by 4 will result in the number of maunds in an acre.

Natives are extremely inaccurate in cutting rectangles out of a field, and as the rows in many fields do not run at right angles to the sides of the fields, it is often very difficult for even an educated eye to hit off the right angle. The above process is so simple that any Native can carry it out. I need not remark that where the returns from a small area are to be a test of the outturn over a large area it is especially necessary that the measurement should be accurate.

I am sorry that I have been obliged to express my doubt as to the general applicability of your correspondent's method of ascertaining crop-produce as he has evidently with much pains-taking obtained approximately correct results himself. I hope some experienced officers may now come forward and judge between us and decide whether enquiry is better or not than

EXPERIMENT.

EDITORIAL NOTES.

MR. RIVETT-CARNAC has made arrangements, we are informed, to supply the Madras Government with the quantity of cotton seed required for experimental purposes during the forthcoming season. The indigenous seed was selected on the pedigree system, at Sheogaon farm during the last month; the New Orleans seed will be supplied by the agents of the Cotton Supply Association in Bombay.

DR. BROUGHTON, the Government Quinologist, has succeeded in obtaining carbolic acid from a plant (*andromeda leschenaultii*) which grows in inexhaustible abundance on the Neilgherries. The acid obtained in this way is purer than that procured from coal-tar, but it is dearer, for while the latter costs only four shillings a pound in India, the acid prepared from the indigenous plant costs five shillings. Unless, therefore, the process of preparation can be cheapened, the discovery will be of little practical value.

THE merchants of Bombay seem disposed to agitate for the abolition of the Cotton Department. They complain that the "Bombay trade has become a trade in one commodity only, "and that Bombay has now come to be dependent on one article "—cotton; that it is unfortunately a very dangerous article and that therefore they do not think it a wise thing for Government to make this trade their pet bantling, and to foster it to the exclusion of everything else."

Government will no doubt take advantage of this state of feeling to sink the special efforts it has been making for improvements in the growth of cotton in a sustained and earnest attempt to raise the character of Indian agriculture generally. The Cotton Department will simply be developed into the Department of Agriculture.

MR. LOGIN, a Civil Engineer lately employed on the Ganges Canal, has made a very successful experiment upon a small scale for improving the growth of cotton in India. An account of this experiment will be found further on in our columns. In writing to the *Cotton Supply Reporter* upon the subject, Mr. Login says : "Among the interesting papers on cotton culti- "vation given me by Mr. Rivett-Carnac, I find you use "American fibre owing to its length and strength in the "'warp,' and Indian for its softness in the 'woof,' and are "able by this means to combine strength with softness and "warmth. If, therefore, you can get at a cheap rate double the "quantity of 'woof' from India by improving the agriculture, "surely a double quantity of fibre for 'warp' is required from "America.

MR. LOGIN is more than a mere engineer. He is a clear-headed man who has made himself master of some of the leading conditions of our relations with the outside world.

"In round numbers," he says, "India has either to send home yearly fifteen million pounds sterling worth of raw produce in excess of what she imports, or she must send home bullion at a great loss, for India is not a producer of the precious metals, but rather a consumer of them. Hence any falling off of exports must necessitate a sending home of hard cash, or a *falling in the exchange*; and this is where 'the shoe pinches' me in particular, having to send home all I can scrape together to my family. The present rate of exchange is 7½ per cent. discount, add to this 3⅛ per cent. income-tax, and any one situated as I am will find that during the year from these two causes alone he has nearly lost one month's pay; so let those who now oppose the cotton interests for a moment think what they are doing, for it is evident (as no doubt you can and have shown) that to double that yield of cotton would sweep away the income-tax and raise the exchange to par. In other words, I could send home nearly £100 a year more to my family, and not feel it. Only let the ladies know this, and you would soon have their lords and masters strong advocates for improved cotton cultivation in India." This is not *quite* true, but it shows a good general understanding of the state of matters. It would be well for India if as vivid a sense of the effects of the Home Charges were entertained by its Finance Minister.

A MOFUSSIL contemporary thinks that the cultivation of the sunflower is likely to become popular in India. "The oil extracted from the seed is said to be superior to both almond and olive oil for table use, and to be employed in manufacturing woollen goods, soap, and candles, as well as for lighting purposes. The *leaves* have been manufactured into cigars, having pectoral qualities, and might perhaps be found more efficacious than stramonium. The blossoms furnish a brilliant yellow dye which stands well. Each acre will contain from 15,000 to 20,000 plants, and the average quantity of seed will be 50 bushels, each of which will give a gallon of oil. The quantity of seed is much increased by dwarfing the plants, the best manure for which is said to be old mortar broken up. The plants should be kept clean and free from weeds, and the quantity of seed required is about six lbs. per acre. They should have sufficient interval between them for exposure to the sun, as under such circumstances they become larger and more fully stored with seed."

THE *Pioneer* :—"The Chief Commissioner has undertaken to review the agricultural operations of the Central Provinces during 1869-70, but anything more dismal to report upon we can hardly conceive, unless it were the general aspect of the world after the deluge. the public gardens, it is true, succeeded fairly —that is, they all looked pretty when the Chief Commissioner visited them, and some of them pay a share of their expenses; but the cotton experiments were failures. In the Balaghat, Sumbulpore and Chutteesgurh divisions, the natives would not grow

s. In the Wurdha district the produce of cultivated patches was disappointing, and in the Bilaspore district waste still; in the latter, however, people took to the cultivation kindly. In the Jubbulpore and Nerbudda districts the experiments failed altogether, and in Chindwarra the crop was not even up to an average yield from the ordinary indigenous plan. Potatoes, opium, Otaheite sugar-cane, coffee, cocoa and areca nuts, sandal wood, china grass, and Carolina paddy were all attempted in little doses. Arrowroot grew luxuriantly, and potatoes were fairly successful. Horse, cattle, and sheep-breeding were all tried, but the sum total of success was "nothing *plus* next to nothing." Yet the report gives us the impression that after all the Central Provinces are alive."

THE AGRICULTURE OF INDIA.

CENTRAL PROVINCES—HOSHUNGABAD.

(By A. C. Elliott, Esq.)

Price-current.

I GIVE below a table showing the price-current of the more important grains from 1822 to the present time. For the first fifteen years the statistics are taken from Major Ouseley's Settlement Report. From 1837 to 1842 inclusive I have only been able to get returns from the grain-dealers at Hurda, where grain is always a little dearer than at Hoshungabad. From 1843 to 1853 (June) the price-current was obtained from a book kept up in the Deputy Commissioner's Office, and again from November 1859 to 1861. The rest of the *nirikhamas* were unfortunately destroyed, as waste paper, although they are among the most valuable papers a district office contains. The interval from 1853 to 1859 was filled up by reference to the books of grain-dealers, in which, however, as the sales are wholesale, the price is always lower than the retail price of the bazaar, which is reported in the price-current. Thus in June 1864, the wholesale price was Rs. 10, while the retail price was Rs. 11-6-0. Prices are permanently lower in the east than in the west of the district:—

Price per Kucha Mani of 24 Kooroos.

Year	Wheat.						Grain.						Rice (husked)					
	June.			November			June.			November			June			November		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
1822...	...			6	10	3				6	2	5	...			11	8	0
1823...	5	0	0	4	5	0	4	0	0	3	0	0	12	0	0	7	0	0
1824...	3	6	0	4	7	0	2	12	0	3	3	0	8	8	0	15	5	6
1825...	3	3	9	2	13	0	2	3	0	2	0	0	15	2	6	7	15	0
1826...	2	10	6	3	2	0	1	15	6	2	6	6	9	6	6	9	2	0
1827...	4	11	0	4	8	0	3	13	0	4	9	0	10	7	3	8	4	0
1828...	4	1	4	4	1	2	3	2	0	3	5	4	9	9	4	7	12	2
1829...	5	7	0	7	1	4	3	6	0	4	15	0	7	15	0	9	10	8
1830...	3	15	0	3	3	6	3	8	0	3	3	0	10	10	4	7	12	2
1831...	4	4	0	4	2	8	4	3	8	3	12	6	9	4	0	7	10	0
1832...	13	10	8	10	12	2	5	2	8	5	12	6	10	5	4	10	14	8
1833...	13	0	0	13	6	8	7	0	0	8	5	4	16	2	8	15	7	0
1834...	7	11	3	8	0	0	5	14	6	6	0	0	16	3	0	10	10	0
1835...	9	2	0	7	4	8	6	10	0	5	6	7	12	3	0	9	1	0
1836...	5	9	9	6	8	0	3	11	4	4	8	3	9	9	10	9	11	0
1837...	5	1	6	5	13	10	3	10	8	4	10	0	9	9	8	10	13	0
1838	5	1	0	4	8	0	4	7	0	5	8	0	11	7	4		..	
1839...	5	2	0	6	2	0	5	0	0	6	8	0		...			...	
1840...	5	0	0	6	6	0	6	0	0	3	2	0		...			...	
1841...	4	8	0	6	10	0	3	12	0	4	8	0		...			...	
1842...	6	0	0	5	0	0	4	4	0	4	4	0		...			...	
1843...	3	12	0	2	12	0	3	8	0	3	0	0	9	12	0	10	0	0
1844...	2	12	0	3	8	0	2	12	0	3	8	0	12	0	0	13	0	0
1845...	5	6	0	8	8	0	4	10	0	8	12	0	13	0	0	13	0	0
1846...	9	4	0	7	0	0	8	0	0	6	0	0	16	0	0	10	0	0
1847...	8	0	0	8	0	0	7	0	0	8	0	0	16	0	0	12	0	0
1848...	4	4	0	6	0	0	3	10	0	4	8	0	12	0	0	15	0	0
1849...	8	0	0	7	8	0	6	0	0	5	8	0	16	0	0	10	0	0
1850...	6	4	0	5	12	0	3	12	0	3	8	0	10	8	0	10	0	0
1851...	4	12	0	4	8	0	3	0	0	3	0	0	14	12	0	14	0	0
1852...	6	0	0	6	4	0	4	6	0	5	0	0	14	0	0	14	0	0
1853...	5	4	0	4	4	0	3	10	0				12	0	0		...	
1854...	4	4	0	4	0	0	3	0	0		...			...			...	
1855...	6	0	0	7	8	0	3	8	0		...			...			...	
1856...	5	0	0	5	0	0	4	0	0		...			...			...	
1857...	4	0	0	4	12	0	3	4	0		...			...			...	
1858...	5	0	0	5	0	0	3	12	0		...			...			...	
1859...	5	0	0	5	0	0	5	6	0	3	10	0		...		16	0	0
1860...	4	6	0	5	10	0	3	6	0	4	10	0	16	0	0	13	11	0
1861...	4	12	0	5	6	0	5	0	0	5	7	0	12	0	0	13	11	0
1862...	3	4	0	7	0	0	2	0	0	.....				...			...	
1863...	13	0	0	13	4	0	10	12	0	12	11	0	24	0	0	24	0	0
1864...	11	8	0	13	5	0	9	13	0	12	12	0	27	0	0	27	0	0

Estimate of the gross produce and expenditure of a plough.

I have now given sufficient details of the system of agriculture, the produce, and the cost of labor, to make an attempt to estimate the net profits of a cultivator. There is great difficulty in this, from the differences that exists in different parts of the district. A cultivator near the hills incurs expenses of fencing and watching his fields which do not fall on a cultivator in the open valley. Weeding is much dearer in the eastern part of the district than in the western, because of the practice of sowing broadcast instead of by drill; and in many villages the cultivators are unable to sow any khureef at all, and therefore cultivate a smaller area, and lose the profit on the khureef fields. These cases, however, are exceptional, for there are very few places where there is not a little undulation, or a little denuded soil, or a river bank on which khureef can be grown. The average case is that of the tillage of twenty-five acres to a plough; of these, twenty shall be rubee, and five khureef. Of the rubee, fifteen acres shall be sown with wheat, two with gram, one with *ulsi*, one with *masoor*, and one with *teora*. Of the khureef two acres shall be under *jowar*, two under *tilli*, and one under cotton. In the eastern pergunnahs *kodon* and *koothi* would be the more likely khureef crops. Just now cotton has become a more favorite crop, but that is not likely to last.

First case.

For the first case I will suppose the cultivator to have only one plough, and to be his own ploughman. He must, however, have a herdsman to look after his cattle, unless he has a son ten or twelve years old to do it, and he must hire labor for weeding, fencing, watching and reaping. For treading out and winnowing he may have to use laborers, or he may arrange for mutual assistance with a neighbour. His land shall be in the open valley, and not close to a road, so that there is only necessity for fencing the field a little, and none for watching, except just when the crops get ripe. He shall have eight acres of fallow land, four of which he keeps for hay and four he pastures his cattle in, so that there is no need for buying any food for them. I shall take the Hoshungabad pergunnah scale of measures, prices, and labor. Thus, then, is how his account will stand:—

Expenditure.

Ploughing.—He drives the plough himself, and fetches his own wood from the hills, and the village carpenter makes it up for him, so that he has no expense on this score, except the cost of the iron for the share: this will be Rs. 2, and will last two years. Expense for one year, Re. 1. His cattle at present rates cost from Rs. 30 to Rs. 50 each, and last from ten to twelve years. If we put the average price at Rs. 40, and the duration at ten years, the yearly deterioration is Rs. 4 a bullock, or, for the four, Rs. 16.

Seed.—He requires seventy-five *kooroos* of wheat, which at Rs. 12 per *kucha mani* cost Rs. 37-8-10; ten *kooroos* of gram, which at Rs. 10 per *mani* come to Rs. 4-2-0; ten *pie* of *ulsi*, which at Rs. 16 per *mani* cost Rs. 0-13-4; five *kooroos* of *masoor* and five of *teora*, which at Rs. 9 and Rs. 8 respectively cost Rs. 3-8-8. The sower will receive Rs. 2 for fifteen or twenty days the sowing will last. The khureef seed is so small that it can hardly be estimated. A *pie* of *jowar*, a *pie* of *tilli*, and five seers of cotton-seed, cost altogether Rs. 0-4-3. Thus for his seed and sowings the cultivator will have to pay Rs. 48-4-3.

Weeding.—The *jowar* is generally weeded once only: twenty men, at two annas each, will do it for Rs. 2-8-0. *Tilli* should be weeded twice, and at the same rate it will cost Rs. 5. Cotton wants three weedings, and the cost at the same rate is Rs. 3-12-0, as it is only one acre. The cultivator must therefore pay Rs. 11-4-0 for weeding. This, however, is the maximum rate. *Tilli* often goes with only one weeding, and cotton with two: formerly three or four pice a day was the weeder's wages, and still they can be got in many parts for six or seven pice; and in Seonee and Hurda *jowar* is not weeded at all, but *kolpaed* twice, and cotton is often not weeded at all, or once weeded and *kolpaed* once.

Fencing.—Cutting, carrying, and setting the thorns and stakes required to fence the *khulla* or threshing floor, give about six days' work to the cultivator and one laborer, whom he must hire to help him. If he has to fence in all his fields it will require from eight to twelve cartloads of thorns, and will be nearly a month's work for the cultivator and his laborer, costing him Rs. 4 in hire. Even in the open valley he will often have to fence in part of his land, or some road is pretty sure to touch it, or else some field lies near the village, and it is probably fair to calculate that fencing, including the *khulla*, costs him Rs. 2.

Watching.—The cotton does not require it, but the *jowar* and *tilli* must each be watched, and that very constantly, for about a month, when they begin to ripen. It is reckoned that three men can watch ten acres, and therefore if the fields lie together one watcher might be enough for both; but generally two will have to be employed. One watcher will get twelve *kooroos* of *jowar*, or Rs. 4-8, the other will get Rs. 4. The rubbee crops need only be watched for one month, when they are ripening,

and the cultivator will club together with others and will pay as his share four *kooroos* of wheat, or Rs. 2, to the watcher. If near the hills, sixteen or twenty-four *kooroos* have to be paid, and there are places where the watchers would be four or five in number and would receive as much as the seed sown, or three *kucha manis*; but in the open valley one man can watch forty or fifty acres. The total cost of watching is therefore Rs. 10-8-0.

Reaping.—Towards Hurda the reaping rate for rubbee is 12 *kooroos* for a *pucka mani*, or twenty-four *kooroos* of wheat (Rs. 12) for 20 acres. In Hoshungabad, the reaper generally gets a twentieth of the produce, or by contract rates 16 *kooroos* for the *kucha mani*, or 32 *kooroos* (Rs. 16) in all for twenty acres. I will here take the Hoshungabad rate, or Rs. 16, as my standard. The cost of cutting the *jowar* is double: first the stalks are cut (*dha'ni*) and then the heads chopped off (*lani*). This will employ ten men, who will get four *pie* of *jowar* each, or forty *pie*, which cost Rs. 1-14. *Tilli* will be cut by eight men, who will receive each three *pie* of *tilli*: twenty-four *pie* come to Rs. 2. Cotton-picking is done thrice over by women and children, who get about an anna a day. Twelve will pick an acre, so that the cost of picking is Rs. 2-4. Cotton cleaning is generally done for Rs. 1 per maund of clean cotton. Formerly the cleaner took the cotton seed as his share, but now it is much more valuable than his wage. The total expense of reaping, including picking and cleaning cotton, is therefore Rs. 19. But as a general rule the cultivator's family would pick and clean the cotton without using laborers.

Village Servants.—These differ very much in different parts of the district. On the whole the general payment is six *kooroos* each to putwaree, kotwar, carpenter, blacksmith, barber, and washerman, and four *kooroos* to the chumar. Total, 40 *kooroos*, or Rs. 20.

Cattle Food.—The cultivator who owns four bullocks has on an average two or three cows, two or three calves, and a buffalo also. He makes the whole over to a herdsman, who, as the herd is not large, need not be full-grown, and will receive about three *kucha manis* of wheat, or Rs. 36, for the year. The bullocks will get half a seer of *usi* or *teora* a day for two months, about half a seer of salt each for four months, and an eighth of a seer for each of the remaining eight months, the cost of all which will be about Rs. 11. They will get the hay of four acres, the grazing on four acres, the *bhoosa* of nineteen and a half, the *kurbi* of two acres, and the cotton seed of one, and it will not be necessary to buy any more fodder for them. Half the acre of *teora* will be pulled up and given them green, the other half will be allowed to ripen.

To sum up, the total expenditure on these eight heads will be Rs. 175.

For the produce, I reckon five-and-a-half fold of the wheat sown to reach the cultivator—a half being lost in treading out, or falling to the gleaners. The other produce I reckon at the rates given in the preceding table of crops. For the *kurbi bhoosa*, and cotton-seed I allow nothing, as they are all consumed at home, and not sold:—

Crop	Acres.	Produce per acre.	Total Produce	Rate per *kucha mani*	Value
				Rs.	Rs. A
Wheat	15	1 *kucha mani* and 3½ *kooroos*, or 5½ *maunds*.	17 *manis* and 4½ *kooroos*.	12	206 4
Gram ...	2	1 *kucha mani* and 4 *kooroos*.	2 *manis* and 22 *kooroos*.	10	29 3
Ulsi ...	1	20 *kooroos*.	20 *kooroos*.	16	13 5
Teora ...	½	2 *kucha manis* and 2 *kooroos*.	1 *mani* and 1 *kooroo*.	8	8 5
Masoor...	1	1 *kucha mani* and 16 *kooroos*.	1 *mani* and 16 *kooroos*.	9	15 0
Jowar...	2	1 *kucha mani*.	2 *manis*.	9	18 0
Tilli.....	2	½ *kucha mani*.	1 *mani*.	19	19 0
Cotton...	1	½ maund.	½ maund.	20	10 0
				per maund	
	24½				319 1

The net profits of the cultivator, after deducting all agricultural expenses, are therefore Rs. 144, or his working expenses are 55 per cent. of his gross receipts. The rent of the land at the average rate of Rs. 1-4-0 per acre will be Rs. 31-4-0, or about one-tenth of the produce, leaving the cultivator Rs. 112-12-0 as his net profit.

Other cases.

I have put here nearly the least favorable case I could give, suitable for the Hoshungabad pergunnah, supposing the cultivator to have to hire all his labor; but if he has an able-bodied wife who can help in the fields, and a son above ten years old, he need employ no herdsman, which will save him Rs. 36, and his family will weed and pick all the cotton, and help in weeding and cutting the khureef. This will save about Rs. 4, say Rs. 40 altogether, and thus the total expenditure will be Rs. 135 only, and the profits Rs. 184. Besides this, the cultivator makes profits from his calves, and his buffalos' *ghee*. If, however, I had taken Hurda as my example, the produce would have been one-fold larger, and the cost of weeding less by about Rs. 10. This would make the net profits Rs. 214, instead of Rs. 184, and this would be about the most favorable case the district could supply. If, again, the cultivator has no khureef lands, and only twenty acres of rubbee, his expenses are diminished by Rs. 28, and his returns by Rs. 57, leaving as net profits Rs. 116. If the cultivator has enough land for two ploughs, and employs a ploughman all the year round, he has to pay him five *kucha manis* of wheat and gram, or Rs. 60. But the herdsman, who receives Rs. 36 altogether, need only be paid Rs. 12 more, and something will be saved in the watching and weeding, so that the extra expense is about Rs. 30, and the net profit on the second plough, if it cover twenty-five acres, Rs. 115; if twenty acres, Rs. 86. The same estimate of profit applies to the zemindar's seer.

Table of expense and produce per acre.

I append here a statement of expenditure and return per acre for each of the most important crops, drawn up on the plan contained in Mr. Hume's valuable Cotton Report of the 12th September, 1864, a copy of which I also append for the sake of comparison. It is, however, very difficult indeed to be accurate in estimating for such small quantities. Watching, for instance, costs as much for one acre as for three if the field be only one acre in size: it is therefore necessary to estimate one-third of the pay of the watcher. But this does not correctly represent what the expense would be if any one experimented on a field of one acre. There is always a gain in large areas, whether in fencing, ploughing, or watching them; and therefore the preceding statement, which shows the way in which hundreds of ploughs do actually divide and manage their lands, seems to me more satisfactory than the one which follows this para.

(To be Continued).

IMPROVEMENTS IN INDIAN AGRICULTURE.

THE COTTON BOLE WORM

THE Secretary of the Agri-Horticultural Society read a letter from Mr. G. H. Kearney, of Bholee indigo concern, Etawah district, dated 27th January 1871:—

The cotton bole worm that attacks New Orleans cotton most particularly is an animal so destructive to the interest of the cotton grower, that I simply place the result of my experience at the disposal of those labouring in the same field, of such magnitude and interest both to England and to India.

The worm is a screw-bodied white one, with an awl-shaped head, and his practice is to steal up from the root of the cotton plant to the pod or bole, and getting a leverage from the calyx or leaves that surround the bottom of the bole or pod for his body, he bores a hole, making a snug retreat supplied with food for himself, leaving no cotton for the laborer "Homo."

After many varied trials, results being allured, I trust it must now be acknowledged that the animal is simply out-manœuvred, for by removing the leaves that gives his body leverage, he can only stay a short time on the pod or bole, and falling off, he tries again and again with no better results, and as a consequence dies from starvation and want of shelter.

It must be borne in mind that the bole worm does not present himself every year, and so the removal of the leaves at the bottom of the pod should only be when some of the worms have appeared.

The removal of the leaves—to out-wit this little destroyer of human labor—would not exceed one rupee per acre, for children could easily do it as also women.—*Agri-Horticultural Society's Proceedings.*

ASSAM COTTON.

MAJOR POLLOCK writes thus regarding this cotton:—I sent you down a few days ago a small parcel containing some pods of cotton I picked out of a field, of the stalks near Tikri Kella, pergunnah Michpara, and belonging to the Luckenpore Rajah, near Goalparah. They struck me as being very fine ones, so I send them, but as my experience regarding cotton culture is *nil*, I may be altogether wrong.

Mr. J. M. Ross (a member of the committee) offers the following remarks regarding this cotton:—

I have heard a good deal about this Assam cotton, but have never before seen it in the pod. The quantity of cotton in a pod exceeds that of almost any other quality of which I am acquainted, except occasional selected pods, which I presume these are not. The cotton is harsh, and staple of the shortest, but from the strength of the fibre and its really good color I [illegible] an article of some value. It would probably sell lower than any cotton imported into great Britain on account of its inferior staple, but I think, in the present state of the home market, it would be worth 5d. to 5½d. per lb. if well ginned and freed from

stained cotton; or say ½ to ¾ per lb., below "Fair Bengal." It is of a quality which would find ready sale here, at probably Rs. 15 to 14-8 per bazaar maund.—*Id.*

LIEUT. POGSON'S EXPERIMENTS ON POTATOES.

The following letter from Lt. J. F. Pogson, suggesting the introduction of new varieties of potatoes into the hills to replace the present worn out stock were read at the meeting of the Horticultural Society :—

I am sorry to report that this year's Mahasoo (Simla) potatoes are more or less diseased. Though fine to look at, when boiled the inside shews green and dark spots, and are quite unfit to eat.

I fear that unless some active measures are taken this year, that next October's crop will be a perfect failure, and then the European troops will suffer much inconvenience from want of this valuable tuber. I believe General Tapp introduced the potatoe into these hills some 35 years ago, and the crops having been raised year after year from the same seed, generally grown in the same field, has at last degenerated.

The bunneahs have managed to get this (potatoe) cultivation almost entirely into their own hands, and as not one of them would expend a sixpence for fresh, sound seed, the destruction of the potatoe crop becomes a mere question of time. Carter and Co., of London, have introduced some very superior, and one splendid variety of potatoe into England. But as yet I do not think any of them have been sent to India.

Agreed, on the recommendation of the Council, that a sum not exceeding Rs. 200 be disbursed for the purchase and despatch of the best descriptions of potatoes procurable from the Hooghly district.—*Id.*

WHEAT.

SELECTION.

Read the following letter from Mr. J. H. Bridgman of Nowra, Gorruckpore, dated 21st February, on the above subject (Mr. Robertson's communication was submitted at the Monthly Meeting in May last, and Mr. Bridgman's previous letter in the following meeting in June).

I take the opportunity afforded by the remittance of my subscription to give you what information I can about my experiments in the cultivation of wheat. The little packet of Mr. Robertson's wheat which you were good enough to send me, came to grief in an unexpected manner. I left it unopened on my library table, while a little tin box was being made in which to keep it free from damp. A day or two afterwards I perceived that a little hole had been made in one end of the packet, and all the seeds extracted. It was evidently the work of a mouse, and was the first indication I received that there was a mouse in the house; I lost therefore the opportunity of trying what result could be obtained, from sowing Mr. Robertson's improved grain. With respect to my selected ears of wheat, measuring from 3¼ to 4¼ inches long, I think I may venture to hope that a great success has attended the experiment. The seeds were purposely sown in quite a medium soil, with little manure, my object being to obtain a variety which owed its increased length of ear to nature only, and not to high culture. They were sown with the spade, and unfortunately in consequence sown too deeply, by which a great deal of the plant was lost; but of those plants which have come up, I find all the ears of the same unusal length as those of the parent grain. Some indeed are long. I find a few which measure 4¾ inch in length, which is ½ an inch longer than any which I selected. I find it difficult to conclude that this can be the result of accident rather than selection. At any rate it affords encouragement to go on with the same course of experiment.

You referred in one of your letters to my own and Mr. Hall's efforts to obtain a better kind of wheat many years ago. The most promising among a great variety of seed which you then sent me, was that bearing the name of "Polish wheat." The grain was hard, but of singular length. I cultivated it successfully, and obtained a large store of it, which I proposed distributing among my tenants. Unhappily an assistant in my employment, acting in my absence under some strange misapprehension of orders, sold the whole of it in the bazaar without leaving a single grain. But I find that though this happened some 24 years ago, the wheat has not been forgotten, for a native zemindar inquired for it last year, describing it with so much exactness that it could not be mistaken. He was very desirous of getting some of it to sow. If it can be procured, I should be very glad to renew the attempt to propagate it.

Resolved, that a small quantity of the "Polish wheat" referred to by Mr. Bridgman, be imported for next season's sowing.—*Agri-Horticultural Society's Proceedings.*

SAFFLOWER.

The fancy prices which safflower fetched last season induced growers to cultivate very largely this year. The prospect of out-turn has been unusually promising hitherto. Late rains have, however, damaged the crops, and the quality produced is inferior to the average of previous years. We have personally visited some of the safflower-growing localities, and observed that the quantity of flower already plucked and formed into cakes is partially discoloured, the continued rains preventing it from drying in time. Flower which has blossomed is stunted and yellow in the plant, and that which has not yet blossomed will, it is feared, do so prematurely, yielding inferior quality.—*Bengal Times.*

To the Editor of the "Daily Examiner."

Sir,—Your paper of the 15th instant has a short account of safflower crop of the coming season, and I see that in some points I am obliged to contradict the opinion of the writer to ward off the misconception from the minds of the safflower buyers.

It is true, as the Editor of the *Bengal Times* says, that the fancy prices which safflower fetched last season induced the growers to cultivate very largely this time; but the out-turn, owing to more lands under this cultivation and the recent rain that fell here, will be very large. It is the opinion of many that the produce of genuine flower will be much greater than last year, but the deficiency of the previous year was compensated by admixture of *sand* and other ingredients.

The people of the safflower-growing districts, fearing the out-turn of the genuine flower to be very large, reduced the fraud which they practised in previous years (*i.e.*, adulteration). The writer also says that late rain has damaged the crop, and that the quality of this season's produce will be inferior; it is not so, but the cakes which were manufactured during the rainy days and which are not well dried up, will only be rotten in the inside. It has also been said by the same gentleman, that the flower already plucked and formed into cakes is partially discoloured; I think that gentleman has seen the flowers which was caked in the rainy days, for the colour of this article entirely depends on trampling and washing with river water. It is the conjecture of almost all the safflower dealers of this side that the market prices of this season will not be discouraging or dangerous.

A Dacca Safflower Merchant.

Dacca, 17th March 1871.

TOBACCO.

DIRECTIONS FOR GROWING TOBACCO.

From Lieut.-Colonel E. Boddam, on Special Duty, Mysore Commission, to the Officiating Secretary to the Chief Commissioner of Mysore.

Among other points connected with the agriculture of the districts I passed through in December last, I noticed the indifferent culture and inferior kind of tobacco grown. Tobacco is in great demand in the European market, especially since the outbreak of the war. The Government are, I believe, desirous of encouraging tobacco growing in India, and there is no apparent reason why we should not have good tobacco in the Mysore country in the cold season: it requires careful culture and irrigation which could be supplied by wells. The Madras Horticultural Society sometime ago republished in its proceedings directions for its growth extracted from Porter's *Tropical Agriculturist*, a now somewhat scarce book;—these directions I append to my letter. I would suggest that good kinds of tobacco seed (Havanna and Sheraz) be procured through the Government of India, and from the Northern Division of the Madras Presidency through the Madras Agri-Horticultural Society for distribution, with these directions, to the amildars. The best kind of tobacco that I saw in my travels was grown at Kanakanahalli, in the town itself.

Directions for growing Tobacco as practised in Virginia.

The soil best suited for the plant is a rich open alluvial, and before planting it should be broken up into a fine tilth. The mould is then drawn into little hillocks arranged in lines, usually 4 feet apart one way and 3 feet the other. (In this country 3 feet by 2 feet would be quite sufficient intervals between the lines, and the propriety of raising hillocks on which to plant the seedlings seems doubtful as they would be apt to suffer from drought.) The seeds are sown in beds manured with the ashes of brushwood, straw, or dried weeds, and each bed is surrounded with a strip of mustard, which being more attractive to insects than the tobacco, prevents their attacking the young plants of the latter. In about a month the seedlings will be fit for transplanting, and they are known to be ready for lifting when the fourth leaf has sprouted and the fifth is just appearing. Rainy weather is best suited for the operation, and

the seedlings must be carefully raised from the beds, so as not to injure the tender roots.

When lifted they are at once conveyed to the field in which they are to grow, and planted by making holes in the ground with a finger or dibble, inserting a plant in each hole and then pressing the earth round the root with the hands. Great care must be taken not to injure the leaves, as they are at this stage extremely tender, and if injured the plant is likely to die. After planting, tobacco husbandry calls for continual labor in weeding, stirring up the soil and earthing up the plants, and these labors must be persisted in through the whole growth of the crop. When the plants shew signs of coming into flower, the flower branches must be pinched off with the finger and thumb nail, as flowering reduces the size, and impairs the quality of the leaves. In lopping in this way, some judgment requires to be exercised as to the height at which the stem is pinched off. In Virginia so much is removed as to leave only from five to nine leaves on the plant, according to the quality of the soil, as it has been found that in general the fewer the number of leaves left the greater will be the strength of the tobacco. Another kind of pruning is also called for. In the axils of the leaves and about the roots, shoots continually appear, and must be pinched off, for if allowed to grow they injure the quality of the tobacco. It is somewhat difficult to determine the time at which the plants should be cut down. When ripe the leaves change their color to a yellowish green, putting on what may be called a mellow appearance, and the web of the leaf appears more prominent and somewhat thickened in its substance. As all the plants in a field do not arrive at maturity together they are cut in succession as they become ready for curing. The proper time for cutting requires to be selected with great judgment, as if tobacco be cut before it is ripe it never has a good color, and is apt to rot when packed in hogsheads. The stems are cut across near the ground with a strong sharp knife, and if thick are divided down the centre nearly to the extremity. The splitting of the stems permits of the freer action of the air and the escape of moisture. When cut they are laid in regular order on the spots where they grow, with the end of the leaves all pointing in one direction. They are then collected and carried to the curing house or barn. This consists of a roof supported on pillars 12 feet high from the ground to the eaves, and partially open at the sides, so as to allow free circulation of the air. The interior of the barn is occupied by horizontal poles stretching across the building in a parallel direction, and 4 feet apart from each other. These poles are connected when the house is occupied by cross pieces called tobacco-sticks, on which the leaves are hung The plant then must be conveyed to the curing house, as soon as the leaves are sufficiently pliant to bear handling. If taken in when newly cut, they get broken and damaged. The operation of hanging is then performed by suspending the plants upon sticks with the points of the leaves downwards, hanging them either on the stalk of the lowest leaf, or by the slit in the stem already mentioned. Each plant is placed so as to hang 4 or 5 inches apart from its neighbour. The agency of the atmosphere is principally relied on for curing the tobacco, and in this country artificial heat could never be required. When the curing has proceeded to a sufficient extent the tobacco is said to be in case, an effect generally produced in four or five weeks from the time of hanging. The method of ascertaining whether this point has been attained is to stretch the leaves gently over the ends of the fingers and the knuckles, and if in good case the leaves will be found elastic and tough and slightly covered with moisture. After this the first rainy day is chosen for taking down the leaves, and stripping them from the stalks. The lower or ground leaves being often soiled and torn, are separated from the rest, while of those produced higher on the stalk some are inferior to others, and the whole are therefore distributed into three heaps. When the operation has been effected a number of leaves are tied together, each little bundle being a little thicker than a man's thumb at the end where it is tied. The bundles are then thrown together in heaps on a wooden platform, where they undergo the process of sweating. This amounts to a slight degree of fermentation, and care must be taken by exposure to the air, to prevent this from going too far. On this point experience must be the only guide. The leaves when properly sweated will once more shew an elastic quality when stretched, and are then in case for packing for shipment. The tobacco is packed in Virginia in casks, 4 feet deep by 32 inches diameter at the heads, and each hogshead will, if properly packed, contain from 950 to 1,000 lb. weight of tobacco. In proceeding to pack, the little bundles are arranged one by one parallel to each other across the hogshead, their points all in the same direction. The next course is reversed, the points being in the opposite direction to that of the first layer. When the cask is about one-fourth full the layers are pressed down by a powerful lever, until compressed into the thickness of 3 inches, and the pressure is kept up until the tobacco will retain its position when the weight is withdrawn. Fresh layers are then added and pressed in the same way till the cask is full.

RICE CULTIVATION.

ACCLIMATIZATION OF CAROLINA PADDY IN THE SOONDERBUNDS.

(Agri-Horticultural Society's Proceedings.)

READ the following report by Mr. A. M. B. Nicholetts, on Carolina paddy sown in Haulgatchyea. Lot No. 109, and submitted a basket-full as a specimen of the produce :—

This paddy, so well known both in America and England, has hitherto defied the efforts of the zemindars to cultivate to any extent.

The present sample is raised from five maunds of seed imported from England by the Agricultural Society, and purchased by the exhibitor at Rupees 20 per maund.

The first experiment was tried in or about the month of July 1868, germination taking place in 12 days. Only two maunds of the five, however, germinated, the yield consequently being small.

In 1869 the germination from the result of the preceding year took seven days, and the crop was an average one.

The next year, however, was very successful, inasmuch that the germination took place in three days. The amount sown was 350 beegahs, and the crop about 2,400 maunds, a sample of which is the same now before the Board.

The exhibitor feels certain that it is a staple that will repay any expense which Government may feel inclined to incur by supporting the grower. He therefore presents it before the Board for sale, at any price they may think fit to offer, as he can, by the Government supporting him, introduce the growth of this valuable commodity throughout the Soonderbunds, and thus greatly benefit the agricultural interests of India.

CAROLINA PADDY IN ASSAM AND MIDNAPORE.

The following report from Mr. Richard Rowe, dated from Debroghur, Assam, 23rd January, was read before the Agri-Horticultural Society's meeting.

I have much pleasure in sending you the report on Carolina paddy asked for in your letter of the 30th November. I was not able to do so at the time I received your letter, as the paddy was still in the ground, and was not cut and gathered till the end of December.

I received the seed late in June, about 20 seers was put into a nursery early in July, and transplanted in August over about a beegah of land. It came exceedingly well, being much stronger in the stalk, and growing more luxuriantly than the Assam paddy alongside of it, which had been put out a month or six weeks before; some which was transplanted at the same time failed entirely.

The yield was about 5½ maunds at the rate of 11 maunds per beegah; the villagers here say they get from 5 to 7 maunds per beegah of their own paddy. This year the yield was little over 5. They say if the Carolina paddy had been sown earlier, it would have given a still larger yield (this may or may not be correct.) Those who have eaten it approve of its quality and confess that it is better than their own. From the success of this sowing, I am of opinion that the substitution of Carolina paddy for the Assam description would be of great benefit to cultivators, the yield being larger and the quality superior. I have kept nearly all the seed for sowing next season.

In connection with the above, the Secretary read the following letter from the Revenue Superintendent of Canals, Bengal, dated 8th February, which is enclosed in a communication from the Assistant Secretary to the Government of Bengal, P. W. D., Irrigation Branch, in which Colonel Stoddard enquires whether the Secretary can help Government in procuring any Carolina paddy for the purpose of cultivation.

I have the honor to bring to your notice the great favor which, in the land commanded by irrigation canals, the experiments with Carolina paddy have met with from the zemindars and cultivators.

A small amount of Carolina paddy was obtained from the collectors, and distributed some two years ago. It is so highly approved of that the yield, in both years, has been almost entirely kept for seed, and thus the area grown with this rice has each year increased.

The excellence of the rice, the largeness of the yield as compared with the ordinary kinds of rice falling under the denomination of *bealee* or *aous*, and the short time it has to remain on the ground, thus affording ample time for the cultivation of another crop within the year on the same land after the reaping of the crop, have been the chief causes of favor it has met with.

It is sown on the higher lands near the distributaries, and is generally reaped in October, having been sown in June or July. The lands are then prepared for cotton or other crops which are gathered on or on before May, when the ground is again tilled for the rice crop; canal water if available is always taken for the irrigation of this crop.

My immediate object in addressing you on this subject is to ask you to be good enough to endeavour to obtain in

from the Agri-Horticultural Society, or from other sources, a considerable supply of selected Carolina seed paddy to be forwarded to them for sale at cost price to the irrigating ryotadars and cultivators. They would, I am confident, eagerly avail themselves of it, and a considerable benefit would thus be conferred on them at no cost to Government.

Resolved, that a reference be suggested to Mr. Nicholetts, who has a quantity of seed paddy for sale according to his report published in last month's proceedings.

AGRICULTURAL STOCK—INDIA.

THE CATTLE SHOW AT NUNDIPETT.

From a very long time back it has been customary among the gowdas and ryots of the surrounding towns and villages to hold an annual cattle fair at the village of Nundipett for the purpose principally of cattle traffic. This fair is inaugurated with the Hindoo festival of Shivaratri. The assembly of buyers and sellers begins about two or three days after the festival days and continues on an average for about ten days. During this period the traffic is carried on pretty briskly, the principal buyers being reddies and ryots from the Bellary and Cuddapah Zillahs; whilst dealers and breeders from Oossoor, Chittledroog, Toomkoor, &c., make this a resort for obtaining good working animals as well as bulls for breeding purposes. The number of cattle brought to this fair has averaged 10,000 ; in some years as many as 15,000 animals have been brought, and it is really surprising to see the droves that come in.

Advantage was taken of this annual fair by the Mysore Government to offer a number of prizes for various classes of cattle, horses as well as bullocks; and for this purpose it was notified for the past few months in all the adjacent villages and throughout the talooks that prizes varying from 5 to 30 Rs. would be awarded, and a good competition—to judge from the numerous animals that are usually brought—was anticipated.

But people could not quite bring themselves to see that money prizes would be given for a good pair of bullocks, or a cow, without an ulterior object on the part of the *Sircar*, and being rather dubious over the whole affair, the poor simpletons swallowed a report that was circulated to the effect that the *Sircar* intended these prizes as baits to tempt and allure the ryots with their cattle, and seize all the animals without payment. There can be no doubt that this impression got abroad and spread very quickly for some of those who had brought cattle to the fair took steps to leave by night, and on the day on which prizes were awarded (20th) not more than 600 cattle of all kinds were shown for competition. It was indeed a very great pity that such an erroneous idea had got abroad, for after the prizes had been really given out and the people saw and understood that no injury was intended to their property, then they began to flock in from all sides, and by Wednesday, the 22nd, more than 8,000 head of cattle had been headed. Among them were some very superior pairs of bullocks, and prices were being asked as far as 700 Rs. Good working pairs were to be had at 200 Rs., and the Commissariat purchased a lot at about this average. Several strings of bullocks were purchased by the cultivators in the Seerah and border talooks of the Bellary Zillah. Five prizes fell to competitors from the Bangaloro district, Mr. H. VanIngen taking the first prize for "the best full grown Mysore breed mare." The remaining prizes, about 17 in number, fell to the Kolar district.

There can be no doubt that the continuation of this Annual Prize Show will tend materially to maintain a superior description of cattle, by inciting breeders to competitions, but it should be borne in mind that unless strict attention is paid to the kind of steers that are kept for breeding, and unless Government aid and assist in the introduction of first class animals for this special purpose, very little improvement will ever be effected.

Much praise is due to Mr. Krishniengar and Mr. Mahomed Ali for the arrangements that were made and carried out for the show, and their exertions deserved a better return from the district people. The prizes were awarded by a committee composed of Capt. T. Clarke, Col. Boddam, and four gowdas. Among the visitors to the Cattle Show were Col. Moore, Capt. Stewart and Shafto, A.D.C., Mr. Ricketts, Mr.E. Christ ianand Mr. S. Arathoon, &c., &c.

HORSES FOR INDIA.

The following paper by Mr. Gilbert Elliot, of the Bombay Civil Service, will no doubt be read with interest :—

To the Right Honorable Earl Mayo, Viceroy and Governor General of India.

My Lord,—In obedience to a desire of your Lordship to have my opinion of Australian capabilities to furnish remounts for British Government, I have the honour to lay before you this the result of my enquiries. At Melbourne I wrote the following letter to the principal colonial newspapers :—

To the Editor of the "Argus."

Sir,—Permit me to invite discussion through your columns concerning the supply of Australian horses for the Indian Governments. More than three parts bred horses are required, under five years of age, between fourteen two and fifteen hands, having feet tough, compact, concaved soled ; flat, short and solid of bone below knees and hocks, the latter lean and long ; barrel round, fair shoulders, and action. Could such animals be got at, say, £20 each ? How, where ? Could a board of two Indian officers and a "vet," moving, as occasion required, through the neighbourhood of Sydney, Melbourne, Brisbane, and elsewhere, as may be suggested, collect 2,000 horses per annum, by buying in the open market, at auction sales, from persons offering, from breeders invited by advertisement to tender mobs of horses to be inspected at places convenient to the board and sellers, where rejection would be at the discretion of the former. Then as to freight, ships could be chartered to carry horses from Sydney, Melbourne, Brisbane. But would it be necessary to ship at intermediate ports ? Could that be done ? Usually perhaps it would be better to overland selected mobs to the three principal colonial ports ! Would the total expenditure fall into figures like these ? :—

Cost of horse	£	20
Cost of shipping, including food and attendance during progress of selection		5
Freight to India		17
Food for two months' voyage, and wages of groom allowing one man for 10 to ten horses		8
Say a maximum to land a horse in Bombay, Madras, or Calcutta ...		50

If this be practicable, the Indian Governments would secure remounts useful for cavalry and artillery at the price given in the Bombay Presidency, which is a maximum of £50 for a horse, the Madras and Calcutta maximum price being £60. Export to Bombay would not be large, as that market is well and regularly supplied from the Persian Gulf, and the sound, active little Gulf Arabs do what is wanted better than Australians could do the work in an Indian climate. However, on this point it must be confessed that the Australian horses hitherto bought for Indian Governments have merely legged, flat-sided, splay-footed, under-bred spongy-boned beasts, good for-nothing anywhere, and of necessity weak and very perishable in India. This has been well ascertained. A Madras commission recently reported strongly against employment of Australian horses in that Presidency, and there, and in other parts of India, nothing short of the sort of horse I have described would be accepted. But there is a pressing want of the article. Expensive studs have altogether failed to give the Indian Government what it wants. Exportation from the Persian Gulf was stopped by the Porte six years ago, and might be again to-morrow. The Indian Empire requires as many strings for its huge bow as it can get, and I write with authority, and state that the project proposed for discussion here is being carefully considered in India. Mr. Ross (of Adelaide, I believe,) was in India some months ago, actively engaged about a scheme the details of which I am not acquainted with. I write of it subject to correction. I have heard that Mr. Ross recommended South Australia as a recruiting ground. Horses were to be bought or collected there, and overlanded to Port Darwin, where an Indian farm or depôt was to be established, the object being gradual acclimatization of horses, and curtailment of sea voyage to India. If this be Mr. Ross's plan it seems objectionable, because a depôt anywhere in Australia is unnecessary and likely to be an expensive failure, for reasons I will give if you think it advisable to do so. Acclimatization sounds practical, but is really theoretical, and, in this case, of the order "cant"; and curtailment of the voyage—an undoubted advantage—must be foregone to secure obvious facilities of markets to purchase in, of freight, and of everything else obtainable at the centres of colonial trade. I submit that the object in view will be easier of attainment by some such arrangement as I am asking about than by a fancy scheme which rests on theory. The Indian Governments should buy in the markets pretty much as other people do, and ship purchases as rapidly as is convenient ; clearly cheapness, excellence, and convenience could be best secured at the centres of trade."

This was freely discussed at Melbourne, at Sydney, and I believe at Brisbane, and the desire there is throughout the colonies to breed and sell at practicable prices really good horses for Indian purposes was apparent, as may be gathered from the following letter, which was in reply to the one I wrote to the *Melbourne Argus* :—

Sir,—There are one or two points in the letter of "Bombay Civilian," on which, with your permission, I will say a few words. First, the class of horses named are now to be obtained in Victoria in somewhat limited numbers, the reason of this being that hitherto there has been only a local demand for horses of this stamp. Indian and other large buyers will not give any such price as would prove remunerative to the breeder. The consequence is that a class of horses have been bred which are sold at prices (for unbroken) ranging from 10s. to 40s. in the open market. I am confident that were any parties directly

interested in obtaining good and serviceable horses—the present speculative buyers do not study this—to make known that a fair price would be given for a number of good horses, there would soon be no real difficulty in obtaining them in Victoria.

I am not surprised to learn that a Madras commission has reported unfavourably of the Australian horse, seeing that they necessarily have reported of the class sent to them. I maintain, Sir, that these are not a fair sample of Australian horses. I have seen horses bought and sold for exportation within the last few months that would, if compelled to keep them, be dear as a gift. Thus our horses get a bad name. I have horses now in use (bred in Victoria) which are second to nothing in the world for strength and stamina. I am not speaking unadvisedly, as I have used in their native places the English, Arab, and also the native horse of the Caucasus.

It is not the Australian horse that is at fault—it is the present defective system of buying for India. Let that be amended, and the horse would be found to be all that is expected.

I perfectly agree with "Bombay Civilian," that acclimatization is certainly of the order "cant." It is not needed, and would so add to the expense that it *would ultimately ruin any practicable scheme for the exportation of horses.* VICTORIAN.

I am with the writer of this letter in thinking that well-bred Australian horses are likely to do well in India. Certainly they work wonderfully in the tropical climates of W. Australia and Queensland; and experience of horses must assure that those of good blood rarely suffer from heat. The sort of horse we have in India from Australia is usually a soft under-bred brute, good-for-nothing anywhere, and his bad manners and poor performances have tainted the character of Australian horses, which in the main are marvellously enduring and full of work. Constantly they are ridden for days together over arid wastes, with just such food as they can crop, at the rate of fifty miles a day, and a hundred miles are ridden by Australians as most people ride twenty. When I was returning from the N. W. Coast of Tasmania, I was overtaken on the tract, which was up to my mare's hocks in mud, by three or four persons who had left a place eight miles beyond where I started from, the intervening road being so bad that I had trouble in passing it a few days before. Yet these people have travelled at night, intending to sleep at a place sixty miles from their starting place, and we were riding in torrents of rain. The Australian horse if properly selected is fit for anything. It is a bold thing to say, but I doubt if your Lordship has a horse in your stables that would carry you eighty miles with the same celerity, ease, and comfort with which an average stock horse is in the habit of taking heavy and unsparing riders, in miles and miles, day by day, up hill and down dale, rising at fallen timber faultlessly, and almost imperceptibly; and though that sort of horse has one pace, a gallop, still there are Australian horses second only to American pacers as trotters and hacks. The best blood, a thoroughly congenial climate, and moderate care could only end one way. A yearling has been produced and sold in Australia for more than 1,200 guineas, which might have been expected from such importations as Fisherman at a cost of £6,000; and seeing that Marchioness, an Oakes winner, was not long ago sold near Melbourne for 3,600 guineas.

I beg your Lordship will read further on where I diverge not from the practical condition of my report. "Victorian," in stating that at present the number of suitable horses is limited, is speaking only of Victoria. But I ascertained that in N. S. Wales and Victoria, at least of 1,000 three parts bred horses adapted for Indian military wants could be collected in three months, at prices between £12 and £20 per head. I can speak very confidently on this point; because Mr. James, a manager of Cobbs's coaches, which ply all over the colonies, was a passenger with me to Melbourne, and he told me that his company had no difficulty in obtaining every year between five and seven hundred horses for the coaches, which are admirably horsed, at about £12-10 per horse. Colonial breeders also gave me information which left no doubt about getting at once as many horses of the right sort as the Indian Government would be likely to want even if a sudden and emergent demand were to occur; it would be just a question of prices which would not exceed £20. Hitherto the rubbish which has been sent to India for Government purposes has often not cost so many shillings in Australia. It is not necessary to say a word more as to the feasibility of getting horses, and good ones, too, at such rates as the Indian Governments give at the Presidencies. The question which seems to me to be of most importance is—How and where horses should be bought?

Western Australia is so situated in regard to India as to make it plain that horses, if possible, should be imported from that colony. For not only is the distance from W. Australian ports to any point of the coast of India nearly 2,000 miles less than it is from any other Australian colony, but there is a saving in time, and an avoidance of rough passages, dangerous to horses, which is of the very last importance. To be satisfied of this, it is only necessary to consult the map attached to this letter, from which it will be seen that horses shipped from ports in W. Australia, north of Geograph Bay, would not have to pass the whole length of the S. Australian coast and round the Lewin, which is as notorious for heavy weather as the "still vexed Bermoothes;" nor would the dangers and delays of Torres Straits have to be faced, which might happen in case of vessels from the eastern ports. Ships leaving W. Australia between the months of September and April would be blown to India by the S. E. Trades in thirty days, and would reach it at convenient seasons and so as to avoid the monsoons. Cargoes would be carried by this soil and easy route without those tremendous risks of loss which make colonial exporters so chary of sending horses viâ the Lewin. The delay and heavy weather so fatal to shipments occurs, in rounding those *Infames scopulos Acroceraunia*, and in passing along the *inhospitabilem Caucasum* of 1,600 miles of the South coast of Australia, all of which would be avoided by getting a supply from W. Australian ports. There is but one condition, and I must confess it is very important in which W. Australia may at present be wanting to render it, what it ought to be the depôt from which suitable horses for India could be obtained with greater ease than from *anywhere else*. There are not many suitable horses there; I doubt whether more than five hundred could be got in a year. But perhaps that number would suffice to begin with, and if the inducement of a regular supply were offered to W. Australian breeders they would within four years get together an ample stock to select from. I was told by persons of experience that there is no part of Australia better adapted for horse-breeding than W. Australia, and they have very good blood there. Knight of Avenel was, I remember, heavily backed to win the Derby in Flying Dutchman's year, and he is still covering in W. Australia, his stock being highly spoken of. I had a long conversation with Mr. Harry Prinsep, of Prinsep Park, near Bunbury, on the coast a little north of Geograph Bay, and he assured me that he would have no difficulty in supplying horses which would be useful in India; and although I must condemn a scheme he has proposed for overlanding horses to W. Australia from S. Australia, because Mr. Forest has just explored the route and found it to be utterly impracticable from want of water, as Mr. Eyre did before him, still I cannot see that affects the W. Australian supply more than momentarily At first there would be a difficulty in getting more than a few hundred horses, which, however, I take it would be all that would be asked for. In a few years a small but steady demand would create a large supply.

I venture to recommend that a few shipments of horses be invited by the Indian Governments from W. Australia. The sort of horse wanted might be specified, and the Government rates, viz., £50 at Bombay, and £60 at Madras and Calcutta promised for all sound and healthy horses landed and coming within the specifications. On these terms, which seem fair to both sides, there would be no difficulty in getting horses sent. But if preferred, a Government agent could buy in W. Australia, and the horses would be landed in India at nearly this cost:—

	£	s.
Unbroken horse	15	2
Driving to a W Australian port.		0
Shipping expenses ...		0
Groom's wages and voyage, allowing one groom for ten horses	1	0
Groom's passage at £5 ...	0	10
Six Gallons of water per diem	0	0
Sundries	0	13
Insurance on £30	0	12
Freights	£10 to 17	0
Add provisions for 60 days, being 5 lbs. grain, 3 lbs. chaff, and 18 lbs. hay per diem	4	10
Maximum cost of getting a horse from W. Australia to India	£41	5

Forty-five pounds per horse would cover all risks, and be £15 cheaper than the cost at which a horse is usually delivered from the other colonies. I believe that to get remounts from W. Australia is thoroughly practicable; and that completely suitable horses could be obtained in such numbers as to render the Indian Governments independent of a supply from elsewhere.

Of course such a proposal would be met by screams from the other colonies, who would call it impossible, and abuse W. Australian horses, but this is just what might be expected, and no more. I am no advocate for taking the Australian horse to the exclusion of horses imported from the Persian Gulf. I know how well adapted those active, hardy, docile little creatures are for military purposes. But the creation of another market at the easily accessible ports of W. Australia is of undoubted importance, as constituting a useful second string for the Indian bow, and I claim for this suggestion complete practicability. I would have it worked out tentatively, slowly at first, and by the people concerned in importing, who would readily avail themselves of a promise to take a specified horse at the Government rates, and would forthwith set on foot arrangements by which a steady and increasing demand could be adequately met. To bring this about it would be essentially necessary to assure traders and exporters that the demand would be steady. The fluctuating character of the Indian horse trade is very much complained of in the colonies. They say there: "If the Indian Governments will let us know what they want, we can provide for them, otherwise it is not worth while to breed good three-parts bred horses on the scale

I trust Government will not listen to such schemes as I have heard a Mr. Ross, of South Australia, propose. To buy horses at all in S. Australia would be injudicious. The blood there is not good. S. Australia is rather a corn and wine-growing country than one in which horses are bred. As to overlanding from S. Australia to Port Darwin, and the establishment of a stud farm there, the proposal is preposterous. The whole continent would have to be marched across, and a stud farm at Port Darwin, if not altogether a chimera, might end in a sham, and a grievously expensive one for India. The W. Australian ports have the same advantage of shortness of time consumed in voyage which shipments from Port Darwin would have; and freight can be obtained in W. Australia which certainly would not be the case at Port Darwin, which is a very infant settlement, with perhaps one ship visiting it in a year. I can assure your Lordship that the proposal was much laughed at in Australia. It seems to me that the most practical solution of the question I have considered is to try importation from W. Australia. In making this suggestion I wish to be understood that the other colonies are at present better able to furnish horses; but the greater length and difficulty of voyage from them is a circumstance so much against them, and in favor of W. Australia, as to render that colony obviously the market from which India should get horses,—I have the honor to be, &c.,

GILBERT ELLIOT,
Bombay Civil Service.

—*Bombay Gazette.*

AUSTRALIAN HORSES FOR INDIA.

To the Editor of the "Bombay Gazette."

SIR,—I note in your columns a report said to be laid before the Governor-General of India by Mr. Gilbert Elliot, on the capabilities of Australia furnishing horses for India, and as I have long studied this question in all its different bearings, and have myself been an importer, I trust you will allow me space for a few remarks thereon. The report is a long one, and my remarks therefore are also lengthy.

First, then, as to whether two officers and a veterinary moving as occasion required could purchase at £20 a-head; and I say at once *yes*; but others would do it for half the money without the cost of the officers to Government. Nor would the veterinary be able to examine wild unbroken colts. They can hardly do it now *after* the voyage. And I need only adduce the trial Government gave *that* plan during the mutiny, when poor Colonel Robins, the then Government Remount Agent, brought himself to grief, and made the fortune of two grasping speculators handing to Government in exchange a lot of horses, half of which were worse than those cast (out of 200 sent us on one occasion for remounts, 98 were at once rejected.) Then, again, as to his summary of prices, he is woefully wrong in the second item. You can easily get horses driven by stockman 200 to 300 miles for 5s. a-head and less; if a large number, to the receiving paddocks, where the charge would be 2s. a month for grazing, and I know I could contract with one of the best breakers to break these thoroughly quiet to saddle at £1 per head, and saddle and harness at 30s.; this gives a much better chance to the horse on board.

The summary would thus stand :—

Cost of horse, say (and he can be got for that)	£	15	0 0
Cost of paddock three months 6s., shipping 6s., attendance 10s. ...	,,	1	2 0
Freight to India, say, average	,,	14	0 0
Food and groom, say...	,,	6	10 0
Maxmium with sundries, say, £38..	,,	36	12 0

delivered in Bombay, which is always the dearest market as to freight; and there will remain to add to this, medicine for each ship, say £20, and the risk to the shipper of deaths. Mr. Elliot is therefore quite right in saying Government can get whatever quantity of horses they require of the right stamp, allowing for a profit to the shipper, for less than the Government estimate, if they go the right way to work. Again, Mr. Elliot errs when he says Australians are spongy-boned useless horses. From my own experience of them in India during the mutiny I speak, and I say we found them superior to country Stud, Cape or Arab bred horses. I speak of a similar class to what comes up now. Mr. Elliott says a Madras Commission reported lately against employing Australian horses, and yet only recently I myself took ten, a fair average sample of a shipment, to a large cavalry station in the Madras Presidency, and they were passed by many old experienced cavalry officers and veterinarians as far superior to anything they ever had sent, as a rule for *officers' chargers*, far less *simple remounts*, and yet these same horses in *this* Presidency were said by the Remount Agent, to whom they were all offered, to be useless and coarse. In the Madras Presidency they had the advantage of having landed a couple of months and of being trimmed up a little. (This makes all the difference, all men, though good judges otherwise, have not the gift of seeing what a horse will make into.) They are now being used as officers' chargers, and much envied are the possessors. I mention this to show how men differ in their opinion of horse-flesh, and how difficult to buy for one man, and hence how much better the home system of allowing commanding officers of regiments to purchase each for his own corps, thus obtaining uniformity in make, size, and colour.

We now come to studs, and Mr. Elliot is correct in saying they have utterly failed. Why? because they have been conducted on so expensive a scale and with so numerous a staff; but I feel confident that studs could be established in India by Government or private enterprise on the Australian principle, whereas good horses could be bred *at less cost* and with a much fairer chance of coming to maturity *fit*. They would have feed and water all the year round; no four months' cold, bleak, wet weather; no three months' semi-starvation and want of water, as the Australians would. They would be more familiarised with man, and therefore lose the character they now bear of intractability, and they would go to their work, when wanted, acclimatized—and a country unlimited in size fit for such a purpose could be easily obtained from, or thus utilized by the enterprising Sir Salar Jung, at little cost.

Good entries cost money all know. Well bred roomy mares in plenty can be had in Australia for such a purpose, and could be landed at Vizagapatam and driven, as in Australia, to the ground selected and prepared for them by fencing or even without it Grass sufficient during the season could be cut for them and stored to help them over the very hot weather, and water is abundant. Would they get this in Australia? We come now to where in Australia would it be best to purchase for such a purpose, and to any one knowing Australia well it scarce requires consideration. "New South Wales," I speak as a "Victorian," and knowing *all* the colonies, therefore unprejudiced. The New South Wales horses are a cleaner, larged-boned horse and fitter for the purpose, as a rule, and Victoria and all the colonies have had to acknowledge it. The West Australian horses are, on the contrary, generally acknowledged to bear the palm the other way. Witness the two cargoes landed here. Well, this compensates for the difference of 2,000 miles in distance a matter of a week at most. No; once on board, a few days more or less, if properly fed and attended, are nothing. I would submit also that Government if they would contract with one or two men to supply them a certain number of horses yearly, could easily get them at two or three years old, and they could run them, as in Australia, at little cost, for one or even two years, and thus have them in condition to go to work, and that thoroughly acclimatized, and there is no reason why they should be handled and broken in that time.

In conclusion, I may say Mr. Elliot's remark about Mr. Ross (viz., "preposterous") would equally apply to his West Australian scheme, as he would soon discover. Only lately double freight was offered for ships to go north of Geograph Bay, not for live stock even, and neither that nor any other inducement could persuade any captain to accept freights. Again, there is only one season in the year when ships could load, and that a short one north of Geograph Bay, and even then you would be necessitated to put them aboard in lighters, and any one knows what that risk is. Government's cheapest way would be to contract for a certain class of horse to be passed by one man in each Presidency (whose style of horse could be easily ascertained), or much better by commanding officers of regiments, and to take them off the contractor's hands immediately after arrival and to establish a depôt to receive them in on landing, thus saving the contracting parties expense of long feeding and the heavy item of Rs. 34 per head they now have to pay for commission, and I have no hesitation in saying that they will then get what they want for £45 per head. I myself would gladly contract for a given number yearly for three years, finding ample security to fulfil it at that rate. I shall be glad to enter into any discussion with Mr. Elliot, and to forward him my address (should he apply to you for it). He is the first man almost in India of late years who has given the Australian horse (I don't mean weed) his due, and had he liked he might, I think, have added: "If kindly treated or broken, especially after being bred on farms or near homesteads, they are quite as docile, if not more so than the Arab of the present day."—I am, &c.,

Bombay, 22nd February. STOCKWHIP.

The Foresters' Gazette.

CALCUTTA, 15TH APRIL, 1871.

FUEL RESERVES.

THE Conservator of Forests has furnished some information to Government, regarding the reserves at Walyar and Thellay. The Walyar reserve, consisting of 963 acres, was first formed in March 1860. The greater portion of the land belonged to Government, but 246½ acres were purchased at a cost of Rs. 1,280. It is situated close to the north of the railway line near Walyar,

and is bounded on the north by a range of hills. In 1868-69 the reserve was enclosed by a trench and embankment, and in the same year 1,000 babul seedlings were planted out, which now average seven feet high. In 1869-70 12,000 tamarind seedlings were planted out, and have well established themselves. Some broadcast sowing of babul, however, failed from want of rain. This year 75,100 pits have been dug in parts of the reserve, and tamarind, babul, wild mango, and veypum (melia) seedlings have been planted out. This promises to be fairly successful, but the plants are still very young. The reserve is fairly covered with jungle in most parts, but bare in some places, and much has to be done in the way of planting. It would be difficult to estimate the yield per acre at present, or to give any information as to chances of re-production. With the exception of 685 cubic yards, cut more with a view to nursery and planting operations, and of which no exact data was entered at the time, no felling has taken place whatever. The tract contains a very great variety of trees including teak. The Thellay reserve, is too distant from the line to become a railway fuel reserve, and the Collector considers it desirable that it should be retained for the supply of the town of Vellore. If, therefore, a sufficient area can be procured nearer the line (which subject is now occupying Mr. Sheffield's attention), this tract will not form a portion of our fuel reserves. It was originally reserved as it required rest, and has not been felled in since its reservation. It has never been fenced in or demarcated.

With reference to the progress made in the formation of fuel reserves, &c., since the Government order of July last, the Conservator reports that these operations have chiefly occupied the attention of forest officers in all the ranges traversed by railways, but up to date they are scarcely more than preliminary. Colonel Morgan has explored all the jungle in the vicinity of the Mettapolliem extension, and he has mapped out what tracts it is necessary to reserve, and his report and sketch map have already been forwarded to Government. There will be no difficulty in procuring a sufficient area in the Trichinopoly district, and Lieutenant Walker is now about to take steps for mapping this out and eventually taking over what may be required. Little or no land is available in Tanjore, and it will probably be cheaper for the railway to burn coal between Negapatam and Tanjore. The Casuarina plantation supposed to exist at the former place is only a garden of two or three acres in the middle of the town and not being able of extension, and showing very poor ground. In company with the Collector of Trichinopoly, the Conservator of Forests inspected a block of land suitable for carrying out the experiment of planting on irrigable land, and which the Collector believed could be made available at a very small cost. Lieutenant Walker has been instructed to take it over. In the Tinnevelly and Madura Districts, Lieutenant Walker has examined the country along the line, and, in communication with the Revenue authorities, has selected sites for the plantations and reserves, and has also submitted a report and sketch map. A considerable quantity of the land selected for plantations comprises beds of tanks, and there is some doubt how far this land can be taken up. There can be no doubt that it will be an excellent plan for cheap planting, especially with reference to Babul and some of the other Acasias best suited for fuel, but at the same time it is probable that an arrangement of this nature may interfere with the grazing rights and rights to water of neighbouring villages, and it would, of course be useless to attempt to plant where cattle could not be excluded. In the Madura District 20,000 to 30,000 large sized Babul trees are to be found growing in the beds of Government tanks adjoining the line, and a similar quantity is reported as growing in the beds of private tanks, which could be leased or purchased, and it appears that these plantations could be increased to an extent that would fully meet all requirements. In the Tinnevelly District there is also much Babul already growing in tank-beds, but this is chiefly on private land, but most of this can, it appears, be purchased or leased. In Salem and Cuddapah Mr. Nisbet and Mr. Yarde have been giving their attention to selecting sites for further reserves and plantations, and Mr. Sheffield, who has assumed charge of the North Arcot Range, is similarly employed in that district.—*Madras Mail.*

THE WASTE LANDS OF THE SOONDERBUNDS.

To the Editor of the "Daily Examiner."

SIR,—It was Dean Swift who inscribed and has handed down to posterity the golden legend that "*the man who makes two blades of grass, or two ears of corn grow where but one grew before, deserves well of his country.*"

The jungle lands of the Soonderbunds now lying waste and unallotted, it is stated, represent an area of 2 millions of beegahs, the greater portion of which, at a very remote period of time, was held under cultivation, and was doubtlessly highly populated. Judging from the remains of ancient temples found on many of the lots, those lands must have contributed largely to the fabulous wealth of the Nawabs Nazim of Bengal in days long since departed. It is unfortunate, however, that the past history of the Soonderbunds has been buried in oblivion, or is shrouded in mystery, and that there is but little on record. Even during the century of occupation by the East India Company, capable of throwing a ray of light on the terrible visitations, which, it is assumed, have swept away countless souls, obliterating all traces of industry, beyond the aforesaid remains of gigantic and massively constructed temples, which have resisted alike the shocks of periodical storm waves and decaying influences of climate, and some of which, unscathed by the hand of time, stand forth at this day, grim but incontestible monuments of the wealth, industry, and superstition of races which once occupied those extensive tracts. Even tradition, the common interpreter of events, over which the dark pall of oblivion has been cast, is silent in respect to those now inhospitable regions; and it is with the view of awakening a public interest in those lands that I impose on myself the task of recording the indications of *resuscitation*, presented by the works of reclamation, which during recent years have been prosecuted in the Soonderbunds, and the measure of success which has attended labors so directed.

Saugor Island, or rather the centre island of the group bearing the generic name of Saugor, has experienced many vicissitudes during the past half century, arising mainly from periodical irruptions of the sea. The work of clearing was vigorously prosecuted during those halcyon days, when that prince of merchants, the late John Palmer, took the lead in commercial operations and stood foremost in every good and useful work, and whose name, as might have been expected, is associated with the Saugor Island enterprise. The work of reclamation and settlement, then undertaken with variable success, was at a later period carried on by Mr. Hugh Fraser (on behalf of Mr. Hunter, late Bengal Civil Service and others) including the manufacture of salt, until the disasters of the memorable year (1864) compelled a suspension of operations. The spirit of enterprise in respect to that exposed location did not, however, then die out, for the estate passed into the hands of Mr. James Kennedy and is reported to be at this present time in a flourishing condition.

The blocks to the north of the islands of Saugor have been cleared and settled. Proceeding eastward, the Mutlah is entered, and on this river the greater portion of the Port Canning Company's estates lie, but which recently have been considerably reduced in their aggregate area, by the abandonment of the following lots:—121, 122, 123, 124, 125, 126, 127, 128, and a portion of 132, representing 130,000 beegahs, owing to their southern position, coupled with the great expense necessary to be incurred, to denude them of their heavy forest growth, constructing suitable sea walls, or embankments, for their protection; digging reservoirs for fresh water, and preparing the lands, otherwise for paddy cultivation, which would call for an expenditure of over ten lacs of rupees; but those lots held by the Company in the vicinity of Port Canning are gradually being cleared and settled; some of them are so and have been classed among their revenue-yielding estates. Several private estates also lie in the vicinity of Port Canning and are gradually becoming cleared and settled; the State Railway from Canning to Calcutta offers the greatest incentive to the prosecution of the good work of reclamation by private individuals in the Soonderbunds, and if the Government of India would but take a livelier interest in the port of Canning, it would secure to the population, which is gradually being drawn to the reclaimed lands of the Soonderbunds, the many benefits and facilities which, as a natural sequence, must accrue at and radiate from that centre of attraction.

Fraser, Hill, Sturmer, Smith, Dicey, Fenn, Donohoy, Adams, Kerr, Caspersz, Kennedy, Caw, Swinhoe, Nicholetts, and several others have left the impress of their labors in the 24 Pergunnahs, Soonderbunds, and all honor be ascribed to those pioneers of jungle-taming in those uncongenial wilds, for the perseverance with which they have, with so much credit to themselves, diligently pursued the work of reclamation, and aided thereby in restoring a larger section of the waste lands in that fever-generating district, to the legitimate purposes of wholesome and beneficent cultivation. It is estimated that 1,50,000 beegahs of land in the vicinity of Canning alone are now producing paddy, and give support to a population of over 10,000 souls, and considering that 20 years ago these lands, now teeming with human life and flourishing villages, were covered with dense and almost impenetrable forests, where the occasional *barking* of a startled stag or the plash into the stream from the oozy banks of a sluggish and overgorged crocodile, alone broke the silence of their deep solitudes, the progress which has been made under innumerable difficulties and much loss of life, is the more commendable, and speaks volumes for the untiring efforts which have been directed in the consummation of so important and so laudable an undertaking. The gentlemen above stated, who stand so favorably associated with the work of reclamation in the Soonderbunds, were none of them capitalists, but were men of small means, borrowing money in some instances, while many worked out the problem by applying the proceeds of their monthly

coming to the good work of reclamation, and it is only known to those who have purchased experience in such matters, what trials had to be undertaken, what misgivings, and what obstacles had to be overcome, before settlements could be founded on those waste salt lands; the want of water, to supply not only the coolies during the lengthened period of clearing and banking, but for the use of roots for some time after the lands had been cleared, not being the least of the difficulties required to be faced and overcome. Tanks, though dug, had to be washed out for four and sometimes five successive seasons before the water could be made sufficiently wholesome for drinking purposes, and supplies had meanwhile to be drawn from a distance of many miles.

The purchase of lands in fee simple has in one sense proved a boon to grantees, as by this measure the risk of the penalty of *resumption* arising from short clearing, determined at the quinquennial inspections, is avoided; but to men of small means it presents another difficulty which cannot be lightly esteemed, *the payment of interest at the heavy rate of 10 per cent. on the unpaid portion of redemption money.* To overcome the pressure of so heavy a rate of interest several of the gentlemen interested in lands in the Soonderbunds petitioned the Lieutenant-Governor of Bengal to waive or lessen the rate of charge. The question was sent up to the Government of India, but put forward in so unfavourable a light, (see No. 3991 of 17th November 1869,) that the Governor General in Council (in his letter No. 725, of 13th December 1869) expressed his concurrence in the views of the Lieutenant-Governor, and requested that the memorialists might be informed accordingly. I repeat that not one of the persons whose names have been given as worthy of all honor for the work accomplished in the Soonderbunds *were capitalists*, and yet the Lieutenant-Governor of Bengal, in his letter No. 3991, of 17th November 1869, in the face of what has been done in the Soonderbunds by men of small means, who are the bees—the working bees of the hive—would shut out all but *purchasers with capital!* Have any capitalists come forward, I ask, to invest in the salt lands of the Soonderbunds during the last five years? Are any likely to do so in time to come? And yet the Bengal Government, ignoring facts which have presented themselves so forcibly to observation for years past, influenced the Government of India to a concurrence of opinion, I will not say by a premeditated misrepresentation of matters, but I will say by the submission of the question in a less practical form than it should have taken.

The rules which govern the sales of waste lands, moreover, are not favorable to the extension of reclamation in the Soonderbunds, inasmuch as the upset price of all waste lands has been fixed at Rs. 2-8 per acre, irrespective of the relative position of those lands, which are more or less valuable, according to the sites they occupy, and the specific characteristics which distinguished them, as high or low lands, fresh or salt lands, all of which, under the short-sighted policy of Government, *have been fixed indiscriminately at the same rate of value*; and it is not therefore surprising to find that the marshy and salt lands of the Soonderbunds, assessed at the same upset price as lands in Assam, Cachar, Darjeeling, and the sweet water lands of the Gangetic valley, should offer the least attraction to the public, covered, as they are, with a dense growth of timber, which when cut has little or no commercial value, and can scarcely be applied to any other purpose than *burning.*

From personal experience in such matters I consider that the wiser policy would be to put a fixed rate per acre on all waste lands according to their respective values; the low marshy and salt lands of the Soonderbunds taking the lowest rank, offering, as they do, the least incentive to purchase.

Travelling further eastward through interminable channels, the blocks known as the Backergunge Soonderbunds are reached. Here the waste lands present a more inviting aspect, as the forest trees are larger and more valuable than those peculiar to the western blocks; and the cleared holdings of the Messrs. Morell, and some others, are startling proofs of what industry, perseverance, and limited capital combined, can effect in altering the face of the landscape and promoting the welfare of man. Moselgunge as well as Soullergunge are on the Horringutta river, and the Government of Bengal, while opposing in every possible manner the onward progress of the Port Canning Company, has markedly rendered every assistance to the Messrs. Morell. The Messrs. Morell certainly rightly deserve the countenance and support of the Bengal Government, but every man who embarks capital in the soil is equally deserving of support and recognition. The smallest cultivator of the soil or reclaimer of land deserves well of the Government, and it would have redounded more to the honor of Sir William Grey had that support been fully accorded to all claimants rather than have been made conspicuous by isolated cases, and in respect of particular individuals only. Beyond the clearing of the Messrs. Morell, the land stretches, as the Backergunge Soonderbunds, stretches away to the eastward up to the Megna river, and here and there vast blocks are reclaimed, cleared, and settled, and rich in paddy and cattle. Little, however, appears to be known of the amount of capital which has been employed in thus partially reclaiming the lands in the Soonderbunds, and what portion of it, as regards has been irrievably lost, in the undertaking. Actual resumptions have been numerous, arising from short clearing, as well as from spontaneous abandonment of lots, from the difficulties presented in preparing them for cultivation, which in some instances had not been thought of when those lands were entered on. I nevertheless contend, that under the auspices of a Government, disposed to act liberally, the whole extent of land measuring possibly 200 miles in width and 30 and 40 miles in depth, would become cleared, cultivated, and profusely populated in the course of 20 or 25 years.

Now, with such waste lands within a few hours' journey of Calcutta, it is not reasonable to expect that every inducement and facility should be afforded by the Supreme Government to push forward the work of redemption, which could not fail to enhance materially the revenues of the State, besides improving the condition of the working classes, by reducing, through increased production, the local value of the principal staple of Bengalee life, and increasing at the same time the arena of labor, as it is estimated that the two millions of beegahs of land now lying waste in the Soonderbunds, when cleared would give space and afford occupation and support to a population of 2,00,000.

Far better to give those lands in parcels of 1,000 to 3,000 beegahs free of rent for 20 years, and then subject them to an increasing rent of half anna per beegah every tenth year, or sell them outright, in single lots, at even 4 and 8 annas per acre than allow them to remain untended and neglected.

It is reported that a Government official is now organizing an establishment for the realization of revenues from the bunkers or forest products of the Soonderbunds, if so, what becomes of the righteous plea of "*baneful monopoly*" under which those bunker rights were wrested from the Port Canning Company? Is it to be understood that the pretext, if not the exact mode of procedure, is but an illustration of the old biblical story of the vineyard of Naboth! *coveted by the king.*

Finally, with regard to the waste lands in the Soonderbunds, it should be borne in remembrance that the man who influences the production of rice where none was produced before, at least within the memory of man, or opens up any other source of remunerative industry or valuable product of the soil, in the emphatic words of my text, *deserves well of his country.*

Official Gazette.

CALCUTTA, 15TH APRIL 1871.

EXPERIMENTAL CULTIVATION OF COTTON.

From T. Login, Esq., C.E., F.R.S.E., and Member C. E. Institute, to Colonel R. Maclagan, R.E., Secretary to Government Punjab, Public Works Department. Camp Bahalgurh 21st October 1870.

SIR,—In 1864-65, while engaged in preparing a project for irrigating the Rechna, Doab, I often had long conversations about agriculture in Egypt with the Manager of the Belfast Flax Company at Sealkote, who had spent several years in Egypt, and who was well known to be an intelligent and practical farmer. From the information I thus gained, as well as from other sources, I was led to think that many practical hints for the improvement of agriculture in India might be got by a visit to that country.

In November last year I had an opportunity to do so, and what I saw and learned during my short stay I had the honor to communicate to Government in my report dated 1st January 1870, so it is not necessary now to enter into details. I need therefore only say that in carrying out the experiment here, an account of which you have asked for, I tried to follow the Egyptian plan of cotton cultivation, as described in my report, in such a manner *that the poorest cultivator in these provinces could do the same, without being put to any extra outlay over the present system in Upper India.* In fact I believe there will be rather a saving in labour by adopting the Egyptian method, as I shall try to show further on; so all that is required is a little more *care*; and the object of this report is to show how, by bestowing it, the yield of cotton may be doubled, and even quadrupled, at least if we are to judge by the results (so far as my experiment goes) here at Bahalgurh, which is 23 miles north of Delhi, on the Grand Trunk Road.

This experiment I have been all the more able to carry out by having fortunately, as sub-overseer in charge of this subdivision of the road, Zoolfikar Ali, an old experienced man, who started in life as a cultivator, and who has taken as great an interest in this experiment as myself.

I should begin by stating that Bahalgurh is situated in the "khadur" (valley) of the Jumna, that the surface soil at the place where the experiment is under trial is neither very good nor very bad, and is known by the name of "dhakur," a dirty greyish

brown colour, and has been under grass for several years, being within the compound of the road chowkee. The thickness of this upper stratum is 2½ feet, below which there is 5½ feet of stiff clay, where it is succeeded by very fine sand, and water is reached at this season at a little less than 20 feet below the surface.

The area under cultivation is 5,880 square feet, or very nearly one-eighth of an acre; and on the 23rd May last operations began by flooding the field with water to a depth of three or four inches, when it was twice ploughed two days later. On the following day it had "khat" (stable refuse) spread over it, on an average about three-fourths of an inch thick, and on the 27th it was again twice ploughed, if scratching to a depth of four inches or so can be called ploughing, after which the ground was smoothed over by having a "mirah" (a plank) dragged sideways over it.

Next day furrows, eight inches high and three feet apart, were thrown up by the "jindrah," an instrument in common use throughout the Punjab; it is simply a board a little over two feet broad, some seven inches deep and 1½ to 1¾ inch thick, with the lower edge reduced to about half an inch. To this board is attached a handle four feet long, so that it is simply a broad shovel requiring two people to work it, one holding the handle and directing it, while the assistant by a rope attached to the board at both ends, like a punkah rope to a punkah, pulls this otherwise unwieldy shovel. The furrows by this rude instrument are soon made, so that the cost of making such furrows should not exceed one rupee eight annas per acre, and it is simply in making them that there is any extra outlay on the present system of growing cotton in India, which is more than compensated afterwards by the reduction of labor and saving in seed.

After this the field should have been watered a second time by filling the spaces between the furrows or drills to a depth of four or five inches, and two days after that the seed should be sown; but owing to a mistake the seed was put into the ground the following day, May the 29th, and on 1st June, or two days after, the field was watered.

The manner in which the seed is sown was first to rub it in fresh cow-dung, and then dry it in the sun, as is always the practice here; after this small holes are made near the top of the drills at every two feet, and four or five seed are dropped into each of these holes, covering them over with earth; but when the plants have grown up a few inches, they should be thinned, and only one, the most healthy, permitted to remain.

In the simple progress above described consists all the difference between the Egyptian system of drills and the Indian broadcast method of growing cotton, which *in Egypt gives a yield averaging 500 lbs. an acre, and here in India only about one-sixth that quantity, and that of a much inferior quality.*

On the 6th and 7th of June the young plants began to show and on the latter date the first clearing of grass took place. Water was again given on the 9th and 17th as before described, care being always taken that the depth between the drills did not exceed five inches, so as not to come too near the young plants, and on the latter date the second weeding took place also.

At Bahalghur, on the 21st June, there were a few drops of rain, but on the 26th it came down in torrents and continued with little intermission for four days. By this time the young plants were from four to six inches above the ground; but this heavy rain quite submerged the field, and out of 730 groups of plants (they had not been thinned by this time) only 422 survived, that is, two-fifth of them were killed.

It was not till the 17th July I could visit this place on my tour of inspection, when I found those plants that survived averaged about 8 inches high, one as much as 16 inches; when each group of plants was thinned, only one plant left remaining, I tried to transplant those now pulled up at the spots where the former ones had been killed, but failed in every instance. As a precaution against this, however, fresh seeds were put in also which have sprung up, but being so late in the season, the yield of the latter will not be *one-tenth* of those which survived the flooding by the heavy rainfall at the end of June. With the exception of a few light showers on the 9th of July, from the 2nd of the month till the 17th, there was no rain at Bahalgurh, where on this latter date there was a smart fall, and the land being low, the water stood in some places from two to three inches above the top of the drills, but this was soon drained off, and the following day all was absorbed, so no injury was done; on this subject I propose making some remarks further on.

I again visited Bahalgurh on the 12th September, when I found a great change, some of the plants being over 6½ feet high, one covering an area of nearly 15 square feet, of which I informed you in a private note; and I am happy on this my present inspection to find that several have attained a height of 7½ feet, and two or three covering over 20 square feet, while by the weight of the pods many of the branches are bent downwards, some nearly reaching the ground.

Along with this report I send by rail one of the plants entire, that you may see how cotton grown from *native* seed can flourish if sown according to the Egyptian plan. This plant is by no means an exceptional one, for there are several much better, but it is rather above than below the average, and was selected as being easily removed without much disturbing those near it. This plant now sent measured six feet three inches above ground and the "tap" root was 8 inches, but evidently interrupted (by its crooked appearance) in its downward course by the ploughing not being deep enough. The main stem has given off 18 branches, large and small, and on these branches were counted 226 seed pods and blossoms in various states of advance, but probably the average will be about 150 (one even exceeds 300), so the sample is rather above than below the average, as before said.

By post I also send you some cotton, uncleaned, which is the yield of 100 pods, which in all weighed equal to the weight of 15 rupees, or six ounces; and by a trial made yesterday I found that on cleaning 318 rupees weight of cotton, the result was 101 of clean cotton, and 217 of seed, or 31½ per cent., very nearly one-third to two-thirds, so the sample now sent should yield nearly two ounces of clean cotton.

It may be observed that the seed is mixed, such as it came from the bazaar, and out of these 100 pods 40 of them bore four lobes, and 60 of them only three to each pod. I also counted how many were affected by the grub worm, and I found 20 of them had been attacked, the larger proportion among the four-lobed pods. The natives say that an easterly wind brings these insects, and that if there be a few days of westerly wind, they die, and do not appear in the pods that begin to ripen with westerly winds, but again make their appearance when the wind is from the east. I mention these little matters as they may be of after use in discovering not only the cause, but also the remedy against this at some future time.

To continue. On the 12th July there was a third clearance of grass, and in August twice, again once in September, or in all six times; while there was one more watering on the 25th September, and a last on the 2nd October; so that in all there have been four ploughings, six weed clearances, and six waterings.

The expenditure on this experiment up to the present has been—

	Rs.	a	p.
On ploughing	2	0	0
„ Manure	1	0	0
„ Watering	5	0	0
„ Clearing grass	1	8	0
Total	9	8	0

and this on only one-eighth of an acre, or nearly Rs. 80 an acre, free from land-rent or supervision charges. Had the experiment been on a larger scale, the rate would have been very much reduced, and to the cultivator probably one-fourth would have covered all; but in an experiment of this nature I consider the expenditure very moderate, as in this case one pays not for the work done, but for the *time* the laborers are kept away from other work. The funds paid out being private, I gave orders that the payments should be liberal, so there might be no complaint of short-payment made to me.

In practice the grass clearances cost the farmers little or nothing, as all goes as green fodder to the cattle; again, the water-rate about equals ten times the charge for canal water, so the above must on no account be taken as an indication of the cost of cultivating by the Egyptian system. Even taking it thus, I believe if the produce were sold in the market, it would meet all the expenditure; for if the yield equals 30 seers, as expected, it would now sell for over 12 Rupees.

Before closing this branch of the subject, it should be stated that in addition to the ravages of the grub worm, there are also birds and animals to guard against. What between sparrows and parrots, squirrels and rats, the "chokeedar" (watchman) has enough to do. Up to the present some 10 rats, and over twice that number of squirrels, have been killed, but as other fields ripen, the temptations to come to mine which was in advance of the neighbouring ones, will become less it is hoped.

Having now gone fully into all that has been done, and the results, so far as we can yet see, I may here state that my reason for submitting this report now, before we know the actual yield, is that in a few days I shall have to officiate for the Superintending Engineer of the Circle, and may not again have an opportunity to prepare so full and detailed a report. For the present, therefore, I can only speak of the estimated yield, which the Natives expect to be 30 seers of clean cotton, and judging from the small experiment before referred to, is not probably far out, for if each plant only produces 100 ripe pods, and they produce two ounces of clean cotton, we have 420 plants yielding 840 ounces, and 300 plants yielding 1/10 or 60 ounces, or in all 900 ounces, which equals over 56 lbs. or very near 30 seers; so the native estimate is not far out, I believe, which if correct, gives an out-turn of little short of 500 lbs. an acre. But even half this result for a first trial, where *no particular care has been taken*, nor the soil particularly good, holds out encouraging prospects for the future. But what do the natives think of it?

All who have come to see the field admit that having the plant growing in drills is a great advantage, as it enables them the more easily to water the land and clear away the grass and weeds as well as facilitating the picking of the ripe cotton without

much disturbing the plants. In addition to this it enables them to sow a cold-weather crop, wheat or barley, with greater facility between the drills, so the labor expended in forming the drills is more than compensated by the above advantages, not to speak of the quantity of seed saved. On the above points all appear to agree, but as to the seed used, the majority say that the whole thing is an imposition, for native seed could never produce such plants, and that I brought the seed from the "wilayat." Only the people in the neighbourhood who know that it was purchased in the bazaar, admit that the seed used was native, and they say that they will try this drill system themselves next year. The shortness of the fibre, however, at once proves this fact, and I used native seed on purpose, so that the poorest cultivator may be able to try this plan himself. The question to establish at present is not quality but quantity; once convince the cultivators that with a little care they can double or quadruple the yield, and they will then be all the more ready to listen to advice about improving the quality; for with the agricultural community in all countries, and in India in particular, "we must creep before we attempt to walk."

I confess myself I was not prepared for such a favorable result as this experiment promises, and the sub-overseer, as well the coolies, thought I had ruined all when I ordered every plant to be pulled up, only leaving one at every two feet. The yield I think would have been improved had I orde ed none of the plants to be allowed to exceed five feet in height, for this has been tried with several plants with good results; so I would suggest that in future experiments an order should be given that the plant should be cropped, not allowing any plant to grow higher than a man's chin, which is a simple order that the most ignorant can understand. The furrows also, I think, should not be less than nine inches, and the ploughing as deep as possible. Had I ordered this field to have been dug by the "phourah" to a depth of eight inches or so, no doubt the yield would have been still greater, and the expense very little more than ploughing such a small area; but this would have vitiated the experiment, as digging could not be carried out by cultivators in general, so I had to content myself with the present mode of scratching the ground, as it can hardly be called ploughing. The heaping up of the soil in furrows in a measure assists to meet this difficulty, for in Egypt, so far as I could observe, they are not much in advance of us out here in this respect, for in passing through Egypt one may see donkeys and dromedaries, buffaloes and bullocks, yoked promiscuously, all dragging the plough, a camel with a bullock or a bullock with a buffaloe.

I now venture to make a few general remarks, and will try to give some reasons *why* such favorable results are obtained from the Egyptian drill system in comparison with the broad-cast system in force out here, where we have the same light, heat, moisture, and also, I believe, soil, for the plains of Upper India are formed from alluvial deposits as well as the land af Egypt.*

First, the cotton plant is a sun flower and requires *light*, which necessitates plenty of space, and that it should not be in the shade. This is evident in the present experiment; for in the compound there is a large Peepul tree, and the plants in its vicinity do not thrive so well as the others; also the few plants behind the out-offices do not get the afternoon sun so well as the others, and are not so vigorous as those which have the sun all day.

Second, space for the roots to spread. This is evident by observing the roots of the plant now sent and before referred to; for it will be observed that the strongest shoots are given off very near the surface to the depth that the soil had been turned up by ploughing, while those which did force their way lower down through the stiff soil are twisted and contorted. With shallow ploughing therefore all the more space for the roots is requisite, to enable them to spread out and convey away nourishment to the plant.

Lastly, and most important of all, is the improved system of irrigation combined with drainage. This opens some interesting points which I shall attempt to discuss at some length.

First of all it is evident that it is an easy matter with a little care to run water between the drills, and to regulate the depth so as not to be less than three inches or more than five inches; thus the water can never come in contact with the stem of the plant. Again, in the case of heavy rain, though during the fall, and perhaps for a few hours longer, the water may inundate the field, yet it is *fresh*, and probably in motion, in which case it is supposed water cannot do injury to vegetation unless at excessive velocities. In fact it is to the overflow of many of our rivers that the fertility of the land in many localities is attributed, as, for example, the tehseel lands of Dhuska, in the Sealkote district; it is to the overflow of the "Aik," which brings down very little sand, but chiefly fine soil, that the richness of the crops is chiefly due. Flowing water therefore, even though it comes from the neighbourhood, and scarcely contains any matter held in suspension, is a different substance to water that is stagnant in its chemical properties, as well as its mechanical ones. Ask any zemindar and he will tell you that fresh rain-water, so long as it does not submerge the plant, and thus drown it, does no harm *so long as the sky is cloudy, but let once the clouds clear away and the direct rays of the sun descend on the water which is not flowing, and it at once becomes injurious to almost all plants*,—rice probably being an exception.

This opens the interesting question—What is the effect of light on water in combination with heat, and how are the chemical properties of the water thus changed, which it could not effect when partially deprived of the light, though the temperature was all along very hot? Be it what it may, there remains this important and well established fact, that the water does undergo some change that makes it injurious to vegetation, except that which is rank; and is not this the reason why, even at home, in a comparatively cool climate, garden flowers and the like are watered in the afternoon rather than in the morning or mid-day?

If such be the deleterious effect of light on water which comes in direct contact with some plants, does it not show a wise provision of nature that the light of the sun is always impaired when she waters the ground, and does not this teach us a lesson that we out here in India should try to irrigate our fields in the afternoon and at night rather than during mid-day? And may not this be the reason why, in the case of crops irrigated by canal water, the grain, though equal in every other respect, is considered by the Natives not so nourishing. This subject opens a field for extended inquiries, but I must pass on to another very important law of nature.

Earth at all times has been known as the great absorber and decomposer of that which otherwise would become prejudicial to animal or vegetable life, so does not the whole secret lie in this little fact why the Egyptian mode of cultivating cotton is so superior to ours in India, namely, that no stagnant water that has been decomposed by the light of the sun can come in *direct contact with the plant, but must first pass through the universal chemical agent earth*, and thus be converted into a fit state for the plant to drink up the purified water. In this I believe lies the whole germ of the question, and to my mind explains why we should find such great differences in the out-turn of cotton in Egypt and India.

I have perhaps dwelt at too great length on these questions; but considering the great interests they affect, both here and at home, I trust my remarks will not be considered without some, value in assisting to further the great object in view, namely improved agriculture in India.

In conclusion, I regret I have been as yet unable to give a photograph of the cotton field as it at the present moment appears, but I may be able shortly to do so. Great care is being taken to know the actual yield, which at present promises to be satisfactory; but as soon as the crop has been all collected, an accurate statement will be submitted.

Such success having up to the present (with one exception) attended the experiment, I would respectfully suggest that similar ones may be tried at all chowkees in the province where water is procurable, and that the zemindars in the neighbourhood be invited to see everything from first to last. By so doing the Egyptian system of growing cotton will soon come to be generally understood, and believed in, when we may look forward with confidence to a general advance in this important branch of industry, and India will be able to hold her own in the cotton markets of Europe.

From J. A. E. Miller, Esq., Secretary to Financial Commissioner, Punjab, to Colonel R. Maclagan, R.E., Secretary to Government, Punjab, Public Works Department, No. 6610, dated Lahore, 12th November 1870.

SIR,—I am directed to return the enclosures of your No. 5418 of 3rd November.

Mr. Login's report is most valuable, and his experiment appears to have been very successful. The Financial Commissioner awaits with interest the return of the actual yield promised in para. 30. The chief features of the experiment were: The area sown was ⅛ of an acre; the soil was manured; the seed was dibbled; the crop was weeded six times. There were four ploughings and six waterings; the plants were thinned; the ground was irrigated with canal water.*

All these circumstances show that an unusual amount of care was bestowed on the culture of the plant. It is unfortunate that the exact description of the seed used was not ascertained; for although it was brought in the bazaar, this does not prove for certain that it was common native seed. Still, allowing that the circumstances were not those which occur in ordinary cultivation, there are fair grounds for believing that the system of sowing in ridges, of dibbling the seed, of thinning the plants, and of keeping the water from the stems of the plant, is likely to be successful where means of irrigating the cotton plant exist.

The system appears adapted only for places where artificial irrigation is available.

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* Speaking of soils, I believe much good would result if a branch of the Geological Survey was deputed to report on the soils. A correct knowledge of their various constituent parts would lead to knowing how to mix them, and thus greatly improve agriculture.

* Not canal water, it would appear from Mr. Login's para 17.

Mr. Login mentions in para. 19 that, owing to his being about to officiate as Superintending Engineer, he may not again have an opportunity to prepare a full and detailed report. The Financial Commissioner trusts, however, that he will be able to take measures for the careful collection of the remainder of the crop and for an accurate record of the out-turn, as the value of the experiment will depend greatly on this. In the meantime, it is to be hoped that the actual yield will come up to Mr. Login's expectations, for in that case he will have rendered a great service to the cause of agriculture in this province in establishing the practicability of obtaining by a comparatively simple process a yield of cleaned cotton hitherto unprecedented.

From T. Login, Esq., C.E., F.R.S.E. Officiating Superintending Engineer 2nd Circle, Punjab, to Colonel R. Maclagan, R. E., Secretary to Government, Punjab, Public Works Department, dated Umballa, 25th November 1870.

SIR,—I herewith have the honor to forward two photographs of my experimental cotton field at Bahalgurh, and to request that they may be appended to my report dated 21st October 1870, on the Egyptian system of growing cotton.

These photographs, I think, speak for themselves, and with the aid of a strong magnifying glass, a better idea can be formed of the state of this experimental field than any report could effect. The foot-note shows that during the first of the three months that the cotton crop is gathered in, the yield during this short period already exceeds the average produce from fields cultivated according to the native mode from two to three-fold.

The next two months the results shall be duly communicated, and I trust the yield continue to be as favorable ; so it appears probable that the ultimate result will equal 500 lbs. of clean cotton per acre, as estimated in my report.

Along with this I also beg to append to my report a free abstract of it, written in the vernacular of this part of India and the North-Western Provinces. I have dwelt chiefly on the main points to be observed in carrying out the Egyptian system, and have tried to express myself in as plain language as possible ; so that it is hoped all can understand what is requisite, even down to the "kaskar," or ploughman. All the weights and measures are stated in the usual manner adopted by the cultivators in calculating the yield of their fields, taking the Government pucka beegah at ⅝ of an English acre, and the kucha beegah equal to ¼ of a pucka one, while the seer equals 80 tolahs or 2 lbs.

In different parts of the Punjab probably it will with advantage be better to retranslate this vernacular papers into the usual "bolee" of the district, and the weights and measures may in some cases be recalculated, and converted into what is most in use in that particular district ; but this, I think, is an easy matter for an intelligent "putwaree" even to accomplish.

My object in forwarding the vernacular paper is because I feel that after all it is not an English report that can instruct the chief parties interested in this matter, but a paper, such as this now forwarded, which expresses in simple language the chief matters to be attended to by the cultivators.

Should this abstract be approved of, I beg that it be printed and circulated among the zemindars through the district officers at an early date, for I believe it is the habit among the cultivators to determine what crop is to be raised long before the sowing season arrives ; so that a few zemindars may be induced to give this Egyptian system a trial, it is desirable that the subject be made generally known and discussed by them some months before the sowing season arrives. I trust, therefore, that the information now communicated will warrant steps being taken so have both the English and vernacular reports printed.

From T. Login, Esq., C.E,. F.R.S.E., Officiating Superintending Engineer, 2nd Circle, Punjab, to Colonel R. Maclagan, R. E., Secretary to Government, Punjab, Public Works Department, dated Delhi, 22nd December 1870.

SIR,—During my inspection tour of the 7th Division Grand Trunk Road, I had an opportunity of visiting my small experimental cotton field at Bahalgurh on the 20th instant, and I found that the yield of "kapas" was 1 maund 15 seers and 1 chitak, of which over half a hundred weight having been cleaned was all weighed in my presence. I found that there was 69·10 per cent. of seed, and of clean cotton 30·90 per cent.

This is 0.60 per cent. less than my first trial, but it is easily accounted for, as in the first case the seeds were twice passed through the "churkhee," and in the second instance only once. The proportion of clean cotton therefore may be safely taken at 31 per cent. and 69 per cent. of seed, which would give a yield per acre of 273½ lbs., as the yield is only ⅛ of an acre.

Judging by the present appearance of the yield, I hardly think we shall get over ½ more, or say 360 lbs. per acre ; but it must be borne in mind that 2/5 of the plants were destroyed by flooding early in the season, which might have been avoided had the drainage been more perfect at first. But for this the yield would probably have been at the rate of 500 or 600 lbs. per acre.

On the whole, however, the success which has attended this first experiment is so encouraging that I have tried this *four row* system on a small wheat field, measuring 150 feet long by 50 feet broad, which promises well also.

The arrangement which sub-overseer Zoolfikar Ali has made in this case is to have the experimental field in the midst of other wheat fields ; and the agreement is that the semindar has ploughed, manured, and now waters the field at his own expense, I only making the furrows and putting in the seed, I agreeing also to make good the loss should there be any.

The furrows in the present case are only two feet apart, and a single grain of wheat (selected seed) is put in at every 18 inches. The cost of doing this amounted to the rate of one rupee five annas for nine kucha beeghas, or only 11 annas 6 pie per acre, while for seed alone by the native broad-cast system 10 seers of seed are used for each kucha beegha ; so, as the price of wheat is 18 seers per rupee, the cost of seed would be Rs. 5-8-11, or a saving by this new system of Rs. 2-4-2½ per acre, simply from the saving of grain.

The seed was sown late last month, but on the 21st instant all had sprung up and appeared promising, and already several stalks from the same root were appearing above ground at another small patch sown earlier last month.

If similar experiments were carried out, the villagers would soon learn the value of this mode of cultivation ; and surely all tahsildars and zilladars have sufficient influence to make such trials at every village in the country. If at the same time they were made to know that their future promotion quite as much depended on the increased produce of the land as it did on increased revenue, I have little doubt but we would soon see a rapid advance in the improved agriculture of India.

From T. Login., Esq., C.E., F.R.S.E., Officiating Superintending Engineer 2nd Circle, Punjab, to Colonel R. Maclagan, R.E., Secretary to Government, Punjab, Public Works Department, dated 21st January 1871.

The undersigned has the honor to report that he has just learned that the total yield of "kapas" since he last reported on the 22nd ultimo, up to the 16th instant, was only 7 seers 1 chitak.

This brings up the total rate of yield to 307½ lbs. of clean cotton per acre, and from the report received not over 10 lbs. more is expected. *

The falling off of the expected yield is probably owing to the late frost ; yet considering that 2/5 of the plants were killed early in the season by flooding to get at the rate of over 300 lbs. per acre it is hoped, cannot but be looked on as satisfactory for the first experiment, and Mr. Login firmly believes that with care, by adopting this Egyptian system, that the yield of our cotton fields in Upper India, where water is procurable, can, without any extra outlay, be doubled, if not quadrupled.

Regarding the wheat field referred to in the undersigned's letter of the 22nd ultimo, the report sent is favorable, but the result of this experiment will be forwarded later in the season.

From T. Login, Esq., C.E., F.R.S.E., and Member C.E. Institution, to the Secretary to Government, Punjab, Public Works Department, dated Umballa, 20th February 1871.

SIR,—I have the honor to report that the picking season for cotton is now over, and that owing to the late frost there has been no increase of the yield from my experimental cotton field at Bahalgurh over that last reported, namely, at the rate of 307½ lbs. per acre of clean cotton, which is however somewhat below what I at one time expected, yet I hope the result will be considered satisfactory, as it is from four to five times the average yield in India.

I have to-day received a report, dated the 18th instant, showing the state of my small experimental wheat fields before referred to, a copy of which is herewith forwarded.

By this report it will be seen that growing wheat on furrows promises quite as satisfactory results as the cotton has given, and I have lately learned that in the Forest Department somewhat similar results have been obtained.

Seeing, therefore, that wherever stagnant water cannot come in direct contact with the plant, it flourishes much better than where the water is spread all over the field as the broad-cast system necessitates, I feel all the more convinced that the causes assigned in paras. 26, 27, and 28 of my report, of the 21st October 1870, must be correct.

COTTON IN THE MOOBARS.

(Agri-Horticultural Society's Proceedings.)

READ a letter from Colonel Man respecting the cotton samples above referred to :—

* Formerly collected, up to 31st Dec. 1870, per acre ..... lbs.
Now collected, 7 seers 1 chitak=14 lbs. per kapas.—
..... lbs. Sea. ..... lbs.
Total yield of clean cotton per acre ..... lbs.

I send you specimens of various descriptions of cotton grown in the Nicobars, some being raised from seed sent out by the Home Government, and one or two samples from plants found on the island.

"I shall feel obliged if you will kindly favor me with your opinion on their value as to quality and fibre. The seeds were sown rather late in the season, but the ground had to be cleared of jungle, and made ready for planting, hence the delay. The boisterous winds which prevail at the Nicobars have stripped the trees of a great number of their pods. I took one bush as a fair specimen, and 134 pods were counted on it, and the man in charge said that at least as many more had been blown off by the wind. (I mean to guard against this in future by planting the ridges). Perhaps you can tell me if the above named quantity represents a good yield.

READ the following report by a member of the Cotton Committee (Mr. J. M. Ross) on these samples:—

No. 1.—This is certainly magnificent cotton, and has probably deteriorated little, if at all, from the parent stock. I make the staple equal to the best "Sea Island," but color and strength rather inferior, probably worth 19 to 20d. per lb.

No. 2.—Slightly inferior in staple to No. 1, but probably stronger. The sample is too small to judge from.

No. 3.—Similar to No. 2, but rather inferior in strength and color.

No 4.—A good merchantable article, with a mean staple of about 1° 1 inch, or equal to the best uplands in this respect. A nice silky strong fibre, and probably worth about 10d. per lb.

No. 5.—The muster is very small, staple seems to have been injured by handling. It seems to me to class with Nos. 2 and 3.

No. 6.—Is clearly from Pernam stock, but I think has deteriorated, and would not be worth more than perhaps 8d. per lb. to-day.

The Secretary observed that sample No. 5 is very similar to some cotton submitted to the Society by Captain Tulloch, of the *Day Dream*, in March, 1860,—(Journal Vol. XI., page 16, Proceedings of the Society) The seed was probably introduced many years ago by the Danish missionaries before these islands were ceded to the British.

The Planters' Gazette.

CALCUTTA, 15TH APRIL 1871.

THE ESTATES.

THE war seems to have exercised a very powerful influence upon the coffee markets of Europe, and it is not improbable we think that we may see extreme prices ruling for the berry in the course of the next few months. The stocks held in Europe on the 31st of December last compared with those of the previous year were as follows:—

Coffee

Imports			Stock, Dec. 31.	
1869.	1870.		1869	1870.
Tons.	Tons.		Tons	Tons.
59,170	86,630	Holland	32,700	30,700
23,900	18,590	Antwerp	6,720	2,670
65,300	39,300	Hamburg	17,500	5,000
42,350	27,300	Havre	18,750	1,600
7,080	3,300	Bremen	2,760	170
20,720	10,310	Trieste	4,100	3,430
6,980	6,560	Genoa	1,270	700
215,750	192,390	Continent	83,800	44,270
77,420	77,930	Great Britain	29,470	28,640
293,170	270,320	Total.	113,270	72,910

The war seems to have caused a diversion of shipments from the Brazils to America, as will be seen by the following figures, which we take from the *Ceylon Times*:—

Exports of Coffee from Rio de Janeiro and Santos:—

	1868.	1869.	1870.
To Europe, bags	1,415,408	1,649,355	999,099
To U. States "	1,139,049	1,290,498	1,433,264

We are indebted to the same journal for the following statistics of the consumption of coffee in the United States:—

	Consumption.
	£
1870	220,611,598
1869	243,241,317
1868	223,300,937
1867	203,606,671
1866	159,918,881
1865	128,146,356
1864	109,086,703
1863	79,719,641
1862	88,969,911

The stocks of coffee at the ports of the United States were, on the 1st January 1869, 301,746 bags, on the first of January 1870, 216,439 bags, and only 178,596 bags on the first January last. Taking all the above figures into consideration we think we may safely augur well for the future prospects of the staple.

The *Ceylon Observer* states its conviction that the older coffee estates of the island are falling back in production notwithstanding high cultivation, and that wherever attention to their requirements and cultivation are remitted, they have gone, or are about to go, out entirely. "We can probably point to Kaduganava, Kornegalle and the lower and older portions of Matella as districts whose marked deficiencies in out-turn of crop have now to be made up by the coffee from the younger districts in order to balance the returns. But there can be no doubt also of the very serious diminution of crop in some of the best-managed but older estates in the country. Ten years ago it was the opinion of the most experienced planters that with liberal and regular cultivation and manuring, a coffee estate might be kept up in all its pristine vigour. One of the ablest exponents of this view is among the first to confess to its fallacy—estates which have been among the best-cared for in the country having now established an average out-turn per acre not much more than fifty per cent. of what they yielded about the year 1860. This is from information of an indisputable character before us, and while we have more satisfactory reports, especially from higher districts, of the result of continuous liberal cultivation on other old estates, yet we suspect that the vast proportion of even well cultivated plantations twenty years old or over, yield now not more than from 50 to 75 per cent. of the out-turn per acre they gave within the first decade of their existence. There is much yet to be learned in respect of suitable manures for differing soils and conditions, and it is well that the Planters' Association is busying itself in this direction."

The same journal tells us that the accounts from many districts of the results of the crop now going forward are quite lamentable. "Twenty to thirty per cent.,—involving a difference of from £40,000 to £50,000 in receipts from produce—is the account of one comparison made between the returns from a number of estates for the current and previous season. In another instance, more than a score of states scattered over a variety of districts give as the result of a similar comparison very much the same figure, shewing thirty per cent. or more of deficiency on last year's returns. Unquestionably therefore we are to have a very short coffee crop in 1869-70; the stores in Colombo will be empty at an early date, and less demand than usual will exist for freight after April and May; but on the other hand, we are promised a very different state of affairs "next year," and the prospects of blossom and consequently of crop really seem to be very good everywhere."

THE TEA GARDENS.

THE *Bengal Times* affirms that both the local and the Supreme Governments are to blame, though unequally, for the Looshai raid. It is not disputed, says the journal, "that the Supreme Government did veto the expedition proposed in 1869, but we "beg leave to remark that the proposal to send a punitive expe- "dition argued but little for the sagacity of those who proposed "it. We care not a straw that such a recommendation fell "through, our grievance consists in the fact that the entertain- "ment of a police force for the frontier was not sanctioned when "it became evident that, failing its presence, the Looshais were "indirectly invited to repeat their depredations."

We suppose we are bound to regard this as the Planters' view of the care. The Looshai raids have brought about we are told at least one advantage to tea planters, as "a strip of land five miles in length is now required for the construction of a road from Hylakandy to Monacherra garden, a second strip six miles in length will be appropriated for the construction of a road from Sonai Mook to Hathicoori garden, and a third eight miles in length" for a road from Hylakandy to Damcherra garden. All the land thus taken up, and the expenses of road-making will be debited to public funds."

The *Indian Daily News* says that the attack on Tipperah, and the late attacks on Cachar, prove that the recent out-break, even if it originated with distant tribes, practically embraced all the clans, within the limits of what is known as Looshai land." We shall probably find the later attacks have been made by a sort of reserve, hurried up to cover the safe retreat of the first raiders with their booty, and to check or distract pursuit. Whatever the

object might have been, the fact to be dealt with is that for a period of two months the savages hung about the frontier making successive attacks, and showing for the first time some indications of a settled plan and method in their operations."

Our contemporary takes it for granted that there will be an expedition next cold season for the punishment of the tribes, and says," operations should begin at the very earliest moment possible, and should be pushed with vigor, based on the conviction of the shortness of the time within which they must be carried on. We have to disillusionise the Looshais as to the impregnability of their forests. We have to raid in a way to convince these clans they are in comparison with us mere novices in the art; since while they can only harry our borders, we can carry fire and sword if necessary into the most remote corners of the Looshai country. The belief on the part of a Looshai clan that the forest will not shield, nor distance protect them will have a more tranquillizing effect than the most elaborate system of frontier defence on our part."

In the meanwhile General Bourchier has addressed the following circular letter to the planters of Cachar :—

Silchar, 8th March 1871.

TO THE TEA-PLANTERS OF CACHAR.

My Dear Gentlemen,—On several occasions I have had conversations with members of your community, as to the most practical means of affording defence for your tea gardens. I offer a few hints of your consideration. In the first place it would be an easy matter to raise a body of Volunteer Tirailleurs in Cachar. You have most of you a good pony and are good riders. Too much organization should be avoided, and only sufficient drill to teach you the meaning of military orders, how to obey them, and skirmishing.

Arms.—For the present any fire-arms you may have might be brought into use with ball cartridges, and also for smooth-bores buckshot. The old foot artillery sword can be purchased for a song from Government. When the corps is more completely organized, I would recommend one kind of fire-arm for all. The Henry-Martini short rifle with sword, bayonet, and sling is about the best you can have, which, if a number are taken, can be procured complete at from £3 to £5. I cannot answer the question which has been put to me whether Government will supply you with arms and ammunition. Every man should, so to speak, be his own instructor; his pony should be taught to stand fire, and he should by practice in his own garden obtain proficiency in ball practice. Three or four neighbours might meet for mutual instruction, and occasional general meetings be held at Cachar or any centre of groups of gardens.

Uniform.—Norfolk jacket of colored corderoy or flannel (latter is best), green or brown canvas, or leather, gaiters and knickerbockers.

Besides arming yourselves it would be an excellent plan for you to arm say 10 or 12 men of your coolies, Ghoorkas or fighting hill tribes; the former I prefer, as they are excellent gardeners, skilful with arms, and faithful. They should be armed with, I think a single-barrelled breech-loading smooth bore, with ball and buckshot cartridge. Arms and ammunition should be kept by the manager, and served out when required for practice or defence.

Again, your attention should be given to the position of your coolie lines, tea-houses, and managers' residences. I have noticed one garden in which nearly every building was placed in a flat commanded by every teelah in the garden—palpably a mistake. They should be built on the crest of the most commanding teelahs, each group so advanced or withdrawn as to afford flanking fire on its neighbour, thus affording mutual protection. Each group should be surrounded by a stockade within which the coolies could retire. The stockades should, if possible, command the approaches from the forest, and be cleared of jungle all round, and communicate with each other, and with water. Give each armed man a trifle more pay, and as a distinctive mark a serge uniform frock. He should be encouraged to go out shooting, and learn the roads and raiders tracks in all directions and be able to act as scouts.

Until about the 15th, I shall be at the different out-posts, but any day after that I shall be happy to talk over the matter with you all, if you will meet me at Cachar on Saturday, the 18th.

Yours very truly,

George B. Bourchier,

Brigadier-General.

The measures which the General at present proposes to take seem to be satisfactory, and are set forth in the following reply by the Viceroy and Governor General in Council to the memorial of the Landholders' Association published by us last month.

THE LOOSHAI RAID.

GOVERNMENT DESPATCH.

From C. U. Aitchison, Esq., Secretary to the Government of India, Foreign Department; to the Secretary to the Landholders' and Commercial Association of British India, No. 429 P., dated Fort William, 1st March 1871.

I have received and laid before the Viceroy and Governor General in Council the memorial, dated the 15th instant, received through you from the Landholders' and Commercial Association, on the subject of the recent raids in Cachar.

The occurrence of these raids, resulting in a deplorable loss of life and some destruction of property, has caused His Excellency in Council the deepest regret.

For the last two years, the difficult question of the defence of the Eastern Frontier from Cachar to Arracan has been a subject of special and anxious consideration on the part of the Government of India, in communication with His Excellency the Commander-in-Chief, the Government of Bengal, and the Chief Commissioner of British Burmah. The tribes occupying the country between our settled districts and Burmah, are split into many minute sections owning no common authority. The country they inhabit is in some places absolutely unexplored, and for the most part very imperfectly known. Those parts of it that have been visited by Europeans have been found to consist of hills of varying altitude, covered with almost impervious jungle, traversed only by paths used principally by wild elephants, and as the war tracks of the tribes. The expeditions which have on several occasions been sent to punish the tribes for marauding in our territories, have not added much to the available information either regarding the country or its people, It has been the object of His Excellency in Council, in communication with the Government of Bengal, by the deputation from time to time of intelligent officers both from the side of Cachar and of Chittagong, to acquire full information regarding the country and its inhabitants, the wants of the tribes, and the causes and object of their raids. As yet his efforts have only been attended with partial success; and for all practical purposes the country can only be described as a dense and unexplored jungle, deadly to European life for a great part of the year.

The defence of districts bordering for several hundreds of miles on a country of this kind is an undertaking of no ordinary difficulty. Neither can a state of insecurity which has existed for ages be remedied in a day Those who settle there, must not be unprepared to face to some extent the dangers usually incident to pioneers in all parts of the world. His Excellency in Council is convinced that it is mainly by the co-operation of those gentlemen who hold lands and have commercial interests in the disturbed districts that any measures taken by Government can succeed. His Excellency in Council is disposed to believe then in some cases tea gardens have been pushed further into the jungles than was prudent, and have been established in exposed situations beyond what would have formed the most eligible line of defence. But be that as it may, His Excellency in Council is of opinion that the defence of an extensive and scarcely defined frontier extending into unexplored territories is a responsibility which the Government cannot accept, and that the first step towards the permanent defence of the border and the protection of our partially settled districts from attacks, such as those which have recently occurred in Cachar, is to define clearly the limit within which the Government is prepared to establish, maintain, and enforce its authority, and beyond which it will not at present undertake the responsibilities of administration and protection.

Such a line it has been the object of His Excellency in Council to lay down. Its definition in no way affects the question of the imperial frontier boundary, the accurate delineation of which has not yet been attempted. I am to send, for the information of the Association which you represent, the enclosed papers,* being selections of the most important portions of the correspondence with the Bengal Government and the Chief Commissioner of British Burmah on this subject. This correspondence will speak for itself, and will show that, while there may be some

* From Bengal Government No. 4983 dated 17th August 1869.
To Ditto, " 1338, " 18th September 1869.
From Ditto, " 6369, " 17th December "
To Ditto, " 315P, " 17th February 1870.
From Ditto, " 1236, " 10th March "
To Ditto, " 542P, " 24th " "
From Ditto, " 2512, " 26th May "
To Ditto, " 1136P, " 30th June "
From Ditto, " 4449, " 28th September "
" Ditto, " 4779, " 27th October "
" Ditto, " 5089, " 18th November "
To Ditto, " 2943P, " 28th " "
" Ditto, " 3166P, " 13th December "
" Military Department, " 3165P, " 13th " "
From Chief Commissioner, British Burmah, No. 11-8, dated 27th June 1870.
To Chief Commissioner, British Burmah No. 1363 P, dated 2nd September 1870.
From Chief Commissioner, British Burmah, No. 74-2P dated 22nd July 1870.
To Chief Commissioner, British Burmah, No. 1363 P, dated 21st September 1870.

difference of opinion [illegible] some minor points of policy, both the Government of Bengal and the Government of India have given their most earnest and prolonged attention to this question, and are fully prepared to carry out energetically such practical measures for the security of the border as may be considered suitable.

As already observed, the first and essential step is to define the limits beyond which direct administration is not to be attempted. Such a line has been suggested in Arracan, and measures for its definition will be speedily undertaken. It will be continued through Chittagong in front of the present out-posts. In Cachar, a line has been generally indicated from the borders of Munnipoor to Hill Tipperah, including all the present tea gardens. It was one of the chief objects of Mr. Edgar's present visit to the Looshai country to determine the boundary line definitely. As soon as this is finally settled, it is the intention of His Excellency in Council to open up such cleared tracks as may be necessary for defence. At suitable intervals posts will be established and held by a sufficient force. The boundary between the parts will be constantly patrolled. An additional expenditure of Rs. 37,000 a year has been sanctioned for the frontier guard of Chittagong, and His Excellency in Council is only awaiting the views of His Excellency the Commander-in-Chief, after his visit to Assam, before finally deciding on similar measures for Cachar. By this means His Excellency in Council is not without hope that the recurrence of raids will be prevented; or, if they take place, that the force in charge of the out-posts will be enabled to inflict on the offenders summary and severe chastisement.

His Excellency in Council looks to permanent results more from a policy of watchful and vigorous defence than from retaliatory expeditions. The experiences of former expeditions on the north-east frontier of Bengal, as in other parts of the Imperial frontier, have led His Excellency in Council to doubt whether such retaliatory warfare does much permanently to remove the real causes of disorder, although it may produce temporary quiet. Circumstances may occur to render expeditions of the kind indispensable for the punishment of those who commit wanton outrages on the lives and property of our fellow-subjects, to vindicate our honor, and deter from future violence, but such expeditions into a barbarous, difficult, unhealthy, and unknown country are always to be deprecated, and seldom produce any lasting effect if they are unaccompanied by measures of a more humane and politic character.

In addition, therefore, to guarding the boundary in the manner above described, His Excellency in Council considers it essential that the district officers on the frontier should endeavour by all legitimate means to win the confidence of the tribes living beyond our line of defence, and establish a salutary personal influence over them. For this purpose, His Excellency in Council has directed that all district officers on the frontier shall encourage frequent and friendly intercourse with the chiefs and tribes, visit them occasionally, induce them to enter our service, and resort to our markets, endeavour in a friendly way to settle any differences or disputes with our subjects, and adopt all means calculated to establish a permanent personal influence among them. So far as this policy has yet been tried, Government has no reason to doubt its ultimate success.

The measures, then, which His Excellency in Council has commenced to carry out for the defence of the frontier are briefly these: to determine clearly the line up to which Government will enforce its direct authority; to establish friendly relations and influence among the tribes beyond so to strengthen the defences by the establishment of military or police posts and by patrolling the boundary, that the tribes shall be deterred from attempting outrages within the restricted limits, but if violence is attempted, that severe and summary punishment shall be secured. It would be unreasonable, however, to expect on such a frontier the same security and protection as in places where law and order have been long established. It behoves those, therefore, who settle in exposed parts to be ever ready to defend themselves, and to co-operate with the authorities in warding off sudden and unforeseen attacks, which, as in the recent instance, neither the local officers nor the residents may anticipate, nor the guards be able entirely to prevent. His Excellency in Council acknowledges with pride and satisfaction, the gallant behaviour of the tea-planters and managers of the gardens which were attacked, and deeply regrets that notwithstanding the determined resistance made by them and by the police in defence of the stockades, the marauders should have succeeded in doing any damage. There are now nearly two thousand men of the police and regular troops assembled in the districts of Cachar. The Governor General in Council has no doubt that measures adopted will have the effect of restoring confidence to all British subjects, both European and Native. His Excellency in Council is deeply interested in the success of British enterprize in the districts of Sylhet and Cachar, and the memorialists may be assured that the Government will do all that is possible or reasonable to encourage its development and ensure its safety.

CINCHONA.

THE COMMISSION OF ENQUIRY ON CINCHONA CULTIVATION.

(The Darjeeling Times.)

THE Cinchona Commission has left for Calcutta after taking evidence and carefully examining the largest cinchona gardens. The results the Commission arrive at affecting the questions of extension of cultivation and manufacture of alkaloids cannot be known for some time. We may however state that it is not unlikely that cinchona growing in this district will not be pushed by the Government, as it is now candidly admitted that only successes have been reported, and all failures except one have been carefully concealed. Canker and unsuitable soil have probably reduced the plantation trees by 50 per cent. The golden dream of Lord Mayo and Sir William Grey having been dissipated, it is to be hoped that the Government will now come to a just decision and leave the providing of *bark* to private enterprise. While under the impression that cinchona in Sikhim was a grand success they greedily grasped at the chance of a practical monopoly; now they will probably be both just and wise and leave the thing alone. It is pretty generally known that cinchona gardens have been extensively made both by private growers as well as by Government in two rival localities in India—the Neilgherries and Darjeeling hills. The Darjeeling folks say that Madras has failed, and the Madrassees swear through thick and thin that it is just the other way. Darjeeling is just now honored by the presence of a Commission on cinchona, and Mr. McIvor, the able Superintendent of the Madras Government Gardens, has been over here to see with his own eyes what all the brag is about, and has been weeping over the state in which he finds the Government gardens here—it is said that he considers the average growth very poor, and the trees suffering from canker, which he views with alarm. The Commission have taken his evidence and he will no doubt have a great pull, in that he has the Darjeeling gardens before him to pull to pieces and pick holes in them, while the gardens on the blue mountains are far away and out of sight. We need hardly say that the opinion of competent men is that the canker is a trifle, and is found among trees all over the world, and that it is only a convenient mole hill which Mr. McIvor's Madras instinct magnifies into a mountain. No doubt the Government gardens are sloppy places in the rains, and must suffer somewhat from canker, the drier gardens of the Darjeeling Cinchona Association suffer from canker though in a less degree, and we have no doubt the much drier plantation of the Tukvar Company will have some traces of canker. Without this redundance of moisture our trees would never have run up above the Neilgherry ones. Mr. McIvor's opinion will have a good deal of weight, and deservedly so, but all the circumstances of the case, such as prejudice, rival interest, &c., will have to be put in the scales also, and may possibly kick the beam against Madras.

The *calisaya* and *condaminea* kinds are no great things in British Sikhim, but we had prided ourselves on the red bark or *succirubra* variety, and it is cruel of Mr. McIvor to come and blast all our hopes. It is very lucky that Sir William Grey is gone before this occurred. All his hopes of profit in mitigation of the expected deficit in opium are like the Ootacamund trees—shattered to the winds. Fickle fortune eludes our grasp, we thought—

> "She is coming, my dove, my dear;
> She is coming, my life, my fate;
> The red bark cries, 'she is near, she is near";
> The gray bark weeps, 'she is late';
> Calisaya listens, 'I hear, I hear';
> And the canker whispers, 'I wait.'"

We hear that the Cinchona Commission have terminated their labours in Darjeeling, and have adjourned to Calcutta to finish their report to Government.

Mr. McIvor, the Superintendent of the Madras Plantations, who happened by a curious coincidence to be at Rungher during the sitting of the Commission, and whose evidence was accordingly taken, has, we hear, condemned in unmeasured terms the plantations in British Sikhim on account of the prevalence of canker in a number of the trees. We believe we are right in stating that canker is not a disease peculiar to the cinchona plant, and that its existence in a plantation of any sort does not necessarily involve its extinction as implied by Mr. McIvor. It has in the present case probably arisen from over propagation, and it is even hinted that it was originally imported in the first plants received from the Neilgherries, and began to abate as soon as healthy plants were raised from seed received from Ceylon.

The late Dr. Anderson, who was a man of European reputation as a botanist, thought so lightly of it that he never even alludes to it in his reports, though he was well aware of the existence of the disease. Mr. McIvor is naturally inclined to take a gloomy view of everything in Bengal, coming as he does from the opposition plantation; but the value of his evidence is still further

lessened, if what we hear be true, *viz.*, that he is largely interested in private cinchona speculations in the sister presidency.

It is obviously the interest of private speculators that Government should not extend their operations much beyond their present limits, and therefore all such evidence as Mr. McIvor's should be received with extreme caution, both on account of his Madras proclivities, his known antagonism to the late Dr. Anderson, and his reputed connection with private enterprise in this particular line. There is no doubt that the discovery of a long known fact would be made the most of by those who have invested their money in cinchona plantation in the hope of driving Government out of the field. We feel quite sure, however, that were Government to comply with the entreaties of some of these companies, that their interest in the growth of cinchona might be bought out, we should hear little more of the matter. The canker can be dealt with as it has hitherto been, by lopping down the trees below the part effected, the immediate result being the growth of healthy shoots.

We think, however, that the state of things which is here shown to exist, should satisfy Government of the very false economy of the now too common practise of heaping up appointment after appointment on the shoulders of already overburdened men. Had Dr. Anderson not had the Botanical Gardens, the forests and the cinchona on his hands at the same time, there is little doubt that all three undertakings would have benefited very much more from the superintendence of so able a public servant than they have done.—*The Observer.*

From C. B. Clarke, Esq., Botanical Gardens, to the Government of Bengal, dated 14th September 1870.

I HAVE received from Dr. T. Anderson in England a private letter containing such important information regarding the cinchona bark sent home from the Rungbee plantations that I venture to submit some extracts.

Two chests of the bark of cinchona succirubra were sent home, each containing about 80 lbs. of the stem bark from three-year old trees. This bark fetched 1*s.* 9*d.* per lb. at public auction. Dr. T. Anderson has no doubt but that it would have fetched a higher price had there been a sufficiently large quantity sent to induce a real competition among the purchasers.

Cinchona calisaya is reckoned the highest class of bark in the English market, but it has been largely cultivated in Java, and the Java bark has proved of very small value.

I sent home the bark from one tree of cinchona calisaya which had been less than three years planted in the permanent plantation, and which produced very nearly 2 lbs. of dried bark. This was therefore not a sample of the best stem bark but a mixture of all the bark peeled from the tree up to the wood made during the current season. Mr. Howard's analysis of this bark is given as follows :—

No. I.—Calisaya (oldest bark) :—		
Sulphate Quinine	0·97	
Quinine	0 93	
		19·0
Cinchonine	1 28	
		3 18
No. II.—C. Calisaya (smaller branches) :—		
Sulphate Quinine	0·51	
Quinine	1 86	
		2·37
Cinchonine traces of Quinidine ..		0·50
		2·87
No. III.—smalles branches Calisaya .—		
Quinine	0·90	
Cinchonine traces of Quinine	0·27	
	1·17	

Mr. Howard sums up his analysis with these remarks :—

"This C. calisaya *is quite of the right sort* [*Howard*] and the only lot from either British India or Java that I have seen on which I could pronounce a favorable opinion. It is quite immature, but the amount of tannin is diminishing at each cutting."

The brokers' valuation of this bark is as follows :—

From Messrs. Jenkins and Phillips, to Dr. T. Anderson, dated London, 12th July 1870.

We have carefully examined the sample of Indian calisaya bark grown at Darjeeling, shown us by Mr. Howard, and find it to be quite of good quality. We consider the value to be 2*s.* 3*d.* to 2*s.* 6*d.* per lb., as compared with South American, of good genuine quality, which now sells at 3*s.* 3*d.* to 3*s.* 6*d.* per lb.

On this I may explain that the South American taken for comparison by the brokers was, I presume, South American quill, as I believe prime calisaya bark from old trees is worth in London 9*s.* per lb.

From H. S. Beadon, Esq., Officiating Under Secretary to the Government of Bengal, to the Officiating Superintendent, of the Botanical Gardens and in charge of Cinchona Cultivation in Bengal, dated 31st October 1870.

I am directed to acknowledge the receipt of your letters, No. 202, dated the 1st July 1870, and No. 220, dated the 14th ultimo, and in reply to convey to you the thanks of Government for your full and interesting report regarding the cultivation and manufacture of cinchona in Bengal.

The Lieutenant Governor approves of your proposals for the retention of the land reserved for cinchona in the valley on the right bank of the Rungjo and in the valley of the Ryang. With regard to the proposed abandonment of the broken ground between the valley of the Ryang and the river Sivok, and its transfer to the Forest Department, the Lieutenant Governor observes that on a previous recommendation made by you the resumption of the ground by the Forest Department was forbidden. If, however, upon further consideration, you are satisfied that you can now dispense with this portion of the reserves, and the Forest Department are willing to take it over, the Lieutenant Governor has no objection to its transfer.

With reference to the important questions discussed in your letter of July, regarding the extension of the area of cultivation of each species of cinchona and the local manufacture of quinine I am to state that before forming an opinion on these matters and reporting to the Government of India regarding them, the Lieutenant Governor would wish to have before him a report of the results of the experiment which was sanctioned in the orders of the 21st February 1870, No. 476.

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From A. O. Hume, Esq., C.B., Officiating Secretary to the Government of India, Home Department, to the Officiating Under Secretary to the Government of Bengal No. 5524, dated 16th December 1870.

I am directed to acknowledge the receipt of your letter No. 3088, dated the 4th ultimo, relating to the cultivation of cinchona and the proposed manufacture of quinine in Bengal, and in reply to convey the following observations.

His Excellency in Council has perused with much interest Dr. Clarke's report on the Sikhim Cinchona Plantations, and considers the progress heretofore made very satisfactory. His Excellency in Council is well aware of the deep interest taken by the Government of Bengal in this most important question, and feels that the extension of cinchona plantations will, under their auspices, be persistently and vigorously proceeded with. Some time, I am to remark, must necessarily elapse before any considerable extension of C. calisaya can take place, and in the meantime I am to suggest that attention might continue to be devoted to extending the area under cultivation with C. succirubra.

His Excellency in Council attaches the very greatest importance to this matter, and he believes that at little present cost, and with a certainty of considerable future revenue, forests of cinchona may be reared in Sikhim, which by furnishing at a comparatively cheap rate large quantities of quinine, will prove hereafter an unqualified blessing not only to the whole of India but to the civilized world.

Expenditure must of course be kept within the narrowest limits compatible with the attainment of the great national objects in view; but due regard being had to economy, His Excellency in Council will be prepared to support warmly any proposals approved by His H. nor the Lieutenant Governor for the immediate extension of the C. succirubra plantations as well as for the gradual creation of others of C. calisaya.

CINCHONA CULTIVATION IN SIKHIM AND ON THE NEILGHERRIES.

From C. B. Clarke, Esq., M.A., Officiating Superintendent, Botanical Gardens, and in Charge of Cinchona cultivation in Bengal, to the Secretary to the Government of Bengal (No. 202, dated Rungbee, Darjeeling, the 1st July, 1870).

SIR,—I have the honor to report to you, with reference to several questions which have lately arisen regarding the cultivation and manufacture of cinchona in Bengal, and which are so closely connected together, that they may advantageously be dealt with as a whole.

Among these matters for present consideration are the questions,—How far the area of cultivation of each species shall be extended in the Government Sikhim plantations? Whether any of the land reserved for cinchona in Sikhim shall be abandoned? Whether the manufacture of quinine shall be undertaken upon the plantations either wholly or partly?

In March and April last, I visited (by order of Bengal Government, No. 476, of 21st February 1870,) the Government Neilgherry Cinchona Plantations, and also those now the Government Quinine Manufactory under Mr. Broughton in operation. I have also received Herr Von Gorkom's Report of the Java Government Cinchona

Plantations," dated July 1868, Mr. Howard's Note Treatise on Indian Quinology, Correspondence to the Government of Bengal of Dr. T. Anderson, dated November 1869, and of Drs. Anderson and Simpson, dated 1st April 1870, and numerous other papers.

In commencing this report with a description of the present state of the Government Sikhim Cinchona Plantations. This will be to a considerable extent a recapitulation of matters already published in scattered reports. I wish to point out the radically different position of the Sikhim plantation from those in the Neilgherries and Java, and I shall not attempt to call attention tediously to the innumerable points in which the experience and practice of Sikhim are in direct opposition to theirs, especially [illegible] experience and practice. It will be understood that when my statements are discrepant with those of Herr Von Gorkom, I am aware of the discrepancy.

The Government Cinchona Planations in Sikhim are Rungyroong, which I estimate to contain 1,000 acres, and Rungbee, measured as 87,162 acres. With a view to economy, I have concentrated all the work at Rungbee, and it will be sufficient to state about Rungyroong, that it contains 9,000 plants of cinchona succirubra and 80,000 of officinalis in permanent plantation, and that the forcing houses are all at Rungyroong, which is distant six miles from Rungbee.

The annexed map shews the Rungbee cinchona reserve. It is bounded on the north by the river Rungjo, on the east by the river Teesta, on the west and south by the line of water shed which separates the feeders of the Mahannuddy from the feeders of the Teesta. This line of watershed from the Darjeeling path to the mountain Sitong is at a great height, probably 6,000 to 7,000 feet; or nearly its whole length. On the east of the Teesta rise the mountains of Bhootan, but between Sitong and the Teesta there is a view over to the plain of Bengal, which commences immediately south of the river Sivok, and through this gap sweeps the moisture-laden air from the plain from the south-east to north-west.

The reserve naturally divides into three portions, *viz*:—

(*a*.) The valley on the right bank of the Rungjo.

(*b*.) The valley of the Ryang.

(*c*.) The broken ground between the valley of the Ryang and the river Sivok.

It is seen by a glance in the map that the whole of the present permanent plantations are in the Rungjo valley. It must be understood that the large patch colored green is not one continuous forest of cinchona succirubra; nature of the ground does not admit of uniform planting, but in the whole sweep of the green patch there exists 1,000 acres of C. succirubra. The under patch has two prolonged lines, which shew the direction in which the permanent plantation of C. calisaya is about to be continued. The upper part of the C. succirubra plantation near B was originally planted with C. officinalis, but this prospered so little, that last year C. succirubra was planted also on the same ground, and the C. officinalis will doubtless soon disappear there.

The plantation has, generally speaking, been pushed from west to east, and the soil has been found to get continually better as we have descended the Rungjo valley. This accounts (irrespective of improved experience in management) for the superiority of the later planted portion of the plantations. The soil where the extension is now being pushed is very good, but probably the right bank of the Ryang valley is still better. The C. succirubra is planted from 2,000 to 3,500 feet elevation; the small out-lying experimental patch on the right bank of the Ryang extending from 450 to 900 feet elevation. The species (C. succirubra), it is found, cannot here be grown advantageously above 3,500 feet elevation, but it may be grown down to 1,000 feet; and even at 500 feet elevation it grows very fairly. C. calisaya is found to thrive best at 1,000 to 2,000 feet elevation, and does not do well at elevations much exceeding 2,500 feet. With respect to C. officinalis, I can only say that as yet it does not thrive or show any signs of becoming a tree at any level on the Rungbee reserve; it has been tried at every level, and where it now stands, *viz*, 3,500 to 5,000 feet, seems the best suited to it.

It will be at once observed, that though the area of ground contained in the cinchona reserve is very large, the area available for extension of our two species, *i. e.*, the area of good soil between 1,000 and 3,500 feet elevation, forms but a small fraction of it. And considerng C. calisaya only, which being our best species, is principally desired to be extended, and which requires ground between 1,000 and 2,500 feet elevation, there is probably not room for more than 1,000 acres of it in the Rungjo valley. It will appear further on that a much larger quantity of C. calisaya will almost certainly be required.

One reason probably why C. officinalis has never thrived there is that no very good soil is known to exist on the reserve within the limits of elevation which it requires. But it is the opinion of Dr. T. Anderson, in which, after seeing the Neilgherry C. officinalis, I concur, that the real reason this species does not thrive here is because the climate of Rungbee is too wet for it. The head gardener in charge of the Government Cinchona Reserve at Nunklow, in the Khasiya hills, reports that C. officinalis "does first-rate on the Nunklow slopes."

The climate under which cinchona thrives is now become a matter of wide interest. Instead of republishing in *extenso* tables of the meteorological observations made on the plantations, or of reducing the whole of these to means, I think a more clear and more [illegible] the climate under which the cinchona is actually thriving can be got from the subjoined small extracts and accompanying remarks:—

Months.	At Rungbee altitude 3,300ft.			At Rishap altitude 2,500ft.		
	Mean temperature.	Maximum temperature.	Minimum temperature.	Mean temperature.	Maximum temperature.	Minimum temperature.
1867.						
January	51	68	40	57	71	42
February	56	69	40	60	75	45
March	65	79	53	69	82	56
April	68	80	59	69	89	51
May	68	81	55	75	91	61
June	70	81	58	78	94	62
July	72	82	64	79	93	65
August	72	83	62	78	90	63
September	73	88	60	78	94	66
October	66	81	49	72	88	53
November	59	75	44	66	84	50
December	55	68	42	...	..	
Mean..	64	..	...	71	...	...

These are the actual observations for the year 1867; they are selected because I believe they are very correct, while I have reason to suspect some of the readings made in subsequent years. The Rishap annual mean of 71° is about 1° too high, owing to the absence of the December observations:—

Months.	At Rungbee altitude 5,000 feet.	At Rishap altitude 2,000 feet.
1869.	Rainfall in inches.	Rainfall in inches.
January	1·05	
February	0·95	1
March	1·90	
April	6·30	2
May	11·85	6
June	25·05	17·2
July	31·05	10·9
August	47·65	27·3
September	29·90	18·8
October	3·00	2·4
November		
December		
Total.	157 70	91·6

These tables are not parallel with the temperature tables above, being not only for a different year, 1869, but taken at a different upper station. Probably the rainfall at Rungbee, at 3,300 feet altitude is about a mean between that at Rishap at 2,500 and that at Rungbee at 5,000.

One year at Rungbee is very like another, both in the temperature and in the general distribution and quantity of rain. The proper climate for C succirubra and C. calisaya appears to be a warm, equable and excessively moist one. Though the rainfall at Rishap is so much below that at Rungbee, yet the humidity is almost as excessive, the warm air from the plains sweeping through the gap at Sivok from the south-east across Rishap and depositing its vapour as rain on the spur of the Rungbee inspection bungalow.

The Rungbee plantations are visited on the average once a year by hail-storms, these are generally very partial and have never done serious damage, though by cutting the leaves they may have checked the growth at times of portions of the plantation.

One very essential advantage of the Rishap and Rungbee plantations is their freedom from violent winds. Situated as they are in a lateral valley within the Himalayas, from no quarter can a wind reach them. The air is nearly always still, and in seven years' experience no damage from wind has been met with. The cinchona trees are very brittle and have leafy heavy head, and one of the chief difficulties with which the Neilgherry plantations have to contend is, that they are fully exposed to the violence of the monsoon, which strips the trees of leaves and breaks the young shoots exactly at the time—the commencement of the rains—when the trees are prepared to make their best growth.

At this point I may mention once more that the cinchona trees are now grown at Rungbee entirely in the open. At first it was supposed, on the faith of Javan experience, that cinchona trees absolutely required shade. Mr. McIvor, than whom no one knows better that a grain of theory is worth a ton of experience, declared from the first, before he had ever seen a cinchona tree a foot high, that the Javan experimental result must be wrong. Circumstances have more than justified Mr. McIvor's boldness in staking his theory, and to him is due the credit that the Indian plantations have been started on the only plan by which they could have attained their present success. In Java (as appears from Herr Von Gorkom's report) the practice of shading the plantations is still resorted to, and from this fact alone I feel convinced that those Javan plantations can never hope to compete with Rungbee in the price at which they can produce bark.

For several years the species on which we shall have to rely at Rungbee will be C. succirubra. The 1,000 acres of this were planted under the dates subjoined, *viz*:—

In	1866	...	..	..	...	25 acres.
,,	1867	...	...	...	...	185 ,,
,,	1868	..	...	...	...	265 ,,
,,	1869	...	.	..	..	350 ,,
,,	1870	..	..	...	...	175 ,,

The 25 acres planted in 1866 are, for various reasons now understood, no better than the Rishap plantations of 1857. Of the 185 acres planted in 1867, nearly 60 acres were planted across the Ryang, *i.e.*, too low; and nearly 40 acres were planted at Rungbee, *i.e.*, somewhat too high. On the whole, there will not be at the close of this season more than 100 good acres at Rishap for pruning and thinning. These will produce not less than 200lbs. of dry bark an acre. I estimate therefore the produce of the current financial year at no less than Rs. 15,000 in value.* As regards the financial year 1871-72, there will not merely be 265 acres (nearly all good acres at Rishap) to thin and prune, but, moreover, the average thinned this year will require thinning afresh.

This leads me to the question of the most advantageous way of managing these plantations from the woodman point of view. They may undoubtedly be coppiced, and as we know pretty well what can be made of them on that system, we generally assume that plan of working in our financial calculations. But it is the opinion of Mr. Gammie, the head gardener here, that it will be found more profitable to work the plantations forest-fashion, *i.e.*, never to clear away, but to continually thin out the worst trees, and never cut a good tree so long as it keeps growing. In this way we might hope ultimately to see trees here which would rival their American progenitors in size, and yield several hundred pounds of bark per tree. This forest plan of working the plantations would require a larger area for the production of a given weight of bark per annum than the coppicing.

General remarks on extension.—Cinchona can now be cultivated in many places, and also in many places at a profit, assuming the present price of the bark to hold. But it is perfectly certain that the price of bark must under these circumstances fall, and it will be the policy of Government to extend cultivation now only where the bark can be produced most cheaply.

As regards the amount of extension to be carried out, Government will have to consider whether the Government plantations shall be worked merely to supply sufficient quinine for the Government service, or whether, by the sale of quinine or of bark, Government will extend the benefits of the medicine among the public. On one point there should be no misapprehension. Quinine is an article of which a great value travels within a small weight. If Government can therefore in Bengal provide itself with a cheaper quinine than the European manufacturers can furnish Government out of American bark, then Government can also undersell the European manufacturer in the home market. Similarly it cannot pay Government ultimately that the quinine for the Madras Presidency should be grown in the Neilgherries, and the quinine for the Bengal Presidency in Sikhim, except on the improbable contingency that the cost of production at each place be found exactly the same. And even on this hypothesis it would probably be economical to concentrate the work at one place in order to diminish the expense of manufacture.

Another consideration with regard to extension is the position of private cinchona plantations. There are about 3,000 acres of private cinchona in the Neilgherries, and about 500 acres of private cinchona in Sikhim. These plantations will probably be highly remunerative if bark maintains its present price; if, however, bark be reduced to one-sixth its present price by the large produce of Government plantations, they hardly could be remunerative. The C. succirubra bark at from three to five years old from this plantation is now worth 1s. 8d. per lb. in the London market. † We believe that we see our way to growing it here in almost any desired quantity at 3d per lb.; so that a fall in the price of bark to one-sixth its value is at least conceivable.

On the other hand, I believe that cinchona cultivation may be very largely extended here before any such fall in price as this can take place. A fall in the price of quinine to half its cost would far more than double the consumption. It might very probably quadruple the consumption, not merely in India but in Austria, Prussia, &c., where quinine is now almost a prohibited article by its high price. Moreover, a very large fall in the price of quinine might enable it to be employed by manufacturers for the creation of the unrivalled dyes of which it is the base. ‡

The quantity of quinine issued from the Government Medical Stores for the official year 1869-70 (for Bengal, North-Western Provinces, Punjab, and Central Provinces,) was 2,671 lbs. Suppose that the existing 1,000 acres of C. succirubra at Rungbee are worked coppice-fashion (which we know can be done, though we do not know it to be the most profitable manner of working), at least 150 acres could be cut annually. These would produce at least 2,000 lbs. of bark per acre, and if this produced 2 per cent. of amorphous quinine, are one per cent. of crystallizable sulphate, this would give 6,000lbs. of crystallized sulphate annually, *i.e.*, more than enough to satisfy the present Government wants.

These figures are extremely uncertain and speculative, but they are, I believe, certainly within the mark. I expect to get 2,000lbs. of bark on an acre worked coppice-fashion, and even from this class of bark I should hope to get 3 or 4 per cent. amorphous quinine instead of the 2 per cent. assumed above.

It would appear therefore that if Government is disposed to grow cinchona only to meet its own local requirements, it is not necessary to extend further the cultivation of C. succirubra at present, and this is, I believe, the opinion both of Mr. McIvor and of Mr. Broughton.

But as I understand the official papers, Government did not commence the cultivation of cinchona in India with any definite intention concerning the manufacture, but with the design of keeping down the price of bark in the London market, and thus diminishing the price of quinine not only as against themselves but as against the general consumer. The parties who will be really injured by the large growth of bark here are not the London manufacturer but the barbarous Government of South America. Their treatment of the bark monopoly deprives them of all title to consideration. (I am here for simplicity considering the question of extension apart from all questions about local manufacture.)

But as long as Government continues extending its area of plantation, it can hardly be expected that private enterprise will do much, and this is, so far as I can see, the only consideration that is much worthy the attention of Government in considering how far the general extension of quinine shall be carried.

Particular extension.—Government having determined the question of general extension, the next point will be to determine in which locality it will be economical to extend each species. The three species demanding present consideration are C. officinalis, C. succirubra, and C. calisaya.

(A) C. officinalis—The most successful plantations of this in India are undoubtedly Mr. McIvor's on Dadabetta in the Neilgherries; the plants are growing into trees, a great number being now 20 feet high. The trees are nevertheless mere poor-looking compared with plants of C. succirubra or C. calisaya, and will never give a yield of bark per acre comparable with that given by C succirubra or C. calisaya. At the same time the high quality of the bark, and the comparative facility with which it can be worked into the, crystallized sulphate, will make the species always worthy of attention. I believe that the Government of India has finally decided not to abolish the establishment of the cinchona nursery at Nunklow, in the Khasiyas. In this case it will be in my power to carry on the growth of C. officinalis on the small scale at Nunklow. If it continues to "grow first-rate there," as it is reported to be doing now, I expect it will be found ultimately that it can be grown cheaper in the Khasiyas than in the Neilgherries. This is, however, at present a more speculation against the established success already exhibited in the Neilgherries.

(B) C. succirubra—The Neilgherry plantations of six, seven-eight and nine years' growth are successful examples of cultivation, and there are no plantations of similar age at Rungbee for the institution of immediate comparison therewith. But in calculating at which place future extension can be most economically carried on, it is not required to compare the yearly attempts at the two plantations, but to estimate what can be done now. With this object, I observed with great attention the last three years' planting of Mr. McIvor, and weighed the results with those obtained on the Rungbee plantations. In these later plantings Mr. McIvor has brought his method very nearly down to that pursued at Rungbee, that is, he cultivates much less than in his earlier plantations, and he plants his trees six feet. The best trees three years out in permanent plantation at the Neilgherries are 12 feet high; on the Rungbee plantations the best trees pass 20 feet high in that time. Nor does this represent the whole superiority of the Sikhim plantations. The trees are much more bushy and of stronger growth, and the cultivation given them is much less than the minimum allowed by Mr. McIvor. To sum up, I estimate that any future quantity of succirubra bark required by Government can be grown at half the cost in Sikhim that it can in the Neilgherries. In stating this conclusion, I may be permitted to record my admiration of the skill in cultivation shewn by Mr. McIvor, and of the ingenuity of resource displayed by him in contending with difficulties. We can show nothing of the kind in Sikhim, but it is a case of Nature *vs.* Art, and I do not believe that any place where the rainfall is under 50 inches a year (with, moreover, a long dry season) can contend with the perpetual drip of Rungbee in the production of succirubra bark. One of Mr. McIvor's ingenious devices has been that of mossing up the trees in order to increase the production of quinine in the bark. Much has been written and printed about this, and enormous pains have been bestowed on comparative analysis of the bark so treated. I have recorded in my previous reports the strong objection to the mossing-up process which exists at Rungbee, and I have stated that if it were proved that mossing-up increases the percentage of quinine ten-fold, I would prefer growing ten-fold the acreage of C. succirubra to attempting the operation of mossing-up the present plantation. I hold to this opinion after seeing the peculiarly ingenious details of Mr. McIvor's mossing-up. But further, Mr. Howard's late great treatise on East Indian Quinology goes very fully into analysis of mossed-up barks under an infinite variety of conditions. Very possibly I have failed to perceive all that it is intended the reader should deduce from those analysis, but so far as I can understand Mr. Howard, the question, how much mossing-up improves yield of quinine by bark, lies involved in the profoundest obscurity. Also, Mr. Broughton (as I gathered from his conversation), who has executed most extensive experiments to settle this question, is still

* This affirms that the bark of prunings will sell at 1s. 6d. per lb. But the fact is that such bark would be almost unsaleable in the English market, and from its yield of alkaloids and unusual appearance would not, under the most favourable circumstances, sell for more than a few pence per lb. This circumstance invalidates the conclusions.—*Ed. S. I. O.*

† Though Mr. Clarke tends to depreciate the value of Neilgherry bark, a large amount of the bark here spoken of was sent from the Government plantations here, and average in price 2s. per lb. in open market.—*Ed. S. I. O.*

‡ Mr. Clarke can have had no experience in the preparation of the dyes to which he refers, or he would not speak of them as "unrivalled." They will not stand sunlight according to present knowledge. Quinine is moreover not their base.—*Ed. S. I. O.*

no doubt what any increase of yield at all will ultimately be found obtainable up to. Under these circumstances, though Mr. McIvor has not protected his discovery of mossing up by a patent, I do not propose to invade his inventor's rights. I have the consolation of knowing that in so far as the moss acts by shading the sun's rays from the bark, any moss applied in the good Rishap plantations would be quite superfluous; the stems are already in the deep shade of heavy forest jungle.

(c.) *C. calisaya.*—This is the magnificent species which ranks first of all bark in the London market, the bark now being worth 9s. per lb. And I believe the only locality yet discovered where it can be grown to any economic advantage is at Rishap in these plantations. I look on Mr. McIvor's efforts with C. calisaya as simply failure in the economic point of view. I searched his plantations to find the biggest plant of any age of C. calisaya there. The largest I could find measured in circumference of stem (four inches above the ground) 6½ inches, and was a small neat shrub about seven feet high. Now, at Rishap (on these Sikhim plantations) C. calisaya grows just as luxuriantly and healthily as does C. succirubra. Good specimens in two years in permanent plantations reached 12 feet high, and would then cut two lbs. of good dry bark each. I expect these plants will be at least 18 feet. high when they complete their third year out. They shew every sign, even more than C. succirubra, that they are going straight up into forest trees of the first magnitude. In Java they have in nine years grown one specimen of C. calisaya up to 18 feet, but the whole details of Von Gorkom's report, and especially the account of the shading given the trees, shew quite clearly that they can in Java no more rival the Rishap C. calisaya than can Mr. McIvor in the Neilgherries. I may mention by anticipation that in manufacturing a totally different method may be employed with C calisaya from that necessary with C. succirubra. In case C. calisaya can be ultimately grown here in large quantity, I doubt much whether any other species will stand before it. I should not be surprised if the ultimate result of quinine growing should be the exclusive cultivation of C calisaya in Sikhim. Under these views, since I have been in charge of these plantations (now twelve months), every effort has been made for the extension of C. calisaya. Unfortunately, though it is quite hardy here when once a rooted plant is obtained, it is exceedingly difficult in propagation, so much so that there is little hope of rapid extension of the species until we obtain seed. Our plantations do produce some seed, but owing to the dimorphism of the cinchona plant, and the extreme wet of the climate in summer, which impedes the operations of insects, our seed sets in a most partial manner, and what amount of seed we may get next cold weather can only be a matter of speculation. I have, by the great kindness of Von Gorkom, received from time to time most valuable packets of C. calisaya seed from Java. I wish therefore to be permitted to press strongly on Government, that whatever other reductions or restrictions upon the extension of the Government Cinchona Plantations be imposed, the extension of C. calisaya at Rishap should be pushed with the utmost energy, and that no expense should be spared in getting up every practicable acre of this invaluable and unapproachable species.

Method of cultivation of cinchona.—I add here, chiefly for facility of reference, for Dr. T. Anderson has fully described everything in his reports, a short account of the method of cultivation of cinchona finally adopted by Dr. Anderson in Sikhim:—

(a.) To obtain plants. Seed is sown as mustard and cress seed is sown, either in an open border, shaded under a mat, or in winter time in a stove-house. The open border succeeds excellently well in summer, but when I received from Von Gorkom about one-fifth of an ounce of C. calisaya seed in last November, the head gardener, Mr. Gammie, raised very nearly every single seed, in all above 9,000 plants, in the stove-house. Cuttings are made just as cuttings of fuchsias, &c., are made. In order to obtain good eyes, stock plants are kept under glass for obtaining slips from C. succirubra, and C. officinalis strike with great ease. C. calisaya here damps off, but in the drier climate of the Neilgherries Mr. McIvor grows C. calisaya by cutting with complete success. When plants are grown by seed, they require picking out in the usual manner to give them more room.

(b.) The cuttings being thoroughly rooted, or the seedlings having attained about four inches high, are then removed into nursery beds. These are mere open borders on the hill side, with a mat shade over the top. The plants stand here three months, and during the latter part of the time the mats are gradually removed, so that the plants become hardened off to stand the tropical sun and pelting rain. They are then about a foot high, and ready for removal to the permanent plantation.

(c.) To prepare permanent plantation, the jungle is burnt during the cold season, and if there is a good burnt little else is required, otherwise the grass left untouched by the fire is collected and burnt; If there are trees on the ground, they are all felled. Small holes are then scraped in the ground six feet apart, and the plants in the nursery beds are stuck out in them in the very roughest way, no shade or care even of the most temporary kind being afforded them. The subsequent care of the plantations consist in cutting the grass from time to time with a hook, to prevent the young trees being choked before they get a fair start. In about three years the cinchona trees form a dense mass under which no jungle can grow.

(d.) I should add that Sikhim is the most steep and crumpled up part of the Himalayas, and that the outer ranges of the Himalaya are gigantic rubbish heaps, in which the stones and earth stand at as steep an angle as the heavy rains will allow. Of all the Sikhim valleys perhaps none is steeper or rockier than the Rungbee valley. The permanent plantations of cinchona are much of them on ground that no laborer except a Nepalese would venture upon, much more manage to stand and work upon, and the cinchona plants are often planted in nooks between rocks as big as cottages, and in every situation that they seem to like better. On the other hand, if the water lodges in the least in the subsoil, although it may be on a place where there is an excellent fall and surface drainage, we get there a bald patch in our plantation.

(e.) I have gone with great minuteness of detail into the cost of growing an acre of cinchona on this method with Mr. Gammie, the head gardener. Taking every possible unfavorable contingency, he estimates the cost of preparing and planting one acre of C. succirubra at Rs. 15, and the annual cost of the repeated jungle-cutting on it during the next three years at Rs. 22 each year. The acre will thus cost Government at the end of the third year something under Rs. 100, allowing for interest of money and superintendence; and the necessary pruning and thinning of that acre will then give Rs. 300. After the third year the cost of keeping will be next to nothing, and the pruning and thinning will give each year increased amounts of bark. These figures result from taking our red bark at its present London market price. In short, assuming the price of bark not to fall very materially, I consider cultivation in all India to be compared with that of growing cinchona bark in Sikhim, and still larger profits might be made by manufacturing the bark instead of sending for sale in London.

Manufacture.—I believe that Government first embarked in the cultivation of cinchona without any views regarding the manufacture. Dr. Ewart, in his pamphlet describing the Rungbee plantations, called attention to the great facilities afforded for the local manufacture and the great economy which would be effected by saving the cost of drying, packing, and carriage to England. In the Neilgherries, Mr. Broughton, the Resident Quinologist to the Government of India, has now established a small manufactory, and in April last was supplying about 10 lbs. per month of amorphous quinine to the Inspector-General of Hospitals in Madras.

There has been a great mass of matter published which appears to bear upon this question of local manufacture; but on closer examination it will be found that nearly all of it is beating about the bush, and refers either to manufacture of the high class C. *calisaya* and officinalis barks, or else consists of laboratory work, or in the announcement of the results of minute analysis. The only bark we shall have in quantity for many years at the Sikhim plantations is young succirubra bark, which presents unusual difficulty in its handling. It may, indeed, be seen in Mr. Howard's great Treatise on Indian Quinology, that some of the ablest German chemists and quinologists have actually declared that there is no quinine at all in this young Indian red bark. And in all the mass of extant literature, I think very few passages can be discovered likely to afford a man the slighest practical assistance in producing quinine out of such bark. The title of Mr. Howard's Quinology of the East Indies might lead one to expect much from it, but I challenge any person to point out a passage in that great book from which the slightest hint about the manufacture can be gleaned.*

Now, my object is not to make any complaint about this. Mr. Howard is by trade a quinine manufacturer, and he is fully justified in keeping the result of his vast experience to himself. But the moral which I desire to draw is, that upon this question of local manufacture the higher departments of Government ought not under these circumstances to pay the slightest regard to the opinion or advice of manufacturers. I make this point very distinct, because I have good reason to believe that interested persons have already commenced attempts by surreptitious influence to hamper the local manufacture in India, even if they cannot hope to stop it altogether.

In the statements concerning manufacture that I am now about to make, I depend therefore almost entirely—1*st*, on the results of my own very limited experience, ; 2*nd*, and chiefly, on Mr. Broughton. As above stated, I enjoyed the hospitality of Mr. Broughton's roof in March and April last, and witnessed daily his factory. He also shewed me many things in his laboratory. I cannot sufficiently express my obligations to his generous kindness. I am fully satisfied that Government has in their own quinologist a man able to advise better on the manufacture of quinine than any other man whose advice can be got; the manufacturers themselves of course give none. And in my experimental manufacture of quinine here, I am aiming as a first step to produce that "amorphous quinine" which from Mr. Broughton's manufactory so highly satisfied the Madras medical profession. This "amorphous quinine" can certainly be manufactured in any desired quantity, and if my skill proves insufficient to produce it at Rungbee, Mr. Broughton has undertaken to lend his best European assistant, or come himself to Rungbee, when it certainly will be produced.

The great chemical authority on Quinine is Pellettier, and he has to this day not been superseded. † As the result of his investigations, he declared that the febrifugal properties of jesuits bark lay in the peculiar vegetable alkaloids therein contained, and he proposed two forms in which those alkaloids might be prepared for medicinal use, and gave the process for their production.

The first form was the amorphous alkaloid itself, ‡ the second, the crystallized sulphate of the alkaloid. Pellettier thought the first preferable. However manufacturers, the medical profession, and the public have till now agreed in adopting the second. The reasons for this have been that the crystallized sulphate is in itself a beautiful and attractive product, and one which it is very difficult to adulterate; but more especially the process given by Pellettier

* Mr. Howard's works does not pretend to treat of alkaloid manufacture. —[Ed. *S. I. O.*

† Pellettier and Canventou indeed discovered quinine, but from the less perfect means in the possession of those chemists, arrived at erroneous conclusions. Though discoverers they are certainly not authorities.—Ed. *S. I. O.*

‡ This was *not* proposed by Pellettier, but by Setturner, who gave a commercially impracticable method for its preparation.—Ed. *S. I. O.*

for making the amorphous alkaloid contained some details which the manufacturers found especially troublesome to work in practice; whereas the process given by Pelletier for making the sulphate was found practicable by the manufacturers, and for actual manufacture on a large scale no other process has ever been employed.

The advantages of the amorphous alkaloid are, that it has not the intense bitter of the sulphate, so that heavier doses may be given to weaker patients, and that its manufacture is less wasteful of bark. For in crystallizing no perfect crystallization can be attained; a certain portion of the substance crystallizes, a residuary portion remains behind in the water of crystallization. In the case of cinchona alkaloid, in many cases not one-half can be crystallized by any skill. Hence crystallized sulphate must always be fairly expensive as compared with amorphous alkaloid. The waste in practice is not so great as appears, because the uncrystallizable alkaloid is not thrown away, but forms the basis of many well known medicines, and is also to be purchased as amorphous powder, and is now employed occasionally by some medical practitioners.

As regards the therapeutic effects of crystallizable alkaloid and uncrystallizable, it is inconceivable that there can be any difference. The crystallized sulphate is often dissolved in spirit or weak acid before taken by patients, and I never heard any medical practitioner say that the efficacy of the medicine was thereby diminished. For in such case, the patient takes identically the same chemical substance as he would swallow were he given uncrystallizable alkaloid, (or the general alkaloid as it comes from the bark), similarly dissolved in spirit or in weak acid.

I have above talked of cinchona alkaloid, meaning thereby the totality of alkaloid obtained from a given cinchona bark. This alkaloid is chemically separable into a series of very closely allied alkaloid substances, of which the principal are quinine, cinchonidine, and cinchonine. These substances are very complex, *i.e.*, they have numerically high formulæ, and as a consequence, there may be still some doubt as to their exact chemical composition. Like many complex compounds, they are by no means very stable, and it is probable that not only in the living tree but even during our laboratory processes, one is liable to be replaced by one of the other. Their complete chemical separation is an extremely delicate matter. In the ordinary process of crystallizing the cinchona alkaloid, all these alkaloids crystallize together in proportions varying with the bark employed, and the state into which the alkaloid has been got by the process employed. I believe I am justified in assuming that in the ordinary commercial sulphate of quinine, the manufacturer crystallizes all he can to the last grain, whether quinine, cinchonidine or some other alkaloid I may remark in passing that quinine itself crystallizes in comparatively short crystals,* and that the beautiful long needles which are regarded as almost a test of quinine are generally cinchonidine. There is, however, no objection whatever to putting out this mixed crystallized sulphate, for the latest experiments in England seem to show that the therapeutic action of cinchonidine is in all respects identical with that of quinine

However this may be, the object of the above is to remove an objection at first raised by some medical officers against the amorphous alkaloid, *viz*, that when they give 10 grains of sulphate of quinine, they give something definite, whereas if they shall give 10 grains of amorphous alkaloid, they will be giving possibly two grains—possibly four grains of quinine mixed with six or eight grains of something which may be rubbish, or may possibly be a strong quinidine-ing alkaloid Now the above argument of mine is intended to shew, that though there may be great doubt in a dose of amorphous alkaloid as to the relative proportion of the quinine cinchonidine and cinchonine contained therein, there is no more doubt than there exists about a dose of mercantile crystallized sulphate; and that it is extremely doubtful whether the proportion of quinine and cinchonidine matters in the least. There appears to be less known about the action of cinchonine. The amorphous alkaloid put out by Mr. Broughton contains on an average 33 per cent. of quinine, 40 per cent. of cinchonidine, and 27 per cent. cinchonine. This has been administered in 4,000 recorded cases in Madras as equivalent to an equal weight of sulphate quinine and is reported to act similarly and satisfactorily.

Mr. Broughton has named this product "amorphous quinine," which is quite defensible on the analogy of "sulphate of quinine." [It is the "Mr. Broughton's yellow or buff powder" of Dr Anderson's letters.] At the same time if it is lawful for me to offer any suggestions to Mr. Broughton on a matter connected with quinine, I would wish to suggest that this product be called simply "cinchona alkaloid,"† which is just what it is. There is the obvious objection (though it may be a superficial one) to Mr. Broughton's own name, that the product is not amorphous quinine, but that only 33 per cent of it is amorphous quinine.

I have received much friendly encouragement throughout my quinine work from Dr. Murray, the present Inspector-General of Hospitals in Bengal, and on the subject of the form in which the bark from the Government plantations should first be tried, he has advised me in detail. Dr. Murray says he would be perfectly satisfied with any product that contains the alkaloids in the same proportion in which they exist naturally in the bark, and that at least in the Government hospital practice he does not object to an amorphous product, as he is satisfied that no adulteration would or could take place within the Medical Department.

Mr. Broughton's product, this cinchona alkaloid, is in short identical with the amorphous alkaloid originally recommended by Pelletier, but Mr. Broughton has devised modifications in the details of the process for its manufacture; by which the practical difficulties attending Pelletier's process have been surmounted.

The Government of Bengal having sanctioned the experimental manufacture of quinine at Rungbee, I have, as above stated, commenced with an attempt to imitate closely Mr. Broughton's process in manufacturing his "cinchona alkaloid." Among other advantages attending this plan of mine is this, that if at any time it is wanted to manufacture the crystallized sulphate Mr. Broughton's process forms the first step in that manufacture, and all the machinery, &c., remain useful.

An impression I find still widely exists, that the manufacture of quinine is a secret, and that any attempt to produce it must fail. Now, any good text book of chemistry will give, not merely a laboratory process to produce sulphate quinine, but will also give an account of the process pursued by manufacturers. The real secret is to perform this process with reasonable economy, and especially to perform the prolonged boiling of the first precipitate in alcohol without any loss in alcohol. In these practical matters, I owe everything I know to Mr. Broughton.

There has been a great deal of correspondence addressed to Government suggesting various plants whereby the alcoholic process might be dispensed with, and the alkaloid obtained directly by precipitation. Dr. Simpson mentions that in the laboratory of De Vriej he has made even crystallized sulphate without employing alcohol at all* So have I, and, moreover, from red bark, but at a great sacrifice of quinine. The objections to the 'alcoholic process were originally defined by Mr. Broughton to be that alcohol is difficult to protect from being drunk, and that there is a liability to serious explosions in boiling it in large quantities. But these two objections exhaust the whole objection to alcohol. Be it recollected that every manufacturer employs this process. An acid will take up the quinine, but it will take up many other things, and in most uncertain proportion, so that at the end of the process it is impossible to say what you have got beside the quinine. Alcohol possesses the quality of taking up the alkaloid *only*, admixed with an unimportant quality of the coloring matter; a result of certain purity without analysis is thus arrived at. Moreover, at the present price of quinine, the alcoholic process pays for itself, *i.e.* it produces more quinine than can be got by any of the other processes, which depend on fractional precipitation, always necessitating some loss. I am satisfied that no process is likely to supersede it in dealing with Indian young red bark. But years hence, should these plantations produce calisaya bark in unlimited profusion (as I believe they will), I am by no means certain that the alcoholic process may not possibly be dispensed with, and a crystallized sulphate produced, with only a moderate sacrifice of quinine, which may then possibly be cheap.

I am now fairly embarked here at Rungbee on the manufacture, and I find that in practice the alcoholic process is by no means the thing to be dreaded. On the gigantic scale on which everything about this plantation is cast, all deduces itself at last to a question of magnitude. We have to boil repeatedly and squeeze dry in presses tons of bark, we have to stow in alcohol hundred-weights only of precipitate. The latter operation requires more cunning in the arrangements, but when those are once understood, the actual performing of the process will not cost one tithe the trouble of the former, merely because it has to be performed on a comparatively manageable quantity of matter.

The crack European manufacturers can undoubtedly manufacture quinine more skilfully than we can hope to do at Rungbee, and it remains to shew the counterbalancing advantages which induce me to believe that the local manufacture will prove permanent here:—

(*a*). The mountain above the plantation is covered with high forest to the summit. Fuel is excessively cheap, nor will it become dearer for many years, unless the cinchona reserves be mulcted of this forest. Charcoal we estimate to cost us seven annas (10½*d.*) per maund of 80*lbs.*

(*b*) Coolie labor (Nepalese or Lepcha) is Rs. 5 (=10*s.*) per month. For most of the manufacturing operations it is as good labor as could be desired, nor do the coolies object to keeping up fires all night; they rather enjoy it.

(*c.*) The Lepchas build large water-tight bamboo houses very cheaply. My large house for the alcoholic process, and which would turn out 500*lbs.* of quinine a month, costs Government less than £27.

(*d.*) Perennial torrents descend the mountain side, and the Lepchas lead water in bamboo tubes to all parts of the factory, which can be turned on or off in an instant, and also can be regulated in amount. In all the distilling, &c., this is highly convenient to say the least

(*e.*) By manufacturing here we avoid the expense of drying, packing, and carriage to England. As to the drying, I doubt if on the large scale we could carry it out satisfactorily in this reeking climate. The expense of carriage to England is not at present a very heavy percentage of the value of the bark, but in case the price of bark falls greatly, it might become of very grave consideration.

(*f.*) By getting the bark directly from the living trees into the boilers an advantage is gained in the manufacture, which only those who have tried it as against working dry bark can fully appreciate. The bark is then quite tender, and gives up its alkaloid with the most charming readiness. An extremely small quantity of acid suffices, the tedious boilings are largely reduced in number and duration, and finally, more quinine is obtained than by any amount of labor could be got from the same bark after having been dried.

* This is an error; quinine in an uncombined state is unknown in the form of crystals.—Ed. *S. I. O.*

† The substance was thus named, not by Mr. Broughton, but by the Medical Inspector General. It is the most convenient name for dispensary use.

* The original process of the Edinburgh pharmacopia, in use for many years, does not require the use of alcohol. It is easy, but wasteful.—Ed. *S. I. O.*

In conclusion, I would beg leave to apologise for the imperfect arrangement of the matter in this report. The subjects of abandonment of ground, of the extension of cultivation, and of local manufacture, are so closely connected in my own mind, that I have been utterly unable to divide off my matter precisely. I beg leave to recommend that the Sivok division of the Rungbee reserve be handed over absolutely to the Forest Department, and that the Eyang valley be reserved intact for cinchona.

COFFEE.

THE COFFEE PLANTER OF CEYLON.

To justify our statement that to be a coffee planter it is necessary that a man should be possessed of knowledge varied and comprehensive, we have but to quote the headings of the chapters into which Mr. Sabonadiere's book is divided.

Introductory Remarks, Selection of Land Soil, Elevation, &c., Felling, Clearing, and Lopping, Nursery, Lining, Holing and Planting, Roads and Drains; Weeding, Topping, Pruning, and Handling, Manuring, Trenching, &c., Picking, Curing, and Dispatching Crop; Bungalows and Lines; Stores, Pulping House and Barbecues; Tools and Machinery; The Enemies of the Coffee tree; the Malabar Cooly; Estimates.

The great feature in the present edition is an entirely new chapter on manuring, which embodies the large experience the author has obtained in the use of artificial manures applied to the extensive properties under his charge. Mr. Sabonadiere's experience has led him thoroughly to believe in the vast benefits of judicious manuring when combined with draining and trenching, and we know that he traces the short crops of the present season to meteorological influences and not to manuring, although, of course, harm has been done and can be done by the ill-advised use of forcing manures. It has now been effectually proved, he states, that Draining to prevent wash and waste of soil, and a system of manuring while the trees are still young and vigorous, tend to prolong the age of estates. There is no doubt that under such a system coffee-trees may have as long an existence as other evergreens; excepting of course such contingencies as overbearing, attacks of grubs, the taproot coming in contact with rock, or becoming rotten from swampy soil, all of which bring the tree to premature decay."

Mr. Sabonadiere, like every one else, gives the preference to cattle dung, where it can be plentifully and economically applied. Of course the mere opening of so large a hole as is usually dug near the coffee trees would effect much good even if no manure were applied. But as the expense of applying large quantities of so bulky and heavy a material as cow-dung is very great, it may be important to our planting readers to know that a gentleman with considerable experience in the use of manures has found that a much smaller quantity than is ordinarily used of cow-dung or pulp will have all the effect of the larger quantity if mixed with a proportion of bone-dust, or better still, superphosphate. Manuring with cattle dung, aided by bone-dust or artificial manure Mr. Sabonadiere believes could be so managed that, with an average expenditure of £3 per acre per annum, "properties of even medium soil might be kept to an average bearing rate of eight to ten cwts. an acre, which would fully repay the cost, and leave a large profit besides." As Mr. Sabonadiere is speaking of cases where the cattle are wholly stall-fed, this judgment founded on his experience is most important, as showing that where capital and skill are applied to the coffee enterprise can be rendered profitable not merely temporarily but permanently. But clearly here, as in all other pursuits, skill must be supplemented by capital. There can be no doubt that much of the failure we have to mourn over in Ceylon has been due to the mistake of attempting too much. Men have cleared and planted 200 to 400 acres of land, when they ought to have concentrated their energies and means on 100. Mr. Sabonadiere is, of course, in favour of burying all the prunings. If labour cannot be spared for so necessary an operation as this the look out is a bad one. We quoted notices of mana grass in our last, but there are many properties where this substance cannot be procured within available distance. In those cases a reserve of forest would be valuable from which fresh earth could be brought to be applied with manure; also twigs to be buried in trenches or to be burnt into ashes while the larger branches could be converted into charcoal. Purchasers of lots in Dimboola, which are high and close to forest not likely ever to be felled for coffee planting purposes, have their compensating advantages in the direction we have indicated. Some of their young plants may be gnawed by rats from the forest, and there may be some tendency to bug from nearness to damp and shade, but it is an immense advantage to be close to inexhaustible reserves of humus and potash. With these from the neighbouring forest, the pulp and prunings of the states, some cow-dung and a small quantity of good bone-dust or really rich superphosphate, we have little doubt that properties at from 4,300 to 5,000 feet above the sea can be kept at an average yield of 7 or 8 cwts. an acre. This in a climate far superior to that of England ought to content reasonable men. When sceptics point to the earlier Dimboola estates opened at a high elevation, estates which bore largely for the first few years of their existence and then went back,—it must be remembered that such properties were opened in the pre-manuring era, while portions of them revived by high cultivation are again yielding heavy and remunerative crops. Mr. Sabonadiere enters fully into the nature and value of composts made of poonac, bone-dust and guano; the latter a substance which should never be used except in combination with others, such as poonac. Of Leechman's compost the author speaks as a capital manure; one pound a tree is a proper quantity to be used, and the average cost, including application, is, say, £6 an acre; it may also be beneficially mixed with other manures. On this estate it was very effective in supporting trees under heavy bearing."

Of Sombrecorum Mr. Sabonadiere's experience does not seem to have been large, but it is favourable as regards the very cases where manuring is most required, those of "poor coffee." We quote the paragraph:—

"Sombrecorum is one of the artificial manures that has lately been manufactured and owes its origin to Mr. B. Tytler, of Palakelle. As opinion varies much on its virtues, I have included in the Appendix some correspondence that has appeared in the newspapers upon the subject. My own experience of Sombrecorum is that it is a good manure; but having tried it on very good coffee the effects were not so perceptible as would have been the case on a poor estate. I have seen it applied to very poor coffee with most beneficial effects, but I fancy it requires to be frequently applied to afford lasting and remunerative results."

The cost of the leading manures and composts, including application, is given; but for the detailed figures we refer to the work. One result is clear; in addition to £25 to £30 an acre which (including buildings) an estate of 200 acres will cost by the time it is brought into full bearing, an annual expenditure of from £1-10 to £3-10 an acre should be calculated on for trenching and manuring. Trenching, closed and open, is described as well as modes of loosening the soil, applying swampsoil, &c. But we have dwelt long enough, though not too long, on this important subject of manuring, the great question on which the prosperity and permanency of coffee estates depend. Knowing the large direct benefits derived from a complete system of paths and cart roads through an estate (as well as the indirect benefits from the loosening of the soil in making them) Mr. Sabonadiere strongly advises the thorough roading of the property as one of the earliest operations, and he is doubtless right, although even the sacrifice of coffee bushes on old estates is as nothing compared with the benefits conferred by paths and cart roads for which they are sacrificed. In glancing over the book some curious facts strike us. In ordinary farming cost of seed is an important and ever-recurring item. In the case of coffee planting the quantity and cost are, we should say, the smallest that can possibly occur. Five bushes of parchment coffee at the most will be sufficient for a nursery yielding plants for 100 acres, so that the equivalent of less than two cwt. of clean coffee value, say £6, would suffice to yield plants for an average estate of 200 acres. In the estimates we see that the cost of plants is taken at £100 for 200 acres in one case, at £45 for 100 acres in the other, or 6s. per thousand. We believe the cost of good plants in Dimboola is now 8s. per thousand; but even taking grubs and the necessity of supplies into account, the cost of plants is about the smallest item of all. In sugar planting and other planting pursuits the case is very different. The instructions for lining, holing, and planting are full and precise. The importance of keeping estates clean from the first is shown by the astounding fact mentioned by Mr. Sabonadiere, that if weeding costs 3s. per acre per annum then the sum expended on only 800 estates was £288,000 annually. Now the sum cannot be under £300,000 an average of £300 for each estate. The prevailing weed, as our readers are aware, is the goat weed (*Ageratum conyzoides*) which unfortunately feeds on the very elements required by the coffee plant for its healthy existence. Botanists who ought to kown tell us it is not indigenous but introduced, like the thistle into Australia, and likely equally to demand special legislation for its control if not its extirpation. Much might be done, we suspect, by the application of some powerful chemical substance to gather heaps of the *ageratum*. Burning cannot often, from the dampness of the climate, be so effectually accomplished as to destroy the amazing quantities of seeds which this plague of a weed produces. Mr. Sabonadiere favours contract weeding under proper regulation. When he comes to pruning the author expresses his belief (contrary to the general practice) that if young trees were allowed to bear their maiden crop before being topped, it would be very much to their future benefit and endurance. He certainly gives good reasons for his belief and against the too early forcing of the trees for the sake of crop. We fancy that the greater or less exposure to wind will determine the practice. In Dimboola we suppose it would be safe to let plants grow to four feet high before topping, while in Medemahaneura such plants would be blown to shreds or uprooted. Mr. Sabona-

diere must have been thinking of the womens' right theory when, in regard to pruning, he wrote :—"Even *women* may be taught to use the knife in a very *workmanlike* manner." In treating of picking there is an application of common sense which seems too obvious to be mentioned, and yet the vast majority of young planters would require to learn from experience what Mr. Sabonadiere thus describes :

"In steep ground, my orders invariably were to pick from the top of the hill. My reasons were that if any coffee dropped it rolled down forwards and was more likely to be seen and picked up, and because the coolies were not loaded when near the top of the field, so they had not to come down to empty their small bags and then have to go up again—perhaps to finish only a few trees—which they are very loth to do, their natural object being to complete their task as quickly as possible."

The value of such an appliance as spouting on an estate is presented vividly in the following extract :—

"Where there is a sufficient declivity and sufficiency of water, spouting should be made use of to transport the cherry to the pulping house from distant parts of the estate. Along the lines of spouting, here and there, in convenient spots where paths converge, receiving houses must be put up, into which the coffee is taken and spouted down to the works. The coolies, being thus saved the toil and labour of a long and, in wet weather, sometimes a dangerous journey to the pulping house, but time, which is always money, is saved ; the coolies are able to gather a larger quantity, and they are saved bodily wear and tear. With a force of 200 coolies in the field, an increase of at least 100 bushels, or 10 cwt. a day may be safely reckoned upon, amounting say to 300 cwt. for the five heavy weeks of picking, and representing a money value of fully £1000 in the London market."

Under the head of bungalows and lines Mr. Sabonadiere argues strongly for permanent buildings of stone with shingled roofs. Very valuable plans and estimates are given from which we gather that even in so remote and expensive a district as Oud-apusilava buildings can be erected at about the following prices :—

Store.—Stone pillars, roof of galvanized Morewood's tiles, sawn timber, coir-matting, floors in three stories, £448.

Pulping House.—Solid masonry, pillars, and cisterns ; a double floor for curing purposes, corrugated iron roof, but not including cost of machinery, £483.

Bungalow.—Outside walls of stone, inner walls of sawn timber, mudded between sawn reapers, planked floors, and single roof, and including £70 as cost of godowns, £356.

The levelling of the sites has not been included.

A first class bungalow for a married European gentleman with a family would cost £ 00. The cost of lines is strangely omitted, but to provide for a property of 200 acres in full bearing, we suppose the following figures would be pretty near the mark :—

	£
Store	5 0
Pulping house	500
Bungalow for Proprietor or Chief Supt,	500
Do for "Sinne Dorey"	300
Lines (say) ?	500
Total...	2,300

This must be near the mark, for one of the estimates gives £2,530 for buildings and machinery, including £250 for spouting. Less than £2,000, it is evident, will not suffice for really good buildings, or at the rate of £10 per acre, leaving £15 to £20 per acre for planting, roads, drains, &c. We need scarcely remark how much the use is facilitated and the cost lessened of imported machinery, iron roofs, spouting, &c., by the railway and the extension of cart roads. The planters of the present generation may have to pay higher for labour and materials of local production, but they have nevertheless great advantages as compared with their predecessors, those, for instance, who had to employ elephants to carry heavy machinery up the Kandy road.

In looking over the valuable matter in the Appendix, we are struck with some curious results arrived at by further experience, Mr. Wall wrote on manuring some fourteen years ago. Time has confirmed (as we showed in our last issue) his estimate of the value of mana grass, but it has completely overset what he wrote about coffee pulp. All he could say of pulp was that it was not "very valuable or very effective, but it costs next or next to nothing." In the experience of others it has proved of immense value even alone ; but certainly most beneficial when mixed either with cattle dung, bones, or superphosphates. Mr. L. St G. Carey considers pulp and superphosphates about the best possible application to coffee ; while in Mr. Sabonadiere's estimation pulp, mixed with cattle dung, is equal in value to cattle dung itself. But can extended use alone, in the face of such large exports, have led to the great rise in the cost of bones ? Mr. Wall stated the cost of bones in 1857 at 3s. 6d. per cwt. (£3 15s. per ton !) in Colombo or 6s. on the estate. Taking five cwts. as the quantity for an acre, about 45s. per acre would suffice for cost on estate and applying. Mr. Sabonadiere is moderate when he calculates the cost of a ton of steamed bone-dust at Colombo now at £8.10 or £10 on the estate. He would apply it at a ton at a cost of 17/6 or £62/6 per acre in all. The half ton this would be 61/3 against Mr. Wall's 45/; the cost of bones in Colombo having thus more than doubled ; the cost of carriage to the estate being reduced from £ 2 10 to £2 per ton ; while the cost of applying has risen from 14/8, say 15/. to 17/6. Allowing for the additional cost of grinding and steaming, the great fact is that bones in Colombo cost now considerably more than double what they could be procured for in 1857. Even so, if of good quality, they are well worth the money, and recent experience points not to their disuse but to their judicious use. We intended that this should be our concluding notice of Mr. Sabonadiere's book, but so many topics suggested by it still remain for discussion that we must devote one more article to the work.

COFFEE PLANTING AND THE BORER.

To the Editor of the "Homeward Mail."

SIR,—In a recent issue of the *Homeward Mail* mention is made of the non-success attendant on bamboo planting in Coorg, in coffee plantations, as a preventive against the borer. This certainly was to be expected as bamboos are the very hot beds of this destructive insect. Therefore is it strange that such a measure should have been adopted ; but we daily see that "facts *are* stranger than fiction ;" and certainly the idea of affording the favourite nourishment and resort of an insect with the view of enticing or bribing it not to injure your property is simply nonsense.

There is, however, a plant, the growing of which might, and I think would, have the desired effect of keeping the borer and all such insects at a distance, as being a strong repellent. I mean the anonas, all of which tribe contain a highly acrid quality, most fatal to insect life, the most common of all, the custardapple, being the most strongly imbued with this principle. Consequently, there is reason to hope that the growing of this plant plentifully, intermixed with the coffee ones, might have mere effect in keeping the coffee estates free from these injurious insects than the attempt in Coorg of bribing them into harmlessness by affording the noxious insect its favourite resort, wherein to breed and multiply.

I throw out this hint that some one more gifted than myself on this head may take the matter up, or those having the opportunity put it into practice, as certainly no harm if no good would accrue from cultivating this delicious and nutritious fruit.—I am, Sir, yours faithfully,

GEO. T. HALEY, Colonel.

WYNAAD.

WE are happy to state that during the past week we have received several communications containing the gratifying intelligence that the prospects of the coming crop are most encouraging. From an estate near Vythery we hear that even if no more rain should fall,—which is not likely to be the case,—at least sufficient has fallen, and the ground is sufficiently saturated to have almost ensured the fruit setting. As better prices are sure to be obtainable now that the dreadful war is at an end, we think we may congratulate all interested in coffee upon the present signs of the times, and trust that this and subsequent years will prove that coffee, as an investment, is a most profitable one. We have been informed by "several oldest inhabitants" that a season like the one we are now entering on, has not been known for more than ten years.—*South of India Observer.*

NEILGHERRIES.

WE are now enjoying most wonderful weather : the rain that used in former days when seasons were good to fall the last ten days in April has visited us early in March. Such a phenomenon we believe, has not been experienced by that mythical person, the "oldest inhabitant." Planters may fairly congratulate themselves on the splendid prospects before them. Coffee, tea, and cinchona have a fine future in store, if we may consider this early rain as the forerunner of a cycle of good seasons. As it is always preferable to be paid in advance, so it is well to score a few inches of rain rather before than after the time. At all events, the plants get a good start, and are in a better position to meet drought, should it unfortunately overtake them, than if they had received no rain at all. We hear that this year there is. in gardens, and absence of insect life, which is very encouraging ; as for the last three or four years it was almost impossible to raise even a cabbage before June. Turnips even are reported to be growing freely, and oats, sown last November, after being ravaged by the white butterfly caterpillars, which appeared in millions in January and were suddenly cut off by an extra hard frost, are now doing well. In fact, wherever we enquire, evidences of changed seasons appear on every side. We are fortunate, for in England farmers have had a hard time

of it to feed their ho[illegible] with hay at £8 a ton, straw at £4, and not a turnip larger tha[illegible] potatoe to be had.—*South of India Observer.*

TEA.

HIMALAYAN ENTERPRISE.

TEA CULTIVATION.

(From an old Planter.)

THE properties, manufacture, and cultivation of tea have probably been familiar to the Chinese and Indo-Chinese races for untold centuries. Marco Palo mentions the use of it as universal in Northern China in the eleventh century; and it is in all probability coeval with the most ancient form of civilization. As is well known, it grows wild in Assam, and the tea shrub which was discovered there forty or fifty years ago, is probably the same as that cultivated by the Chinese and latterly by Europeans in the Himalayas. Change the respective localities, and each would, in all probability, under favorable circumstances, develop into the other.

The tea shrub is peculiar to semi-tropical climates, by which I would convey climates, which without being absolutely what in India we call hot, are yet like the hot ones subject to a monsoon or rainy season. Such are China, Ceylon, the Indian Archipelago, most parts of South America, &c.; but the tea plant cannot, as far as yet ascertained, be profitably cultivated in *all* of them. In such countries it is to be noted that the vine will not flourish, nor can grapes worth anything be produced, Moisture and cloudy weather prevailing in the summer month which prevents the fruit ripening; roughly speaking, where grapes grow well, tea will not answer and *vice versa*.

This the Jesuit missionaries discovered when, during the last century they undertook to make wine at Pekin but failed in doing so, though they supposed that nothing would be easier. The same failures have been made in various parts of the world with respect to tea.

Enthusiastic innovators and developers have tried it in Mexico, Brazil, the Cape, Australia, New Zealand, Chili, &c., but (though lately there have been favorable accounts from California) hitherto without success. It would be as well, by the way, if some scientific botanist, or horticulturist, or arborist, or all three combined, would publish a work giving us the history of the acclimatizations which during the present century have been tried *and failed*; it would save an immensity of money, trouble, and disappointment.

There exist numerous people who seem to think that anything that *grows* in Europe will grow in India, if only planted and watered. They propose to introduce *Ribstone Pippins* into the Central Provinces, hazelnuts and grapes into the Monghyr Hills, &c., &c.

These same people if they heard an English landholder talking of planting an avenue of mangoes in his park would see the absurdity at once; but somehow, though they can understand Indian trees and shrubs not answering in Kent or Sussex, they can't understand English ones not doing in India. Perhaps they think that as *they* have succeeded, plants and trees from their part of the world ought to succeed too; *quien sabe*, as the Portuguese say.

Another ticklish peculiarity of tea is that though the seed in certain soils and climates may germinate freely and produce fine luxuriant seedlings and plants, it is quite possible that the manufactured produce may turn out, however great care has been taken with it, to be of very inferior quality as a beverage. Sundry acute and enterprising individuals have been "let in" in this manner. The fact is that *profitable* tea planting requires a combination of circumstances in soil, climate, elevation, moisture, &c., &c., not to be met with everywhere.

Tea was introduced into the N. W. Provinces and the N. W. Himalayas about 25 years ago, a great deal of expense and trouble being taken by Government to procure plants and seed of good quality from China, Chinese manufacturers, &c., &c. It is to be noted, however, that this said trouble and expense was not incurred by a liberal Government for the benefit of their own countrymen, of those, in fact, who now carry on the enterprise. The Englishman, the traditional interloper, was never "contemplated in general orders," the idea being that "the Natives" would jump at the notion, go into the new branch of industry with a will, and make a good thing of it, which would raise the revenue and redound to the credit of all parties concerned. It was only when they discovered that blacky (who is not fond of jumping at all) would have nothing to say to the business, when, in spite of all favorable conditions, inducements, persuasions, and promises they found that nothing on earth would induce him to jump; that they, to save their own credit, sent out "into the highways and hedges" and offered worse terms than the Native had refused to the British interloper.

Having vainly spent eight or ten years in attempting to soft-sawder blacky into going ahead, the authorities finding it, what is vulgarly called, rather a "blue look out," issued in 1856 a notification to the effect that they were prepared to make grants of land (waste) to individuals (Europeans) who were willing to undertake the cultivation of tea in Kumaon, the Deyrah Dhoon, Kangra, &c., that such should be supplied with plants and seeds gratis, and the reports of Dr. Jameson, Superintendent of the Government Botanical Gardens, N. W. P., with those of other officials connected with the experiment, was published for the information of intending settlers. Unfortunately this information, which was all the [illegible] had to go upon, besides being rather meagre, was based [illegible] mistaken conclusions and calculations; it was the work, in fact, of a man who thought he could answer for the mercantile [illegible] of an experiment, without taking the trouble of practically working out the proposition or the conclusions on which his hypothesis was founded. For example, he affirmed as a proved fact that [illegible] of tea bushes would, under ordinary circumstances, yield [illegible] lbs. or thereabouts of made tea per annum, and strongly recommended the greatest possible number of acres (up to 1,500) being taken under cultivation.

As I before observed, nobody possessed in those days the slightest knowledge of tea cultivation other than that contained in the Government reports, and these reports were naturally (the Government having been experimenting in various localities for the last 12 years) supposed to be trustworthy and conclusive. The planters accordingly calculated that at the rate of 200 lbs per acre (the lowest estimate given) they could get a tolerably profitable return, and so they could have done at *that* figure, but they discovered, after expending their capital in planting out the utmost area their funds would admit of, that the real yield of good but unmanured land instead of being 200 lbs. was 50 lbs., or exactly one quarter (or even under) what Dr. Jameson had named. These two instances of the imperfect and inconclusive nature of Dr. Jameson's report, viz., his stating the average yield per acre at 200 lbs., and his recommending the largest possible areas to be put under cultivation, did more harm than all his other blunders put together; I therefore avoid remarking upon or criticising the rest of the work, which is not likely to mislead anyone now-a-days. It may, however, be here noted as an instance of the practical value of official opinions and of official experimentalising, that the dicta and prophecies respecting the future of tea, the *modus operandi*, &c., of those (officials) who had been many years in the provinces, where the experiments were conducted, who had experimented in it themselves, and were supposed to know all about it, have for the most part proved utter fallacies.

1st,—It was first asserted that "the Natives" would eagerly take to the cultivation; this turned out a mistake.

2nd,—It was next represented that tea cultivation might be profitably undertaken by anyone with sufficient capital, that the work was light and easy, and that the best plan was to commit it *in toto* to the superintendence of trustworthy Native subordinates; the reverse was found to be the case.

3rd,—It was held to be incontrovertible that companies stood a much better chance of success than private planters, the theory being that their large capital would enable them to stem reverses, to hold on, and ultimately run down the latter. The running down was not yet come off.

4th,—On the failure of all attempts at profitable tea cultivation, based on the Government experience and on the Government experimental practice, the official guidances, going "right about face" with alarming promptness insisted that the whole enterprise was a delusion and a snare and *impossible ever to succeed*. Events are now slowly but surely proving this to be another addition to the list of their "bad shots," and I am sorry to be obliged to state that in the course of my experience (extending over 15 years or thereabouts) I cannot recollect having seen them make one good one.

(To be continued)

KANGRA VALLEY TEAS.

SIR,—In your impression of the 4th instant, I was sorry to perceive that "Scrutator" has again rushed into print on the heading of "Indian Teas," and attempted to refute the answer I have to his former letter on the same subject in the *Pioneer* of the 11th October 1870. I say "sorry," because I have to repeat the gist of the letter to object to, every word of which I uphold, because I advanced nothing I cannot distinctly prove. When I see an unsupported attack on both the tea and district of Kangra, I feel bound as one interested in that locality to disabuse "Scrutator" of his notions, which are quite contrary to the facts. "Scrutator" remarks in his first letter:—"If this tea was no better than the *last* crop grown at Holta, it would have resulted in a heavy loss to the grower, as two per pound was the most which was offered for that crop." He now says, I misunderstood the statement, and that the year referred to was the last on

which the Government held the estate. It is a pity he did not then state the same in black and white; for, not I only but all my friends who read the letter understood it to refer to the crop of 1869, and were very indignant about it; and if I had not written denying the statement, others were ready to do so. I am confident that all my assertions in the *Pioneer* of the 28th October 1870 can be verified by the Kangra Valley tea-planters. It is well known that the Kangra teas are not so strong for mixing purposes as the Assam; but that they are bought up at high prices, and in some cases at even higher rates in London than the Assam teas, I have evidences in my *escritoire* to prove. This shows that they are mainly inquired after for the purpose of drinking without any admixture, because the pe[culiar] and delicately-scented flavour is largely appreciated, by[ect. leas]ing consumers. A great London tea dealer likew[ise] informed me that in some instances the Kangra tea [was] used for mixing with China growths, as a ... extract:—' portion sufficed to permeate with its aroma sufficient quantities a large quantity of the usual tasteless Chin[ese] made. Anyhow, whether for mixing purposes or not, the fact remains the same, viz., that Kangra teas all round h[ave] at the London auction sales realized extreme rates on many occasions; and have at times eclipsed the prices obtained by the Assam Company; and of this also I possess the proof. I also maintain that the residents can obtain more land in Kangra if they require it, and many can tell you of lands they declined to purchase well suited for tea cultivation. It speaks extremely little for the great experience of the "oldest resident" if he thought it worth his while to buy 40 acres of tea garden that was "miserably bad and unfit for tea;" and if the truth were known, it would probably be found that the "oldest resident" from want of tact and skill in negotiating with natives had himself alone to blame for his ill-success in obtaining land. The cost of land carriage to the nearest sea-port is doubtless higher in Kangra than that prevailing in Assam or Cachar but an overwhelming setoff against this is in the far lower rate paid for labour, viz., Rs. 4 per mensem, and which has not to be imported. There is no scarcity of labour in the Kangra Valley, and I have heard of many planters turning away hands they had no work for.

The coolies are all men of the district,—say two-thirds from the neighbouring villages, and the remainder from various places none of which being as a rule south of the Sewalik Range. I also repeat that "the *bulk* of the plantations is on nice sloping ground," (I referred only to the Kangra Valley), a visit to which on "Scrutator's" part might perhaps convince him of the accuracy of this statement. You will observe that the word "*bulk*," to which exception has been taken, allows some portion to be as "Scrutator" has described it, on ground requiring to be terraced. As "Scrutator" has seen fit to disparage the Kangra teas, climate, soil, formation of land, supply of labour, without the smallest foundation in fact, I therefore beg most distinctly to deny his assertions, and to suggest that both he and his friends should favor the Kangra Valley with a visit and ask the several planters their opinion on the above subjects. I had almost forgotten to notice the following in "Scrutator's" last letter—"and the statement that at Palumpore Fair the present proprietor alluding to the Holta Estate, sold his tea for 1, and 2 Rs. per lb., is a startling comment on former management which could only produce tea worth two annas." I *quite* agree with "Scrutator" in this being a very "*startling comment*," but since he only fears to doubt the truth of the statement, I recommend him to write and ask either Major Charles Strutt, or his manager, about it. Referring to the tea made at the Government Garden at Holta before it was sold to Major Strutt, "Scrutator" in his first letter says, I have no hesitation in saying that every lb. of tea grown by Government has cost 10 (ten) Rs. per lb., probably more." I conclude by inviting "Scrutator" to prove this assertion.

OMEGA.

Kangra, 8th March 1871.

THE CACHAR TEA GARDENS.

Kumaon, 1st March.

THE past fortnight has been a splendid one for all interested in the cultivation of rather in these parts, upwards of three inches of rain having fallen, making total of 5 inches and one-fifth for February. The temperature fell some 7 or 8 inches and hoar frost became very hoary, giving a severe check to vegetation, which had made great progress under the previous mild sparinglike weather. For the last week there has been a succession of brilliant sunshine and accompanying blue skies, and the thermometer having risen to nearly its original figures trees and flowers are rapidly bursting into leaf.

In a short editorial in your issue of the 25th ultimo, you quote some statistics regarding Cachar and its tea gardens, which would seem to give a satisfactory reply to the oft-repeated query "why does tea not pay?" It is to be hoped, however, that the future will give a more satisfactory reply to the above query than the past has been able to do with regard to the sister district in question. In a late issue of *Toulmin & Co.'s Weekly Circular*, the average prices of Cachar teas sold in Calcutta from 15th to 31st December last, are quoted, and a few details of the quantities of tea sold and the prices realised may not be uninteresting to some of the readers of the *Delhi Gazette*, which numbers among its constituents all sort and conditions of men. During the fortnight in question one thousand three hundred and sixty-four chests of Cachar tea were sold by auction, some plantations *averaged* as low as 11 annas and 6 pie per lb., while others *averaged* as high as Rs. 1-2-6 per lb., the average of all the averages being 15 annas and one-fourth of 1 anna per lb. Taking each chest to average 80lbs., a total of [illegible] lbs. were sold at four auctions within two weeks. The teas sold making up the averages consisted of Pekoes, Pekoe Souchongs, Souchongs, Congous Broken teas and Dust. In Cachar as in other tea districts, doubtless tea-planting suffered from ignorance, carelessness and stupidity on the part of the planters, but the figures quoted before seem to shew that the tide has turned there as it has elsewhere. To my knowledge one of the Cachar tea gardens has this last season made *a clear profit* of Rs. 60,000, and last year or the previous season it *cleared* Rs. 65,000. In this province I know several estates which during last season *cleared all expenses*, leaving an overplus available for dividend, but these plantations are in the hands of men who make tea-planting a labour of love and an avocation followed after with enthusiasm, and it is to be hoped that these are but the beginnings of better things to follow.

Tea-planting in this province has suffered from several species of planters.

1st.—We shall say there is the lazy planter, who affects kid gloves and looks after his plantation in his bungalow, where he amuses himself all day or nearly so, trusting almost entirely to natives. In the evening when work has ceased the tindal or chowdry arrives at the bungalow makes his obeisance, and is addressed "Salam chowdry, kam aj utcha hai?" "Ha sahib khoob utcha hai," replies the chowdry; "Bohut atcha chowdry, salam," replies the sahib, and this going on from week to week, and from month to month, the result is that for every 100 rupees spent the estate gets value on work for 40 or 50. No wonder that tea should pay as it has been doing!

2nd.—We shall say there is the ignorant and conceited planter, for ignorance and conceit generally go hand in hand. This gentleman is a shade better than his lazy brother, for although the light which is in him is well nigh darkness, he acts more or less to his farthing rush-light, but the details of his cultivation and general management are something unique, to the unbounded satisfaction of his shareholders, who, like a certain character we read of in Shakspear, he has been paying "with vow and promises" these dozen years. Of him and his idiosyncracy, however, more anon.

TEA CULTIVATION ON THE NEILGHERRIES.

[BY JAMES MACPHERSON.]

Manufacture of Black Teas.

THE various means of producing black teas are almost unlimited; so much depends upon the skill and convenience of the workmen, the size and convenience of the factory, and the state of the weather, that the conditions of manufacture, and consequently the quality of the manufactered product, are necessarily very varied.

With a factory of a sufficient size, and with an abundance of fuel and good arrangements, the manufacture of tea may be rendered almost independent of the weather. Should the reverse of these conditions be the case, the manufactured tea will, as a rule, suffer in quality, from the impossibility of supplying all the conditions of space, time, and heat.

The first stage of the manufacture will be the gathering in of the green leaves; and it will be necessary to make some few remarks upon the condition or stage of growth to which the plants should have arrived before the crop should be picked.

It will be necessary to keep *two* important objects in view, viz., the obtaining a maximum yield of leaves, and at the same time preserving the health and vigour of the plants. Many and serious blunders have been, and still are, committed in this direction. No pains should be spared to preserve a proper balance between the leaves and roots of the tea plant under cultivation; the health of the one depends entirely upon the vigour of the other; if the leaves are overplucked the root action speedily becomes impaired, the leaves will be *produced* in smaller quantities as a natural consequence, and the whole plant will speedily assume a stunted and unhealthy appearance. The Chinese have found that *three* (spring, summer, and autumn), may be advantageously taken in their climate; and there cannot be a doubt but each of these crops are made up of two or at most three pickings, and that they allow their plants to make a good and abundant growth before they venture to rob their foliage.

Any other course would inevitably ruin the health of their shrubs; indeed, they admit that in those instances where they are induced to pluck the young and undeveloped spring leaves for the manufacture of Pekoe teas, the health and vigour of the plants receive a very material check.

The difference of yield is of course in favour of healthy plants, and it is an utter mistake to suppose that the taking twenty pickings per annum will yield a greater weight of tea than the taking ten; there must be comparatively less in each picking when twenty are taken, while the quality of the produce will eventually be impaired, from the circumstances of the plants being checked in their vigour.

The young shoots should be allowed to make six or seven leaves before the pickings are taken, and then the terminal bud and the tree leaves below it, together with the tender stalk, should be pinched off, thus leaving four leaves at their base, ready to burst into a successional growth.

Should bulk, rather than fineness of texture, be a desideratum the fourth leaf may be taken, if it be sufficiently tender to make into tea.

A good gang of women who are well acquainted with their work will average from 18 lbs. to 20 lbs. each of green leaves per day in the spring; I have had women pick as much as 29 lbs, while from 24 lbs. to 28 lbs. was a very common day's work. It is an excellent plan to pay the women so much per lb. for picking, regulating the price accordingly as your plants may be young or old, or give an abundant or only a meagre crop of leaves.

It was my practice to lower the price per lb. as the women became better acquainted with the work, commencing at half an anna per lb. and yearly reducing the price until the work was at last taken at a quarter anna per lb., and even this latter price is too high; when the day's work is done the women bring in their leaves to be weighed, and if any of their baskets be found to contain unduly coarse leaves, the whole day's work should be confiscated; if this be done once or twice it will operate very beneficially upon the careless pickers. As the leaves are weighed they must be spread thinly upon cloths or mats; they should be from 1½ inches to 2 inches thick, and great care should be taken to preserve this thickness evenly, as fermentation in this stage is to be carefully avoided. The leaves usually remain thus spread out from four or five o'clock in the evening until seven o'clock next morning. In the morning early, if there be sun, the leaves should be exposed to the air and tossed in the hands until they are flaccid and the edges present a bruised or reddish appearance. If there be no sun this work must be done within doors, especially in rainy weather, and ample accommodation will be indispensable for these purposes on large estates. When the withering is complete the roasting commences; the roaster takes a double handful for each roller (one roaster being ample for a dozen rollers), and this allowance is thrown on the pan and kept constantly and briskly in motion for four or five minutes. The pans are heated to such a degree that the leaves crackle when thrown upon them: no especial degree of heat produces this crackling in all leaves. Very succulent leaves will crackle and part with their moisture and become flaccid more readily than older, harder autumn leaves; but for general purposes it will be sufficient to have the pans so hot that a crackling sound is produced, and if the heat should vary a few degrees more or less the inconvenience will be an unpleasantly hot job for the workman if the pans are too hot, and a prolonged roasting before he can render his leaves sufficiently flaccid if the pans are too cold.

When the leaves are sufficiently flaccid they are thrown upon a table with a bamboo mat nailed upon it, and the rolling commences; this operation requires great care. Every effort should be made to retain a coolie who rolls tea readily; coolies differ much in this respect. Young lads with pliable fingers will often attain the peculiar action required in rolling in two or three days, while others are seemingly quite incapable of acquiring it. Fortune very well compares the motion to that of a baker kneading dough; both hands are used in the same way. The ball of leaves is firmly clasped in both hands, the thumb of the right hand lying close on the mat, and the fingers and thumb of the left hand overlying the right; the hands are then pushed outwards, and the ball of leaves should at the same time receive three or four complete turns under the hands before the arms are fully extended. The leaves are then drawn inwards, and again pushed outwards, and so the operation continues until the leaves are sufficiently rolled. Coolies differ somewhat in their *modus operandi*; some men alternately reverse their thumbs for the outward stroke, and these men are generally the best and easiest rollers; they seem to completely turn round the leaves in their hands more evenly and readily. This is all-important, so far as appearance is concerned, for upon the leaves being well and evenly rolled without breakage, depends the future appearance of the tea. It must be borne in mind, however, that the principal object of the rolling is to express the superabundance of green acrid juice from the leaves; this should be the more particularly attended to in the preparation of black teas, as in their manufacture great degrees of heat cannot be employed to drive off the juices in the earlier stages of the process. It will commonly take from five to ten minutes (according to the quality of the leaves) to well and thoroughly express the juice and at the same time give the leaves a good even twist. I have commonly allowed one coolie for every 20 lbs. of leaf, and one roaster for every twelve rollers. As the leaves are finished rolling they are separated and strewn thinly upon a cloth, kept in the shade, and protected from drying currents of air until the day's work is complete; they are then well mixed, so as to render the whole day's work of a uniform quality; they are then packed in baskets, holding about a quarter bushel, and are allowed to remain thus packed from 5 p. m. until 7 a. m. next morning. The leaves should be packed moderately tight, and placed in a part of the factory where a thermometer would shew about 73° of Fahrenheit.

The degree of fermentation may always be regulated by placing the baskets in a warmer or colder position, or by the degree of tightness with which the leaves are pressed into the baskets. Neat lids should be made to fit the top of the baskets within. If the fermentation has proceeded in a proper manner the mass of leaves should present in the morning a pleasant malty smell, a uniform dull orange colour, and a moderately sensible degree of warmth.

In the morning early the tea should be turned out of the baskets and the leaves separated by being passed between the hands, they should then be thinly and uniformly spread upon cloths in the shade to await the roasting; the roasting pans should be half filled, and the leaves kept constantly stirred until they are warmed through, and a considerable amount of the moisture is dispelled. As the pansful of tea are roasted they should again be spread out thinly upon the cloths until the whole are done. When this process is complete, the leaves will have a slightly moist and clammy feel, and a strong vegetable smell. After lying two or three hours exposed to the air, this kind of roasting may be again repeated, and the leaves again spread out thinly for the night. Next morning, if there be sun, the leaves may be exposed to it, still remaining thinly spread upon the cloths, and when they are three-quarters dry or more, they may be carried in for the final drying over charcoal fires.

In the drying process, the greatest care will be necessary to provide against the tea being smoked or burned. If hot water were used this burning or smoking would be impossible; the pipes would be laid parallel in a brickwork trough, so arranged that they would present the largest possible heating surface, and the tea might either be placed above them on cloths, or on wire-work frames, and within a few inches of their surface. At present, however, with charcoal fires the greatest care must be taken that no leaves drop upon the fire, as they burn and cause smoke which imparts disagreeable flavour to the tea; smoke is sometimes caused too by imperfectly burned pieces of charcoal; this is also to be avoided; such pieces should be very carefully picked out before the fires are laid. When the fires are perfectly free from smoke, the tea should be placed over them in the bamboo baskets or wire sieves, and as the drying operation proceeds, the tea should be carefully removed from off the fire at intervals of a quarter of an hour or so and turned; it should be borne in mind that the drier the tea becomes, the more readily it will burn, and that the fires should be allowed to deaden towards the latter part of the process. When the tea is perfectly dry and crisp it may be at once removed from the fire; the degree of dryness may be determined by the crispness; if, upon being bitten, a leaf feels at all soft between the teeth it is insufficiently dried.

The drying complete, the tea may at once be sifted into congou, souchong, and orange pekoe, and packed in tin canisters, or lead lined boxes, and securely fastened up.

If, however, any coarse leaves have been picked, the teas had best be packed in store bins and there remain until the whole season's crop is in. It may then be advisable to mix the whole of the teas in store, and re-pick, sift, re-dry, and then pack the whole, but this will, in a great measure, depend upon circumstances, such as the market for which the teas are intended, &c.

There are, as before mentioned, many other methods of preparing black teas, such as sun drying, drying on the pan, rolling before roasting, rolling after the second and third roastings, withering in the shade, &c., but in any or all of these methods, it must always be borne in mind that fast drying has a tendency to give a green tea quality, and the more especially if the drying medium be artificial heat; indeed, the rapidity with which teas are dried, seem to me to constitute the chief differences; other parts of the process may be made to neutralize the effects of rapid drying to a certain extent, but if tea be ever so well or evenly fermented, for instance, and are then at once dried off on the pans, comparatively more of the essential juices will be retained in the leaves, and they will, consequently, approximate more closely to green teas.

In separating teas, two methods may be employed, viz., separating the leaves in the picking by selecting and separately picking pekoe, souchong, congou, and bohea leaves, and preparing the selected leaves separatety; for this operation separate gangs of pickers will be necessary. The most easy and economical of the two methods is to pick all the leaves with the stalk (as previously described), and then to separate the finer leaves by sifting; for this purpose two sieves will generally be sufficient, and

meshes may be respectively from the one-eighth of an inch to a quarter of an inch for the separation of the very coarse autumn leaves; intermediate sizes may, of course, be used if it be desirable. The smaller sieves will pass through orange pekoe, and retain souchong and congou; the larger sizes will pass through souchong and retain congou, &c. It will always be advisable to pass the finer teas through the sieves first, as they do not get so much mixed with the broken particles from the coarser teas, if they are only once sifted.

Flowery Pekoe.

This tea is entirely composed of the undeveloped convolute leaf-bud, and great care should be taken to pick this alone. The best woman only can pick from eight to ten ounces per day of these undeveloped leaves, so that the tea, if pure, must of necessity be a very expensive article; it will be worthy to pay as much per ounce for these buds, as is charged for ordinary leaves, and even at that price [illegible] hesitate to take the work, as they find it so laborious. It cannot be made in very great bulk, and it is perhaps better to regard it as a curious luxury than as a marketable article.

When the leaves are brought in they are weighed and spread in Kandies upon cloths for the night; in the morning they are exposed to the air and sun to evaporate the juices; they may thus remain until above 10 a. m., according to the weather, and they will then feel very slightly crisp to the touch; they are then taken in and roasted once on a moderately cool pan; no rolling will be necessary, as the undeveloped buds do not contain more juices than may be evaporated, and they are moreover as well rolled and compact as nature can make them. After the roasting (which should be carefully performed so as not to destroy the white hairy pulverescence) is complete, the leaves may be again spread out upon cloths in the shade, and they may thus remain until next morning; they may then be exposed to a day or two day's sun, taking care to occasionally turn them; the tea may then be finally dried over charcoal fires and it must then be packed closely in good boxes, as these finer descriptions of teas are very liable to get musty and spoil

Green Teas.

The principal difference between green and black tea is, that the one is rapidly dried and the other slowly.

In green tea the drying commences as soon as the leaves are brought to the factory, consequently the juices of the leaf and its coloring matter have had little time to receive much material chemical change. Upon the leaves being weighed they may be at once roasted and rolled during the night; or, if it be advisable to sacrifice color to convenience, they may be spread out thinly during the night on cloths, and roasted early in the morning without any additional exposure; the leaves in this fresh state will require rather more roasting than in the preparation of black teas, before a sufficiency of the juices can be driven off to render them perfectly flaccid and pliable, and to facilitate this the pans may be made a few degrees hotter. When the leaves are sufficiently roasted they may then be very carefully rolled, expressing, as much as possible, of the very acrid juices. It would be a very good plan, after rolling the leaves, to perfectly express the juice by passing them through a press of some kind, no injury to the twist would result, and the drying operation will be much facilitated, and, I am disposed to believe, the flavor will also be improved. When the leaves are perfectly rolled and the juices thoroughly expressed, they may be thinly spread on cloths exposed to the sun for an hour or so to still further evaporate the juices (or, if the weather be wet, they must be spread under shelter); here again the advantages of the hot water system of heating would be very great, the leaves could be passed over the pipes to evaporate the juices in any state of the weather, and thus very materially lessen the labour of drying off the teas on the pan. When the leaves have been sufficiently exposed to render them slightly crisp, they must then be transferred to the pans and be kept constantly stirred until they are perfectly dry and the desired color is obtained. A sample of uncolored green China tea should be kept to imitate, and when the desired color is obtained, the tea may then be removed from the pans.

The roasting of green teas on the pan is really a hard and tedious process, and every effort should be made to lessen the time and labour required; one man cannot stand at a pan constantly stirring and turning the leaves from eight to ten or eleven hours (according to the state of dryness of the leaves when the operation begins), and he must consequently be relieved, and it will sometimes be advisable to dry the leaves during the first day for four or five hours, and defer the obtaining the requisite color until the next morning.

When the color is obtained the tea should be winnowed or sifted, and sorted into young hyson, gunpowder, and hyson; it should then at once be packed in close boxes.

THE MARKETS.

LONDON, 3rd *March* 1871.

COFFEE.—The market remains [illegible] and there was less disposition to bid at the sales to-day, a large proportion being bought in, and prices of that which sold being again rather lower.

PLANTATION CEYLON.—Of 1,600 casks 12 tierces 10 barrels 542 bags only about a third part were casks sold; small to middling color 60s. to 66s. 6d., small pale and grey 59s. to 59s. the principal part bought in at 60s. to 76s., for middling to good colory; the bags consisted chiefly of bs. riage and mixed lots, and sold at 48s. to 61s. Teas [illegible] oakfalf bales withdrawn.

1,167 bags washed Kio nearly all sold; middling to good bold colory, 61s. to 66s. 6d. 50 bags unwashed bought in at 57s.

This market has been dull since the issue of our last circular, and prices are about 1s. to 1s. 6d. per cwt. lower. In public sales 1,700 casks, 584 barrels and 1,020 bags Plantation Ceylon were mostly sold at 57s. to 61s. for small, 61s. to 69s., for low middling to middling 72s. to 82s. for good middling to good bold colory, and 74s. to 82s 6d. per cwt. for peaberry. Of 1,490 bags Native Ceylon about one-third sold at 57s. to 58s. 6d. for good ordinary, and 60s. per cwt. for peaberry 1,540 bags Bonthyne Singaporo, were bought in at 59s. to 61s., of which 165 bags have since been sold at 58s. 6d. per cwt 233 half bales Mocha sold at 85s. to 96s. for ordinary mixed to good greenish 52 half bales long berry were bought in at 100s. per cwt 7 tierces and 320 cases Neilgherry sold at 61s. to 65s. 6d. for small colory to middling greyish, 73s. 6d. to 74s. 6d. for good middling colory and 73s. to 77s. 6d. per cwt. for peaberry. 28 casks and 13 cases Travancore sold at 69s. to 70s. per cwt.

LONDON STATISTICS, FOR THE FIRST NINE WEEKS OF THE YEARS 1871, 1870 AND 1869.

			W. I.	Ceylon	E. I.	Mocha.	Brazil	Other Foreign	Total
Imported	1871	Tons	150	3,027	639	111	1,601	381	5,054
	1870	,,	101	2,764	276	..	265	14	3,420
	1869	,,	45	2,651	842	66	1,716	340	5,660
Delivered for Home Con	1871	,,	82	1,818	720	41	13	431	3,114
	1870	,,	135	1,577	652	14	70	260	2,708
	1869	,,	47	1,677	606	26	158	299	2,813
Delivered for Export	1871	,,	230	2,840	616	14	1,047	661	5,978
	1870	,,	39	3,044	685	18	1,316	282	5,382
	1869	,,	61	3,025	878	25	1,522	252	5,763
Stock 25th Feb	1871	,,	1,270	12,443	3,543	421	1,587	1,049	21,208
	1870	,,	293	12,611	3,090	80	1,070	1,285	19,321
	1869	,,	147	8,100	3,319	110	3,330	955	15,961

CALCUTTA, 14*th March* 1871.

INDIGO.—We have nothing of interest to report in this market, there being only a few old lots of Indigo left unsold, chiefly composed of *good* and ordinary *Rungpore* qualities for which sellers are not disposed to accept the market value.

With reference to the new crop, we are glad to be able to say that the October plant is generally well reported on over all the *Lower Bengal* Districts, and the rain which fell during the early part of this month has greatly assisted planters in putting in their spring cultivation. In *Turhoot* and *Chuprah* where the sowings were effected early, the fall of rain necessitated the re-drilling of a portion of the lands, but the loss from this cause appears to have been but slight, as the bulk of the lands were only sown down after the weather had cleared up again. The advices from the *Benares* and *North-West Provinces* as usual at this early date.—*Messrs. Moran & Co.'s Circular.*

CALCUTTA, 22*nd March* 1871.

INDIGO.—Season '70-71 closed last month, and the crop '70 is distributed to the various destinations as per memo here following. Since the public sales terminated some odd-and-end parcels, chiefly Native manufacture, have sold privately at firm prices, and a number of European and American orders still on hand must remain unexecuted till the year's crop comes to hand next November.

APPROXIMATE DISTRIBUTION OF CROP '70.

Shipped To	Great Britain	10,500	Chests.
,,	Germany, Holland & Belgium... ...	4,500	,,
,,	Russia	3,000	,,
,,	France	1,500	,,
,,	Italy & Switzerland	400	,,
,,	United States	2,100	,,
,,	Persian Gulf, &c.	1,500	,,
	Total Chests, Season '70-71 ...	23,500	Chests.

CALCUTTA, 22*nd March* 1871.

INDIAN TEA.—The season's supplies being about finished up, the sales are very small, and consequently the three auctions held during the week comprised only 680 chests offered, all of which found buyers excepting 20 chests. All descriptions were well supported at former prices, and good liquoring Pekoes were eagerly competed for.

Three small public sales have taken place during the week, consisting of 880 packages, all of which were disposed of. A large proportion of the teas offered were Broken Pekoes and Fannings, mostly realizing full rates. Extreme prices continue to be paid for all descriptions, notwithstanding the rather unfavorable reports received from London. Advices received respecting the new crop continue to be very satisfactory, and the season 1871-72 is expected to commence some time in the middle of May, when the first public sales of the season are expected to take place.—*Toulmin & Co.'s Circular.*

THE

SUPPLEMENT TO THE
"INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. II.] CALCUTTA, THURSDAY, 15TH JUNE, 1871. [No. 11.

Advertisements.

TRAVELLERS' REQUISITES.

GENTLEMEN'S DEPARTMENT.

Leather Portmanteaus in all sizes.
Flat Valises in every make.
Overland Trunks in all sizes.
Leather Hat Cases, round and square
Square mouth Leather Bags.
Japan Uniform Cases in all sizes.
Railway Trunks of every make
Canvas Bags for dirty Linen
Hats and Caps of every description
Silk and Wool Shirts in all sizes.
Stout Flannel shirts, new patterns.
Warm Flannel sleeping suits.
New Algoa Sleeping suits.
Lambs' Wool Undershirts.
Warm Merino Undershirts.
Lambs' Wool Drawers (long and short)
Warm Merino Drawers (long and short)
India Gauze Undershirts
India Gauze Drawers (long and short)
Lambs' Wool and Merino socks
White and Colored Cotton socks
Warm Cloth and Ringwood Gloves.
Boots, shoes, and slippers, in every make
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LETTERS TO THE EDITOR.

ENGLISH FARMING IN THE NORTH-WEST.

(BY F. HALSEY, ESQ.)

Amritsir, May 10th 1871.

ROBERT KNIGHT, Esq., Bombay.

MY DEAR SIR,—I am afraid I cannot give you detailed information with reference to *all* my crops, that is, how much per acre is produced; of some I can, however, and these you are most welcome to. First of all, I would mention that all I grow is, as you suppose, for my cattle. At present I am not in want of a market, because I have not been long enough out from England again to have any animals fit to sell. My chief aim is to produce bullocks for draught purposes, superior to those at present seen in this part of the country, and cows that will give more milk than the indigenous animals. But to carry this out, one must first get up a herd of breeding animals, and when I first came here 2 years and a half ago, my great difficulty was to find beasts which to my mind were sufficiently good to commence operations upon.

One point has always to be kept in view, namely, one animal may be very good for draught purposes, but absolutely useless as a milker; and the selection of the male and female must be made with judgment, or their offspring will inherit the bad points of both. I could no doubt find a good market both at Lahore and Meean Meer for fat cattle, and it might be made a profitable speculation; but in this country breeding cattle for draught and milking purposes cannot satisfactorily be carried on at the same time as breeding cattle for slaughter. I would of course keep Mahomedan servants, but the class are very bad cowherds; besides which I am averse to killing animals which I mix among every day, and which are almost as fond of me as I am of them. No Hindu servant would remain in my service if I bred animals only to slaughter them.

With reference to out-turn of crops, I only grew 2½ acres of oats this year; the out-turn was 70 bushels to the acre, or 12 maunds of 82 lbs. to the beegah of 2·4 beegahs to the acre; the corn stood at 33 lbs. to the bushel. The above out-turn may be considered very satisfactory as the seed oats I sowed were of a very inferior description, only 27 lbs. to the bushel, procured with some difficulty from the Saharunpore district. I quote from Stephen's "Book of the Farm" :—"The yield of oats varies in similar circumstances even more than wheat or barley, from 30 to 90 bushels an acre; a bushel from 38 lbs. to 48 lbs. the bushel." No doubt if I had used manure the result would have been much better, but I purposely chose soil which had been cropped for 15 successive years; my manure was ploughing 10 inches deep, and so, as it were, bringing up maiden soil. The oats themselves I use for my horses, and the straw is cut with lucern in the chaff-cutter for my cows. The total cost of the crop was about Rs. 85, and its value when thrashed, Rs. 146. The land was of course irrigated from the Baree Doab Canal.

One small crop of peas I grew for the Agri-Horticultural Society of India; the amount of land cultivated was 4/15ths of an acre; the peas turned out were 16½ imperial bushels, and the total weight 1068 lbs. or over 64 lbs. to the bushel; the cost of cultivating this crop was Rs. 13-12-11, and its value when reaped, at their present value, 28 seers per rupee, gives an out-turn of Rs. 19-1-2. In this case I have taken the price of the common grain of the country as my guide as to value; those I grew were really much more valuable being garden peas; neither have I taken into account the value of the straw which is considerable.

A small piece of carrots I grew, namely ·502 of an acre, and produced 320 maunds of carrots, which at 6 maunds per rupee, would give a result of Rs. 63-5-4 as against a merely nominal expenditure of perhaps Rs. 5.

But by far the most valuable crop I can grow is lucern, as you will see from the following :—

Expenses on one acre

Land @ Rs. per beegah..	Rs. 24 0	
Australian seed 20 lbs @ 1	2 0	
Manure (light soil) 48 cwts @ 1s.	18 0	1st year
Ploughing twice with English plough	4 0	
5 Per cent on cost of plough bullocks valued @ Rs. 240	12 0	
Water rent and water advantage rate ..	3-12	
	108-12	
Second year.		
Land	24 0	
Water	3-12	
	27 12	
Third year		
Land	24 0	
Water	3-12	
	27 12	
Total expense for three years	Rs 164 4	

Income from one acre

First year 5 cwts @ Rs. per acre	Rs. 288
Second year 7 cwts @ Rs. per acre	" 336
Third year 7 cwts @ Rs. per acre	" 336
	Rs 960

I know of no crop that will produce like that. Of course to get such a profit as this one must be situated near a large town, but on the other hand, one has there to pay Rs. 24 per acre for land instead of Rs. 4-8. The same result would not be got out of the Punjab as heavy rains kill the plant, where they do not, or rather there are no heavy rains. During the hot weather, the hotter the winds blow the more the plant grows, provided it can have plenty of water.

Mangold wurzle grows magnificently here, the only difficulty about it is, it comes in when the weather commences to become hot, and very great care has to be used in feeding animals with it, as unless mixed well with chaff, great danger may arise from too great heat being generated.

Carrots come in in the middle of the cold weather, and there is no greater milk-producing thing in the world, but like all

milk-producing food, the milk is increased at the expense of the butter.

I am afraid I have written you a very long story, but I know these questions interest you as they do myself, which must be my excuse.

You are at perfect liberty to make use of the whole or any part of this letter.—Believe me to remain, my dear Sir,

Yours very faithfully,

FRANCIS HALSEY.

HIMALAYAN ENTERPRIZE.

TEA CULTIVATION—NO

(From a

To the Ed

the

ricultural Gazette of India.

I [illegible] them up my last, or rather my first instal[illegible]nt, by noting the Pro[illegible]se prophecies and "bad shots" of the offici[illegible] "quid nunes" which, by the way, your "diabolus," who is evi[illegible]tly not well acc[illegible]osted in Latin, has printed "official guidances," thereby making [illegible]n excessively sagacious shot at my meaning, and proving himself a fiend of no ordinary acuteness and penetrati[illegible]

Had he said "guides" he would have improved, [illegible] anything, on my own text—for guides they were—who, after leading us a nice dance, breaking our shins, frontispiece, and knuc[illegible]les for us, over sundry and diverse obstructions (not a few of w[illegible]ich were purposely laid in the way) finally landed us in a qu[illegible]gmire, or Slough of Despond, consoling us by informing everybody who would listen to them that we should "never get out."

And small thanks to them if we now see a tolera[illegible]le chance of doing so.

It must not, however, be supposed that because the writer does not spare the ignorance, ill-will, and obstructiveness shown to private enterprise in some parts of the North-W[illegible] Provinces, that he is going to be blind to the blunders, mistakes, &c., committed by the planters, or silent on the head of the shortcomings of those who expended their capital in attempting to develope the resources of the tea districts.

He happens to be one of those, who, so far from thinking that blundering and incompetency had better "be buried in oblivion" on the principle of "least said soonest mended" opine that enormous harm is done every day (especially in India) by this good-natured, but foolish and short-sighted practice.

People run upon rocks and shoals (official and other wise) one after another, because those who first venture don't take the trouble to point out the manner of their "coming to grief," or because, instead of reporting the harbour master to the proper authorities, they "make it up with him" over a glass of grog.

The harbour master may very likely "not be such a bad fellow after all, when you come to know him," but if he is too lazy or too pig-headed to remove or notify obstructions, he must expect to "catch it hot,' every now and again, *anent* which process I don't object to the grogging and making all square, but not, if you please, *beforehand*. When tea was first started in the North-West Provinces, the prevailing idea among the "knowing ones"—an idea which, like all the rest, first emanated from official sources—was, as aforementioned, to the effect that companies would stand a much better chance of success than private individuals. It was taken for granted that they would, on account of their capital being larger, be able not only to go on longer, but to buy up and generally exterminate every small proprietor in their neighbourhood.

This was about as logical as to prophesy that of two gamesters he of the longest purse *must win*, no matter how he played his cards.

Strange to say, no sample of the wisdom and experience with which we were in those days so specially favored was more implicitly "taken for gospel" as on this.

If you belonged to, or held shares in a company (no matter who was manager), and if the company had, or were shortly going to have "500 acres under tea," you were on the high road to fortune. Anything under this acreage was, you were informed, useless.* Nothing went down but companies; it was unmistakeably demonstrated that managing directors, shareholders, reports (printed), auditing of accounts, holding of meetings, &c., &c., &c., were required to make money by tea.

Anything in the way of agriculture was quite a secondary consideration, if not superfluous altogether.

In fact, the whole business was conducted a good deal on the principle on which the Frenchman made his plum-pudding; wonderful acuteness and foresight was displayed about everything *except* what they could not possibly get on without.

An honest, hard-working man, with a thorough practical knowledge of agriculture, would have stood about as much chance of [illegible] charge of the management of a plantation in those days, as he would of being asked to dine *tete-a-tete* with the Governor General.

The qualifications for these billets had no reference to agriculture acquirements; they involved merely a certain amount of "brass" and keeping accounts.

Keeping accounts, covered like charity, a "multitude of sins;" in fact, if you could only show enormous carefully ruled ledgers, and talk glibly of balancing, auditing, &c., your sins were not believed in. You might have failed in everything you had tried your hand at; you might be lazy, ignorant, and dishonest; but if you could only "balance accounts" you made, in the opinion of the directors and shareholders, "an excellent and trustworthy manager" and a first-rate "man of business."

Some of these "first-rate men of business" contrived to spend as much money on ordinary plantation work in six months as an average private planter would get through in six years, but then "they always did everything so much more efficiently."

Their work was "*really done well you know*," not "slurred over, and you should see the accounts, correct Sir, to a halfpenny."

It is no doubt a great privilege to be ruined by a manager who "keeps correct accounts."

This notion of ledger and printed reports being not only a sure check to fraud or dishonesty, but also a guarantee for sound agricultural knowledge, having once taken firm hold of the minds of all who had invested in tea, was extremely difficult to eradicate.

The directors and shareholders knew nothing about the work themselves; they would not ask any of the small private planters for information, as they had always been told by their "excellent and trustworthy managers" that these unfortunates (the private planters) were on the brink of ruin.

They consequently went on auditing, balancing, reading reports, holding committees, &c, for a great number of years, often wondering when their dividends were coming, but thinking it "low" to show want of confidence in the management. This could not last for ever. Some companies, as the American say, "busted up" "right off;" others lingered on barely paying expenses, and ultimately, by taking counsel before it was too late, are beginning to weather the storm.

My object, however, in taking what some people may call an ill-natured retrospective view, is not so much to point out the blunders committed at the outset, blunders which it may be plausibly urged are unavoidable in the case of all new enterprises, as to demonstrate that the greater part of them are due to the careless and ill-advised action of Government.

It is true that ignorance, and in some cases dishonesty, had a great deal to do with the losses suffered by the companies, but while admitting this to the fullest extent, it must be borne in mind that the *great* mistakes, and consequent *great* losses, suffered by the said companies, are due solely to the defective, and in many instances, entirely unreliable information supplied.

After ten or twelve—or rather after twelve or fifteen years of experiments carried on by Government—they discovered that tea *would grow* in the Himalayas and in the Dhoon, but whether it *could be grown profitably* they knew no more than whether it could be grown profitably in Central Africa.

They imported seed and plants from China at enormous expense; they made tea plantations at enormous and wasteful expense; they manufactured tea at ditto. ditto, and then they wrote reports asserting that it could be *profitably* cultivated, all their experience having proved directly the reverse.

Besides this they displayed throughout their many years of experimentalising a want of practical sense, an ignorance of the simplest statistical details necessary to demonstrate whether a staple would or would not repay the cost and trouble of culture which may well make tax-payers shy of the new Agricultural Department now contemplated, *i. e., if* it is to be conducted on principles at all identical with those of the North-West Provinces' Botanical Gardens, and what guarantee have we that it is not?

* Another specimen of the (official) industrial and politico-economical knowledge prevailing in a certain province, "infested by interlopers," may not be here out of place.

The planters having been very troublesome for some time, and there being a great demand for coolies at the sanitaria, it was given out that the "great man" would be "compelled" (much against his will of course) to double the rate of hire throughout the district, in the case of all coolies employed to carry baggage, *i. e.*, the baggage of *non-official* travellers, Government servants, *drawing travelling allowance were excepted.*

This enlightened measure would, it was confidently affirmed, infallibly ruin the planters, as they would be compelled to pay their men double, or they (the men) would leave them and all take to carrying loads.

After a great deal of solemn proing and conning, and profound predictions of the dreadful effect which must ensue to the wretched interloper, the fiat was given forth, the sword of Damocles fell, and the result was—nil!

Strange to relate, the evil-minded planters still contrived to get plenty of labour at two annas per diem, although that fixed for porters was four, and have done so ever since, while Government have still to *press* coolies at the latter rate.

Such a notion, for instance, as to take an acre of land, to sow or plant the same with tea, to keep a careful account of the cost of hoeing, weeding, manuring, in addition to that of first preparing and planting, the value or effect of certain manures, the amount of tea realised, the cost of its manufacture, packing, and carriage to market—never struck them for a moment.

Yet they had European overseers at each garden drawing high pay, and, as a rule, doing nothing else, besides as a matter of course, three times the number of chowdries, &c. that were required.

In fact so far were they, at the time they reported the experiment as brought to a successful issue from having come to any *practical* conclusion, or acquired any *real* data, that, as has since been proved, had the planters gone directly counter to every piece of advice (on tea cultivation) given in the Botanical Superintendent's Report, had they done *exactly the reverse* of what was laid down, they would have about hit the mark.

(To be continued.)

EDITORIAL NOTES.

ATTENTION, we observe, is being called in England to the use of powdered charcoal as manure. It is well known that charcoal, when used for filtering water, has the property of retaining its organic matter, and of rendering the water fit for domestic purposes. "Charcoal (carbonic acid) enters largely into the "composition of every description of plants, and consequently "must be beneficial to their growth. Wood charcoal is produced "in large quantities now in Scotland, at £3 or £4 per ton."

THE agricultural statistics of Ireland for 1869 shew the size of the holdings to be as follows :—

Holdings not exceeding	1 acre			49,394
Above 1 and not exceeding	5	"		75,895
" 5	"	" 15	"	171,699
" 15	"	" 30	"	127,086
" 30	"	" 50	"	72,511
" 50	"	" 100	"	55,670
" 100	"	" 200	"	21,876
" 200	"	" 500	"	8,210
" 500	acres		"	1,541

The quantities of land occupied have necessarily a close connection with the amount of capital which each class of occupiers has invested in farming. Small occupiers rarely, we believe, keep sheep, while the number of cattle reared and fattened is relatively less in proportion than the number kept on medium-sized and large farms.

THE amount of capital employed in the occupation of farms in England is a question of considerable interest to us in this country. The farming capital of Great Britain is estimated, we believe, on the average at from £5 to £7 per acre, but the agricultural returns of the country give no information upon the point. The estimates which have been given by writers on agriculture as to the amount of capital employed by farmers in arable farming, and in combined arable and pastoral farming, are believed to fall short of the actual amount.

The amount of course varies according to the system of farming pursued. According to the *North British Agriculturist*, the capital required to occupy a farm to the best advantage varies from £8 to £20 per acre, according to the system adopted. "There are arable farms in Scotland where the tenants have invested in their farms from £15 to £20 per acre. It is a common belief among the more advanced farmers that the larger the amount of capital employed, provided it is judiciously used, the higher are the tenant's profits. This applies particularly where the breeding or feeding of stock, or both combined, is practised."

A very large amount of farming capital must have been accumulated in Central and Western India in the last few years, and the backwardness of agriculture in these territories is, we are persuaded, owing rather to the apathy of the cultivator than to want of the means of improvement. Men who can afford to put silver tires upon their cart-wheels, can hardly want a few hundred rupees of capital to farm holdings of 20 or 30 acres. It is time that the State took up the question of improving Indian agriculture in earnest.

WE are indebted to Mr. Halsey of Amritsir, for a very interesting letter upon English farming in the Punjab, which we have given above. In a letter recently addressed by the same gentleman to the Agri-Horticultural Society of Calcutta, Mr. Halsey says :—

"To show you the effects of deep ploughing I would mention that this year, or rather last September, I sowed a piece of land with carrots (country) using only half the amount of seed that the zemindars do. The land had only been ploughed once with Statkartt's plough, and side by side with the land I farmed was another field of carrots sown on the same day as mine, but ploughed eight times with an ordinary native plough. My carrots were ready for consumption a fortnight before the zemindar's; his were two inches across at the head by six inches long, mine averaged eight to ten inches, and many were 12 and even 14 inches across and a foot long. A European who *rents* land in India has literally no reason to use manure if he will employ an English plough at ten inches deep, he turns up maiden soil: you have only to change your land every year."

Mr. Halsey says further :—

"I have very strong doubts whether we can improve the wheats of this country. Nothing in England would beat the wheat here this year, length and weight of ear combined with long straw. I am going to test a great number of fields this year, by weighing the contents of one imperial bushel, and if I mistake not, we shall find it fully up to a European standard.

WE were indebted to the same gentleman for an interesting notice in our last issue of the Great Cattle Fair held annually at Amritsir, and we reproduce below an article upon the same subject contributed by him last year to the columns of our Lahore contemporary, the *Indian Public Opinion*. Mr. Halsey writes concerning this fair to the Agri-Horticultural Society :—

"Our spring cattle and horse fairs are just commencing; they are held at distinct places however; the cattle fair is one of very old standing, having been held twice a year for a hundred years or more before even an Englishman was thought of in the Punjab. The horse fair is of our getting up, but it bids fair to be as important as any in the country. At both prizes are given;—at the horse fair good prizes were always given, but when I first came here I found they used to distribute about Rs. 500 only among many thousands of animals, and with no system of any sort; but I am glad to say that has now been changed, and Rs. 1,800 was distributed, in handsome prizes of Rs. 100 and Rs. 50 each, among the cattle; the same amount is to be distributed now.

"Government permits a small fee of 1 pie in the rupee to be taken on all sales that take place. This is farmed out, and you will be better able to comprehend the value of the stock that changes hands at these fairs, when I tell you that these fees have been farmed out for this year for Rs. 2,500, which represents Rs. 4,80,000 worth of cattle, the farmer having to make his profit besides and keep up a large staff of servants to see that all cattle that are sold pay the proper fee. I have no doubt that the now comparatively liberal prizes will have a marked effect on the improvement of cattle in this part of the world."

THE total live stock of the United Kingdom on the 25th June last, was as follows :—

	Great Britain.	*Ireland.*
Horses	2,050,000	530,000
Cattle	5,453,000	3,796,000
Sheep	28,397,000	4,393,000
Pigs	2,171,000	1,459,000

According to returns chiefly for the year ending 30th March 1870, the live stock in the Colonies was as follows :—

	Horses.	*Cattle.*	*Sheep.*
Australia, Tasmania and New Zealand	699,200	4,059,500	49,136,000
Natal	20,000	454,000	393,000
Cape of Good Hope (1865)	227,000	692,000	9,836,000

These returns may possibly be of some use to Indian officers engaged in settlement proceedings.

A DIFFICULTY has lately arisen from the increasing export of indigo from Pondicherry. Indigo *leaf* is free of duty, while the manufactured dye pays an export duty of 3 Rs. per maund. In consequence of this exemption, the leaf is imported from our own Mofussil into Pondicherry to be there made into dye. It is stated that 2,000 lbs. of dry leaf, or 1,000 lbs. of green, are required to make a maund of indigo, on which the duty would be Rs. 3. The Madras Chamber of Commerce are of opinion that to meet the difficulty indigo leaf should pay duty. The Collector of Customs recommends that the leaf, whether dry or green, be charged with an export duty of Rs. 3 per candy of 500 lbs., but this, it is said, would be prohibitive, as it would double the duty on the manufactured article. The Board of

Revenue recommend Rs. 6 a ton, or Rs. 3 a bandy-load, which is about 1,500 lbs. of green or dry leaf. The former rate would about equal that on the dye in the case of green leaf, but in the case of dry leaf (technically "dust") would double the duty on the manufactured article. A lower rate would, however, offer special inducement to export the green leaf for manufacture in foreign territory, and differential duties are undesirable. The Board's proposal has, therefore, been recommended to the Supreme Government for adoption in the revised tariff of export duties.—We are indebted for these particulars to the *South of India Observer*.

THE area of land under cultivation [illegible] cereals at Home, in France, and the United States respectively, during the year 1870, was as follows:—

		United Kingdom.		United States.		France.
Wheat	acres	3,770,000	.	19,200,000	.	17,400,000
Crop navy	,,	2,623,000	.	1,02[illegible]	..	2,200,000
Oats	,,	4,42[illegible],000	..	9,[illegible]00,000	.	8,200,000
Rye	,,	74,000	.	1,6[illegible],000	.	4,780,000
Indian Corn (Maize)	,,			37,000,000	..	1,653,000
Potatoes	,,	1,639,000	..	1,222,000	..	3,066,000

As regards other kinds of agricultural productions which are of importance in the respective countries, the vineyards of France cover as many as 6,037,000 acres, while 332,000 acres are planted in France with beetroot for sugar. In the United States, there are 181,000 acres under tobacco, 95,000 acres under the sugar-cane, and 7,750,000 acres under the great staple of cotton. By the table of the quantities of the various crops produced, France is shown to have had in 1869 upwards of 96,800,000 bushels of wheat against 252,000,000 in the United States. Maize is returned as yielding in 1869—818,800,000 bushels in the United States, and for the same country in 1869 the crop of tobacco is put down at 273,775,000 lbs.; the crop of cotton at 3,155,000 bales, of an average weight of 150 lbs., and sugar at 400,000,000 lbs. The few comparative figures that can be given of the average yield, per English acre, of the principal corn crops abroad, exhibit for France about 17 bushels per acre for wheat, 21 bushels for barley, 25½ for oats, and 15 for rye. The average yield of wheat in the United States is stated at 13¼ bushels per acre.

WITH the view of obtaining information that might assist in showing the progress in the practice of agriculture in Great Britain, a few questions were added last year to the instructions issued for the guidance of the officers employed in collecting the agricultural statistics of the country, which they were requested to answer to the best of their ability. The following abstract of the answers has been made, showing the number in the affirmative and negative under each question:—

1. *Whether the draining of land is extending?*—England, number of counties, 12; number of answers, none or not required, 6; yes, 25; no or not much, 11. Wales, number of counties, 12; number of answers, yes, 4; no or not much, 8. Scotland, number of counties, 33; number of answers, none or not required, 5; yes, 18; no or not much, 6.

2. *Whether hedges and fences are being removed to enlarge area of fields?*—England, number of counties, 42; number of answers, yes, in parts of counties, 35; no change, 7. Wales, number of counties, 12; number of answers, yes, in parts of counties, 4; no change, 8. Scotland, number of counties, 33; number of answers, yes, in parts of counties, 15; no change, 13.

3. *Whether steam cultivation is in use?*—England, number of counties, 12; number of answers, yes, 19; no, 14. Wales, number of counties, 12; number of answers, yes, 3; no, 9. Scotland, number of counties, 33; number of answers, yes, 5; no, 24.

4. *Whether the use of machinery for cutting the crops and preparing corn for market is increasing?*—England, number of counties, 42; number of answers, cutting crops, yes, 41; preparing corn, yes, 39. Wales, number of counties, 12; number of answers, cutting crops, yes, 11; preparing corn, no, 12. Scotland, number of counties, 33; number of answers, cutting crops, yes, 26; no, 2; preparing corn, yes, 26; no, 2.

THE AGRICULTURE OF INDIA.

EXPERIMENTS.

THE POTATOE.

AT a meeting of the Agricultural and Horticultural Society held [illegible] on February last, the following letter was read from Lieut. Pogson, suggesting the introduction of a new variety of potatoe to replace a worn-out and diseased kind at Simla:—

Having in June 1870 received a new kind of potatoe from Messrs. Hooper & Sons, of Covent Garden, London, bearing the name of "Climax," I have the pleasure to send by rail a few tubers for distribution.

Messrs. Hooper and Sons describe "Climax" as a seedling of the early Goodrich, with a stout erect stalk, full medium height, internodes of medium length, and very large leaves; the tuber is above medium, quite smooth, in form of a short cylinder swelled out at the centre, eyes yellow, and often projecting, skin of medium thickness, netted tough and white; flesh solid white, heavy and brittle, never hollow, boils quickly, mealy, and of floury whiteness.

One pound of these potatoes gave an out-turn of one hundred and ninety pounds.

I will now give you the result of my experience in growing the "Climax" in the hills and the plains. As already stated, the potatoes came from England in June last; they came by sample post; two only were in a planting condition. Not having a garden I made a bed of earth against a rock at Landour, placing each potatoe one yard apart; knowing that half of the growing season had passed, I despaired of the result. The potatoe halms grew vigorously, covering nearly seven feet of ground. They were taken up in the following October with a net produce of 22 lbs., some of the tubers weighing 8 ozs., thus producing a crop in about four months. I think the result is of a sufficiently satisfactory nature to enable me to believe that the climate and soil of the Himalayas suit this tuber.

Leaving the hills the latter end of October last, and not wishing to lose the potatoe season in the plains, I planted some of the hill-grown produce in my garden at Morar, using only the ordinary garden soil without compost, as the white ants are troublesome at all seasons of the year. About Christmas-day they put forth leaves and continued to grow vigorously; they were taken up in April with a satisfactory result. It will be seen that two crops of potatoes have been grown in ten months.

Messrs. Hooper and Sons, in their catalogue for 1870, price this potatoe at three shillings and six pence per lb.

The Secretary mentioned that he had sent one-half of this supply to Captain Pogson.

THE POTATOE CROP IN DARJEELING.

DARJEELING, once so famous for its good large potatoes, is rapidly declining in this respect, each successive year showing such a marked falling off both in size and quality as to excite a fear that we shall ere long be as badly off as the people of Simla, where the present season's supply of potatoes is reported to be more or less diseased.

Here, as at Simla, the cause directly operating to bring about degeneration of the potatoe crop is the continued use of the same seed. The native cultivators who supply our market are too ignorant, or perhaps unwilling, to incur the extra expense of purchasing fresh seed occasionally; but as neither their ignorance nor their greed should be permitted to bar care and improvement in the culture of our favorite tuber, we ought to endeavour to help ourselves by importing and distributing some of the better sorts of seed throughout the district. The cost would not be great, and would be indeed a trifle if shared in by all the permanent residents and house-holders.

In matters of this kind it is constantly happening that somebody at some time or other introduces a good thing for the public benefit, gives it a fair start, and then leaves it to operate on its merits, not unreasonably expecting that somebody else will, in the after-time, keep up the requisite sustaining pressure. But how often it happens that nobody follows up in the right track, or that an occasional solitary attempt is too feeble or uncencouraged to do much good. This is exemplified in the case of General Tapp, who is said to have been the first to introduce potatoes into Simla *thirty-five* years ago, since which time nobody, it would seem, has followed up the General's good action,—and so the potatoes there have degenerated to such a degree as to be now declared "unfit to eat."

We do not know who had the honor of being the first potatoe planter in Darjeeling, but it is advisable that any and all who would like to emulate his example, should set about doing so in earnest—or shall we have to petition our Municipality to take up the matter in connection with some of the other numerous projects which it has in hand for the public weal?

THE SUNFLOWER PLANT.

To the Editor.

SIR,—I was pleased to notice a word spoken on behalf of the "noble sunflower," in a leading article in your paper of the 8th ultimo, and I am glad to see that the plant can be put to some "noble use." Some people have an insane antipathy to sunflowers, and cut them up whenever they meet with them; yet, a sunflower would seem to be a very fit denizen of this "land of the sun."

I have not observed the sunflower attain to such vast proportions out here as it does in Europe, where I have seen it some seven or eight feet high, with a fine branching head of flowers—

> "One, the lofty follower of the sun
> Sad when he sets, shuts up her yellow leaves,
> Drooping all night; and when he warm returns,
> Points her enamour'd bosom to his ray."

Birds seem most to affect the seeds at home, so that you rarely can get a perfect head. I am sorry that you appear to speak rather disparagingly of the "jack" and "mangoe" trees; yet what would you plant instead? With regard to *Poinciana Regia* (as it *should* be spelt), it should never be planted for any other purpose than as a "flowering ornament." It is not useful, and it is not always ornamental, particularly when it stands stiff and gaunt, denuded of its foliage, and covered with great scimitar-like legumes, or pods, for it boasts of no leaves during the hottest and dryest portion of the year, and only bursts into its splendid bloom of flower and foliage on the approach of the monsoon.

The jack-tree, on the contrary, (with its noble brother, the *Angeli*), is a most useful as well as ornamental tree; the roots of the jack are not "surface-seekers," but dive down deeply into the earth, breaking up the lower strata or sub-soil. The tree is "evergreen," and the constantly falling leaves tend to enrich the soil underneath its spreading branches which afford a charming shelter both for man, beast, and for coffee! The timber of the jack, a tree which grows pretty quickly, is largely used for manufacturing into furniture, &c.; and that of the *Angeli* for building purposes. The fruit of both, of the jack in particular, with the seed, is greatly used and sold as an article of food on the western coast, the average annual return yielded by a good jack tree being about Rs. 10 for fruit alone, not less. *Experto credo!* The leaves form a first-rate fodder for goats, sheep, and cattle, and are very fattening.

I must say that I am not so favorably disposed towards the "mangoe" tree; since taken as a timber tree, it is very slow of growth, and as a fruit tree, is only valuable if it be a "graft-mangoe;" it gives a good shade in time, and there are many very lofty and stately wild mangoe trees in the forests, no doubt of wonderful age, but neither the wood, the fruit, nor the leaves are of nearly so much importance as those of the

TCHACKKA.

Trivandrum, 4th May 1871.

(NOTE).—*Tchackka* is said to be the old Sanskrit word from which jack has been derived, or rather corrupted.—[T.]

MAIZE CULTIVATION.

WE learn from the *South of India Observer* that some recent experiments in maize cultivation, in the Godavery district, have not produced very great results; but the little that has been done may perhaps be considered satisfactory. The results of nine of these experiments are not recorded; in two or three other cases the results are imperfectly stated. In two experiments only does there seem to have been any interest taken in the results, and these two present some peculiar points, which are noticed as follows by the Superintendent of the Sydapet Farm:—"I am at a loss to account for the very different results of the two experiments. Thus Plot No. 1, which was sown with 1 lb. of seed, and *was irrigated*, produced *only* 40 *cobs*; while Plot No 2, sown with only ½ a lb. of seed, *produced* 90 *cobs*. As the cobs are reported to be the *same in size*, the distance apart of the plants in the two experiments would in no way account for this. It seems probable that the plants were destroyed during the growth of the crop, or that some of the cobs were carried off before the results were ascertained. In the first instance, at the least 600 vital seeds were sown, in the second only 300 vital seeds, whilst the second produced 100 per cent. more cobs than the first. The fact that *the cobs were the same size in both experiments* proves conclusively that the smaller result in the first instance was not due to climate, soil, or cultivation." In reply to some remarks by the Collector of the Godavery district, expressing doubts as to whether the maize was recommended chiefly as a grain or as cattle fodder, Mr. Robertson observes: "I am not aware that I ever recommended maize *specially as a producer of green food*. Indeed, in this respect, it is inferior to the cholums of this country. It is more costly to grow, and only produces one *cutting* of fodder; while our cholums require very moderate cultivation, and will produce three or four cuttings of green fodder. Maize is undoubtedly a valuable fodder-producer, but it is rather as a grain-producer that it will be most valuable to the agriculturists of this country. The following statistics show its importance in other countries. The Commissioner of Agriculture for the United States of America, in his Report for 1868, states that the aggregate yield of the maize crop for that year amounted to nine-hundred million bushels, while the aggregate yield of the wheat crop did not exceed *two hundred and twenty-five million bushels*. Again, the English trade accounts for eight months ending August recorded the following important of grains:—Wheat, 19,776,933; barley, 5,007,142; oats, 7,233,513; beans, 996,384; maize, 10,007,704; and peas, 1,411,440."

RICE AS A BREAD-STUFF.

THE use of rice as a bread-stuff is probably coeval with the human race. Like many of the other cereals it extends beyond the reach of record. Under the name of *orus* in Arabic, *oruza* in Greek, *oryza* in Latin, *ris* in French, *reis* in German, and *rice* in English—it has been known to history for two or three thousand years, being mentioned by Theophrastus twenty-two hundred years ago, and by Horace, Pliny, and Celsus at a later date. Its native place is probably the steaming river bottoms of India, whence it travelled eastward and northward to China and Japan, and westward to Egypt and to us. When it reached Egypt we know not; early enough, however, as many think, to give rise to that singular exhortation of the royal preacher of Israel, twenty-eight hundred years ago, in which, alluding probably to the mode of sowing rice on the swollen surface of the Nile, he says:—"Cast thy bread upon the (face of the) waters: for thou shalt find it after many days." Eccles. xi. 1. After being introduced into Italy from Greece, as we learn by the form of the name, and being domesticated for centuries in all the southern countries of Europe, it was carried, in the year 1795, to the then infant colony of Carolina; where it was soon cultivated to such an extent, and brought to so high a degree of perfection, that the rice raised upon the southern seaboard of the American colonies, now the United States, has been ever since known in Europe as Carolina rice. As an article of food it surpasses in importance every other cereal in present use. Wheat may be more nutritious, rye more hardy, maize spread over a wider range of temperature—but rice feeds the greatest number of human mouths. Among the swarming millions of the Tropics, and of China, it occupies the same place as wheat in the warmer parts of the temperate zone, and rye in the colder. It has been estimated that if the human race were divided into families according to the predominant use of the several grains, the rice-eaters would occupy the first place in number; while wheat and maize would contend for the second, with a fair promise of victory to the maize; and the fourth place would be held by rye, oats, and barley. Indeed, besides being "the staff of life" in the most populous parts of the earth, it is now so extensively used among all the other grain-eaters of the race, that it is questionable whether a greater amount of it is not consumed as a breadstuff than of all the other cereals combined. *Its Characteristics.*—Among botanists it is known by its Latin name *oryza*, of the class Hexandria, and order Digynia. There is but one species, though there are many varieties; for the wild rice, so-called, of the North American ponds and lakes, is not a rice, but a reed—not an *oryza*, but a *zizania*. Food chemists tells us that it contains "less of the nutritive principle than wheat." This, however, is in some measure compensated by the fact that of all the cereals it is the most compact—a merchantable bushel of maize or Indian corn being rated at 56 lbs. and wheat at 60 lbs., while rice, which rarely sells by bulk, and therefore has no established standard like the others, seldom weighs less than 65 lbs. to the bushel, and oftentimes more. Its compactness is shown also in its resistance to being crushed, having almost a gravel-like hardness: and also in the fact that skilful boiling will cause it to expand and double—perhaps treble—its former bulk. But, however weighty in the scales, it is exceedingly light upon the stomach. In general wholesomeness, in delicacy of flavour, and in the variety of uses to which it is applicable, it is probably not surpassed by any other grain. To the strong stomach of the day labourer it is as well suited as the coarse bread of the Indian corn, rye, or oats; while for the delicate appetite of the invalid, or for the tender organs of the babe, it is a safe substitute for sago, arrowroot, tapioca, or cassava.—*Food Journal.*

SOAP PLANTS.

THE *Journal of Applied Science* publishes some interesting information on saponaceous plants. Many plants in different countries furnish useful substitutes for soap to the natives, where there are no conveniences or materials for manufacturing the ordinary soap of commerce. Prominent among these are the soapworts, tropical plants belonging to the genus *Sapindus*. The Hindoos use the pulp of the

fruit of *Sapindus detergens* for washing linen. Several of the species are used for the same purpose instead of soap, owing to the presence of the vegetable principle called saponine. The root and bark also of some species are said to be saponaceous. The capsule of *Sapindus emarginatus* has a detergent quality when bruised, forming suds if agitated in hot water. The natives of India use this as a soap for washing the hair, silk, &c. The berries of *Sapindus laurifolius*, another Indian species, are also saponaceous. The name of the genus *Sapindus* is merely altered from *Sapo indicus* (Indian soap) the aril which surrounds the seed of *S. saponaria* being used as soap in South America. According to Browne, the seed-vessels are very acrid; they lather freely in water, and will cleanse more linen than thirty times their weight of soap, but in time they corrode or burn the linen. Saponine exists in many other seeds and roots—the legumes of *Acacia concinna*, in which a considerable trade is carried on in some parts of India, and in the root of *Saponaria vulgaris*, *Agrostemma githgo* and *Anagallis arvensis*. It also occurs in various species of *Dianthus* and *Lychnis*, and in the bark of *Silene inflata*. *Gypsophila struthium* is used by the Spaniards for scouring instead of soap. The bruised leaves of *Saponaria officinalis*, a native of England, forms a lather which much resembles that of soap, and is similarly efficacious in removing grease spots. The bark of *Quillaia saponaria* of Central America answers the same purpose, and is used as a detergent by wool-dyers. It has been even imported largely in France, Belgium, &c., and sold in the shops as a cheap substitute for soap. The fruit of the *Bromelia pinguin* has also been found useful as a soap substitute. A vegetable soap was prepared some years ago in Jamaica from the leaves of an aloe, which was found as detergent as Castile soap for washing linen, and had the superior quality of mixing and forming a lather with salt water as well as fresh. Another vegetable soap which has been found excellent for washing silk, &c., may be thus obtained: To one part of the cake add one and a-half parts of the before-named *Agave karatu* macerated in one part of boiling water for twenty-four hours, and with the extract from this decoction mix four per cent. of resin. In Peru the leaves of the Mogney Agave are used instead of soap; the cloths are wetted, and then beaten with a leaf which has been crushed; a thick white froth is produced and after rinsing the clothes are quite clean. The pulpy matter contained in the hard kernel of a tree, called locally *Del Jaboncillo*, is also used there for the same purpose. On being mixed with water, it produces a white froth. In Brazil, soap is made from the ashes of the Bassena or broom plant, which abound with alkali. There are also some barks and pods of native plants used for soaps in China. The soap plant of California is stated to be exceedingly useful. The bulbous root, which is the saponaceous portion, resembles the onion, but possesses the quality of cleansing linen equal to any olive soap manufactured. From a paper read before the Boston Society of Natural History, it appears that the soap plant grows all over California. The leaves make their appearance about the middle of November, or about six weeks after the rainy season has fairly set in; the plants never grow more than a foot high, and the leaves and stalk drop entirely off in May, though the bulbs remain in the ground all the summer without decaying. It is used to wash with in all parts of the country, and by those who know its virtues, it is preferred to the best soap. The method of using it is merely to strip off the husk, dip the clothes into the water, and rub the bulb on them. At St. Nicholas, one of the Cape Verde Islands, they make a soap from the oil of *Jatropha curcas* seeds, and the ashes of the burnt papaw-tree leaf. The oil and ashes are mixed in an iron pot heated over a fire, and stirred until properly blended. When cool it is rolled up into balls about the size of a six-pound shot, looking much like our mottled soap, and producing a very good lather.

AGRICULTURAL STOCK—INDIA.

From Lieut.-Col. E. Boddam, on Special Duty, Mysore Commission, to the Officiating Secretary to the Chief Commissioner of Mysore, dated the 21st March 1871.

I HAVE the honor to forward a memo. on cattle-breeding. The necessity for the measure proposed has been repeatedly remarked on by the Chief Commissioner in conversations about the cattle of the province:—

MEMO. ON CATTLE-BREEDING.

While the Government in the interests of the ryots has initiated and is furthering measures for bettering the cattle of the province by holding cattle shows, by seeking to improve the forage, by endeavours to mitigate or ward off epidemic cattle diseases, and by introducing amrat mahal bulls for breeding purposes, the farmers themselves should not neglect the means at their disposal for aiding the Government in its efforts for their benefit. They should give more attention to the breed of their cattle; not, as at present, allowing stunted ill-bred bulls to herd with the village cows and still further deteriorate the quality of the stock. The village authorities acknowledge the evil, but do nothing to remedy it.

The amildars who are on the spot might effectually exert their influence with the people to have every puny ill-bred bull within their districts emasculated and turned to some use as bullocks, instead of doing harm as at present. They have only to bestir themselves in the matter; there is no prejudice or opposition likely to arise.

THE AMRITSIR CATTLE FAIR.

(Indian Public Opinion.)

THE prizes at the Umritsur Spring Cattle Fair were distributed on Thursday last (4th ultimo) by Major F. M. Birch, the Deputy Commissioner. We regret to observe that although Major Birch had sent notice round the station and to the hotels, there were only two European gentlemen to be found who took any notice of his invitation. This is greatly to be regretted, because the chief part of the people who visit these fairs come from a distance, many from independent territory, and the presence of the Englishman on these occasions is highly appreciated by the natives.

It cannot be said that the prize list, which was the same as last year, was satisfactory; in the first place, the value of the prizes was meagre in the extreme, when the funds available and the number and value of the animals which come to the fair are taken into consideration. We believe we are correct in stating that there is a very considerable sum collected from former fairs in hand, and on this occasion the amount paid by the contractor was over Rs. 2,600, while under Rs. 600 were distributed in prizes.

The Umritsur Spring and Autumn Cattle Fairs have now been in existence about one hundred years and are the most renowned in India this side of Buttessur (near Agra), and Government have an opportunity open to them here of improving the breed of cattle at no expense to themselves and with very little trouble attending it.

In no class of domesticated animals does the principle and consequent advantages of natural selection so quickly make themselves apparent as in cattle—and it is a known fact that attention to the bull is of primary importance because the progeny follow the male in preference to the female in this class of animals. Our Colonial friends are very well aware of this, and hence the prices they pay in England for bulls of good stock. We wonder what our Punjab jat would say to £1,000 being paid for a bull, yet more than eight years ago that sum was paid for "Royal Butterfly," and £500 is a common figure for bulls of a high order of merit.

In England one of the most important points looked for in cattle-breeding is smallness of bone and quantity of meat.

In this country where beef is eaten by such a small minority of the population, we must not look for these points, but rather the contrary for large bone, as without it there cannot be the strength so necessary in where almost the entire haulage is carried on by oxen. We believe we are correct in stating that one cross of English blood makes itself immediately felt in this country, both in the quantity of milk produced by the cross-bred and in the rapidity with which it comes to maturity; the cross-bred animal will reproduce its species a year before the indigenous one will. Notwithstanding the smallness of bone which is looked for in English cattle, there need be no fear of their causing deterioration in this respect, for although the bone of the English beast is small, it is only so in comparison with the amount of flesh it carries; it is really enormous when put side by side with the many miserable specimens we see in the Punjab.

Turning to the prize list of this year we find two rewards of Rs. 50 and Rs. 25 for 3-year old bull calves, Rs. 20 and Rs. 10 for 2-year old bull calves; while lower down we find bulls (that is to say, 4-year olds and upwards) 1st class 3 prizes at Rs. 10 each, 1st class 3 prizes at Rs. 5 each: no system could be devised better calculated to injure the breed of cattle than this. In India steers are not castrated as at home shortly after birth, but when they are two or three years old, consequently young bulls are brought to these fairs to carry off the largest prizes and are then turned into animals which never can be of any use in improving their species. Going on with the list we find Rs. 30 and Rs. 15 given for 3-year old cow calves, also Rs. 15 and Rs. 10 for 2-year old cow calves, while a little further down the list there is a prize of Rs. 20 for "4 approved milch cows belonging to one party;" also a prize of Rs. 6 for "2 approved belonging to one party." Now we must own this arrangement beats us altogether, and we will say no more about it that than it is most unsatisfactory. Among oxen Rs. 40 is all that there is available for distribution, and Rs. 42 for buffaloes, Rs. 65 for riding camels, Rs. 50 for loading camels, Rs. 16 for goats, Rs. 72 for gram-fed sheep. In the last class no one, we believe, ever exhibited—probably because they despise to send animals fattened for slaughter to a fair at which prizes are offered—intended to promote improvement in breed.

In giving prizes for cattle we are of opinion that there are two principles which should be kept in view—one the improvement

of cattle for draught purposes and the other for milking purposes; because it is very well known that a thin-skinned, silky-haired beast likely to be a fine milker would not be adapted to improve the breed for draught purposes and *vice versa*; a coarse-haired, hardy beast fit for the plough would be utterly unfit to improve the breed for milking purposes. And we trust when the time for the next fair approaches the authorities in Umritsur will bear this in mind, and we now append a prize list such as we should like to see. The total amounts to Rs. 1,880 which is not very much, and we think this might be added too if necessity arose at the time :—

PROPOSED PRIZE LIST.

Bulls likely to improve the breed of cattle with reference to draught purposes—

		Rs.
Four and five years old and upwards ..	1st prize ...	100
" " " ..	2nd " ...	50
Three years old	1st " ...	50
" "	2nd " ...	25
Two years old	1st " ...	25
" "	2nd " ..	15
	Total ..Rs.	265

Bulls likely to improve the breed of cattle with reference to milking purposes—

		Rs.
Four and five years old and upwards	1st prize ..	100
" " " ..	2nd " ...	50
Three years old	1st " ...	50
" "	2nd " ...	25
Two years old	1st " ..	25
" "	2nd " ...	15
	Total...Rs.	265

Cows likely to improve the breed for draught purposes—

		Rs.
Four and five years old and upwards ..	1st prize ..	100
" " " ..	2nd " ..	50
Three years old	1st " ...	50
" "	2nd " ..	25
	Total ..Rs.	225

Cows likely to improve the breed for milking purposes—

		Rs.
Four and five years old and upwards ..	1st prize	100
" " " ..	2nd " ..	50
Three years old, ...	1st " ...	50
" "	2nd " ...	25
	Total...Rs.	225

For the best youngest cow on the ground, which shall be less than three years old and shall have its calf by its side—

The date of birth of cow and calf to be certified by the tahseeldar of the purgunnahs in which they were born or by some other means held to be satisfactory by the judges. .....Rs. 50

Buffaloes.

		Rs.
Bulls, any age	1st prize ..	100
" "	2nd "	50
Cows, any age	1st " ..	100
" "	2nd " ..	50
" "	3rd " ..	25
	Total... Rs.	325

Oxen.

The best pair suited for carts, bullocks, &c.—

		Rs.
Four and five years old	1st prize ..	50
" " "	2nd " ..	25
Three years old	1st " ..	25
" "	2nd " ..	15

The best pair suited for plough and ordinary farm work—

		Rs.
Four and five years old	1st prize ..	50
" " "	2nd " ..	25
Three years old	1st " ..	25
" " . ..	2nd " ..	15
	Total...Rs.	230

Camels (Riding.)

		Rs.
Four years old and upwards ..	1st prize ..	50
" " ..	2nd " ..	25
" " ..	3rd " .	15

Loading.

Four years old and upwards ..	1st prize ..	50
" " ..	2nd "	25
" " ..	3rd " ..	15
	Total..Rs.	180

Goats.

Rams	1st prize ..	10
.. ..	2nd " ..	5
Milch Goats, ...	1st " ..	10
" "	2nd " ...	5
	Total...Rs.	30

Sheep.

Size and length and fineness of wool to be the criterion of goodness—

		Rs.
Rams	1st prize ..	30
"	2nd " ..	15
Ewes	1st " ..	30
"	2nd " ..	15
	Total..Rs.	90

Recapitulation.

Bulls	530
Cows	500
Buffaloes..	325
Oxen	230
Camels	180
Goats	30
Sheep	90
Total... Rs.	1,880

CATTLE FAIRS IN THE PUNJAB.

The improvement of the breed of cattle in the Punjab is a subject we have often urged in these columns, and the Punjab Government has very heartily done its best to promote the desired end by recognition of fairs, liberal offers of prizes, and instructions to commissioners and deputy commissioners. It is not in every case that the wishes and aims of Government have met with intelligent response, but there is certainly much more interest now taken in the matter both by Europeans and the natives themselves. About a year ago we drew attention to the inadequate scale of prizes at one of the large local fairs and the inefficiency of the manner of adjudging the prizes, and on that occasion we published an improved scheme for the guidance of the authorities who looked after these fairs. That scheme met with the approval of the Government and was adopted *in toto*. At the first fair at which the enhanced scale of prizes was in operation the animals exhibited were much the same as in former years; but as soon as the people went to their respective homes and spread the news regarding the large prizes, the effect was very marked.

Six months after that fair, that is, on the occasion of the last Umritsur Fair, there was a marked improvement in all classes, particularly in four and five year old cows and two year old bulls. There were also two 2-year old cows with calves at their sides, which at last fair all present said was a *thing unknown in India*. This only shows how quickly a return can be got from a cow if it is duly taken care of, and there is every reason to believe that last year gave a fair start to improvement of the Punjab cattle by increased prudence in breeding and care in management.

Before proceeding to more special notice of any local fairs, we wish to call the attention of the Financial Commissioner to the occasional difficulty under which local official judges labour when called upon to distribute prizes for cattle. These difficulties are seldom experienced in dealing with horses, as the judges either are assisted by, or are themselves, experienced officers or veterinary surgeons.

In judging of cattle, however, they are dealing with animals of totally different points, and the result is that in too many cases, a good fat animal or one with a pretty face carries off the prize. We wish to point out that perhaps the best thing under the circumstances would be for the Financial Commissioner to draw up a set of instructions for the guidance of local judges, which should be sufficiently precise to define the excellencies required and yet popular enough in language to be easily understood by any ordinary district officer. Such instructions would require to be very carefully prepared, it is true, but they can easily be obtained and they are assuredly most desirable.

There is in some quarters a disposition to trust to natives for judgment in such matters, a course much to be distrusted. Natives are for the most part much more ignorant about cattle-breeding than the most ordinary European, and wherever there is a European who has studied cattle-breeding, the natives must sink into the back-ground altogether. He is the "heir of all the ages" of criticism, reasoning, trial and experiment; they are the complacent slaves of *dustoor*. He will bring to the field a bull perfect in every fibre of its muscles, in the condition of a race-horse, with its pedigree and its progeny to witness for it; they will prefer a debauched enervated village Brahminy with a skin bursting with fat and a constitution flaccid and vigourless, as different from the well-bred animal as a sleek podgy Baboo would be from a Greek athlete.

Another point upon which there seems to be necessity for local regulation, is the method of collecting dues from those attending the fair. We take it for granted that those attending the fairs for the purpose of buying and selling cattle are always willing to pay so much in some form or other for remuneration of the local authorities who grant the site for the accommodation of their cattle and provide sanitary arrangements for their comfort and health. We take it also for granted that the authorities are always desirous of levying certain dues on these large collections of people, either for the sake of levying, to keep their hands in, as it were, or to provide prizes for exhibitors of good animals and to pay any expenses the municipality have been put to by the meeting. The common way is to farm the levying of dues, putting up the contract to auction, with the understanding that the contractor only levies at a certain moderate rate. Although this plan has its advantages, especially to an indifference or lazy municipality, it has also great disadvantages. The contractor cheats the people almost invariably, in the most flagrant way, out of more than the legal due. We called attention most pointedly to this last year as having taken place at Umritsur, as we were in a position to testify to the existence of the malpractice, and we regret to hear that similar misconduct on the part of the contractor went on this year, until a gentleman, in the public interest, prosecuted him in court. Through a very *natural* break-down of the native witnesses, the case was dismissed, but the magistrate expressed his decided opinion that the allegation of malpractice was perfectly correct, though unfortunately he was not able to convict. The Umritsur method is to charge one *pie* per rupee on all sales, and the

cheating is the taking of money for examining the rupee to *see if they are good*, and also for stamping the cattle. If we want an easy illustration of what is possible in the way of making money off such contracts, we beg to call attention to the fact that at the Gooloo Shah Fair of Sealkote, on the 22nd September last, there were only 3,000 cattle on the ground, and yet the contract sold for Rs. 750, so that *four annas* for each animal must have been exacted by the contractor to cover his cost, and we are certain he would levy a good deal more (say *six annas*) in order to make a fat profit of, say 50 per cent. Major Jenkins should see to this. Let us now look at the Umritsur figures. There were thought to be above 40,000 cattle on the field. The contract sold for Rs. 2,800, and at the rate of one pice per rupee this necessitates sales to the extent of five and a-half lacs. Were all sold and this their value, this would give an average of somewhere about Rs. 14 per head, so that the contractor must have levied at least an anna and a-half per animal (though indeed he was charged with taking much more).

Now, we say, have cattle more farming. Let the municipality collect the duties in an honest way and let them be collected at tolls on the principal roads leading into the ground. There are, we believe, only three great roads along which cattle are driven in to the Umritsur Fair ground. If one anna per head were charged indiscriminately on all cattle, that, with 40,000 cattle, would produce Rs. 2,500, an ample sum for all expenses and prizes. If more is required the people would willingly pay *two annas* a head, to be saved the trouble and extortion of the contract system. A two-anna toll would thus produce at once Rs. 5,000, which would make the hearts of the Committee to sing for joy. Again, we should propose, in addition, that all animals entering for competition should pay an entrance fee of one rupee. This fee would guarantee the exclusion of bad animals, would save the Committee much trouble, and would not prevent really good animals being exhibited, but would rather foster a spirit of prudent care for, and pride in, lively animals among the native community. We are glad to observe that Major Jenkins, at Sealkote, is taking an interest in promoting the cattle fairs in his district by building wells and offering good prizes. There is still however much to be done, if we may judge from his report. We should advise him to try to obtain the assistance of some European gentlemen in his Prize Committees, and see if he could not do better by our toll-system than by the contract-system. And, finally, if the Financial Commissioner will do not issue such instructions as we have suggested, those who take upon themselves to be judges should make sure for their own credit that they know something of what they are called on to express an opinion about, and that they should have first of all a clear understanding among themselves, as to what points in an animal the highest authorities consider good or bad.

An animal that takes a one-hundred rupee prize at a great yearly fair has its reputation made, and if by the absolute ignorance of the judges entrusted with the distribution of the prizes, a bad animal is taken and a good animal excluded, the whole object of the prize-giving is frustrated, inasmuch as *false* notions of what is wanted are impressed on the native exhibitors. —*Indian Public Opinion, 5th May* 1871.

CATTLE DISEASE IN DARJEELING.

THE cattle disease in this district is virulent. There are two kinds—*Gontee* or small-pox—which is not incurable, and rinderpest or murrain, which may be said to be quite incurable. On the roads the draught bullocks are mostly dead from rinderpest. The new hill cart road from Sookna up is unbearable from the dreadful stench arising from dead cattle. How is it that "the authorities" don't do something. They might see that dead cattle don't fester on the roadside for days and weeks without any notice.

There is a European inspector of police at Kursiong who might be spurred into activity, or if the man is merely kept for ornament, surely some native subordinate might be made to see that dead cattle on the roadside are buried.—*Darjeeling Times, 29th April.*

RICE CULTIVATION.

REPORT ON THE CAROLINA RICE DISTRIBUTED IN THE PUNJAB DURING THE SEASON 1869.

FIVE maunds of the Carolina rice were received from the Financial Commissioner during 1869, and were distributed as follows :—

	Seers.
To the Deputy Commissioner of Hushiarpore	20
Ditto Dhurmsalla	20
Ditto Lahore	30
Ditto Abbottabad	20
To Secretary, Local Funds Committee, Umritsur ..	20
To each of 25 Local Funds, three seers, amounting to ..	75
Sown near the Badami Bagh	5
	200=5 Maunds.

Each of these officers have been requested to send in reports of the success of the crop, but returns have not yet been received from the following,—Mooltan, Delhi, Peshawur.

With regard to the other districts, Colonel Elliott, Deputy Commissioner of Loodiana, states, in his office memo. No. 560, dated May 27th 1870, that the Carolina rice sent to the Loodiana Local Funds in May 1869 was not sown, as the soil there being sandy, did not admit of its culture, and that no more need be sent to his district in the present year.

Similarly, A. H. Benton, Esq., Secretary, Local Funds Committee, Gurgaon, in his office memo. No. 420, dated June 6th 1870, writes :—"In reply to your No. 8, dated May 24th 1870, I beg to state that no use was made of the Carolina rice seed received from you last year, as the Committee had no ground suitable for sowing rice. Scarcely any rice is grown in this district ; only some of very inferior quality in Ferozpore purgunnah, where the soil is more suitable than here ; you need not therefore trouble yourself to send any seed this year."

The Deputy Commissioners of Shahpore, Ferozpore, and Montgomery, also state that they are not able to give any account of Carolina rice seed which they received.

The Secretary, Local Funds Committee of Hissar, states that the Carolina rice forwarded to his district in May 1869 was experimentally sown in two or three places, but apparently owing to the severe drought which prevailed in that district last year not a single seed germinated.

The Secretary to the Local Funds Committee, Bunnoo, also states that the Carolina rice seed did not germinate.

This was probably from the same cause ; but it is to be regretted that in Hissar at least means were not taken for remedying the ill-effects of the drought.

The Secretary, Local Funds Committee of Sirsa, in his office docket No. 52-714, dated 28th June 1870, states that, owing to too late sowing and excess of moisture, the cultivation of the Carolina rice seed was entirely unsuccessful.

And R. W. Thomas, Esq., Deputy Commissioner of Karnal, states, in his office docket No. 271, dated 8th June 1870, that the Carolina rice was sown in his district, but destroyed by a heavy fall of rain ; some five seers of paddy have been got from some of the surviving plants.

Also the Secretary, Local Funds Committee, Dera Ghazee Khan, states that the crop of Carolina rice failed entirely, but does not explain for what reason.

And the Deputy Commissioner of Dhurmsalla states that the Carolina rice was reported to have come to nothing, the reason being that it was sown too late to be of use.

The Deputy Commissioner of Jullundhur states that the seed appears to have been received last year while he was on leave, and that he finds it lying there on his return ; that it will be sown this year, and a report shall be submitted at an early date.

The Deputy Commissioner of Hazara also states that the Carolina rice seed was received late for the season, but that it will be sown this year, and the result will be duly communicated.

The favorable reports received were as follows :—

A letter from P. Butler, Esq., Secretary, Local Funds Committee of Jhelum.

"In reply to your letter of the 12th current, enquiring as to the result of the Carolina rice, I have to state that the three pounds you sent were sown over one *kanal* of alluvial land near the Talleanwala Government Garden. The crop or about one *murla* of this came to perfection, and the out-turn, amounting to four seers, has this season been sown out over one *bigha* of the same description of soil.

"The remaining 19-20ths of last year's yield was destroyed, owing to exceptionally heavy floods from the River Jhelum having swept over and submerged it. I should like to know whether you think it desirable to experiment with respect to the capabilities of the soil for the growth of the Carolina rice in the three other *tehsils* of this district. If sent to Tullehgung and Chuckowal the crop will be entirely dependent on well irrigation ; in the Pind Dadan Tehsil *sailabee* and canal irrigation is available."

A letter from Colonel Blair Reid, Political Agent and Superintendent of Chamba, dated 12th May 1870, states that he obtained some Carolina rice seed last year, and it succeeded so well, that the people at Chamba are asking to get more, and that he will be much obliged if some can be sent at once, for it must be sown soon ; that he would gladly pay for any quantity procurable up to 20 seers ; to be of any service it must be sown this month ; that if Carolina rice cannot be procured, any other good kind may be sent ; but the Carolina kind seems peculiarly adapted to the climate of Chamba.

In accordance with the above, 20 seers were sent in divided parcels by pattern post, and a letter was written, asking for further information. To which the following reply was sent :—

"Many thanks for ordering the Carolina rice ; I will give you the result of the present year's sowing ; but I can give no information as to last year, excepting that the crop was very

abundant. It was sown in ordinary rice-land and cultivated in the usual way. The area sown and the quantity of seeds put in I cannot ascertain. It was but a small quantity ; and I had little idea at the time that any pains would be bestowed on it. The people here make a large profit (at present rates) on their ordinary crop. They don't care about trying anything new, especially if it requires any degree of trouble, but the produce of this sample of rice was so extraordinary, that I have been asked to procure a further supply."

Also reports from different native gentlemen in Lahore, and from the Secretary to the Municipal Committee.

From J. Hutchinson, Esq., C. S., Assistant Commissioner and Secretary, Local Funds Committee, Lahore, to Dr. T. E. B. Brown, Secretary, Agri-Horticultural Society, Punjab.

"With reference to your letter of the 7th current, I have the honor to report as follows, in regard to the results arrived at in connection with the produce of the Carolina rice, 20 pounds of which were received for distribution in the Lahore district. The Tehsildar of Shurruckpore, to whom three seers were given, reports that the rice was sown in the usual way, but that the grain turned out coarse, and much inferior to the country rice, and that it ripened 20 days before the country rice.

"*Nubbee Bux, of Shalimar* reports that the rice was sown by him in August, and that it also ripened 20 days before the country produce. The produce from the four seers of rice which he received was one maund and ten seers, and the produce would have been greater, but for hail that fell after the paddy had been sown.

Dewan Ruttun Chund, to whom four seers were given, states that the rice was sown by him during July in two *murlahs* of ground, watered from well-water, and that after it had sprung up, he transplanted it to other ground in the month of August. In October the paddy ripened, and the produce was two maunds.

Nawab Nawazish Ali Khan reports that the four seers sown by him yielded four maunds and twenty seers, and that the rice was good.

Dewan Byjnath reports that the yield from the four seers given him was one maund and two seers ; the rice was good. The yield would have been greater only that the supply of canal water was stopped from local causes for a time. He also states that when the paddy is in the ear that neither wind nor storms will throw it out, and that the plants appear to be much stronger than the country plants. He remarks that the rice is coarse, and when cooked remains so, and is not approved of."

Translation of the reports of the results of Carolina rice distributed for experimental sowing in the Lahore District. From the Deputy Commissioner of Lahore, to the Nazir, dated 18th June 1870.

The Carolina rice received from Dr. T. E. B. Brown, Secretary, Agri-Horticultural Society, Lahore, should be distributed to the following, who should be enjoined to furnish reports of the results of the sowing in due time :—

	Seers.
Nawab Nawazish Ali Khan	4
Dewan Ruttun Chund	4
Dewan Byjnath	4
Nubbee Bux, of Shalimar	4
Tehsildar of Shurruckpore	5

Nazir's reply.

"In compliance with the above, I have the honor to state that I have distributed the Carolina rice as follows :—

	Seers.
Nawab Nawazish Ali Khan	4
Dewan Ruttun Chund	4
Dewan Byjnath	4
Nubbee Bux, of Shalimar	4
Tehsildar of Shurruckpore	5

Deputy Commissioner's order to the Mohurrar, dated 11th January 1870.

All samples, &c., that you have received of the Carolina rice should be forwarded at once to Dr. Brown, the Secretary, Agri-Horticultural Society.

Sent as follows :—

	Seers
From Dewan Ruttun Chund	1
Dewan Byjnath	2
Nawab Nawazish Ali Khan	1
Tehsildar of Shurruckpore	1
Nubbee Bux, of Shalimar	4

With following reports from above :—

From Ahmed Yar Khan in behalf of Nawab Nawazish Ali Khan, to Deputy Commissioner.

I beg to acknowledge receipt of the four seers of Carolina rice sent. The report accompanies.

Report.—I have received your letter enquiring about the results of the Carolina rice sent, that you sent me some time back. I sowed the rice in two *kanals* and 10 *murlahs* of land, irrigating the same from canal. The yield from this sowing was four maunds and 20 seers, sample of which I send with this report. The seed that I have retained for next sowing I shall report on in due course.

From Dewan Ruttun Chund, to Deputy Commissioner of Lahore.

After due salutations, I beg to acknowledge the receipt of the four seers of rice which you so kindly sent me for experiment.

I sowed the rice in July in two *murlahs* of ground, irrigating the same from a well. In August, when it rained, I had another piece of land, about five or six *kanals*, cleared, and had the plants taken up from the former place and planted out widely in the latter. In October, when the crop was ripe, it yielded two maunds of rice. It appears that this rice yields more than the country rice, but owing to the transplantation above mentioned, many plants dried up, and the produce was in consequence comparatively less. Next season this rice will be sown with great care. I send two packets containing samples of that sent me and of that produced.

From Dewan Byjnath, to the Deputy Commissioner, Lahore, dated 13th December 1869.

After due salutations and respects to the most exalted gentleman, the Deputy Commissioner of Lahore, I beg to lay before your notice that, in compliance with your orders, calling for a report on the results of the Carolina rice sent me for experiment, I have to report as follows, though the samples of the seed sent me and of that produced preclude any remarks from me, as they plainly show what has been the result, yet, as I have been desired by our kind benefactor, the Deputy Commissioner, both verbally and by writ to do so, I willingly obey :—

Report in detail of the results of the Carolina rice.

On February 17th 1869, I received nine seers of Carolina rice from the great and luminous star of improvements, the Deputy Commissioner, and on June 18th, I received four seers, aggregating to thirteen seers. This quantity I distributed for sowing as follows :—

I sent five seers to a village which belongs to me called Ajudiapore, in purgunnah Lahore, situated in the south, and six seers to Rukh Noorwala Bughiarwala, in purgunnah Shurruckpore, Lahore, granted me by the most munificent Government, also situated to the south, on the banks of the Ravi.

I shall first write about the results at Ajudiapore. At this place I had 11 *murlahs* of ground sown with rice in the beginning of *Sawun*. The seed germinated, but owing to rains having failed, and the brackish water that had to be substituted instead, the growth of the plants was retarded, and were also very much injured in consequence. The soil of this part of the country is unusually dry, as water is to be found at 55 feet from the surface, and in order to secure the growth of rice, a body of water about half a foot deep has always to be kept up in the beds. It is true we have the canal here, and on occasions of drought it has proved a great blessing, but unfortunately this season the canal was also closed. In *Bhadown* also no water could be obtained from the canals, and water is very much needed during this month to carry out the transplanting successfully ; the consequence was, that a very inferior crop of rice was produced. The canal on this occasion was also closed owing to the flooding of a river, which washed the bridge away. The canal officers are not to blame for this, as who can do aught against the will of Providence. Though ordinarily five seers of rice would be sufficient for one beegah of land, yet the yield on this occasion, owing to causes above enumerated, was only one *kanal*, amounting in weight to two maunds.

This rice seems very good for cultivation, and zemindars esteem it for the sake of the yield, which is very much greater than country rice ; but they prefer the latter, as it is not easily injured, the ears being light, by storms, stress of weather, or other causes.

There are two ways of thrashing rice in this country,—one, and the most popular way, is to dig a pit a few feet deep, and then gather the rice-stalks in bundles and strike them earwards against the edge of the pit, when the paddy separates and drops into the pit. But the Carolina rice will not admit of the above process. In order therefore to thrash it in the most economical manner, a process similar to that of thrashing wheat in this country has to be adopted, and when the seed is thus separated it resembles a very coarse and inferior kind of rice, called *sofeda* or *sounput* in the Punjab. It cannot be said to even approach our *begmi* or *basmutti*, the superior sorts of rice. When cooked also, it in no way looks unlike the *sofeda*, which neither refines nor has any flavour. I had two seers of it cooked to try it myself, but I found that it neither increased in quantity nor improved in flavour. Rice of this nature is classed among coarse rice, in fact, it is coarser than the coarsest rice of this country.

But to me it would appear that this rice, if imported from America, must have been imported for some very good qualities in the shape of a rarity. Probably there is some other way of cooking the rice in America to bring out those qualities, in which attempt we have entirely failed. I would therefore suggest that enquiries be made from where this rice has been obtained, as to

what constitutes the excellence of this rice, and how it should be cooked and used. The raeeses, sirdars, and other wealthy people of Punjab, do not approve of it on account of its coarseness. Probably the wealthy classes of America have some other way of using this rice; this fact should certainly be ascertained.

Now I shall write about the results at Rukh Noorwala on the banks of the Deg. I sent six seers of the rice to this rukh, which was bestowed on me by the munificent Government in April 1869.

The land having lain fallow up to this, the sowing could not be done so satisfactorily as on land that had been previously cultivated, and there being no means of irrigation, the sowing here, I regret to say, failed, except one *kanal* and seven *murlahs*, where the seed simply germinated, but the plants were soon scorched up for want of water, and all the rice gathered from the stray plants here and there amounted to about 13 seers. I must, however, remark that the soil of this rukh seems well adapted for rice sowing, as it is close to the branch of the Ravi, locally called the Deg, which renders it rich, and now only a good strong well is required to be constructed on it. The soil here is not like the soil of Manjah before described, as water here is to be obtained at only 20 feet from the surface. I have now with me one maund and 15 seers of the rice, and by the good will of Providence I hope to distribute it extensively for cultivation at next kurreef. It will therefore be observed that of the 13 seers of the rice received, I distributed 12 seers and retained one seer to send up by way of comparison with the rice produced here from that seed, and I now make up two parcels and beg to forward them as specimens.

From the Tehsildar of Shurruckpore, to the Deputy Commissioner of Lahore.

I beg to acknowledge receipt of the four seers of Carolina rice sent me, which I transferred, under orders from yourself, to Moharee, Lumberdar of Kote Deenah, the soil of which place is admirably adapted for rice cultivation. I have requested the Lumberdar to sow the rice carefully, and to inform me of the results; as soon as I hear from him how the rice has fared, I shall furnish my report accordingly.

Tehsildar written to again for his promised report.

You have not yet furnished your report on the results of the Carolina rice sent you in June last, and which you reported having transferred to Moharee, Lumberdar of Kote Deenah, and stated that as soon as you learnt of the results of the sowing you would furnish your report. The rice season has passed, and you are therefore directed to send in your report, accompanied with samples, at once.

Tehsildar's Reply.

In reply to above, I beg to report that the Lumberdar sowed the rice I gave him after the fashion of country rice, and watering it the same way. The crop ripened 20 days earlier than country rice, but it does not seem very good. It is coarse, like a very inferior kind of rice that grows here. This is probably owing to the difference of climate and the nature of the rice, and the proper mode of sowing the same not being known to the zemindars.

From Nubbee Bux, of Shalimar, to the Deputy Commissioner of Lahore.

I received the four seers of Carolina rice on the 18th of this month, and sowed the same on the two following days, *viz.*, the 19th and 20th. The seed has germinated, and we are now looking after it. In *Sawun* we will transplant the rice, and in *Katick* I shall write the result of the experiment.

Nubbee Bux written to again.

On the 21st June four seers of Carolina rice were sent you to sow and to report on the result. Up to this however you have intimated nothing. You are therefore directed to furnish your report at once

Reply.

The rice that I received from your honor to sow by way of experiment, and which I reported before that I had sown, and that the seed had germinated, I beg to state has yielded 1 maund 10 seers. I used to water the beds every eight days, and the crop ripened 20 days before this country rice. I send ¼ seer as sample for your honor's inspection.

The yield would have been greater, but owing to a severe hailstorm the crop was much damaged, and hence the above quantity was only produced.

A letter from Deputy Commissioner, Hoshyarpore.

With reference to your demi-official of 10th June 1870, regarding Carolina rice sent in 1869, I have the honor to submit the following result of the produce :—

The seed was distributed to five persons of purgunnah Dursooba, a rice-growing part of the district. Two pucca seers were sown in one *kanal* of land in April, which ripened in November, and yielded, with free-watering, 22 pucca seers of husked rice. The flavour of the rice is medium, and is not appreciated by the people quite so much as that produced from country seed.

Lastly, the report of the seed sown in the Agri-Horticultural Society's Gardens.

Carolina Rice.—This was sown on the 23rd of May, and well watered until it was about eight inches high; it was then transplanted, each plant singly, set about 8 inches apart, the ground being flooded at the time of transplanting, and it should be kept so till it commences to ripen; but the transfer of the Badami Bagh took place just after it was transplanted, and it suffered much on that account, as it could only be watered at the discretion of the person to whom the garden was made over; however, there was ample proof that if it got water plentifully it would have produced a much greater crop than the rice grown in the Punjab; the ears are much longer and larger. The natives speak very highly of it for its productiveness. In this case the product was at the rate of seven maunds to one beegah. The rice is very much superior in quality to the rice grown here.

From the above reports it would appear that the Carolina rice germinated well when it was sown at the proper time and place, and that there is reason to believe that it did not receive fair treatment in those districts in which it is reported to have failed to germinate.

CARDAMOMS.

TRAVANCORE CARDAMOM SALES.

AGREEABLY to the published notification, the sale of the remainder of the cardamoms of this year's crop took place at Alleppey on Saturday last, the 22nd instant, at the Commercial Agent's godowns. About 150 candies were brought forward, but the highest price realized was only Rs. 2,530 for two candies, against Rs. 2,800, the highest rate obtained at the last sales. The attendance was pretty fair, and, as usual, the purchasers were chiefly native merchants. A few candies were bought by a Cochin firm for a Madras house. Subjoined are the prices realized :—

First Sort.

2	Candies @ Rs	2,300	per Candy.
2	,, ,,	2,325	,,
2	,, ,,	2,400	,,
2	,, ,,	2,450	,,
2	,, ,,	2,530	,,
10			

Second Sort.

30 Candies @ Rs. 2,12)/2,185 per Candy.

Third Sort

60 ,, @ Rs. 1,406 1,500 ,,

Fourth Sort.

50 ,, @ Rs. 815 880 ,,

Seeds.

10 ,, @ Rs. 1,210 1,3?0 ,,

150 Candies.

The sale of ivory, bees' wax, and teak and blackwood logs will take place shortly.

COCOANUT PLANTING AND COIR.

SOME TIME ago when referring to the extension of cocoanut planting in Penang and the province, we advocated the making of coir by the hand amongst the natives, and cited, as an instance, the profitableness of the industry which we had observed in Ceylon. Apparently our remarks have had no effect in introducing into this part of the settlement what we still think would be a paying labor amongst the natives, and an article of considerable importance as an export. At present all the use cocoanut fibre is put to with the exception of making a rope for a well bucket or for some other trifling domestic purpose is firewood. In our oil factories the husk is used as firing in boiling the kernel into oil as well as in boiling rice and curry in our kitchens. This is a waste in our home consumption; but when the number of cocoanuts exported are taken into consideration, the material loss must be considerable. We will take at a rough guess that half a million of cocoanuts have been exported from Penang during the past three months of the year, and when it is known that the nuts are exported with their husks, the material loss may be estimated. This loss is not only a great one to the export market but also a loss to the import one. In neither is fibre utilised. The greatest loss is in the export, as in the consuming market the kernel is the product purchased. This is more apparent when we know that half of the husk in the shape of a dust manure can be easily returned to the trees without much expense. This ought not to be lost sight of by planters, as the matter forms an ingredient of the after crop, and must be supplied otherwise by manure.

There cannot be much doubt about the benefit there will be derived from the introduction of this industry, more especially when we consider that the labor will be distributed amongst the native Malays, a class who have little to depend upon beyond their labor for support, and who, in our easy prosperity, it is just possible we may overlook. There is perhaps no tropical colony that has so many advantages for coir-making as the province of Penang, and we hope yet to see coir, as cocoanut oil will be, ere long, one of the items of export in our price currents. Both articles will pay as may be seen from the value they fetch in the London market, and it is surely a pity that coir should longer be lost here.—*Penang Argus, April 8.*

COCOANUTS AND COIR FIBRE.

In a recent issue we copied an article from a Penang contemporary in which he bewails the great loss to the cocoanut cultivators in that island from the husks of their cocoanuts not being utilised. As many as half a million of nuts were exported in three months, the writer said, and yet no attempt was made to take off the husks or to manufacture them into fibre. There would certainly be an advantage as regards stowage and freight in removing the husks of this large number of nuts before shipment; but the Penang journalist will be relieved to learn that beyond this the planter loses little if anything at all. In fact the value of the cocoanut husks barely repays for the cost of removing them. Removed they must be, and coir fibre is then manufactured from them; but the expense of manufacturing absorbs all the value of the fibre in the market without leaving anything but the merest fraction for the producer. If the Penang cocoanut planters were to husk their nuts and convey them to another "Hultsdorf Mills" (if such existed in their capital) they, in all probability, would not be allowed what would pay for their pains. The calculation here is that 10,000 nuts yield a ton of cocoanut oil (valued at £27 in the local market) and a ton and a half of coir fibre (equal to from £20 to £30). But the expense in the latter case of manufacturing and preparing the fibre is very great when all the labour is properly taken into account. However, if the intention be to get the natives (and not European planters) of Penang to utilise the time in manufacturing coir fibre, which they now simply waste, our contemporary's is a very laudable endeavour. We are only surprised that natives in Penang should not long ago have found out the profit of husking their cocoanuts during the large amount of spare time at their command, and of turning the fibre to account. They must be much less enterprising even than the Singhalese.—*Ceylon Observer.*

Cocoanuts and coir fibre have recently attracted a good deal of attention. With reference to the manufacture of the latter we have collected some information to satisfy our Penang neighbours that their loss is little or nothing from not sharing in the trade in coir. The manufacture of this fibre, in fact, is almost more costly than the return obtained from it in Ceylon. But we now find from information placed at our service that the Penang cocoanut planters need not come so far for information on the subject. The manufacture of coir fibre has been carried on at Singapore, and only recently, a special business of the kind in which a considerable amount of money was sunk, was entirely given up. We are reminded, too, of what we had entirely forgotten in penning our remarks which appear elsewhere, namely, that in the majority of cases, the husk is indispensable to the safe and sound conveyance of the cocoanut to a distant market. Mr. Wilson, than whom no one can speak with greater authority on everything connected with cocoanuts, says that not only do the husked nuts get bad from the shells being broken in stowing, but even if uninjured they often become affected through the germinating "eyes," so that the shipment of nuts with the husks on is by far the safer plan. Anyone who has been in the great cocoanut mart between Leadenhall and Bishopsgate streets must remember the work in husking carried on there by the Jewish dealers and their employés, who, it must be confessed, would be the better of a lesson from the Singhalese in the proper mode of getting rid of the husky covering.—*Ibid.*

IMPROVEMENTS IN ENGLISH AGRICULTURE.

HARROWING WHEAT IN THE SPRING.

We have frequently taken occasion to speak of the advantages of this practice; still few farmers seem disposed to follow it, either from a lack of faith in its advantages, or from an indisposition to depart from the old beaten track. A good harrowing of a wheat field at the proper season in the spring, when the ground is just dry enough, has been found from repeated practice equal to a good working of a field of corn with the best plough or cultivator. In England a good hoeing and weeding of the wheat crop is found of so much importance that many of the farmers "dibble in" their seed so as to have the plants come up in perfect rows, in order to afford the greatest facilities for the operation. In our country labour is too dear to admit of this kind of planting. Indeed there is no need of it. Our mechanics have so perfected the wheat drill that the seed may be put in with almost the same degree of accuracy that the English labourers can put it in with the dibble, so that if the price of labour here would warrant hoeing, the regularity of the drilled wheat would admit of this operation; but it is too early to think of bestowing labour in this way. The harrow answers almost as good a purpose. Experience and judgment must determine the precise time when this work should be done. It should not be before the heavy frosts are over in March, and always when the ground is sufficiently dry to pulverise. To one unacquainted with the operation, he would imagine the entire crop would be torn up by the roots, but it is not so. Let the harrow be not too heavy, with the teeth sharp, and the best results will follow the operation.

If clover or grass seed are to be sown on the wheat, the harrowing should be done at any time when the ground is in good order to work, at the most suitable season sowing the clover or grass seed. The harrowing should be done first, and the seed sown immediately, to be covered by the next rain.

As evidence of the advantages of harrowing wheat, we give the experience of Mr. L. Graves, as published in the *American Farmer*. He says:—"I promised you in April to write to you about the result of harrowing wheat in the spring. I find it pays well; it gives the wheat a good start, and the harrowed portion ripens as early as the unharrowed part, and has much heavier heads; if the state of the ground and the weather suits at the time, the wheat ought to be harrowed. I shall always prefer doing it".—*Colman's Rural World.*

POTATOE SEED.

A correspondent inquires—"What is your opinion on the influence of cut and uncut potatoes for seed, and on small and large ones? There are many contradictory statements in the papers."

The contradictory statements are owing to the varying circumstances under which the experiments are made, without a sufficient repetition of them. Conclusions are drawn from too few tests. A single experiment will not do for the basis of a theory.

If the soil is sufficiently moist when potatoes are planted, cutting is an advantage. It reduces the number of stalks, gives fewer new potatoes, and, as a necessary consequence, allows those few to grow larger and develop themselves better than where they are numerous in the hill, resulting from many stalks from all the eyes of a whole potatoe. But even here there is a considerable difference with different varieties, some potatoes growing thicker and more numerous in the hill than others.

If the soil and season happen to be quite dry, the cut pieces dry up rapidly, lessen the supply of food to the young and growing sprouts, and the plants are enfeebled. In such cases the crop will often succeed better by planting whole potatoes, the skin of which being nearly impervious to moisture, keeps them plump for a long time. If potatoes are planted early in the spring, when the soil is nearly always quite moist, and remains so for some weeks, there can be no objection to cutting potatoes into pieces before planting, and the crop will be likely to be better and the tubers more uniformly large.

There is much diversity of opinion relative to the value of small potatoes. They are not usually so successful as large ones. But the wrong reason is assigned. It is said that "like tends to produce like," and that, therefore, small potatoes tend to produce small ones. This would be true if true seed from flowers, instead of portions of the root or stem, were employed. We might as well say that grafts cut from a large tree would produce larger fruit than others, or that planting large trees from the nursery rows would give orchard trees of greater size. The truth is, the tubers of potatoes are essentially underground stems, and the eyes are the buds. We could no more expect to get larger trees by using large buds than larger potatoes by planting large tubers. Nevertheless, we find by experiment, that large potatoes give the heaviest crops. What is the reason? Simply this, that the large tubers give a greater supply of nutriment to the young sprouts, just in the same way that in a moist soil they will do better than in dry hot ground. In repeated trials with potatoes not over an inch long, cut into as many pieces as those four inches long, no perceptible difference was observed in the size of the tubers produced from both; but on careful weighing the large seed was found to yield about one-eighth more on an average. This difference was undoubtedly owing to the earlier and more vigorous start from the large seed, and to the continued supplies of nourishment, and not from any inherent change, as of "like producing like." The planting of the potatoes in these experiments was done in fine, mellow, moist soil and early in the season; had it been late, or in a dry or parched soil, it is probable that the small potatoes would have yielded nothing.

It is well known that some varieties deteriorate in successive years in particular soils, so that the magnitude of the crop is gradually diminished. It would be interesting to determine by a long series of trials whether the constitutional weakness is affected by selecting the largest seed only, on the one hand, and small seed from poor crops on the other. Several years would be required to determine such questions, under different circumstances, side by side.—*Cultivator.*

EXPERIMENTS WITH POTASH ON POTATOES.

SIR,—Few things speak more for the value of potash to the agriculturist than its now regular appearance among the other manures in the week's prices of our agricultural papers, and in the advertisements and circulars of manure dealers. But though abundance of experiments upon phosphatic and nitrogenous manures are extant in our agricultural books, those upon potash are few, and not readily found.

Having tried potash very thoroughly upon potatoes, I send you some particulars and results, which will, I hope, prove useful to some of your readers who are about to plant their potatoe crop :—

Manures.	Weight per acre of Produce.			Extra cost of Potash Manure over the other.			Value of increase from Potash Manure.			Profit over cost of Potash Manure.		
	Tns.	cwts.	lbs	£	s.	d.	£	s.	d.	£	s.	d.
4. Superphosphate, 4 cwt ; muriate of potash, 4 cwt.	7	6	80	1	18	0	6	1	1	3	3	1
8. Superphosphate, 4 cwt., salt, 4 cwt.	5	11	64	....			....			..	..	
4-8. Same as above in another field, and the following year, 1869	6	15	0	1	18	0	4	8	0	2	10	0
	4	7	41	....			....			..	..	
11. Farmyard manure, 15 tons	7	7	103	....	..		.	.		.....		
12. Same with lime, 3 cwt ; muriate of potash, 2½ cwt. ; and salt, 2½ cwt.	8	8	11	1	12	0	2	12	2	1	0	2
14. Farmyard manure, 10 tons, and lime, muriate of potash, and salt	7	15	15	0	13	4	2	14	4	2	1	0
15. Same as above, but without the potash	6	12	71	.....			.....			..	...	
19. Lime, 3½ cwt. ; salt, 2½ cwt.	4	17	68	...			.....			..		
20. Lime, 2½ cwt. ; muriate of potash, 1½ cwt. ; salt, 1½ cwt.	5	11	90	1	0	0	1	16	8	0	16	8
21. Lime, 10 cwt.	4	11	93	1	3	0	2	11	7	1	8	7
26. Superphosphate, 2½ cwt ; muriate of potash, 1½ cwt ; and 1 eruvian guano, 2½ cwt	6	1	7	Less cost.								
27. Bone-dust, 5½ cwt. ; 1 eruvian guano, 2½ cwt.	5	5	109	0	12	3	1	12	8	2	1	11
28. Dissolved bones, 5½ cwt., 1 eruvian guano, 2½ cwt	5	5	109	0	4	6	1	12	8	1	17	2

The first two experiments are the results for one year only, all the rest are the average of three years. The source of potash employed was muriate of potash of 80 to 83 per cent. strength, and is charged at 10s. 6d. per cwt.

The soil of plots 11 and 12 was a somewhat heavy loam ; of 19 to 28, a light gravelly loam, and the rest a medium gravelly loam.

As the practical result of very numerous experiments, I can recommend for potatoes, per acre, superphosphate of lime 6½ cwts., muriate of potash 3 cwts., and sulphate of ammonia 2½ cwts. This will be found for potatoes much better and safer as regards disease than farmyard manure ; and if the latter be valued at 8s. per ton laid down in the field, the above mixture will be found also cheaper, even taking into consideration the after-effects of the farmyard manure.

These experiments were tried upon the Blennerhasset farm, owned and farmed by William Lawson, Esq., and where, in 1868 and 1869, 40 and 70 acres of potatoes have been grown entirely with these chemical manures ; and though 14 and even 18 cwts. per acre have been applied, the potatoes are to-day (March 25th) coming out of the pits nearly as sound as when they went in.

I have tried the effect of potash manures upon grains and grasses, and cannot advise their application to the grains as a profitable investment. Upon a grass crop, rich in clover, the effects of potash are very marked, and when applied in moderate quantity—say, under 20s. cost per acre—will generally prove profitable if *quality* is wanted ; but where a great weight per acre of rye-grass is wanted, the addition of potash to the manures suited for that purpose has not proved profitable upon our soils, though the quality of the produce was certainly improved.

It has also shown profitable results when applied to turnips, and probably all root crops will pay for the use of potash along with the ordinary manuring.

CHARLES D. HUNTER.

Blennerhasset, Cumberland, March 1871.

The Foresters' Gazette.

CALCUTTA, 15TH JUNE, 1871.

FUEL PLANTING.

From Lieut.-Col. E. Boddam, on Special Duty, Mysore Commission, to the Officiating Secretary to the Chief Commissioner of Mysore, No. 2, dated the 12th April 1871.

I HAVE the honour to offer a few suggestions to district officers about fuel forest planting, being of opinion that some system should be adopted to insure success.

However hardy the class of tree selected for a plantation, its seedlings must have a certain amount of shade and moisture. Broad-cast sowing on such poor uncultivated high ground as is likely to be allotted to fuel forests will not answer I fear. Major Beddome, Conservator of Forests in Madras, tells me it does not pay ; has only been partially successful in a few spots, which were thoroughly ploughed, not merely surface scratched as native ploughing in reality is, and the seed sown in unusually favorable seasons as regards the rain-fall.

It is therefore absolutely necessary to get this shade and moisture artificially, which may be managed in one of the several ways I now proceed to point out :—

1st. *Trenching.*—Narrow trenches should be dug, 18 inches to 2 feet deep, 6 to 8 feet apart, in which the seeds should be sown and watered by a cart going between the 2 trenches and watering both. This plan has been found successful by Major Beddome.

2nd. Trenching without watering by cart, the trenches being deeper and broader, the seed sown and in addition between the trenches a row of the large scarlet castor oil of Bourbon* (4 feet apart) to grow up and form a shade to the seedlings and help to keep up moisture by their leaf drip. This castor oil has enormous leaves, a very large spike of fruit which will partly repay expenses, grows very rapidly, and lasts about 18 months. It loses its leaves in the 2nd hot season, and should then be eradicated. It has not yet had a trial in this respect.

3rd. Major Beddome tells me that the small green chilly is very useful for shade, particularly for sandalwood seedlings, 2 or 3 seeds sown round the young sandalwood soon afford it an excellent shade, and it lasts as long as it is required.

4th. *Nurseries for Seedlings*—Hundreds of little beds for seeds of the various fuel trees, in which they can be raised and planted out into pits early in the following monsoon, the pits being prepared beforehand. This is a very successful but expensive plan.

5th. Bamboos used as pots having a very large hole at the bottom, plugged up with moss† or grass. These pots to receive the seedlings when 3 inches high with a little earth round them, after this the bamboos to be kept in shade and watered till the plants are fairly established, when they may be shifted to their places in the plantation by the whole contents of the bamboo and moss being bodily pushed out at the top, so planted without injury to, or exposure of, the seedlings' roots. The transplanting may be done at any time but the hot season. This is an excellent plan and saves many casualties. The bamboo pots should cost about 2 pie each and last several times.

6th. Seeds of trees sown in very small baskets, 2 or 3 seeds in each ; these baskets are put bodily into the pit when the seedlings are ready and the basket-work cut eventually, the strongest seedling is let to grow and the others removed.

7th. Plants lifted from the nursery-bed, a ball of wet earth pinched around them and moss wrapped round the ball, they are then kept in shade till re-established and ready to plant out into pits.

8th. Another excellent plan would be to plant in the soft alluvial soil of receding tank seeds of the babul, which likes a rich mud and would thrive in such a position.

Each of these processes will involve some outlay which the Government must be prepared to meet, but the expenditure will not be a loss as would inevitably result from attempts made to grow plantations by merely scratching up the surface of the soil and letting the seeds take their chance or neglecting to water them.

Lastly, the plantations must be fully protected from the ravages of village goats and cattle by aloe or *euphorbia* fences ; and where the grass periodically burns in the dry season, the neighbouring grass should be fire-traced under supervision.

In open sandy situations *casuarina* planting is very successful ; in others *cassia florida, acacia speciosa,* and *amara* and *neem* ; in black soil or rich clay, the babul.

* I can furnish a large quantity of this Bourbon castor oil seed, having cultivated it extensively.

† Moss should be collected in the hilly forests and sent to districts for this purpose.

AUSTRALIAN TIMBER.

(To the Editor of the "South of India Observer.")

SIR,—When I was at Melbourne last year, I requested Dr. F. Mueller, F. R. S., Director of the State Garden of that city, to give me some information with reference to the value of Australian timber; he has most obligingly forwarded the accompanying memorandum, shewing the value and uses of the most important Australian trees, and has also sent me the Report on the Victorian Exhibition of 1861, and two pamphlets on Australian vegetation, which I forward for your perusal, as I think the publication of the memorandum and extracts from the reports may be of interest to many of your readers, so little being generally known about Australian timber. Very few people, I imagine, are aware of the valuable tree we have in the *Acacia melanoxylon*, or blackwood, so common all over Ootacamund, more generally known as the *Acacia robusta*. You will observe that Dr. Mueller describes it as one of the most useful timbers in Australia. Could not you obtain and publish a list of the trees indigenous to Australia, now growing on these hills, so that all the useful and ornamental kinds we have not might be obtained? The *Acacias* and *Eucalypti* we have appear to me to flourish better here than those of the same age I saw in Australia, but whether they will equal the marvellous giants of Victoria, time alone will shew. Here is what Dr. Mueller says of the latter in his pamphlet on Australian vegetation:—

"The marvellous height of some of the Australian, and especially Victorian trees, has become the subject of closer investigation, since of late, particularly through the miners' tracks, easier access has been afforded to the back gullies of our mountain system. Some ascending *data*, supported by *actual* measurements, are now on record. The highest tree previously known was a *Karri Eucalyptus (Eucalyptus Colossea)* measured by Mr. Pemberton Walcott, in one of the delightful glens of the Warren River of Western Australia, where it rises to approximately 400 feet high. Into the hollow trunk of this Karri three riders, with an additional packhorse, could enter and turn in it without dismounting. On the desire of the writer of these pages, Mr. D. Boyle measured a fallen tree of *Eucalyptus Amygdalina*, in the deep recesses of Dandenong and obtained for it the length of 420 feet, with proportions of width, indicated in a design of a monumental structure placed in the Exhibition! while Mr. G. Klein took the measurement of a *Eucalyptus* on the Black Spur, ten miles distant from Healesville, 480 feet high! Mr. E. B. Heyne obtained at Dandenong as measurements of height of a tree of *Eucalyptus Amygdalina*—length of stem from the base to the first branch 295 feet; diameter of the stem at the first branch, 4 feet; length of stem from first branch to where its top portion was broken off, 70 feet; diameter of the stem where broken off, 3 feet; total length of stem up to place of fracture, 365 feet; girth of stem three feet from the surface, 41 feet. A still thicker tree measured three feet from the base, 53 feet in circumference. Mr. George W. Robinson ascertained in the backranges of Berwick the circumference of a tree of *Eucalyptus Amygdalina*, to be 81 feet at a distance of four feet from the ground, and supposes this Eucalypt, towards the sources of the Yarra and Latrobe rivers, to attain a height of half a thousand feet. The same gentleman found *Fagus Cunninhami* to gain a height of 200 feet and a circumference of 23 feet."

It is not at all likely that in these isolated inquiries chance has led to the really highest trees, which the most secluded and the least accessible spots may still conceal. It seems, however, almost beyond dispute that the trees of Australia rival in length, though evidently not in thickness, even the renowned forest giants of California *Sequoia Wellingtonia*, the highest of which, as far as the writer is aware, rise in their favorite haunts at the Sierra Nevada to about 450 feet. Still one of the mammoth-trees measured, it is said, at an estimated height of 300 feet, 18 feet in diameter! Thus to Victorian trees for elevation the palm must apparently be conceded. A standard of comparison we possess in the spire of the Munster of Strasburg, the highest of any cathedral of the globe, which sends its lofty pinnacle to the height of 466 feet, or in the pyramid of Cheops, 480 feet high, which, if raised in our ranges, would be over-shadowed probably by Eucalyptus trees."

I was much struck with the beauty of some of the gum trees in the mountain ranges near Adelaide, South Australia, fine handsomely stemmed trees with thick graceful foliage and branches descending nearly to the ground. I was told they were the red gum. I may mention that these trees had plenty of room for their branches to spread, which is rarely the case here. I could obtain the seeds of this handsome gum or any other tree from Adelaide if required; but if we want to have ornamental timber, we must allow ample space for the trees to throw out their lateral branches.—Yours faithfully,

DOUGLAS HAMILTON, Colonel.

P.S.—I am glad to hear from Mr. Jamieson that some of the indigenous flower seeds I brought over are already germinating in the gardens. A moiety was sent to the Government Gardens at Bangalore, so that should any fail here they may succeed there, and *vice versa*.

3 J

JARRAH OR WEST AUSTRALIAN MAHOGANY,—*Eucalyptus Marginata.*

This tree, which covers an extensive area of ironstone ridges of Western Australia, furnishes a timber that for particular purposes has perhaps no rival anywhere. It is preferred to all other kinds for railway sleepers, for which purpose large quantities are annually shipped to India, for jetties, piles, bridges, and ship-building. It successfully resists all attacks of sea-worms and white-ants, and vessels built of this wood have in consequence done away with all copper plating. It is very durable, works well, and makes a fine finish; it is of a close grain and of a slightly oily nature, and considered here by ship-builders superior to either oak, teak, or indeed any other wood.

KAURI PINE.—*Dammara Australis.*

A splendid light straight-grained timber, from New Zealand, and very extensively used here for furniture, boat-building, casks, and very much esteemed for decks of ships, where it is said it will last as long as two decks made of common imported pine; also for railway break blocks and for carriage work of every description. It is also well adapted for lower masts of ships and for all similar work. It is more durable than almost any other pine.

HUON PINE.—*Dacrydium Franklini.*

A Tasmanian timber of excellent quality, much employed by cabinet-makers for light furniture, as well as by turners (the close and curly grained), while the straight-grained is employed by boat-builders, and for this purpose very highly esteemed; but its price prevents it from being used in such quantities as could be desired. The best timber comes from the Huon river, although that from Macquarie Harbour is the richest in color. The tree grows solely in Tasmania, and there only in the cool, deep, and springy forest ravines.

HONEYSUCKLE.—*Banksia Australis.*

This tree furnishes a wood of a very soft and spongy nature, and is therefore not fit for cabinet or turner's work in general, but is used for inlaying and small fancy turning, also to a larger extent for last making.

IRON BARK.—*Eucalyptus Sideroxylon.*

A valuable timber, possessing great strength and hardness and much prized for its durability by carpenters, ship-builders, &c. It somewhat resembles red gum, but it is more difficult to get large trunks of it sound in the heart. It is largely employed by waggon-builders for wheels, poles, &c., by ship-builders for top-sides, tree-nails, the rudder (stock), belaying pins and other purposes. It is also used by turners for rough work. This is considered the strongest wood in the colony. It is much recommended for railway sleepers, and is extensively used in underground mining work.

MOUNTAIN ASH.—*Eucalyptus Amygdalina.*

This tree, which grows in abundance in the mountainous regions of the colony, attains a colossal size, and furnishes a very good timber for general building purposes. It is a similar wood to blue gum, and stands next to it in quality; but the expense of carriage to Melbourne from the ranges prevents as yet its being used so extensively as it otherwise would be. It is employed for the keels and planking of ships, for cottage building, also in great quantities by splitters for palings, shingles, fence-rails, and similar purposes.

WHITE GUM.—*Eucalyptus Goniocalyx.*

This tree attains great dimensions, and furnishes a good and useful timber for builders, but is not so plentiful as many other kinds of Eucalyptus. For house-building, fence-rails, and similar purposes it is extensively employed in those forest districts in which it is abundant, and has proved itself a valuable timber.

STRINGY BARK.—*Eucalyptus Obliqua.*

This tree grows in great abundance on most of the barren mountains of Victoria, and attains in favorable localities gigantic dimensions. The timber is very extensively used by builders and others, like blue gum and mountain ash, but is far inferior in lasting quality. It is the cheapest wood near Melbourne, and is largely employed for rough wooden structures, for fence-rails, shingles, &c. It splits with remarkable ease.

BLUE GUM.—*Eucalyptus Globulus.*

This is a first class wood, used for a great many different purposes. The tree is of extremely rapid growth, and attains a great size; ship-builders get keels of this timber up to 120 feet long, besides this they use it extensively for planking and many other parts of the ship, and it is considered to be generally superior to American rock elm. A test of strength has been made between blue gum, and English oak and Indian teak; the blue gum carried 14 lbs. weight more than oak, and 17 lbs. 4 oz. more than teak, upon the square inch. There is a rather peculiar method in use for seasoning the timber for naval purposes; after it is cut, place it upon a muddy beach, half way between high and low watermarks, for six months or

longer; this takes all the natural sap out of it, causes it to become very hard, and prevents it from shrinking afterwards. Blue gum, besides for ship-building, is very extensively used by carpenters for all kinds of out-door work, also for fancy-rails, railway sleepers, for shafts and spokes of drays, and a variety of similar purposes.

BLACKWOOD.—*Acacia Melanorylon.*

This wood, if properly seasoned, furnishes a splendid material to cabinet-makers for all kinds of household furniture; it is also extensively used by turners in the manufacture of billiard tables and for all similar purposes. It takes a very fine polish and is considered equal to the best walnut. The fine-grained wood is cut into veneers. It is also employed by coopers, carriage-builders, boat-builders, and many other trades, and is one of the most useful timbers of Australia, and the best for bending. Lightwood is only another term for blackwood.

VICTORIAN BOXWOOD.—*Eucalyptus.*

A splendid timber, very hard and strong, suitable for railway sleepers, fence posts, for naves of cart wheels; it is much esteemed by ship-builders, and used for almost any purpose about a ship, either above or below water, but principally for the following: main stem, stern post, inner post, deadwood or heelknees, floor timbers, futtocks, transomes, knighthead, hawsepieces, cant timbers, stern timbers, quarter timbers, fashion timbers, breasthooks, riders, bowrails, &c. This wood works well after it is steamed in a kiln; it has a close curly grain and does not shrink or split. For railway sleepers boxwood will last about 10 years.

RED GUM.—*Eucalyptus Rostrata.*

A very useful timber for all kinds of work where strength and durability are required. It is our best (Victorian) wood for fence posts and railway sleepers, for which purpose it will last at least a dozen years, and if well selected, much longer, also for piles in bridge-building, for felloes of strong drays, &c. It is also much used by ship-builders for main stem, stern post, inner post, deadwood, floor timbers, futtocks, transomes, knighthead, hawsepieces, cant timbers, stern timbers, quarter timbers, fashion timber, bottom planks, breasthooks, and riders, windlass, bowrails, &c. This timber should be steamed before it is worked for planking. It can be got of great size. It is not generally suitable for turners or cabinet-makers, as it will not retain its shape when worked; moreover it is too heavy and too hard to work. Next to the jarrah or mahogany from Western Australia, red gum resists the attacks of sea worms best of any known timber.

MYALL.—*Acacia Homalophylla.*

A very hard, dark-brown wood of a fine scent, and principally used for making pipes, but also employed by turners generally for small objects. The wood cannot be got of large size, and its use is therefore somewhat limited.

RED CEDAR.—*Cedrela Australis.*

This is a magnificent tree growing in abundance in the wet deep forest valleys of the littoral parts of New South Wales and Queensland, and furnishes perhaps the most valuable of all Australian timbers for all kinds of cabinet-makers' and joiners' work. It is used for almost any kind of household furniture, for doors, window frames, counters, &c., as well as for boat-building, being especially well adapted for racing-boats on account of its lightness. It is also cut into veneers, and takes a good bright polish. The greatest portion used here comes from Richmond river, where immense logs of it can be got. Cedar is also used for musical instruments, and for this purpose much esteemed.

ON THE EXTENSION OF FRUIT-BEARING TREES AMONGST THE RURAL POPULATION.

AT the last meeting of the Agri-Horticultural Society of India, the following extracts of letters from the Officiating Inspector General of Forests were recorded:—

"The extension of fruit-bearing trees amongst the people is one deserving the special attention of your Society, and you would render the whole country the greatest service, by pressing on the official community of all classes, European as well as Native, the advantages that must arise to the great mass of the population from increasing the capabilities of the country in this respect. It is a fact that so large is the consumption of wood, when that is still used for fuel, that in the districts of Meerut, Muzuffernugger, and Saharanpore, the fine old mangoe trees that form in groves (topes) the sole ornament of those parts, are being cut down by greedy zemindars, who thus sacrifice the past of half a century's growth, and the future of hundreds of maunds of fruit, for the immediate realization of a little ready money.

"In Oudh, and in some parts of the North-Western Provinces, the land revenue, it is believed, is partially remitted on lands covered with groves. In the Central Provinces large sums are annually spent in planting trees, but hitherto, except in some cases, the operations have not been very successful, as the climate militates very much against the establishment of trees without they are constantly watered, and this is a most expensive operation. In Berar, revenue is remitted on land covered with plantations, but as under the ryotwaree system of land revenue the trees after 20 years become, by the terms of the settlement, the property of the holder of the land, there seems no legal power of preventing their being cut down.

"The evil resulting from the destruction of trees has been and is constantly pointed out by the civil officers to the zemindars, and there can be no doubt that a district officer, who really choses to do so, may do much to prevent their wanton and unnecessary destruction, and a circular embodying the views of the Council will be submitted by this department to Government for sanction.

"It may be stated, however, for the information of the Council, that in the Punjab, which is the most denuded of trees of any of the provinces of Upper India, Government is now spending nearly a lakh of rupees annually by direct agency on plantations.

"In the North-Western Provinces also, a special officer has been appointed for the propagation of fruit trees at Raneephett for distribution over the country."

Official Gazette.

CALCUTTA, 15TH JUNE, 1871.

EXPERIMENTAL FARM, MADRAS.

REPORT FOR THE YEAR ENDING 31ST MARCH, 1870.

The Season, &c.

A RAIN gauge was set up at the farm in October last. The following are the registrations since the 1st November :—

Rain-fall.	*Inches.*	*Inches.*
November	8·35	
December	5·24	
1870.		
January	4·50	
February	1·25	
March	None.	
		19·34

The Government Astronomer has kindly furnished me with the following registrations, made at the Madras Observatory, during the previous months of the year :—

April	0·12	
May	None.	
June	1·94	
July	5·19	
August	4 40	
September	4·57	
October	3·45	
		19 67
Total..		39·01

It was so excessively dry during the months of April, May, and June, that very little field work could be done, and the sheep stock suffered greatly from the extreme heat. On sixteen days in the latter month, the maximum thermometer recorded above 100 degrees, and the thermometer exposed in the sun frequently registered 140 degrees.

The showers which fell during July and August enabled us to commence field work again; and we took advantage of the opportunity to plough and clean the land intended to be cropped during the cold season. September and October were very favorable months for preparing the land for sowing, and no weather could be more suitable for the young seeds than that experienced in November, rain falling on twenty days during the month. In the next month rain fell only on nine days; and in January only on three days. About the middle of this month, a severe storm of rain and wind broke over the district, and did a considerable amount of damage to maize, cholum, and other tall-growing crops; the rain, however, was beneficial to the pastures. Rain fell only on one day in February, and there was no rain in March. The amount of rain that fell during the monsoon was considerably below the usual quantity, and very little water was stored for irrigation. The weather experienced was, however, very favourable for growing crops; the falls of rain were so regular and gentle.

Buildings.

The farm bungalow was completed in December last, and is now occupied by the Superintendent. A granary is being erected at the home-stead; it is a two-storied building and consists of three rooms. The upper-room is 63 feet long and 20 feet wide; it is lofty and well ventilated, and is intended to

be used as a store for seeds. The two rooms on the ground floor are 35 feet and 26 feet in length, and each 20 feet broad. One of the lower rooms, it is proposed, will be used as a store for cattle food. In the other room seeds will be cleaned, weighed, and packed for dispatch. Having now ample room for storing cattle-food and seeds, we can purchase whenever favorable opportunities present themselves. The market is supplied very irregularly with these commodities; at times famine prices are asked, while on other occasions they can be purchased on very reasonable terms. With such a market, plenty of granary room is absolutely necessary.

Two large cattle-sheds, and one sheep-shed have been erected. These sheds are chiefly composed of farm materials. The roofs consist of grass and palmirah leaves, and they are supported on brick and chunam pillars. One of the cattle-sheds contain fourteen loose-boxes, and the other ten; each loose-box is 9 feet long and 9 feet wide, and is intended for one bullock; each box is railed off from the adjoining ones, and the ground is sunk about 2 feet below the surrounding ground. The sheep-shed is divided into 8 pens; each pen is 15 feet long and 7 feet wide, and will contain eight or ten fattening sheep. Sundry repairs have been made, and the condition of the buildings kept up.

Permanent Improvements.

We have resumed possession of nearly fifty acres of land which was in the hands of tenants. The land is in plots in different parts of the farm, and was the cause of a considerable amount of trespass over the cultivated land. The farm now consists of about 125 acres within a ring fence, and as there are no tenancies within its limits, there is no longer an excuse for trespass. Nearly the whole of this 50 acres was covered with wild guava jungle, with a number of very poor mangoe trees, scattered here and there. Nearly the whole of the land consists of very inferior soil; the small portions that had originally been of a better quality, have become so exhausted by constant cropping without manure, that there is now little perceptible difference in any part of it. Seven hundred rupees has already been realized for jungle clearings off this land, and this sum, judiciously expended, will go a long way towards restoring the fertility of the better portions, and bringing the whole into the same condition as the other part of the farm.

Five hundred and forty-three yards of road have been abolished, thus adding 5,430 square yards to the cultivated area of the farm and reducing the costs of keeping up fences and roads.

Drains have been cut over different parts of the farm to carry off surplus water during the rains. Several new banks have been constructed for distributing irrigation water more directly and expeditiously over the farm. A large amount of labour has been expended in levelling fields and stubbing up tree stumps and brushwood.

Manures.

A large quantity of acquatic weeds have been collected off the river Adyar. I have found these weeds particularly valuable, not so much for their manurial value, as for the property they possess of starting fermentation amongst material which it would otherwise be very difficult to decompose. Not only by their own decomposition do they yield moisture, but in virtue of their hygroscopic qualities they attract a good deal of moisture. In this dry climate it is a difficult matter to decompose mangoe leaves and cumboo or cholum stalks.

In digging a drain we came upon a seam of rich alluvial deposit; it is about three feet thick and is situated about two feet from the surface of the ground, and can be raised at about one anna a load. We have already used with great advantage a considerable quantity of similar soil, obtained from tanks and the river bed, as a base for our composite manure.

With this soil we mix burnt earth obtained at an old brick-yard on the farm, mangoe leaves, old-yard manure, the acquatic weeds already referred to, bazaar refuse, &c., jungle plants, such as the mudder plants, the wild indigo, and Croton oil plants, and pour the blood and slaughter house refuse through the whole. The amount of fermentation is regulated according to the period when the manure is required. If it is for immediate use, the heap is thrown up lightly, and fermentation takes place rapidly. If it is for use at some distant date, then we cause the carts to pass over the heap and consolidate it as much as possible. We also regulate the fermentation according to the nature of the soil to be manured. Thus if the land is very light and sandy, we have the manure thoroughly decomposed before applying it; if, on the other hand, the land is stiff and adhesive—qualities a very small area of our land possesses, —then we apply the manure in a half fermented state.

We have given up the cart-sand to a tenant; though a fair supply of manure was obtained from it at certain seasons, still it scarcely paid for attendance, besides the manure was very inferior; it chiefly consisted of sweepings, and contained a considerable quantity of weed seeds.

A large amount of first-rate manure was made on the farm by the fattening stock. The greater portion was made in the loose boxes, where it was uninjured either by the sun or the rains. I have not yet had an opportunity in this country of making a careful experiment, to determine the relative value of a manure as usually made, and as made in loose-boxes. I am however, perfectly satisfied that the manure is very much superior to any manure I have yet seen in this country, and that loose-box feeding, which has done so much for the agriculture of England, can do much for the agriculture of India.

Though we cannot hope, in the present day, to see box-feeding adopted in this country for the same object as in Europe, still there can be no reason why working and young cattle should not be kept in loose boxes at night. If we are to grow cotton, maize, &c, we mus have manure, and there is no better or more economical way of making it than under the loose-box system. On sanitary grounds alone the system is worth general adoption. At first sight it may appear objectionable to keep the animals for three or four months in the boxes, without removing the manure; however, I have become acquainted with no bad results that arise from the practice; indeed, on the contrary, though we have fed a considerable number of cattle since we commenced the system, none of the animals have had a single day's illness, and in several instances, the manure was not removed for upwards of three months, while it had accumulated to nearly two feet in depth. Of course the excrements are not allowed to collect on the surface; the usual plan is for the cattle feeder to enter the boxes three or four times a day, and with a fork throw up the bedding. No smell whatever is perceptible, and there is nothing that the most fastidious person could object to; indeed, in this respect it is much cleaner than the usual system, which allows the solid and liquid excrements to lay and decompose upon the surface of the ground. In the loose-box system the products of decomposition are absorbed by the litter, and the straw, in virtue of its capillary action, takes up the liquid matter.

Fences and Trees.

A considerable quantity of corkapilly seed was sown, for filling blanks in the hedges and completing the fences at the sides of the roads. We have found this a valuable shrub for forming hedges; it has formidable spines, and bears trimming and cutting like the English Hawthorn. Unfortunately its green leaves are so very attractive to goats and sheep that it is difficult to rear where they have access to it. If it was not for this nuisance, the sides of our highways and roads might be as pleasing as in England.

Under the shade of trees, and on very sandy soil, I have experienced great difficulty in rearing this shrub. On sandy soil during the hot season, it loses its leaves and looks bare and unattractive; while on clay soils, it is green during the whole of the year. I sowed some seed in nursery beds and transplanted the plants into the hedge-rows, but the result was not so satisfactory as when the seed was sown at once in the hedge-row. The plants should be frequently cut over, or the hedge will grow to a considerable height, and will be so open near the ground as to be useless. The seed can be purchased or collected, in an ordinary season, at about 2 annas a measure. A number of young mangoe trees of a valuable sort have been planted in vacancies in the hedge-rows on the sides of roads, and a number of bamboos, raised from seed, have been planted along the banks of the river.

Cattle.

Bulls	3
Heifer	1
Working bullocks	18
Feeding cattle	15
	37

The bulls are regularly worked; they are tractable, and are very useful for carting. The working cattle have all been trained for field work, such as ploughing, cultivating, drilling, hoeing, &c.; their work has been unusually heavy during the past year. Excepting on Sundays and on two or three holidays, they had not a single idle day during the whole year. Their daily working hours are from 6 A. M. to 10 A. M. and from 1 P. M. to 6 P. M. In England and on the Continent, where draught cattle are employed, teams of two or even four pairs of oxen are often yoked to implements; we here think one pair sufficient to draw, and in these countries the "alternate" or "half-day system" of working oxen is frequently adopted, while the animals generally have a mouth or two at grass during the summer. However, our working cattle have enjoyed very good health, though the heavy work has told rather severely on some of them. Their usual food, during the year, consisted of chaffed cholum straw, crushed gram, oil cake, and tour.

The following was the usual daily allowance per pair:—

	lbs.
Chaffed cholum straw, about	100
Gram	4
Ground-nut cake	4
Tour	4

The cost was about 7¼ annas; when maize could be obtained, half the quantity of gram only was given, and the same quantity of maize added.

Several experiments were made during the past year in cattle feeding

In the beginning of February 1869, six bullocks, aged from four to six years, were purchased for Rs. 90; their average live weight was 435 pound per head. They were put up to feed on the 26th of February. Four of these animals were killed before the 18th of June; one was killed on the 7th of May, another on the 21st of May, another 14th of June, and another on the 18th June. The cost incurred for feeding and attending these animals was 61-5-11, or per month Rs. 4-12-6 per head. The food was charged at the following rates:—

	lbs.	
Cake..	60	per Rupee.
Maize	42	do.
Tour..	120	do.
Bran..	48	do.
Cholum fodder	375	do.
Paddy straw	112	do.

These prices include cost of preparing the food, chaffing the straw, crushing the cake, &c. "In cost of attendance" one man at 5 Rs. a month is charged for attendance on fifteen cattle, and ten per cent per annum is charged on capital expended in building the loose-boxes. The total expenditure on these four bullocks, including the original cost of the animals, was Rs. 121-5-11. The beef sold for Rs. 196-12-2, and the manure, valued at one-fifth the cost of cake and corn consumed by the animal, made the total receipts Rs. 210-0-10, leaving a clear profit of Rs. 20-0-8 per head. One of the remaining animals was sold alive, and left a profit of Rs. 8-6-1, and the other was fed for ten months for Christmas beef, and though it realized nearly Rs. 20 more than any other animal of the lot, it only left a profit of Rs. 2-10-3; the beef was of first-rate quality; however, it was evident the animal was kept too long. Indeed, the results of our experiments go to prove that if the animals are in fair condition, when purchased, four or five months feeding is sufficient to fatten them, and that the profit diminishes as this time is exceeded. Full details of this experiment appears in the appendix attached to this report. Several other cattle-feeding experiments were made; but owing to the "cattle-weighing machine" getting out of order, we were unable to ascertain the live weights of the animals; the financial results were, however, of such a very satisfactory character, that fattening cattle will in future become a part of the regular practice of the farm

A number of experiments were made to determine the feeding values of the different fodders grown on the farm. Amongst others the following:—

Four bullocks, aged from four to five years, were put into the loose-boxes in the beginning of February last. They all received the same amount of cake and corn, and each animal had as much of the fodder as it could consume; they were weighed at the end of every ten days with the following results:—

	Bullocks fed on grass.	Bullocks fed on cholum fodder.	Bullocks fed on guinea grass.	Bullocks fed on gram fodder.
1st Weighing	384	343	287	360
2nd do.	400	340	304	375
3rd do.	415	335	310	375
4th do.	423	359	c 315	388
5th do.	431	367	329	396
6th do.	430	383	331	403

Much to my surprise the guinea-grass produced the largest results, thus the animal consuming this fodder yielded an increase of 15·33 pounds for each one hundred pound of its live weight. The results from the other three fodders were very similar; thus for each one hundred pound of the animals' live weight, grass gave an increase of 11·97 pounds; cholum fodder, 11·66 pounds; and gram fodder, 11·94 pounds. I believe the results obtained from the guinea grass, is larger than will be obtained under ordinary circumstances. In repeating the experiments on other animals, in no single instance has guinea-grass given such returns. These results will be better appreciated when considered along with the cost of producing these fodders; thus, on this farm, the cost of producing one ton of each of the fodder is:—

Grass	Rupees 10
Gram fodder	,, 3
Cholum fodder	,, 2½
Guinea-grass	,, 7

or their relative cost will stand thus:—grass 100, guinea-grass 70, gram fodder 30, and cholum fodder 20·50.

Sheep.

Rams	18
Ewes	74
Wethers	56
Gimmers	50
Lambs	53
	251

A considerable reduction has been made in the sheep stock; nearly all the sheep of the Nellore breed have been sold; it was found that this breed of sheep did not thrive so well on artificial keep as the Patna and Mysore varieties. During the dry parching weather experienced in April, May, and June last, a considerable number of Nellore sheep died, and the whole of them were much out of condition, while the Patna and Mysore, the Patna more particularly, though grazed with the Nellore's, and fed on the same food, suffered very little, and were always in fair condition. A few Mysore sheep died, but very few in proportion to the number of Nellore's. Of all the breeds we have Nellore, Patna, Mysore, and Coimbatore, the Patna is undoubtedly the best. It comes earlier to maturity, feeds more rapidly, and gives a greater percentage of mutton.

Lambing commenced shortly after the rains, and at a time when there was an abundance of grass. However the results were not as satisfactory as I could wish; certainly our lambs are larger, and better able to stand the effects of the approaching hot season than those we had at this season last year, still more lambs died before reaching a month old than died last lambing season. I attribute this to the effects of the milk, from the ewes having consumed a large quantity of hastily-grown immature grass. I have known in England similar results arise from putting ewes too soon upon irrigated pasture. The consumption of this immature grass produces certain chemical changes in the milk, which renders it indigestible, and injurious to young lambs; also, the cold nights and heavy dews might have something to do with the deaths. I would rather have to encounter the hot weather than these difficulties again. In future I shall arrange for the lambing season to commence about the beginning or middle of January, instead at the beginning of December, and will endeavour to have a few acres of gram for the ewes and lambs during the months of April and May, as my experiments have proved that gram can be grown as late as the latter month.

There is no reason, on these sandy soils, why a succession of crops should not be grown for consumption on the land by sheep. True we have in this country such heavy rains and dews, that during certain months of the year this practice would cause great loss amongst the stock; still during six months of the year this system could be adopted with profit if the necessary crops can be provided. To this matter I am now giving attention, as I feel certain that if we can provide crops for consumption on the land, by sheep, during the dry season, we will have solved one of the most difficult problems of the day—how to provide manure for dry land cultivation?

While the agriculturists of this country have so long recognized the advantage of folding sheep at night, on arable land, it is strange that the importance of providing green food for their consumption on the land has not long ere this been recognized. There is nothing in the practice that is prejudicial to caste or noxious to their feelings.

The grazing ground on this farm is of the most wretched description; during six months of the year it scarcely contains a blade of grass, while during the remainder of the year it produces nothing but weeds and bad grasses. The ill effect of this grazing was very forcibly demonstrated last year. The flock, during 3 or 4 months was divided—one half was sent every day to Guindy Park to graze, and the other half was grazed on the waste land belonging to the farm; at night all the sheep were brought into the fold on the farm and similarly fed. Amongst the Guindy lot we had a few slight cases of diarrhœa, but did not lose more than two or three sheep during the whole period. The case was very different amongst the sheep grazed on the farm waste land; we often had in a morning as many as fifteen or twenty cases of severe dysentery; though medicine was administered and the sick animals carefully nursed, a considerable number succumbed to its effects. In the first stages of the disease, we found the following mixture produce good effect:—

Catechu powder	4 Drachms.
Powdered Chalk	1 Ounce.
Ginger powdered.....	2 Drachms.
Opium powdered.....	½ Drachm.

mixed together in half a pint of cold water. A teaspoonful of the solution was administered night and morning. When given in the first stage of the attack a couple of doses generally effected a cure; but after the first stage had passed, no treatment that we adopted was successful. We certainly succeeded in stopping the wasting discharge, but the animal only lingered a little longer in misery.

There are some very good ewes and rams in the flock; we have weeded out a good many inferior sheep during the past year, still there are many more to remove. I believe we can do much more permanent good by "selection" than by introducing new breeds into the country. When a breed is elevated by "selection," there are no constitutional disarrangements by climatical changes; the food of the district meets the wants of the animal. Serious mistakes have at times been made in attempting to introduce into districts, where the agriculture is of the simplest and rudest description, animals which are

only fitted for the best farmed districts. What at home would be thought of the person who advocated stocking the Cheviot Hills with south downs, or the Southerlandshire mountains with short horns; and yet suggestions equally ridiculous are constantly being made in this country. Let us first make the best use of the breed we have and then talk about the introduction of improved breeds. Until agricultural practice is improved it is useless to introduce improved breeds of stock.

Two of the best young rams of the season 1868 were presented to two large land owners for use in their respective districts,—one to H. H. the Rajah of Venkatagherry, and the other to His Excellency the Maharajah of Poodoocottah.

A number of sheep were fattened; they were chiefly old ewes, and animals weeded out of the flock. The financial results were much the same as those recorded in last year's report. Gram fodder was largely used in feeding. The following experiment was made to determine the value of this fodder, in comparison with grass and cholum fodder. Three lots, each lot containing the same number of sheep, were put up to feed, and weighed at the end of every ten days. Each lot received the same quantity of corn and cake and as much of the green food as the animal could consume :—

	Weight of animal fed on grass.	Weight of animal fed on cholum fodder.	Weight of animal fed on gram fodder.
	Pounds.	Pounds.	Pounds.
1st Weighing	230	199	200
2nd do.	232	203	201
3rd do.	238	210	196
4th do.	240	217	207
5th do.	242	226	224
6th do.	249	230	229

Thus the animals fed on grass only gave an increase of 8·26 lbs. per each 100 lbs. of their live weight at the commencement of the experiment, whilst those fed on gram fodder gave 14·5 lbs. and those on cholum fodder 15·58 lbs. The grass was only the inferior stuff usually cut for horses. I intend to repeat the experiment with fresh hariyali grass grown under irrigation.

Pigs.

Boars	3
Sows	9
Sucking Pigs . . .	24
	36

A large number of young pigs have been sold; the majority of them were sold for slaughter. A couple of good boars were selected from one of the best litters; they have thriven well and promise to make useful animals. I propose to improve this part of our live stock by the same means suggested for the improvement of the sheep stock, viz., by "selection." We will sell to the butcher all the animals which do not possess certain attributes, and only rear those which seem best suited for our purpose. Our pigs continue unusually healthy; we have had no sickness whatever amongst them.

(To be continued).

MODEL FARMS.

(To the Editor of the "Indian Daily News.")

SIR,—In one of your editorials of the 10th, and another of a previous date, you oppose the introduction of model farms, and would substitute education as a means to improve the agriculture of the country. I must here remark that you will be disappointed if education alone is introduced. Model farming has the same obstacles that education will meet with. Superstition is not the only obstacle to improvements in agriculture. The obstacles are so great that the cultivator could not improve even if he tried. It is not want of intelligence that keeps the cultivator in his present state. It is the bad land tenure, and the insecurity which is a barrier to improvement. Our cultivators are much more intelligent and better up to their work than you seem to be aware of. If they do not manure their land, they will give you a very good reason, viz., that they are too poor and their tenure too insecure, which were caused by the power the Government conferred on the zemindars, and which I see you would have in a kind of way re-established by advocating the appointment of zemindars as a kind of magistracy. This I consider the meaning of one of your editorials.

The cultivator knows the value of manure, of irrigation, &c., &c; and if you ask him why he does not sink wells, he will give you a very good reason, viz., that his rents would be raised and he would be ruined. With regard to the introduction of a variety of crops, there is no cultivator in the world more ready to grow new crops than our cultivators, if you can prove to him that they will pay, and that a permanent market is available. And I consider model farms to be of great assistance to agricultural industry; but all efforts made to improve our agriculture will be of no use unless long leases are granted and compensation is secured for permanent substantial improvements. The action at present taken by the cultivator is guided by wisdom. When he is permitted to improve and enjoy the fruits of his labour, he will act with equal wisdom, and it would not be wise for him to run in opposition to laws that carry with them their own Nemesis.

You seem to attach too much value to education, unaided by sound and just laws. What kind of education would you give the cultivators? Teach them to read and write, and learn more superstition in pagan or godless schools, from which true morality will be excluded. If you expect this kind of education will drive superstition from the land you are very much mistaken. There is a very large number of natives now in India who have a far better education than the cultivator can easily secure, and they are more superstitious than the cultivators.

If the agriculture of the country is to be improved, the land tenure, &c. must be improved, after which both education and model farming will be of great assistance. Hoping you will excuse the liberty I take in writing on a subject which I consider of great importance, I remain, yours, &c.,

X.

Purneah, 10th April 1871.

BOTANICAL GARDENS AT SAHARUNPORE.

THE *Pioneer* thinks that as the late change of superintendents has brought the Saharunpore Botanical Gardens under public attention, the following notice of Dr. Jamieson's last report may be of interest We should here express our regret that a copy was not forwarded to us at its first publication, as reports when seen for the first time in the "Selection from Government Records" savour too much of the antique to be quite suitable for so fast moving a chronicle as a daily newspaper. We are, however, grateful for the report even at the eleventh hour, as it is pleasant reading, and shows that the Saharunpore gardens are a success. From them there flows annually an immense stream of trees, shrubs, and flowers; every department of the State profits by its generous fertility. Public and agri-horticultural gardens received 3,500 trees and shrubs and 900 lbs. of seeds, the Military Department was supplied with 2,000 lbs. of seeds, the Civil with 224 parcels of seeds and 14,000 fruit trees and flowering shrubs. To the Forest Department several hundred lbs. of the more valuable timber seeds were distributed, while the Railway, Jail, Canal, Police, and Customs Departments all came in for their shares. Native noblemen and gentlemen, we are glad to see, purchased largely, the demand for grafted plants being especially very great. Experiments have been made with considerable success in the cultivation of cotton, Carolina paddy, cinchona, and mulberries. The latter indeed flourished luxuriantly, confirming Dr. Jamieson in his opinion that the cultivation of the silk-worm might be largely developed with advantage to the agricultural classes. In every district there are thousands of weak, old, and crippled idlers for whom such work as silk-worm rearing and silk-reeling is admirably adapted, and who would, were the cultivation developed, become a source of wealth instead of poverty to their respective communities. Rhea grass has also been grown with complete success, as also were Spanish chestnuts. This tree, first introduced into Upper India by Mr. John Strachey, fruits freely in the Dhoon and Lower Himalayas, and is destined, so Dr. Jamieson believes, to be a very valuable acquisition to the native community in years to come. Last season seeds obtained from trees raised by him in the Dhoon were selling in the bazaar at Rs. 2 a seer. Ipecacuanha and the cork tree have also been taken in hand, but the results of the experiment will belong to the reports of the next decade, for both are slow growers.

The Planters' Gazette.

CALCUTTA, 15TH JUNE, 1871.

THE ESTATES.

THE prospects of the next coffee crop in Ceylon are suddenly clouded. Up to the early days of April everything promised, says the *Observer*, a bumper crop in all directions, and much consolation was derived from these appearances in the midst of the short out-turn of the last season. But the continuance of wet weather in the latter half of April has seriously imperilled the chance of even an average return being obtained from the estates in the higher districts during the season 1871-72. The heavy and continuous rain-fall has sadly interfered with the blos-

sons, the hope of large crops must be considered as dissipated, and it will depend on the weather for the next week or two if a fair average amount of fruit makes its appearance on the trees. "Our latest report from Dickoya dated the 30th, contains news of a change of weather for the better, the rain having cleared off for a day or two. We trust it may continue dry and sunshiny that a good blossom may be secured; but meantime the recurring thunderstorms and plentiful supply of rain which have marked the past few weeks in Colombo, appear to culminate, as we write, in all the signs of the advent of the South-West Monsoon. Meantime, it is an ill wind that blows nobody good, and the present wet season gives promise of being an unusually favourable one for low districts. Indeed the occurrence of another wet blossoming time is leading not a few to think of Mr. Tytler's 'wet cycle,' and the chances of our present experiences being simultaneous with its inauguration. If so, coffee-planting in the upland districts extending between the Newera Elliya and Adam's Peak mountain ranges may be put to its severest test; but the result in view of the careful and improved cultivation of the present day can be regarded without dismay, although a succession of wet seasons would undoubtedly dull the brilliancy of the hopes now entertained by many with reference to their prospects in that quarter."

The same journal thinks there is no reason to doubt that the export for the season 1870-71 will reach 900,000 cwts., or little more than 10 per cent. short of that for 1869-70.

A correspondent of the *Ceylon Observer*, while admitting that manuring carefully and in a *thoroughly good* way will keep up old estates and make them pay moderately, protests against what he calls "the mad and wicked use made of stimulants. Most of your planting readers know well that bone-dust, superphosphate of lime, and sombreorum have been applied at less than an estimate of 10s. per acre, which means that coolies have to make at least 150 holes per man a day. Two cuts with a mamotie close to the stem of a tree is taken for a hole, and into this, on the top of the roots, is placed a strong burning manure. How a tree survives at all after such treatment is a marvel. I am glad indeed to find that the general opinion is against the wild theories so recently rife: depend upon it attempts at 'making haste to be rich' by a lavish outlay on manure, applied without due care and precaution will end wretchedly. Old age will *show* its weakness, and Mr. Harrison made a mistake when in one of his railway speeches he said that with easy transport for manures we should not hear of any more estates dying out. Estates *will* die out, and what is worse, will be forced out before their time, unless a change is made in working them. Last year's wretched crops set men thinking what will this year's do? Am I wrong in saying that the coming crop will not be *much* better than last? I trust I am wrong, or sad indeed is the prospect of embarrassed proprietors."

THE TEA GARDENS.

A CONCESSION has been made by Government to the Eastern Bengal tea-planters which is held by them to be of considerable importance. The clause of the Labour Contract, which formerly stipulated that each labourer should be allowed garden ground *immediately attached* to his hut, is now altered, so as to permit the allotment of garden ground to be "conveniently adjacent" instead of absolutely adjoining the house accommodation.

A correspondent of the *Bengal Times* (3rd May) says that "hitherto the weather in Assam has been comparatively cool, but for the last few days exceedingly warm. Rain is spoken of as greatly wanted. Some of the gardens have been troubled with 'red spider' and 'blister blight,' both of which tend to decrease the yield of leaf."

Another correspondent, writing from Assam, complains bitterly of the state of the roads in that province. The question is, "whether there is no surplus revenue from reproductive works, and if not, whether it is the duty of Government to sit supinely by without making an effort and witness the gradual lapse of a splendid province into primæval jungle." He complains of the general neglect everywhere apparent, and deplores that so valuable a country, rich in its resources and facilities for development, should be an object of no interest to Government, except so far as it can be made to yield without outlay enough revenue to satisfy the authorities.

Tea prospects in the Darjeeling district were, according to the *Darjeeling News*, never so bright. "We don't know a single old garden that is not likely to pay handsomely this season. We recommend every one in this district with a few spare rupees to buy shares; they can be had just now in Calcutta and London for about one-fifth of their true value. Hill gardens, now that the thing is understood, are yielding 4 to 5 maunds of tea per acre. This means a profit, and a very high one too. There is little doubt that in three months time a share in a tea garden in this district will only be obtainable at a very high figure, especially in the best gardens like Tukvar, Soom, Lebong, Darjeeling, Punkabaree, &c. Up to date the crop has been from twice to five times what it was at this time last season."

The estimated tea crop of the principal estates in Darjeeling for 1871, with approximate area under plant are given as follows:—

	Acres.	Mds. Tea.
Chongtong	250	480
Singtam	110	320
D. Wilson's	120	350
Himalaya	450	2,000
Tukvar	550	2,500
Darjeeling	1150	5,000
Badamtam	170	800
Bannockburn	170	500
Munchoo	300	1,000
Mineral Spring	170	600
Aloobaree	200	300
Dooteriah	550	1,400
Hopetown	400	900
Keloobaree	70	280
John Stalkartts	120	300
Nahore	175	400
Rosshope	250	750
Single	600	2,100
Kurseong	150	400
Kurbu	180	650
Mukkaybaree	400	700
Castleton	250	650
Dreary Lane	500	1,700
Selim	550	1,800
Nagree	180	300
Punkabaree	200	800
Faloddy	120	650
Adulpore	100	350
Terai Coy	200	650
Southby's	150	500
Panchai	100	350
Mahanuddy	80	300
Soom	360	850
Teendharee	100	280

"There are thirty other gardens, I hear, all young ones or very small in area, whose out-turn I have heard no one mention, so I cannot say anything about them."—*Correspondent Darjeeling News.*

TEA.

HINTS ON CACHAR.

(*To the Editor of the "Englishman."*)

SIR,—In your issue of the 17th instant, I see the very good advice given by General Bouchier to the Cachar planters. His observations about Goorkhas are perfectly correct, as I know from some years' experience as a planter in Darjeeling. They are the best men for the work, and in difficult paths I doubt there being better men to get along. Unfortunately, however, they are not generally willing to go to Cachar as coolies, as they can get work in the hills; but very likely they would be willing to go as tea-makers, chowkeedars, syces, &c. It would, I think, be well if the owners of Cachar gardens tried to obtain a few good men. Goorungs are the best for fighting; and Kumboos or Limboos, if there is any carrying of baggage or work. They are also good for fighting, but should be selected by the person who understands them.

With regard to the stockades, the advice is certainly good, but unfortunately cannot be carried out in many gardens without very great expense. Where no theelah of sufficient surface is available to construct a large stockade on, so that the coolies might find shelter, one or more small strong ones might be made, and so placed as to command the whole of the coolie lines, which might be surrounded with a wide and rather deep ditch, the earth being thrown up inside so as to form a parapet. The stockades being so placed as to flank the ditch, it would prove a very difficult matter for the raiders to force an entry, and the expense would not be very great.

Excuse this long letter.

X. Y. Z.

THE CACHAR FRONTIER.

LOOKING dispassionately at the facts brought to light by the late raids on our south-eastern frontier, we think that one point requires explanation from those entrusted with the frontier defence, be it the Bengal Government, the Commissioner of Dacca, or the Cachar and Sylhet local authorities. This is :—Who is accountable for the state in which the frontier defences existed in December 1870 ? Had the orders, unquestionably issued by the Government for the defence of the frontier, been carried out ? After the raids of 1869, when the columns sent against the Looshais had from one cause or another failed in their object, the Government determined that the frontier should be guarded by strong police posts with, we believe, communications between them. The planters assert, and the public naturally assume, that these orders have never been carried out. We gather this from a mass of correspondence before us.

There were, it is true, on the Cachar frontier strong guards of police at Moniarkhall, Nowurbund, and Jhalnachurra ; and, as we note that General Bouchier has adopted these posts as strongholds, we conclude that they are salient points of defence. There were also numbers of small guards scattered about the outlying tea gardens, courting attack by their weakness. The distances between these posts average from twenty to thirty miles ; the roads were seldom patrolled ; the bridges, certainly over the streams where most required, were, as a rule, smashed ; and between Moniarkhall and Doorbund a path existed through a deadly jungle, known only to Mr. Daly and the beasts of the forest. The stockades were as rotten as touch-wood, though intended as a refuge for the garrison on the first alarm. It was the same in Sylhet—only worse, the stockades were more rotten and the bridges more smashed than in Cachar. Roads were simply unknown, and in many cases jungle grew unmolested to the very doors of the posts. Will any one contradict our assertion that the orders of Government were not obeyed ?

Such was the state in which these districts in the hour of trouble were found by the military authorities. Worse still—from its being known that Mr. Edgar was in the Looshai country, using there his civilizing influence—the planters were lulled into a state of fatal security. The Officiating Deputy Commissioner and the District Superintendent of Police were in northern Cachar (on duty). The millennium of the south had set in, the time had arrived when it was expected that the planters and Looshais, like lambs and lions, would lie down together and Mr. Edgar was to be the little child who should lead them. This was pretty much the position when, in December last, the lions, forgetting their poetical duty, swooped down upon the lambs, carrying off their property, children, and as many skulls as they could conveniently carry. Is no one accountable for such a state of things ? Are impassable bridges, isolated outposts, and rotten stockades unavoidable accidents, things, of course, involving no disgrace to our frontier authorities ? That the military force at Cachar was too small we admit ; also that the removal of the detachment of the 44th from Sylhet was a mistake ; but it was a mistake made by the civil authorities and the Bengal Government, who believed that the police were a quite sufficient protection, until the time came when the Officiating Deputy Commissioner of Cachar was telegraphing here, there, and everywhere, that the enemy were at the door and the station denuded of troops. Then, with all despatch, marching with only food in haversacks incredible distances and without tents, the 4th and 44th nobly responded to the call of their General ; and we have the confession of the Looshais themselves that the heavy loss inflicted upon them at Moniarkhall was chiefly the work of the disparaged 4th. There fifty-seven of the raiders lost their lives while many others were wounded In fact, wherever the savages came into contact with troops, they were helplessly worsted, until they were, as we know, finally checkmated at Allynuggur by Captain Robertson.

It was indeed high time that a new *régime* should be inaugurated. Since the arrival of the Commander-in-Chief at Cachar to strengthen the hand of the general officer, the line of defence recommended has been at once commenced upon, and if the rains only hold off another fortnight, the three stockades in Cachar and two in Sylhet, each garrisoned by a company under an European officer, will be completed and connected by police guards at convenient points along the line. As long as the weather permits, these roads will be kept open, but it is not to be expected that the system can be matured at once in a manner to defy the interruptions caused in such a region by the monsoon. After the rains, lines of communication destroyed must be renewed, and every precaution taken to prevent any return of raiders into British territory.

These precautionary measures, however, are just what ought to have been taken years ago, and we cannot but ask the question again—is no one to blame ? A strong cordon was ordered to be established : it was not established or was not maintained. The flabby side of our Indian administration is that responsibility, as a rule, carries no penalty. Once in a quarter of a century an example is made, as lately in the Department of Public Works ; but, as a rule, a great official neglects his duty and a calamity occurs, Government shrugs its shoulders, hints delicately to the delinquent that perhaps his dereliction was open to censure, and sets about repairing the calamity.

We have described above the precautions which are being adopted for the moment ; but for lasting effect the surest expedient will be an expedition both of reward and punishment next November. We say "reward" because the effect of chastisement on the guilty clans will be multiplied ten-fold when contrasted with generous recompense to those chiefs and tribes who, in the face of temptations, have remained inoffensive or friendly.—*Pioneer.*

COFFEE-TEA.

A DISCUSSION has been going on lately in the home papers respecting the use of the leaves of the coffee tree as an infusion in the same manner as tea. There seems to have been an intention on the part of some one to offer a medal for the manufacture of this substitute for tea. On this point a correspondent of the *Journal of the Society of Arts* writes :—"The thing had been tried without success ; for although a good substitute for tea has frequently been prepared from coffee leaves, it has always been to the injury of the coffee crop, and of the shrubs itself ; at the same time, the tea produced has been decidedly inferior to ordinary, nay, very ordinary, tea ; and should this substitute ever be introduced, we shall require special training before we can learn to drink the infusion, for although it tastes like a good congou, its smell is so exactly like the sickly odour of senna-tea that it would require a strong mind and an indifference to a bad smell, which few possess, before its use can become general. The large seeds of the tea plant, if roasted, would make a better substitute for coffee than some of those now used, but it is better to have our tea from the *Thea bohea*, and our coffee from *Coffee Arabica*, than to try and reverse these natural sources." Colonel Haly writes on the same subject as follows :—"Coffee-tea is very commonly used by the coolies on the coffee estates in Southern India, and can be purchased at four annas per lb. in the native bazaars on the Neilgherry Hills. The beverage made from those leaves, though not so pleasant to the taste as tea, is decidedly most refreshing and invigorating, and many is the time I have felt much refreshed by a draught of it when out shooting on the Neilgherry Hills. As to its being cheaply produced for the purpose of adulteration, no harm could well accrue from this description of admixture with ordinary tea, considering that much more objectionable leaves are now supposed to be largely used for this purpose. In my estimation much credit is due to the Society of Arts for endeavouring to further the introduction of this decidedly wholesome article of food, which I consider will be brought within the reach of the poorer classes at a much more moderate rate than the present highly-adulterated tea now but too often supplied to them as a genuine article."

TEA CULTIVATION.—THE SITES SUITABLE FOR ITS PROFITABLE GROWTH.

Communication from Mr. S. C. Peal, of Sapakattee, Seebsaugor, Assam, to the Agri-Horticultural Society.

I PROPOSE to lay before you a few questions relating to tea cultivation, and the sites most suitable for its profitable pursuit ; some relate to the present and some are of future interest.

It may be known to you that for some time past there have been many attempts by influential bodies in England, to draw attention, through the Secretary of State for India, to the desirability of introducing tea as a staple article of industry for India. Little enough seems to be known at home about this country or Assam, and still less about tea.

From the nature of the case, much money has to be sunk before it is always possible to ascertain whether tea will pay in any given locality, and this is one where special care is needed and past experience of value as well as failures due to past oversights.

In 1823 tea was first heard of as indigenous in Assam ; in 1824, leaves, seeds, and some hundred plants were sent to the Botanical Gardens, Calcutta. For some reason or other Dr. Wallich, I believe, pronounced them not to be "tea," and maintained this for some six or seven years.

In 1832, Lord Bentinck deputed Captain Jenkins to examine and report on this question, and aided by Lieutenant Charleton, he settled it as true that tea was indigenous. Two years later, 1834, Government determined to introduce to this province the China variety of plant, which we may now deplore, as it bids fair to exterminate eventually the fine indigenous kind. In 1836, China plants arrived.

In the above, we may notice that it took years of discussion ere it was conceded we had tea here at *all* ; and that after all the most inferior kind was largely introduced and propagated.

During the discussions that followed, as to the most suitable localities, it was constantly asserted that an elevation sufficient

to ensure *frost* in winter was a necessary condition of success, and so deeply was this ingrained, that it lasts to our day. Hill land was sought for everywhere. Theelas planted where cultivation was out of the question, or the entire surface soil would wash off, and where difficulties of transport were at a maximum; all this too when it is patent that flat or slightly rolling land can be far better worked and cultivated, and now seen to pay equally well or better.

Tea may perhaps be traced to Kumaun from the fact that one of the Tea Commissioners was Dr. McClelland, Resident Surgeon at that place.

Questions of soil and climate generally were attended to; but one branch of the latter subject almost entirely omitted, and which, except among planters, is even now almost ignored, *i. e.* the amount and *steadiness* of rain-fall.

No matter how we may plant, prune, or cultivate, if we do not get rain, the crop will fail. Eighteen hundred and sixty-nine gave us some cases of this, and the spring of 1870 is a fresh case in point, where serious results followed the drought.

To most of us in Assam this was an unusual affair, though not so to others. In the North-West and other places where rain falls late, and more sparingly, the number of "flushes" of leaf are known to be far fewer than here, varying from 6 to 10 or 12 in some parts, and from 5 to 15 about Darjeeling even, while in Assam it is 20 to 22, which is most noteworthy.

We here get 3 flushes per month, while at Darjeeling and in North-West they get often but 1—See *Agricultural Gazette of India*, September 15th 1870, &c.

Tracing the matter back, we find that at first there were said to be only four pluckings, (or plushes) per season, the first in April, making Pekoe; 2nd in June, making a coarser kind; 3rd in August, making Souchong; and 4th in October, made Congou.

As time went on, the trees were pressed harder, and yielded oftener, in some places now yielding 8 pluckings, and where climate is most suitable up to 20 with profit.

It must be borne in mind that the *total* annual fall of rain will not indicate the most suitable area for tea growing. Many parts of India have a heavy annual fall down in a few months, and with long droughts before and after. What is needed, is a steady monthly fall from, say March till October, and it will be seen from Sir Chas. Lyells' Principles of Geology, Dr. Hooker's Himalayan Journal, &c., that Eastern Bengal peculiarly fulfils these conditions.

The S. W. Monsoon passing over the Indian ocean and the Bay of Bengal becomes heated and charged to saturation with water, which it retains while traversing the lower tracts of land until on the west side it impinges on Rajmehal and on the eastern flank against the Kasia and Garrow hills, where being deflected upwards into a colder strata it precipitates water copiously.

Where no hills occur, as on the Calcutta line, this water-charged wind goes on till reaching Sikkim, where meeting an obstacle, and rising, it is cooled, and discharges rain so freely that it makes Sikkim the "*wettest* part of the Himalayas."

It may be borne in mind that rain-fall can be in excess as at Cherra Poonjie, where the entire surface soil is so generally denuded.

In no other parts of the peninsula of India can these conditions of steady average monthly rain-falls be found, combined with suitable temperature and soil; and this leads me to consider Assam, Cachar, and lower ranges of Sikkim as really the only portions of this country *peculiarly* suited for "tea" as a staple.

In the North-West, in Bengal, and other places, tea will grow, but that it can be carried on *profitably* I very much doubt.

A collateral branch of this subject is the question of how far "forest" affects rain-fall; Dr. Hooker says that the relative effects of rain-fall on forest, and this again in return on the rain-fall, are difficult to separate, as they act reciprocally, and undoubtedly *part* of our very "moist climate" is due to this cause, and how far it might be affected by extensive clearings is impossible to say with certainty.

It is usually regretted that with such fine soil and climate, Assam is such a huge "jungle," and that it is not opened up and cultivated extensively, while all the time it is possible that this *apparently* desirable object, if attained, might cause the ruin of the province, for more than one reason; and that as these jungles disappear, so may, to a great extent, the "fine growing climate," leaving us like Lower Bengal.

This is a point on which all are more or less interested,—Government, planters, and ryots. Last spring, the latter suffered severely in many parts by the drought, as the land was too hard to plough till late in season. If it is once seen generally that North-East Bengal is, *par excellence*, the future "tea province," there will be as great a rush for land as of old for these forests, necessitating, perhaps, other *new rules*; unless the Government are prepared with sound arguments demanding forest conservancy, over and above those used by the Forest Department on account of timber. Grass-land is here in abundance (fit to grow rice), there are many thousand acres of uncultivated "potar," as it is called; the native population could easily be quadrupled, adding to the prosperity of the valley; and grass jungle has little or no influence on rain-fall.

There are reasons why the hills surrounding us need as yet no particular attention as to restriction in clearing forest, for as long as they are inhabited by the present races, "jooming" will be more or less a *necessity*; and thus some 90 per cent. of their area will be tree jungle. It is the attempt to render the plain of Assam a "fine open country" we must attend to. With regard to forest conservancy (as a principle) Assam is a most promising tract. It is especially suited for India-rubber of which there are several kinds (11 or 12 "bors" and some 40 ficus), teak, sal, sissoo, and many kinds of timber not yet known, and the preservation and propagation of which alone, to the exclusion of the host of useless timbers now on the list, would seem the soundest policy.

Large tracts on the banks of the tributary rivers as near the hills as possible could be reserved, and laid out in forests of the various timbers worth growing—as yet little has been done, of necessity. The forests, generally, however, seem greatly overrated as to value of the standing timbers, and the attention of the department might profitably be directed more to the future than the present; and at same time that large future supplies of timber are secured, a general denudation be avoided. I may here remark that the really *workable* tea area in the province is far smaller than is generally supposed. To a casual traveller, extensive tracts may be shown as tea land, both in the plain and on the hills around, while to one in search for land it often turns out very limited. Patches of forest may be seen which on close scrutiny will yield but 1 or 2 per cent. of land safely above flooding level. In the hills, thousands of acres can be seen, out of a tenth of which alone could a "crop" be *transported*, and if steep, *cultivation* is impossible anywhere.

As regards irrigation, to which some writers point for the cure of drought, it is doubtful, first if it can be done; secondly, if done, whether it would be effectual. A writer in the *Englishman*, October 12th 1870, says, four or five men could irrigate eight acres per day. Let us compare this with ordinary rain-fall. We here get about ·25 of an inch per day, which on a garden of 200 acres equal some 5,000 tons of water. I doubt very much our ability either to lay this amount on or in theela gardens to find it *at all* during droughts; yet if all this could be laid on while the air passing over the garden was hot and dry, not a quarter would remain, but be evaporated in an hour. A *warm, moist* air is what we need to force on the young shoots into leaves quickly, (see Lindley), the air to be near the point of saturation so as to check evaporation, while the heat forces the growth. So that I doubt the advantage of irrigation, with a dry air and hot sun shining as is usual in droughts.

In conclusion, looking at the steadily increasing demand for Indian teas, the likelihood of recurring disturbances in China and that tea, when carefully grown (at the right localities), will yield large profits, it is no wonder we see the attempts made to introduce it as a staple all over India; but when carefully investigated, I believe it will be found that England's future tea garden will be Assam, and that wherever the climate is not both *warm* and *moist* from early spring to late autumn, tea, though it may grow, cannot be made to do so *profitably*.

THE PROTECTION OF THE CACHAR FRONTIER.

To His Excellency the Earl of Mayo, Viceroy and Governor-General of India.

The humble memorial of Tea-planters and other European residents in the districts of Cachar and Sylhet,

HUMBLY SHEWETH,—That your memorialists are deeply interested in everything connected with the welfare of the districts in which they reside, and that they have invested large sums of money in clearing and planting with tea what had hitherto been unprofitable jungle, and have created within the last fourteen years an industry of great and increasing importance, affording employment to a large number of Europeans, and a still larger number of natives.

That your petitioners during this period have had many difficulties and trials to contend with, such as are incidental to the commencement of almost every new enterprise undertaken under similar disadvantages, but that in most instances these had been overcome, and large and valuable properties had taken the place of what had previously been dense forest.

That your petitioners would point out that this satisfactory result could not have been arrived at had there not existed a sense of complete security to life and property within these districts, as otherwise it would have been impossible to have settled down the very large number of labourers coming from all parts of India who are now resident upon tea estates, and upon whose labour the very existence of tea-planting on this frontier depends. Your petitioners would further represent that a continuance of the same state of peace is from similar reasons equally necessary.

for the successful prosecution of their industry for the future, and they regret to have to say that in consequence of the savage and determined attacks which have been made in the present year by Looshai tribes all along the frontier; this sense of security they do not at present enjoy.

That your petitioners feel that it is unnecessary to recapitulate here the details of the murderous raids above referred to, as your Excellency had doubtless been informed from official sources of all that has taken place; but your memorialists desire to bring to the notice of your Excellency that, apart entirely from the serious loss of life and property which has been sustained, the disastrous effects of these raids upon their interests have been very great. On many concerns, garden operations essential to the success of the present season have been stopped for months, the imported labourers have been panic-stricken, and flying from point to point, many have left the district for ever, and in exposed positions the majority absolutely refuse to remain beyond the term of their existing legal engagements. Should his state of things continue, it is clear to your petitioners that any gardens which are now in existence must be abandoned, and the value of tea property generally in Cachar and Sylhet be depreciated to a very large extent.

That under these circumstances your memorialists respectfully beg that the most effectual measures possible be undertaken to prevent a recurrence of these raids, and to re-establish that sense of security in these districts which is now wanting. Your petitioners are desirous of doing all that it is possible for them to do to this end, but they feel that, placed as each planter individually is in immediate charge of a large number of timid and helpless labourers, the majority of whom are women and children, they cannot, when raids occur in their vicinity, combine in such a way as to afford much assistance to each other. Your memorialists also, while they are grateful for the measures of defence which have recently been adopted, and have every confidence in the zeal and ability of the officers employed on this duty, fear that against enemies, such as the Looshais have shown themselves to be, the establishment of a series of fortified positions at intervals along the boundary line, and the opening out of communicating paths between these, will not of themselves suffice to defend a frontier such as that of Syhlet and Cachar, which extends over two hundred miles through a dense forest country, and presents everywhere possible points of attacks. Your petitioners would point out that the character of Looshai warfare is essentially one of surprise, and that it is in their power, without any previous warning to us, to attack in strong force any point they choose along this line of two hundred miles; while on our side it is impossible to maintain a strong guard everywhere, and even when such a guard is in position at the point of attack, the experience of the Moniarkhall raid this year shows that the Looshais can with ease loot and plunder as they wish before re-inforcements can arrive. Your memorialists beg further to represent that these defensive measures tend but slowly, if at all, to any permanent pacification of the frontier which, in their opinion, is the great point to be aimed at. The successful warding off of a raid does not secure the country from the liability to future attack, and your petitioners would remark that an unsuccessful raid, by its disturbing effects on the labourers in their employ, is almost equally as injurious to their interests as a successful one.

That your petitioners are therefore deeply impressed with the necessity which exists for the adoption against the Looshais of more decided measures than are involved in a policy of pure defence, and they are of opinion that no permanent immunity from future raids can be hoped for until an expeditionary force shall have been despatched to the enemies' country, those tribes who have raided upon us been punished, the captives in their possession restored, and all have seen that we have both the power and the will to compel respect for our frontier. Such an expedition your petitioners believe to be quite possible of accomplishment, and they are convinced that it would exercise a most salutary effect on the Looshai and other savage tribes on the frontier, and give a basis for future measures of repression and conciliation, which would in all probability protect these districts permanently and give back that sense of security which, as subjects of the Government of India, your memorialists have a right to expect, and which is so absolutely necessary for the future successful prosecution of the industry in which they are employed.

And your memorialists, as in duty bound, will ever pray.

Signed on behalf of a general meeting of planters and other European residents of Cachar and Sylhet, held at Silchar on the 17th April 1871. R. B. DAVIDSON, Chairman.

COFFEE.

TEA vs. COFFEE.

(To the Editor of the "Madras Mail.")

SIR,—It is rapidly becoming apparent to even casual observers that coffee-planting on the Neilgherries and the Wynaad has proved a great mistake. But why this discovery should not have been made long ago, and why, in the face of existing facts, men will still stake their fortunes on it, are points which have tasked my brains not a little. When a man is about to enter upon an important undertaking, such as building, or starting a business, he first carefully estimates the probable cost and ultimate profit, and on the other hand, as carefully reckons the actual funds he possesses available for the scheme, and satisfies himself whether it will work to his advantage. If the result proves unsatisfactory, he will, as a wise man, abandon his scheme at once. This we all know is a rule practised universally amongst enlightened nations. Now the question is, why has an exception been made in it as regards coffee? That no fair estimate was made at the commencement, I feel pretty certain, for otherwise no one would have been fool-hardy enough to venture on it. I state confidently that no man can wring a fortune from coffee, in fact he will not only lose every fraction of what he is worth, but involve himself fearfully in debt. Instances of this kind have occurred but lately as your readers are no doubt aware. I know of one gentleman who obtained employment on a coffee estate at the age of fourteen; at twenty he embarked his little all in a virgin estate, lived sumptuously on the *working* income of his estate, and on enormous borrowed sums which he fondly hoped to be able to clear off soon. At about the age of forty-five he was a ruined man, with a wife and children looking to him for support. Everyone almost had hitherto a blind, devoted faith in coffee, and unlimited loans were granted him.

I will now adduce some reasons as to why coffee-planting will *not* pay. A speculator purchases an extent of uncultivated land, for, say, Rs. 100,000, and plants it with coffee. Of course he can't plant the whole at once, but gradually. The trees won't bear till after three years. During that time he must work the estate from private resources. If he plants 80 acres, he will require at the very least 25,000 Rs. annually for their working. This seems a large sum, but it is no less true. Labor itself comes up to about Rs. 1,000 per mensem. Besides this, two superintendents will cost at least Rs. 500 a month. Thus labor and supervision amounts to Rs. 18,000 annually, and I have allowed a moderate outlay. Generally, there are as many as four or five superintendents employed. But so many are not necessary, and go towards ruining a proprietor sooner than otherwise. But to return to the point, deduct Rs. 18,000 from Rs. 25,000, and you have a margin of Rs. 7,000 annually for machinery, tools, building, conveyance, agency, and other little contingencies. It is barely sufficient. For the first three years therefore the working of the estate will have cost its proprietor Rs. 175,000, not a farthing of which came from the estate itself. This, added to the price of the land, brings the sum to Rs. 175,000 which the estate is expected to clear in time, besides making its owner's fortune! The first crop will be naturally small. I assume it sells for as much as Rs. 10,000; then Rs. 15,000 must come out of the owner's private coffers. Allowing the sale rises at Rs. 2,000 a year, as the crop increases in quantity and quality, it will take 7½ years after the *first* crop, before it can clear annually its full cost of working; and for these 7½ years, about Rs. 225,000 must be added to its own income to keep it up. So that, as it starts on its eighth year, and begins to pay for its working, it will have cost its owner something like 240,000 Rs.! And all this time he must support himself, and *that's* no trifle. Now, will any sensible man calculate and say, that coffee will pay? Unless you plant *more* you can't expect to get in a larger income, and that will entail a further cost, too tedious to go into. There is only one way in which a man can gain in this speculation, but it is a dishonorable mode, though perhaps very frequently practised. It consists in buying an estate at a mere song from a proprietor who finds his fortunes becoming desperate, and re-selling it to some green-born, who knows nothing of the country, at an exorbitant price.

Having pointed out the folly of embarking in coffee, I will turn to the next speculation which I trust to prove a better one. Tea was introduced on the hills later than coffee, and somehow very little confidence is reposed in it as a profitable undertaking by most planters. As a proof of this I may mention that a tea estate, sixty acres planted, was sold the other day in Coonoor for 6,000 Rs.! The fact is, everybody's eyes are beginning to open with regard to the ruinous prospects offered by coffee, and tea, being a speculation too, is judged of by the same rule. You can pick leaves from the tea plants all the year round, and of course reap a larger harvest than in coffee. Therefore, it is not *necessary* to have such a large extent of ground for tea as for coffee. Fifty acres would make a decent plantation on a small scale, but few men are requisite to work it, and it can be better supervised. Such an estate costs, I will say, Rs. 50,000. One superintendent and one efficient tea-maker is enough. Their joint salaries would amount to no more than 100 Rs. per mensem. Labor would cost Rs. 300 per month I thus allow Rs. 5,000 annually for supervision and labor. Buildings, &c, would amount to about Rs. 5,000 annually, making a total of Rs. 10,000 a year for maintaining it fairly. I would here state that it would be much more profitable to dispose of tea in the Indian markets, or as much as practicable. I can state from experience that 40 acres planted with tea should produce at least 80,000 lbs. of green leaf, or 20,000 lbs. of prepared tea *annually*. The leaves of the tea plant can be plucked when the latter is a year old, so that when you begin plucking at the rate I mentioned, the estate will have cost 55,000 Rs. The first year's harvest will be, say, 15,000 lbs. of prepared leaf which, at the low rate of Rs. 1-8 per lb., amounts to Rs. 22,500. The cost of maintenance for two years would be Rs. 20,000, and a margin of Rs. 2,500 would be left towards clearing the capital cost. In a year or two it would produce 20,000 lbs. of prepared tea. Deduct 10,000 Rs. annually for working, and calculate the profits, and it will be seen that in the space of five years,

the cost of purchasing the estate, and working it, will be entirely cleared, and a margin of Rs. 2,500 will be left for the proprietor's personal support during that time. Of course this is but a rough statement, but if the matter is honestly weighed, it will be found to be correct in the main.

II.

(To the Editor of the "South of India Observer.")

SIR,—I cannot help making a few remarks on a letter which appeared in the *Madras Mail* of the 3rd instant, under the heading "Tea *vs.* Coffee," a letter calculated to cause an infinity of harm to coffee-planting as a speculation, were it not that the whole letter abounds with such glaring absurdities, that any man with the smallest possible knowledge of the subject of coffee-planting, would at once perceive that the writer of the letter has no personal acquaintance with his subject. He does not even seem to have taken the trouble to obtain reliable data to work upon.

A man, when entering on an "important undertaking," such as writing a letter most damaging to the interests of coffee, should carefully estimate his own ability, and satisfy himself that he is not likely to commit any egregrious errors. Had our friend, Mr. Blank, carefully perused and considered his letter after writing it, I feel convinced he would have abandoned it to the waste-paper basket at once.

Writing as a coffee proprietor, and one who believes that coffee, when worked properly and judiciously, is a profitable investment, and a far safer one than people at the present moment seem inclined to think, I cannot allow a letter so prejudicial to the coffee interest to pass without remark.

Mr. Blank's speculator lays out ten thousand pounds in uncultivated land to open eighty acres! At the high rate of £4 per acre he would get two thousand five hundred acres for his outlay. Now a man who buys two thousand five hundred acres of land to open out eighty acres should not be allowed to remain at large; at any rate he should be under the surveillance of a discreet and watchful keeper. If Mr B. worked an estate of eighty acres, at the rate of £2,500 per annum, I am not at all surprised that he found coffee a failure; £10 per annum per acre, is a fair estimate of the up-keep of an estate, buildings included. At this rate the cost for keeping up 80 acres would be £800 per annum. Mr. Blank also keeps two superintendents on his 80-acre estate. One superintendent can, in reality, work from 250 to 300 acres. Whereupon earth Mr. B. found four or five superintendents on an estate of 80 acres it is hard to conceive; surely, he must have mistaken maistries—great swells in their way—for superintendents.

Mr. B. has no foundation for his sweeping condemnation of coffee. There have, doubtless, been instances of lamentable failures in coffee-planting. These have generally arisen from two causes:—1st, the planter has to borrow capital, or has not sufficient capital to commence upon. 2nd, the real proprietor lives at home in ease, leaving a superintendent, with no interest in the estate, to work it. Moreover, people seem to think that they can enter on the cultivation of coffee with no previous knowledge of the habits of the plant, or nature of the business. In every other vocation of life, whether the church, law, soldiering, sailoring, mercantile, tinkering, or tailoring, it is necessary to serve a long apprenticeship before one can hope to become a bishop, or earn a respectable livelihood.

My experience in tea-planting is limited, so I refrain from picking holes in Mr. B.'s statement; I only hope that Mr. B.'s calculations as regards tea are not so utterly fallacious as they are on coffee. I am of opinion, that if Mr. B. has only written his letter to pass away an idle hour, he should come forward like a man and confess that he was ignorant of the matter on which he wrote. By such conduct he would be entitled to be ranked as an honest man, who, for a short period had been labouring under the delusion that he could give the world a straight tip as to coffee-planting.

But where was the editor of the *Mail* when the proof of Mr. B.'s letter was produced? Surely he must have delegated his power to some subordinate, quite unworthy of promotion, during a temporary absence It seems to an outsider most curious, that a journal—one of weight too—which has strenuously, and with effect, maintained the coffee interest, the editor of the same being also a man not only acquainted with coffee in the concrete, as a pleasant matutinal beverage, but in the abstract as a cultivation, should have allowed such a letter to have found place in his columns. I cannot help thinking that if he knowingly inserted the letter, it was with a view to writing it up in an easy leader when other matter became scarce. Trusting that you will find room for this short letter,

Believe me, yours to command,
Box.

Cherumpoody, 11th April 1871.

III.

(To the Editor of the "South of India Observer.")

DEAR SIR,—Under the above heading a correspondent of the *Madras Mail* has, according to his own admission, been "tasking his brains not a little" to prove that "coffee-planting on the Neilgherries and in the Wynaad" has proved a great mistake, while on the other hand, the writer avows that tea-planting in its results is all that could be desired. I am somewhat interested in coffee and must confess the above announcement, which "even a casual observer" is supposed to accept, came upon me as a novelty. I immediately referred to my private ledger to discover, if for many years past I had not been laboring under a mistake, the existence of which seemed to threaten imminent annihilation to all my future prospects and appeared likely to have involved me in great and unlimited liability in the past, without my having been cognisant of it. You may judge of my relief, when my search furnished the following results. One estate in which I had bought some few shares, yielded me at one time as much as 42 per cent. for my money; and since the shares passed off my hands, they have, I am assured, by their possessor, never paid less than an *average* of 18 per cent. Another estate, in the first year of yielding, gave me back 25 per cent. of all it had cost, and this year (the second) sufficient coffee has already been taken off the trees to satisfy me that I shall have even a handsomer return. Again, a third estate, in which I regret I am an infinitessimal proprietor, has for seven years past paid me more than cent. per cent. A fourth has never been unkind enough to give me less than 16 per cent. and has continued to do this continuously, even after paying for its cost.

This is my experience, which, I am confident, all who are interested *bonâ fide* in coffee will, on comparing notes with me, confirm. It is somewhat at variance with that of the correspondent of the *Mail*, and I can only account for the singularity of his observation, on the supposition that he has made a mistake in investing his money in *tea*, and endeavours to write down coffee by writing up tea. "Bad case, abuse the plaintiff's attorney," is well known to have been the docket of a shrewd attorney on one of his briefs, and I fancy "in tasking his brains," (which, bye-the-bye, I am quite willing to consider to be of the normal weight) the *Mail's* correspondent could conceive no better way of dealing with the subject he took upon him with such temerity to handle than to imitate the example of the attorney referred to.

It may be urged that my personal experience, as detailed above, is exceptional. I will grant this, for the sake of argument, and proceed to analyse the reasons given by the writer, whose remarks I am criticising, "as to why coffee-planting will *not* pay?" I may summarise his estimate of the cost of a coffee estate as follows :—

Cost of land	Rs	1,00,000
Bringing 80 acres into bearing ..	,,	75,000
Maintaining estate till it pays its own working	,,	65,000
	Rs	2,40,000

This moderate expenditure is distributed considerately over eight years, at the end of which, we are told, the estate will only begin to pay its working expenses. Bringing it up to this stage the writer then leaves it in disgust, and does not pause to enlighten his readers when it will ever begin to pay or yield the slightest return to its owner, but runs off to the (to him) more inviting subject of tea. I take his first item, one lac for the cost of land alone. At the average rate at which most coffee-lands in Wynaad sells, viz., from 20 to 30 Rs. an acre, this outlay would secure the possession of from 5 to 3,300 acres. Few of your readers, I think, would have to cudgel their brains much, to extract an adjective of qualification for him who would purchase 5,000 acres to plant out only 80! The next two items aggregating 140,000 Rs. are given to represent the cost of bringing the estate into bearing, and maintaining it till it pays its working expenses. As a set-off to this I append the following estimate which one of the oldest and most experienced planters in Wynaad has been good enough to furnish :—

Cost of bringing 100 acres into full bearing ..	Rs.	33,000
Yield of 100 acres, properly cultivated—		
40 tons, which, sold on the coast, will realize	,,	24,000
Deduct working expenses	,,	12,000
Net profit ..Rs ..		12,000

or nearly 36 per cent. on the outlay. I would remind my readers that the above sum of Rs. 33,000 represents the *total amount of capital out at any given time.* All who have any acquaintance with the subject will, I think, be able to judge for themselves which of the two estimates comes nearer the truth: the one founded on gratuitous assumptions, or the other built upon and confirmed by the experience of years. The idea put forward by the writer in the *Mail* of four or five superintendents, each on Rs. 250 a month to look after 80 acres of plantation, is really far too absurd to need contradiction.

The *Mail's* correspondent adduces one instance of his personal knowledge of the bankruptcy of a coffee planter, and would have his readers generalize from this. I think I know the case he alludes to, and if I am right in the matter of identity, I could prove that anything but coffee brought on insolvency; but that, on the other hand, it helped to mitigate the evil effects of personal disorder. An instance of a tea-plantation that had cost Rs. 30,000 selling for little more than Rs. 3,000 came within my own immediate experience a few days ago. The owner parted with it, at this sacrifice, not from impecuniosity, but from disgust; many causes, I believe entirely outside the pale of accidents attendant on tea cultivation, induced him to do so; but were I to generalize from this solitary instance, and inweigh against tea-planting in general, Mr. Blank of the *Mail* might reasonably conclude that my reasoning powers had received no development, since I lay a baby in a wicker basket, smiling blandly at the coral hung over my head.

I trust I have succeeded in showing how ridiculously incorrect are the statements put forth by the correspondent of the *Mail* in reference to coffee. I am, as far as my experience justifies me in saying so, confident that no other product can pay as coffee does. To those who embark with capital, it always proves a faithful friend, and to a host who have entered on it with borrowed means, it has been more than generous, for it has, in the generality of instances, enabled them to pay 10 or 12 per cent. for their borrowed capital,

and from 16 to 20 to those who buy and ship their coffee, and has still left them a residue sufficient to keep body and soul, wives and bairns, comfortably together.

A man's positiveness is generally, I think, in inverse ratio to his knowledge, and there are not a few who measure their depth by their darkness; amongst this number, and simply as far as coffee is concerned, I am reluctantly constrained to class the correspondent of the *Mail*, and his positiveness is really refreshing as an intellectual study.

J.

IV.

To the Editor of the "Madras Mail."

SIR,—You have had so many very excellent jokes in the *Madras Mail*, from first to last, (*vide* the Albert-Edward-Alfred correspondence) that I may be wrong in considering ——'s letter on the Tea *versus* Coffee subject *au serieux*, but whether in fact or earnest, the letter inserted in your columns of 3rd instant is calculated to give so many erroneous impressions that, as one largely interested in Wynaad coffee, I cannot allow it to pass by without a word of reply. A more affecting case than that of your correspondent's friend who began coffee-planting at fourteen, and was ruined at forty-five, cannot be conceived; but he, at least, had the satisfaction of living "sumptuously," and if he purchased the land for his "virgin" effort, and worked that effort on the basis laid down by your correspondent, I wonder he kept his head above water even as he did. To follow your correspondent through his reasons "why coffee will *not* pay." He starts with a purchase of land at Rs. 1,00,000 ! ! Now, why should he spend a lac of rupees ? In this unremunerative district the top price for splendid forest is Rs. 40 per acre, which would provide him with no less than 2,500 acres to open and plant ! Your correspondent is quite right in stating that "he can't plant the whole at once," but he lays down his 80 acres and gives us no clue as to his operations after the first season. His figures for the up-keep of the 80 acres are truly alarming, but fortunately from practice here are known to be utterly fallacious. "Labor itself comes up to Rs. 1,000 per mensem, he says, but what labor can he find to do on an estate of 80 acres (but "live sumptuously") to represent Rs. 12,000 per annum, I am at a loss to conceive. Then, as to superintendence, we usually allow *one* European superintendent to each estate of 300 acres (assisted by a beginner, if the acreage is larger than that), and by one or two East Indian writers. The above superintendence would represent Rs. 400 per month at *the most*, but your correspondent allows Rs. 500 for his 80 acres, and darkly hints at four or five superintendents, although I give him the credit for saying "so many are not necessary." His other items are not worthy of remark, as the amount paid for buildings, transport, agency, &c., is contingent on rates of carriage, and the crop to be gathered, but under prudent management and with *reasonable* outlay and fair seasons, like the past, I state confidently that coffee *will* pay, and what is more, has paid magnificently. I think I should have no difficulty in putting him in the way of a superintendent who would work his 80 acres for less than half of his figures, including everything. I may mention in corroboration of the above remarks that one estate in which I am interested, of three times the area of your correspondent's, was last year worked for rather *less* than the figures mentioned by him.

I know nothing about tea, but wish my brother-planters in that line every success, and when we are quite ruined at coffee we will think of it. From your correspondent's shewing it "must be all prizes" and no "blanks."

Yours faithfully,
A WYNAAD PLANTER.

South Wynaad, 6th April 1871.

V.

SINCE our first notice of the letter which appeared in the *Madras Mail* under this heading we have kept silence, expecting that some of the well-known authorities on planting matters would have refuted the mis-statements therein contained, and shown our readers, in the most convincing way, from actual statistics of estates now in existence, what coffee has done, and what it may be expected to do. We have no wish to depreciate tea-planting as a speculation; indeed, we have every reason to wish and hope that it may prove highly remunerative, and that the slopes of our Blue Hills may be covered with estates, securing for their owners a charming retreat in a salubrious climate and beautiful country, with a wholesome and interesting occupation. Still, as we before observed, the cultivation of tea has not yet passed *quite* beyond the region of speculation; and it is worthy of remark that, although we have received so many letters from coffee planters, exonerating their pet pursuit from the charges brought against it by Mr.——, no tea planter has thought it worth while to urge anything in support of the wonderful statements about the profits of tea ! Mr. ——, whose emphatic assertions somewhat remind us of the letter addressed by a Mr. Neate to *Public Opinion*, some time back, stigmatizing the King of Prussia and Count Bismarck, as unmitigated scoundrels—and whose affected plain-speaking and "honest" fairness are very refreshing—evidently knows nothing whatever of the subject on which he has written; his errors and mis-statements (to use the mildest term) are palpable to every one who knows anything of the matter, and have been pointed out to those who do not, by the letters we have published from correspondents. We shall not, therefore, go over this ground again, but merely touch on one or two of the defects in his arguments which seem to have escaped notice. For instance, Mr.—— considers it necessary to have at least two superintendents on a coffee estate, costing Rs. 500 a month, while on a tea estate one superintendent and a tea-maker are to be procured for Rs. 100 a month ! How is this ? Does the tea estate, which bears crop nearly all the year round, require less intelligent supervision than the coffee plantation whose crop only takes up three or four months ? Or is it that the superiority of the climate in tea districts, and the delights of the charming pursuit, inevitably leading to riches, and therefore free from all anxiety, tempt men to live on a tea estate for a fifth of what they would require in Wynaad? Mr.—'s "gentleman who obtained employment on a coffee estate at the age of fourteen" (nothing like beginning early !) and "lived sumptuously on the *working* income of his virgin estate," up to the age of forty-five seems not to have made such a bad thing of it, even though ruin overtook him at that time. We venture to think that had he lived somewhat less sumptuously up to, let us say, the age of thirty, he might now be able to enjoy himself without fear of the fate that has overtaken him. Mr.—— has a happy knack of assuming a position and arguing from that stand-point, as if it were already an ascertained fact. After giving us a set of unreliable figures as statistics, he says—"Now, will any sensible man calculate and say that coffee will pay ?" and further on—"Having thus pointed out the folly of embarking in coffee, I will turn," &c., &c. Such absurdities may provoke a laugh, it is true; but they are very annoying to men really interested in the matter, who sometimes find their partners or principals, if unacquainted practically with the subject, misled by such mischievous folly. Mr.—— further says "you can pick leaves from the tea plants all the year round, and of course reap a larger "harvest than in coffee." We protest against this "of course;" you may cut grass from a mountain side all the year round, but that does not show that you have a larger harvest than a man who only picks the fruit from his orchard once a year. If Mr.—— be, as there seems some reason to suspect, the would-be vendor of a tea estate with which he has burnt his fingers, we would advise him to adopt some other mode of praising up tea than by reviling coffee, which has too many defenders for such an attack to be made with impunity. We are glad to see that all our correspondents have too much sense to return his silly attack by abusing tea.—*South of India Observer.*

VI.

While greatly approving of "J.'s" letter in our issue of April 6th, we must beg to differ from him as to the estimate for bringing coffee into bearing; allowing liberally for superintendence on 100 acres, we certainly consider that coffee should be brought into bearing for Rs. 200 per acre or Rs. 20,000 on a hundred-acre estate; if the buildings are made "pucka" within the first three years, from four to five thousand rupees more might be allowed. "J." doubtless means that the expenditure of the first year of crop would not be covered by the produce, but we are of opinion that if the sum we have named (say Rs. 2,500, with pucka buildings) were properly spent during the first three years, the expenses afterwards should be very small, until manure is required, and easily covered by a small crop. Let us say, for instance, in the third or "maiden" year:—

Hand-weeding, @ Rs. 10 per acre	1,000
Pruning & Handling, @ 3	300
Repairs to roads and drains	200
Superintendence & allowances	2,400
Land tax and sundries	600
	Rs. 4,500

Two hundred-weight per acre would be 10 tons :—

Cost of picking, curing and transport, say at the rate of Rs. 70 per ton	700
	Rs. 5,200
Value of 10 tons on the cost, @ 26-4 per cwt	Rs. 5,250

This would be a *very* small crop, and we have taken a low value for the coffee, and yet show a profit. To those who doubt our figures we would say—make inquiries among practical planters, and you will hear of many estates that have paid back their whole capital in seven years from the commencement (not "7½ years after the first crop," as —— says), several that have done it in six; and some, where the places have been opened from neighbouring estates, and in consequence the charges for buildings and superintendence have been light, in five years from the burning off !—*South of India Observer.*

VII.

To the Editor of the "South of India Observer."

SIR,—In your article on "Tea *versus* Coffee" last week, you omit purchase of land altogether in your estimate. Now ——— makes this one of the chief items of expenditure, and we all know that, though his calculation is far out of the way, good jungle is not to be had for nothing. If you add the price of 250 acres of land at Rs. 40 per acre to your estimate, you bring it up to more than "J's"—as Rs. 35,000 against his 33,000 without counting anything for making an entrance road, the cost of which would very likely be considerable.

Yours faithfully,
E.

South Wynaad, April 29.

VIII.

WE publish a letter to-day from "E.," who finds some fault with the figures we gave last week for opening expenses, on the ground that we have allowed nothing for the purchase of land. Of course, we are aware that "jungle is not to be had for nothing," but we were referring merely to cost of *opening* land, and understood "J." at the time to mean the same; in this we were doubtless mistaken, as he gives the amount, Rs. 33,000, as the largest that the planter can, at any one time be out of pocket, and of course must include cost of jungle. We cannot, however, agree with "E." as to the price of land. Government jungle can almost always be bought at the price of the survey, which is generally about Rs. 2 per acre, and the tax then exacted, of Rs. 2 per acre, cannot be considered as worth more than ten years' purchase, ten per cent. being the general rate of interest on borrowed capital on this security. If the intending planter of 100 acres buys 200 acres of forest (and why should he have a larger reserve of land?) at this rate the purchase money would amount to about Rs. 400, and the tax on the 100 acres he plants for the first two years, and on the other hundred that he does not use, which he would not have to pay if he bought land from a private individual, may be considered equal to another Rs. 2,400, making the whole purchase money of the land Rs. 2,800. There is a very large amount of first-rate forest jungle to be bought at a much lower price than that named by "E." Natives are generally content with from ten to fifteen rupees an acre for their jungle in most of the forest parts of Wynaad, bamboo land being generally cheaper still, and many European holders would be very glad to sell some of their large tracts of spare jungle at Rs. 20 an acre. The price given, Rs. 40 per acre, is a very rare one, and the number of estates that have been planted on land bought at that price could easily be counted on the fingers of one's hand. As to "E.'s" other point, an entrance road, we quite admit that this may be a very expensive item; it is possible that a road three or four miles long might have to be cut, rivers to be bridged, embankments thrown up, and rocks blasted; but who would give a high price for land that is not easily accessible? Besides, if the land purchased were so situated, it would be unwise to cut a cart-road at such great cost until the crops were worth the expense; for anything up to 20 tons (four cwt. per acre or double the crop we allowed) a bullock track would be quite sufficient. But it is very improbable that anything like such a road would be needed, and even if there were no neighbours to share the expense, we do not think the cost to the estate should exceed twelve or thirteen hundred rupees, or the value of an extra ½ cwt. per acre. An entrance road for carts is very valuable, both in transport of crop and bringing manure, &c., on to the estate; but it may be made at too great a cost, and we certainly think that if it involved the outlay of *more* than an extra twelve or thirteen rupees an acre, it had better be left alone, and the planter be contented with bullock transport, at any rate until the heavy crops make it worth.—*South of India Observer.*

COFFEE SHIPPED BY STEAMERS.

SINCE the unfortunate experience of the steamers *Emma Ash* and *Stagshaw*, a decided prejudice has existed at this port against the shipping of coffee by canal steamers. It is understood too, that instructions were in many cases sent out by London houses not to despatch by steamers in consequence of the lower prices fetched by the coffee so received. Such a result was contrary to all expectation; for it had been previously argued that coffee sent *via* the Canal with the greatly shorter voyage, could not fail of getting home in much better colour and condition than that sent by the Cape. The steamers referred to, however, made passages little if any better than the long sea trip, and doubtless their cargoes did not escape material damage. In any case a sufficient answer as regards the condition and price of coffee shipped by a suitable steamer through the Canal is afforded in the return of sales published in last *Observer*, which includes the parcels sent home by the *Arcturus* in January last. Some 150 tons were shipped with remarkable despatch by that fast steamer, on the 28th of January, and almost all the marks of coffee included in the shipment have realised very full prices. We have only to mention "Haldumulle," "Monsarat," and "Tyrpane" marks as fetching from 90s. to 96s. 6d. per cwt. to shew how satisfactory the result has been. There can be no doubt, therefore, in view of other advantages besides fair prices, such as the quick return and saving of interest on money, that advantage will henceforward be freely taken of the fine steamers now trading on the Canal route for the transport of coffee to the home market. A considerable portion of next season's crop may well be expected to be despatched by this route, for the saving of time is not to be despised by the shipper or the planter. One result will probably be to cause a little more irregularity in our freights market, perhaps to raise the rates abnormally at times, in consequence of sailing ships refraining from "seeking" freight at this port in the same number as usual; but the use of the telegraph must soon equalize matters, especially as the close of the year will probably find us in communication with the Australian as well as the China ports.

WYNAAD AND THE PLANTERS.

To the Editor of the "South of India Observer."

SIR,—After the very large and satisfactory crop just secured in this district, you will, I am sure, be glad to hear that so far from being shaken by its late exertion, the coffee looks generally vigorous and healthy; and thanks to the extremely favorable weather we are now having, it bids fair to repeat the performances of 1870-71. The "oldest inhabitant" confesses that he has very seldom seen such abundant and frequent showers, so essential to our well-being as planters; and certain it is that all the blossom already appeared has set capitally, and there is quite enough moisture in the ground to do the needful with a large blossom now about at its full: so I hope we may write ourselves as safe for something good again this year. If for no other reason, this will be satisfactory as a proof that Wynaad coffee is not a mistake. On this subject enough has already been said, and the counsel for tea, in the late case of "Tea *versus* Coffee," has been already considerably "chawed up." Whether he has retired to some Oriental Colney Hatch or gone in for tea stronger than ever, I fancy never will be known in print; but should he decide on the latter, I hope he may buy his land cheaper than his letter mentioned—Rs. 1,000 per acre seems stiff, even for tea.

The "Nabobs," as you called them in an earlier issue, have gone to England, a consignment of three, positively the last, I believe, having left us this week. They seem cheerful enough, as a rule, but generally grumble at two things: the difficulty in remitting money to England, save at ruinous exchange, and the fulness of the P. and O. steamers. I fancy they may, in spite of enormous profits, manage to "spend *half* their incomes," so difficult for a Wynaad planter to do.

Now as to us left blooming in Wynaad, having seen our friends to the head of the ghaut, with an accompaniment of valedictory tears, and "small" parcels to English friends, and the usual fluid restoratives, what is the best to be done? It is hot and feverish, and there is next to nothing doing: coolies in Mysore, and crop all at the coast, or nearly so. A general stampede I think is the only thing, and the delights of Ooty may somewhat alleviate the sting of being left an exile from England, and keep us from envying those more fortunate than ourselves.

Pour moi! I almost fancy my hair wants cutting, and I must look out my best kit and investigate my cash chest, with a view to the Blue Mountains. Glad to hear your season has begun, and that it is likely to be a good one.—I am, Sir, Yours faithfully,

Vythery, Wynaad, 29th April 1871. AGRICOLA.

THE COFFEE CROP.

IT will be seen by reference to our table of exported produce, that the short crops of coffee are at length beginning to tell upon our shipments of that sample, which on the 14th instant shewed a deficiency of 5270 cwts. there being an excess of 524 cwts. of plantation, and a deficiency of 5794 cwts. of native coffee.

The prediction regarding the shortness of the present crop which we ventured to make several months ago, is about to be verified, and though it may still be difficult to estimate with any accuracy the actual extent of this season's deficiency, all doubt as to the fact has been removed to the statements received from the principal producing districts, as well as by the marked falling-off in the weekly returns of railway receipts. These returns for the past six weeks for which we have results, shew the following deficiencies as compared with last year:—

For the week ending March	5th	decrease	£119	2	10
Do.	do. 12	"	367	18	5
Do.	do. 19	"	427	17	10
Do.	do. 26	"	1021	15	10
Do.	April 2	"	604	7	11
Do.	do. 9	"	1,236	8	1
		Total..	£4,217	10	11

During the whole of the above period there has been scarcely any diminution in the up-traffic, so that we are able to form a tolerably correct idea of the extent to which the receipts of coffee from the interior have fallen off since the end of February, as compared with the quantities brought down at the corresponding dates in 1870.

It is too soon to speak of the coming coffee crop, for although one or two blossoms have made their appearance, the principal show of flower has yet to come forward, and the weather in most districts had been so unfavourable to within a few days ago, that we are not yet advised as to the effect of the recent favorable change in the planters' prospects. It is true that from Dimboola, Rangalla, and one or two other districts, we have very encouraging accounts of the show of blossom, more or less advanced, as may be gathered from planting reports, in our present issue, but generally the showers have been too frequent to allow of the ripening of wood and the formation of blossom, and there is no doubt that whatever may be the extent of the ensuing crop, it will be late. This will be especially the case in Happotella, whilst in the Rackwane districts the estates are very forward, all those which were last season backward in their production promising bumper crops for the ensuing years.—*Ceylon Times.*

MANURING, AND MANURES, BY ONE OF CEYLON'S MOST EXPERIENCED COFFEE PLANTERS.

To the Editor of the "Ceylon Observer."

DEAR SIR,—The appearance of the second edition of Mr. Sabonadiere's Planting Manual is very *apropos* at a time when some authoritative statement relative to manuring seems to be desiderated. The new chapter added on this subject is as full as it can be. No dogmatic rule can be laid down that will apply generally; facts can be stated and recommendations made; but, beyond this, circumstances so vary that practical managers alone must decide what is best for each individual case.

Cattle-dung is the only fertiliser that can be universally applied with success.

All others must be guardedly used according to local circumstances, taking into consideration soil, climate, age, and condition of the trees.

Guano is rightly discarded, or nearly so, from the list of manures. To it can be attributed much of the disappointment of early manuring and many of the desolate fields one sees. It may be serviceable at great elevations in small quantities, but it is unsafe. At this time of day it should be needless to remark that the freer from weeds a property is, and all estates now being opened should be kept perfectly clean, the more benefit will the trees derive from manuring because they will not be robbed. When there are weeds, they should with prunings, leaves, &c., be collected and utilised by a system of compost depôts at distances that it will pay to carry all to. This would remove the objection so common that heavy composts can be applied only close to roads. In addition to weeds and prunings compost heaps can be formed wherever there is patna land, as in some districts and swamps. These must not be applied crude and sour, but after thorough manipulation and always with the addition of say half a pound of bones, or half that quantity of sombreorum or other highly concentrated preparations.

When patnas adjoin an estate it is customary to have cattle sheds at different points. When both estate and native cattle are housed, the natives will bring their cattle in considerable numbers for a small payment per head, thus one stone can be made to kill two birds, make valuable manure and alleviate cattle trespass. It is advisable always to put a small quantity of some artificial manure with all cattle-dung and composts; it makes them go further and improves the latter. The approved modes of application are different in new and old coffee; the first has not suffered from wash and is easy work. A hole to each tree is better than one to four, the semi-circular, nine inches by four, above the tree, or what I have seen answer remarkably well is a shallow hole all round the tree and close to the stem. In this mode of application great care is necessary that none of the large roots are cut. The manure, well mixed with soil is applied immediately over these. Manuring old coffee is as difficult work as new coffee is easy. In old washed places where tons upon tons of the soil have gone to fertilise Neptune's garden, and the trees stand out of the ground as boys grown out of their trowsers, it is not an easy matter to place the manure where the trees can get it. Where stones are plentiful it is a good plan, and not very expensive to build a small terrace to every tree, and then the manure well mixed, with the best soil procurable out of the holes usually dug for the manure above the trees, is shaken in among the roots and all well covered, the holes left open as an open trench, and the sediment collecting in them should be put round the tree every time they are cleared out. Where stones are not procurable the best must be done with the soil alone.

Much of the disappointment arising from manuring not realising expectations is caused first from the use of over-stimulants, and second, the trees being allowed to over-bear without further timely aid being afforded them. How often one hears the remark that such and such a manure put a splendid crop on that field, but did not ripen it. A manager knows when trees have more crop than they can ripen thoroughly exhausted, and it should be in his power to help them.

Thatching is good if it can be kept up, not otherwise, and I should rather advise that all vegetable substances be made into the compost and applied as recommended above.

Yours faithfully,

20th April, 1871. P. M.

COFFEE "LEAF DISEASE" AND BLIGHTED BERRIES.

A PLANTING correspondent in forwarding some diseased leaves from coffee bushes, says:—"You evidently want to know what the leaf disease is, I send you some specimens. You will notice the peculiar orange-coloured smut or powder in the leaves. It is pretty general, I believe. There is less of it on sheltered spots than on exposed portions of estates. It is to be seen in manured as well as unmanured coffee." Indirectly we have received the following further notice of the extent to which this apparently novel pest of the planter prevails:—"Enclosed I send you two leaves from a coffee estate in a good district and elevation. The superintendent calls it "leaf disease," and during the last fortnight about half the leaves have fallen from the coffee trees; he cannot account for it, neither have Mr.—— or Mr.—— (very experienced planters) seen anything of the sort before; it is found on young and old coffee, high and low, what has been manured and what has not; the only thing observed is that coffee exposed to the N. E. has suffered most. There was some of this disease last year but not much, and the fear is that it will affect the blossom. Can you give me any reason for this withering, and is there any remedy that you can suggest? It looks like fungus."

A Happootella planter writes:—"What can you make of the enclosed parchment coffee, can you see anything wrong with it? It has never gone through a pulper, and can't be 'pulper damaged.' At least 10 per cent of the parchment of my present pickings is as black as the sample sent you, and the cherry looks as if it contained beans worth 80s. a cwt. In washing it passes along with the good parchment and is not distinguishable from it when dried, unless it be peeled, when you find nothing but *rottenness*. I hope it is *frost* and not disease; there was a little of it last year but nothing to speak of, but really ten per cent is too much of a good thing to be passed over without enquiry into the case. Perhaps some one of your readers can explain it. The estates near are affected in the same way."

Still another, Madoolsceema planter, reports:—"I take the liberty of sending you a small parcel of blighted coffee and of asking you from your knowledge of the cause of the disease. It is about 12 years ago since I first became acquainted with it down on the Rangalla estate, where it was considered *bad* at 3 and 4; here I have it in this morning's washing 18 per cent. I can't account for it otherwise than that there is too much coffee on the trees for them to carry off well as the field from which this came is bearing heavily and the trees do not look very vigorous."

The following explanation in respect of the "leaf disease" appeared in the *Observer* of 23rd May last, but was overlooked by us when we inquired on the subject lately:—"We have been favored with a copy of the *Gardener's Chronicle*, in which the following contribution of interest to Ceylon planters appears:—

"We have recently received from our excellent friend, Mr. Thwaites, a specimen of a minute *fungus* which has caused some consternation amongst the coffee planters in Ceylon, in consequence of the rapid progress it seems to be making amongst the coffee plants. A few trees were noticed to be infected in May last, and at the same time of Mr. Thwaites' communication (July 21) two or three acres were showing the *fungus* upon the leaves. These latter fell off before their proper time, and fears are entertained as to the effect on the amount of the crop.

"The most curious circumstance is that amongst more than a thousand species of *fungi* received from Ceylon this does not occur, and that it is not only quite new, but with difficulty referable to any recognized section of *fungi*. Indeed, it seems just intermediate between true mould and Uredos, allied on the one hand to Trichobasis, and on the other to Rinotrichum. Though the *fungus* is developed from the parenchym of the leaf, there is not any covering to the little heaps such as is so obvious in Uredo and its immediate allies, while the mode of attachment reminds one of Rhinotrichum; we are obliged therefore to propose a new genus for its reception.*

"As the *fungus* is confined to the under surface of the leaves and the mycenium is not superficial, it may be difficult to apply a remedy; but we should be inclined to try sulphur by means of one of the instruments which are used in the hop grounds in Kent, or syringing with one of the sulphurous solutions which have been recommended for the extirpation of the hop mildew.—*M. J. B.*" [Rev. M. J. Berkeley.—ED. *C. O.*]

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* Hamiloia, Berk, and Broome: sori somewhat circinating hypophyllous, naked; flocci distinct, inarticulate, flexuous spores somewhat kidney-shaped, at first smooth, then granulate verrucose on the side, attached obliquely at the base by a little papilaform point Hemileia vastatrix, Berk and Br., forming little white orbicular patches on the under side of the leaves, consisting of minute tufts of flexuous threads surmounted by a single subreniform spore attached obliquely at the base, rough externally with wart-like papillæ, quite smooth on the side nearest the flocci.—The upper portion of the leaf above the patches looks as if it were burnt. Our figure represents a group of threads with young immature spores highly magnified, together with one of the tufts as seen from above, and spores in different positions.

"Having referred the paper to the most competent authority in Ceylon (who, we are glad to be able to announce, is preparing a second edition of his 'Enemies of the Coffee Tree' for the press), we have been favoured with some off-hand but very interesting information on this and kindred subjects. Our correspondent writes:

"Thank you very much for sending me the number of the *Gardener's Chronicle* containing a notice of another kind of *fungus* attacking the coffee tree. I knew it very well and had made a note of it for the second edition of my 'Enemies of the Coffee Tree.' However, I did not know that it had been sent home and noticed by botanists there, and I am for this reason glad that you have sent me the description. We have not got the *fungus* here, but it has been mentioned to me as doing much damage in Hewahetta, and odd to say, only a few days before you sent me the *Chronicle* I received a long letter on the subject from Ouvah, where it seems to do much harm. As old pests (the bug) get out of date, new ones seem to appear; what shall we have next? People who write about these things always want to know a *remedy*, but that is difficult to prescribe; what is said in the *Gardener's Chronicle* on this subject is, of course, not applicable on a large scale."

It will be observed that Messrs. Berkeley and Broome write of the coffee leaf *fungus* as "white orbicular patches on the under side of the leaves," whilst our correspondents allude to the one on the leaves they send as a rust-colored powder. In glancing over the under surface of one of the leaves before us, and which was nearly all covered by a rust-colored *fungus*, we observed two patches nearly white, and whilst forgetting what we before quoted, we told one of our correspondents that we considered these white spots the matured state of the *fungus*. We believe it will be found on examination that this rust-colored *fungus* and the one already described are the same species. At the recommendation of a correspondent, one of the gentlemen interested in this subject has sent specimens to Mr. Thwaites, Director of the Royal Gardens, Peradenia, who will be able to give a decided opinion on the subject and also suggest a cure if there be any. Another correspondent informs us that so far back as 1867 he collected some leaves from a coffee estate at Kallibokka which he believes were affected by this *fungus*. The burnt-like appearance of the upper sides of the leaves opposite the parts affected by the *fungus* are to be seen distinctly on all the leaves sent to us on the present occasion. From the glance we have given to the diseased berries sent us by the aid of a common lens, we do not observe the appearance of any *fungus* on them, and we feel inclined to ascribe their want of maturity to some other cause, possibly to that suggested by the Madoolsema planter; but we must make further inquiries before arriving at a more definite conclusion on this point.

ENEMIES OF COFFEE.

This is just the season with short crops, early despatch, small receipts, heavy balances against the estates and not overmuch to do for carters or coolies, to bring to light all manner of bugbears with reference to coffee cultivation and to lead to the discovery of very many extraordinary and deadly enemies. We have already, as our columns will testify, had a full share brought under our attention. Grub, diseased berries, and leaf fungi are all being discussed; but fortunately, the publication of the opinions of Mr. Thwaites, the able and learned Director of the Peradenia Gardens, and of Mr. Nietner, the greatest practical authority on the subject, will probably have the effect of quieting a good deal of needless alarm with respect to the berries and leaves, although all admit that the grub is a more serious evil. Here is Mr. Nietner's reply to our application for information:—

"I am in receipt of yours of the 2nd ultimo enclosing blighted coffee berries and leaves. As to the former, almost every planter I should think would say that they had been damaged during the process of curing; but if this has *really* not been the case, I should say that they have been stung by the bug *(Strachia)* referred to in my pamphlet on the "Enemies of the Coffee-tree," page 18, which see Extract referred to:—'6 *Strachia Geometrica*—This is a bug but of a different description from the brown and white bug, to which it bears but little resemblance. It is oblong-oval, argulated, plump, 5-16ths long by 3-16ths wide, of yellowish color, marbled on the upper side with grey and orange. It is allied to the so-called green or fœtid bug. Mr. Alexander Brown received this insect from Badulla and kindly forwarded it to me. It feeds upon the juice of the young berries, three per cent. or more of which were said to have been damaged from this cause. This is the only instance of coffee suffering from this insect that has come under my notice. However, allied forms are found both here and in Europe, doing sometimes considerable damage to vegetables by destroying the buds. There is no fear of the insect ever becoming a *serious* nuisance on coffee plantations.' If this should not be the case either, I have nothing to add to what appears from Mr. Thwaites on this subject in the *Observer* of the 2nd ultimo. Regarding the fungus which causes the "leaf disease," I have also nothing new to say. I believe it is to be met with on all estates in the Island; however, I have never seen it do any *serious* damage, and feel inclined to doubt that it ever does; the trees seem to get a sort of wintering through it and then recover. Somebody writing about "white grub" in your paper a short time ago, said that it only attacked dead trees: he is wrong, it kills the trees."

GRUB AS A COFFEE PEST.

(To the Editor of the "Ceylon Observer.")

Dear Sir,—In reference to the letter upon "Grub on Coffee Estates" signed —— which appeared in a late issue of the *Observer*, I am sorry to say I have to my cost observed the same fell scourge at work, and always among the best coffee, bad luck to it! It has been suggested that it is owing to marshy ground; no such thing, for it occurs invariably in the richest, fattest, and most porous soil. And, as —— well observes, your coffee adjoining, but untouched as yet, is all that could be wished to gladden the eye and cheer the heart of the planter; he comes round again and lo! what a change is there. Trees which he lately admired as model bushes, blasted, and hastening to decay, even already in the sear and yellow leaf. I pass over the other conditions or assumptions, that grub is caused by climate, wind, wash, &c., as almost unworthy of consideration. My firm opinion (though I should not like to dogmatize upon the point) being that grub is caused through excess of decaying vegetable matter, and hence it is most abundant in the fattest ground. I very much regret being unable to offer a remedy, probably soot or coal tar, might have the effect of killing the vermin, but then the difficulty is to know when to begin since it is the best-looking coffee generally that is taken! But, unless I am greatly mistaken, the grub is an insect in a transition state, probably hatched above ground, in which case the most likely way to get rid of it would be to destroy the eggs. Has any of your readers possessing a turn for science seen the eggs or ascertained where and how they are hatched? Such in my humble opinion is the direction enquiry ought to take with a view to the extirpation of this most destructive pest. Hoping this will elicit further light upon the subject, in which I am, like many more,

Deeply Interested.

Ouvah, Feb. 21st, 1871.

P. S.—Coffee on marshy soil dies out from totally other causes well known to every observer: never from grub.

[We cannot doubt that carbolic acid, properly applied, will prove fatal to grub, without injuring the vegetation—Ed. *C. O.*]

A NEW WEED.

Some time ago a planter in the neighbourhood of Newera Elliya called at our office with a few bits of a composite plant which he said was spreading rapidly about Hackgalla, and was becoming a more troublesome weed on coffee estates than the goat weed, at the same time expressing a strong belief that it was introduced to, and had spread from, the Hackgalla gardens. The following extract of a letter from the Director of the Royal Gardens, Peradenia, gives an account of this plant as far as its history in connection with Ceylon is at present known:—

"The composite you send me is a very troublesome weed at Hackgalla, just as much so as the *ageratum* or even more so as in hard ground the roots go deeper into the soil. It is the *Conyza angustifolia*, and was first sent me "from a pattana" near Hackgalla by the native conductor, Charles, who was in charge of the garden a year or two ago, before my brother commenced his superintendence. If not a native of Ceylon, I don't know how it got here. It occurs sparingly in this garden but we root it up as soon as it appears. The seeds would scarcely have been sent to me intentionally by any of my correspondents. In getting seeds from other tropical countries, we are liable to get seeds of their weeds intermixed with them. One good seed of this plant would soon furnish a stock of it for acres. I am sorry it is spreading in the neighbourhood of Newera Elliya as it will no doubt be soon all over our cultivated ground to keep company with the *ageratum*."

There is a full account of the *Conyza angustifolia* given in De Candolle's Prodromus, vol. 5. p. 383, where it is stated to be a native of India, but of what part, unknown. It is so like some of the blumeas and other composite plants which grow so commonly on the patnas, &c. of the higher ranges that we believe we are not far wrong, in expressing our belief that this weed is a true native of Ceylon, and that it is only of late the circumstances suiting its spread into coffee estates have occurred. A gentleman who passed through several of the coffee districts and who visited Newera Elliya and Hackgalla sent some seeds which he collected *en route* to the overseer of the Circular Walk in Colombo, and amongst the plants resulting from those seeds, we have now before us one of the *Conyza* in full flower. It is a long, lanky plant, about three feet in height, its stem being densely covered by very long linear leaves exceedingly like those of the common European ribwort the *Plantagol lanceolata*, but those of the *Conyza* have a few distant large serratures along their edges, and are long and narrow at each end. The flowering branches spring up from near the top of the plant and are about a foot long, covered for their whole length with smaller divisions which, in their turn, are surrounded by small green flowers, with white tips not unlike those of the common *ageratum*. The lowering branches are surrounded by awl-shaped leaves, varying from ½ to 2 inches in length. The stem and branches are covered by small longitudinal striæ or ribs, and the whole plant is covered with tomentum interspersed with long hairs. Notwithstanding the remarks of the Director of the Royal Gardens at Peradenia and the fears of our correspondent, we do not think, from the appearance of this plant, and the longer time which it will take to grow and produce flowers, that it will, with ordinary precaution, become a troublesome weed on coffee estates. The *Conyza Ægyptiaca*, a native of Egypt as its name implies, identical with the *C. semipinnatifida* and the *Erigeron hispidum* and *sublyratum*, native of various parts of India, is a native of the northern portion of Ceylon, and the *C. viscidula S. Wallichii* is a native of Ceylon, growing at an elevation of 1,000 to 3,000 feet, proving that if our new enemy is not a true native, it has members of the same genus common in Ceylon.

We perceive, that in his enumeration of Ceylon plants, Thwaites gives the *Ageratum conyzoides* as a true native, but we have on a

former occasion expressed our conviction that this worst of all weeds, the keeping down of which costs the Ceylon coffee planters more than £100 per annum, is not a real native, but has been introduced and has run over nearly all cultivated lands throughout the island. The strongest evidence against this plant being a native is the fact that the natives have no genuine name for it, the now common one *Hulan-tala* or wind basil is evidently a recently invented one, indicating that it is a plant sown by the wind.

The same correspondent informs us that when travelling with a companion from Newera Elliya to Hackgalla they came upon some tall rank plants of what our correspondent at once called the common European dock, growing as a weed near a European's house on the roadside, but which the said European insisted on calling a horse raddish until he was convinced to the contrary. This, and a score of other weeds, are now common enough about Newera Elliya, and we fear that all the laws of nature are in favor of their distribution once they are introduced.

DISEASED COFFEE BERRIES ON THE "WILSON BUNGALOW" ESTATES.

DEAR SIR,—Enclosed I send you three coffee leaves on which you will find several little red insects, which do injury to the coffee tree, for the trees on which they are found turn brown. First the leaves look as if dust had been blown on them and then the branches die from the top until the tree dies out. I have cut the top branches off but to no purpose. Under the branches and on the stem there is generally a red fungus which I had thought to be the disease until this week. I have had 18 or 20 trees die during the last 4 or 5 years in this way. It does not seem to spread fast; in two places I have had 4 and 5 trees die near to each other; the rest singly and generally on the dry ridges and slopes. I do not know if this enemy of the coffee trees exists in any other district, nor do I know of a remedy as yet, but hope to find out one, unless some of my brother planters or others can give me one. Though at present there are very few trees affected thus, yet who can tell to what extent it may spread; so I think if possible "a stitch in time may save nine."

I am glad to say that on the whole this valley is looking very well with fair prospects for next year; the autumn crop is over, and pruning and manuring are being pushed on; the spring crop on the lower parts is now coming in. Our great drawback of former years, "the black bug," seems to be disappearing by degrees, so we may hope for better times. The weather is about the same as we usually get in April, viz., showery. I shall feel greatly obliged by your giving this a corner in an early issue of your valuable paper.—Yours very truly,

W. J. C.

Ambawella Valley, 20th April, 1871.

ARTIFICIAL MANURES AND THEIR ANALYSIS.

DEAR SIR,—It is a pity that your correspondents do not write more frequently *upon manuring*, so as to give the public the benefits of as much practical experience as possible. Recently there have been letters in your paper, tending to show that although a considerable quantity of manure has been applied, or at least a proportionate amount of money expended, yet in return the crops gathered do not justify a belief that the manuring has *paid*. Unfortunately hardly anyone has any data to go upon as to the real qualities of the materials supplied to his trees, whether they are *what they ought to be* or merely *counterfeits*. It is generally believed that a strong smell denotes an equally powerful manure; or, in other words, the more offensive to the nose, the more beneficial to the coffee. This is entirely a mistake, for not only can the volatile properties of any substance be so settled as to smell no stronger than the soil of the field, but every kind of manurial aroma can be so imparted to the said soil of the fields, as to deceive (when slightly mixed with small quantities of manure material) anyone, unless subjected to a quantitative analysis. A very small quantity of organic matter in any substance will produce a far greater smell than should be perceptible in any really good and unfermented manure. This misapprehension as to what constitutes a valuable or worthless material, is the chief cause why artificial manures have in some instances in Ceylon proved a complete failure.

At home the usual practice is to have small quantities of all artificial manures analysed by a qualified man, whose position and known integrity places him beyond distrust. To meet expenses, and that they may not lie too heavily upon individuals, agricultural unions are formed, by which combined action reliable returns are obtained. It was said in Parliament that only five manufacturers throughout the United Kingdom could be depended upon, and a certain few wished for legislation to restrain the sale of unwarrantable stuff as manures. When artificial manure has been furnished by a manufacturer, and it has been discovered to be not according to guarantee, it remains at the option of the purchaser to take it at his own valuation, or return it at the expense of the vendor. To such an extent has dishonesty in this industry been carried, that dealers have not deemed it worth their while, in all instances, to take back rejected manures, preferring to leave it both uncared and unpaid for. It is more usual for decency's sake to remove it, when the buyer will not accept it at any price, and then come the questions:—What to do with it? Where to sell it? Simply this: *sell it where no questions are asked.* In Ceylon do we request a guarantee? Do we ask questions? Do we ever extract a small quantity and send it to be analysed? Are people who sell us manure, or rather send it out, allowing a commission on its sale, likely to be more honest than home dealers; or are there any of us here who can tell by appearance and smell, or any other means, whether a ton of stuff sent out as manure, is worth £10 or only the cost of landing it, not even the bags in which it is enclosed? These are all questions that should be answered before further expense is incurred in putting to one's coffee trees, what may not be as valuable as the earth of our ravines.

V. S. V.

THE COMMON BRACKEN (FERN) AS A MANURE FOR COFFEE.

(Communicated.)

THE following extract from Mr. Donaldson's British Agriculture refers to one of our most abundant ferns of the interior, which scarcely differs as a variety from the common bracken of Scotland, several times alluded to in the "Lady of the Lake." It is so abundant on some of the patnas and other open ground near some of the coffee estates in the interior, and indeed in other places as a weed in the coffee, that the hints here given for killing and converting it into a good manure may prove of use to several of our readers. When speaking to a gentleman in Dolosbagie about the means of killing this fern, he informed us that the villagers gravely told him the best way to do so was by thrashing it with switches: just as good a way as any other, because the plant ultimately dies like any other if its fronds are thrashed to death or cut off. The creeping roots die in this case for want of their lungs; but we believe the best way after all to get rid of it, if once it gets into a coffee estate, is to dig up the creeping roots (rhizomes) and expose them on the surface or have them removed. A few cuttings of the young fronds close to the ground would no doubt also soon kill this fern:—

"FERN"—*farn kraut*, German—*fearn*, Saxon—*filices*, Latin—is a plant of the cryptogamous class, and though the kind is numerous, only one vegetable comes under the notice of agriculture, the "*pteris aquilina*" of botany, or the common brake. It grows on soils of good quality, and is very generally diffused over heaths and uncultivated grounds. The roots spread horizontally and go deeply into the ground, and are often difficult of extirpation—frequent mowing of the young plants, and ploughing and dunging have been recommended, and above all, the pouring of urine upon them—sheep folded on fern ground will banish them by means of the dung and urine. Fern has a salt, mucilaginous taste, and is used for thatch, for heating ovens, and mixing with bread, and for being brewed into ale. It is very astringent, and used in preparing kid and chamois leather. The ashes of ferns afford a large quantity of salt, about one-ninth of their weight, chiefly the sulphate and sub-carbonate of potash. One thousand parts of the plant cut in August, and thoroughly dried, afforded 36·46 of ashes, which yielded by lixiviation 4·5 of salt. 1,000 parts of fern gave 116 lbs. of saline matter, and 100 parts gave 3·224 of earths, 4·00781 of ashes, and 0·6259 of potash: 10,000 parts contain 62 of potash. Ferns are dried for being used as litter for cattle, and must be laid in the bottoms of the yards and in very moist places, as they remain long unchanged. The organization must be completely saturated. The ashes are a good top dressing. The plants must be cut while green, as the alkali escapes from the withered plant by every shower that falls. Where ferns abound a good litter may be got from them, and the dried plants may be cut into lengths by the straw-cutting machines, which will much facilitate the reduction of the tough fibrous texture.—*Ceylon Observer.*

WHAT IS A WEED?

A PLANTING correspondent writes:—"I enclose an article clipped from the *Melbourne Leader* of the 25th March, on "What is a Weed," which I think those of our coffee cultivators who are constantly in the habit of *bagging* their weeds (under pretence of eradicating them) will do well to study."

WHAT IS A WEED?

We might lay before our readers a list of the names. (1.) Of weeds the seeds of which are found in samples of grain, and by their presence detract from its value both for seed and for milling purposes. (2.) Of weeds which infest fallow land and which it should be the object of the farmer to destroy when he subjects his land to the process of fallowing. (3.) Weeds which encumber the soil, but whose seeds, being small, do not find their way into the sample of corn. (4.) Those called underlings, which are similar in many respects to those in the third class. (5.) Weeds which infest pasture lands. All this we might do, as it has already been done, in works on agriculture. Nay, we might give long lists under each of these five heads, classifying the various so-called weeds as annuals, biennials, and perennials,

coupled with the common English and the uncommon botanical name of each; showing which are troublesome on account of their roots, or rather underground stems, and which are obnoxious on the score of their seeds. But if all this had been done we should not have advanced one step towards answering the question which forms the heading of this article. This question we have been led to ask, and shall endeavor to answer, from the perusal of a letter on the subject which will be found in our correspondence columns, signed "W. F." The production of weeds is part of the course imposed on the soil in consequence of man's first transgression; and curiously enough, it is the retribution that follows the wrong of exhaustion:—"Thorns also and thistles shall it bring forth to thee, and in the sweat of thy face shalt thou eat bread." Thus the production and destruction of weeds are both the result of wrong-doing - outraging the decrees of an all-wise Creator. Weeds have been held in great detestation by all true cultivators from the days of Job, the patient, upright farmer of Uz, who, on his farm, employed no fewer than 500 yoke of oxen. In his solemn protestation of the integrity with which he had fulfilled the several duties of life, and making the proper cultivation of his land the culminating point in this declaration, he says:—"If my land cry out against me, or the several furrows thereof likewise complain, let thistles grow instead of wheat, and noisome weeds instead of barley."

Having thus shown that a mere list of the names of so-called weeds would not help us to a solution of our question—that weeds are a consequence of the transgression on the part of man of nature's laws, and that conscientious and careful cultivators from the days of Job down to those of "W. F." have always held them in the utmost abhorrence, we now come to the question itself, "What is a weed?" When this question was put to an old farmer who was denouncing weeds in general, he indignantly replied, "A weed is a useless plant that robs the soil." But when it was pointed out to him that even the meanest plant that grows was not created in vain, he attempted to mend this definition, and doggedly asserted that a "weed, is a weed, and everyone knows what that is." It would appear, however, that "W. F." and one or two more from whom we have received communications on the same subject do not know. We may therefore state, for their information, that the true definition of a weed is "a plant out of place." This only is a weed. There are no weeds in Nature's universal farm. The crop of this year may become the weed of next. Anyone who has grown a crop of potatoes and sown the ground with wheat will have had an ocular proof of this statement. When a man is hoeing mangels, everything what is not a mangel is treated as a weed, and yet the hoer may be cropping down plants that constitute the crop in the next paddock or on some other portion of the farm. Weeds, then, bear no distinctive character as such, and plants only become weeds by the mere accident of position. The weed is treated as an enemy to the crop, but it is by no means such as regards the soil. Weeds, as we have before stated—and it is to this that "W. F." takes exception—do not impoverish the soil. Any plant, as we have shown, may become a weed, but no plant can impoverish the soil except by the aid of man. Carry off the land on which it has grown any crop produced, whether it be for the use of man or only a "noxious weed," and the land becomes impoverished. Leave the so-called weeds to decay on the ground where they were produced, and the land is enriched by the decaying substances. Weeds do not waste fertility, as far as the soil is concerned; they are only detrimental and injurious as regards the crop intended to be grown. Let it not, however, be supposed for one moment that weeds should be allowed to grow because they do not rob the soil of its fertility. It is enough that they rob the crop of the benefit to be derived from the fertilising matter intended for its support. Next in importance to the due and proper preparation of the land for any crop, is the sedulous destruction of all plants that may appear, except those sown or planted as the crop, and all plants not sown or planted must be treated as weeds because a weed is a plant out of place. The thistle is a weed on pasture land used by man for the depasturing of his flocks and herds; but in the wild waste by its growth and decay it yearly adds to the richness and fertility of the soil. Thus, all plants have their uses, and land, after it has been improvidently impoverished by man is taken possession of by inferior plants called weeds, which grow and exercise their utmost power to restore its lost fertility. But no cultivator who carefully manures his land can afford to grow a plant out of place, *i. e.*—a weed.

WEEDS.

SIR,—Among your notices to correspondents in *The Leader* of the 11th, I was a good deal surprised to read that weeds did not impoverish soil. It staggered my ideas a bit, for, ever since I was a boy, and used to spud up docks and thistles I have believed, as I was taught then, that weeds are bad everywhere, whether in a crop or out of one, and that they rob the soil I think there cannot be a doubt. In proof of what I say, weeds always take possession of poor land, and where they do, it is useless to try to grow any crop, and the land gets poorer and poorer. Now if the weeds did not impoverish it, what makes it poor? Then, if I manure a piece of land and there happens to be seeds of weeds in the manure, and if these weeds grow up, am I to think that they do not rob the land of the manure I had put into it? I can hardly think that you will say so, and yet I cannot tell what to make of your notice to your correspondent if it does not mean that. If I am wrong, I trust you will tell me so in your notices to correspondents.—I am, Sir, yours respectfully,

Sandhurst, 18th March. W. F.

THE MARKETS

CALCUTTA, 27th May.

INDIGO.—The London quarterly public sales concluded on the 16th instant: of the 12,000 chests which passed the hammer 6,800 sold at irregular prices, and, as compared with the quarterly sales in February last, the values ranged thus:—good qualities at par; common descriptions difficult of sale at 3*d.* to 6*d.* decline per lb.

Prospects of the growing crop are all that could be desired for the present, but a change for the worse may happen any day between this and August. Manufacturing is in progress throughout the Eastern Bengal districts, and so far everything is in favor of a good out-turn.

INDIAN TEA.—A very limited business has again to be reported owing to the small quantity of tea at present come to hand from the producing districts. Since the 17th instant only two public sales have taken place. On the 19th instant 323 chests and on the 24th instant 406 chests were offered, making a total of 729 packages, of which 267 were withdrawn for higher rates, the remainder finding buyers. The greater portion of the teas offered were a new season's growth, and met with good competition at rather improved rates. Further sales are advertised for next week, but no great quantity is at present likely to be offered

BENGAL SILK.—There is but little change to note since last mail, and few transactions have taken place Reports of the European, China, and Japan crops continue favourable,—a circumstance which influences even those buyers who believe in the probability of an improvement in the position of the article at home now that the disturbances in France appear by the latest telegrams likely to subside Producers, on the other hand, are firm holders with the exception of the owners of low and middling Native qualities, for which they continue willing sellers at a reduction of from four to eight annas per seer. It is reported from the northern districts that they have had excessive rain, which is likely to lessen their produce.—*Fontaine & Co.*

INDIGO.—Since the date of our last circular we have experienced very unusual weather; instead of the fierce dry heat that is generally characteristic of this month, scarcely a day has passed without one or more good falls of rain, which have been most favorable for the rapid growth of the plant, and the accounts from the various districts of *Lower Bengal*, as well as from *Tirhoot*, *Chumparun*, and *Chuprah*, are consequently very good; the plant is everywhere in a more advanced state than it generally is at this date, and if we are fortunate enough to escape any heavy gales or excessive rain, manufacturing will probably commence in another fortnight or three weeks. In *Eastern Bengal* the rivers are still too low to admit of the factories being at full work but the yield from the plant has somewhat improved. In the *Beauleah* promises and the *Doab* the *Khoon tea* are well reported on, and advantage has been taken of the late falls of rain to sow down a good deal of land that is generally left until the rainy season sets in about the middle of June.—*William Moran & Co.*

LONDON, 5th May

SILK.—The following is from the circular of Messrs. Hunt & King:—"There has been little animation in the silk market during the past month, and no recovery from the weakness and partial decline in prices mentioned on the 5th ult. Affairs in France have tended to restrict business as much as possible, while the present range of prices precludes buying except for actual requirements, in face of the approaching crops, the deliveries progress fairly. In China silk our quotations are nominally without alteration, the demand having been sufficient to absorb the moderate arrivals, and, except the very coarse and inferior sorts, all kinds are current. Canton silk goes but slowly, and the pressure of the large proportion of coarse sizes somewhat affects prices; Japan silk, special qualities excepted, is still out of favour, common Mybash is occasionally sold at a very low rate. From Shanghai the latest advices and telegrams report a very limited business, high prices, and reduced stock. The settlements for the season show a falling off of about 8,000 bales compared with 1869 and 1870. From Japan also a few hundred bales only had been settled at much above our present rates, and the settlements are below the average of the past six years 7,000 bales; stock, 3,000 bales. In Bengal silk there is no change. In European silk prices are nominal, with very little business."

COFFEE.—The parcels offered on Tuesday were large, and with a dull demand for grey kinds of colonial. Prices declined 1*s* per cwt Superior sorts were without change. 1,200 casks, 250 barrels, and 150 bags Plantat on Ceylon, all sold; fringe, &c., 43*s* to 54*s* 6*d*; grey, small to bold, 54*s* to 60*s* 6*d*; small to fine bold colouiy, 57*s* 6*d* to 86*s* 6*d*; peaberry, 70*s* 6*d* to 82*s* 6*d*; 10 casks and 700 bags East India, part sold, fine Mysore, 81 Native Mungerabad, 50*s* to 58*s*; Penang, 49*s* 6*d* to 5*s* 6*d*; 380 packages Mocha, chiefly sold: yellowish, 94*s* 6*d* to 9*s* 6*d*, long berry, 106*s* to 1 7*s*; 130 bags Natal sold at 52*s* 6*d* to 65*s*; peaberry, 71*s* 6*d* to 72*s* 6*d* 1,600 bags Rio sound bought in at 50*s* to 54*s*, damaged sold (300 bags) at 49*s* to 5*s* At public sale yesterday 430 casks, 20 barrels, and 170 bags Plantation Ceylon went off flatly; part was bought in, the remainder sold at prices in buyers' favour: small to bold grey, 53*s* to 6*s*; small to middling coloury, 57*s* to 60*s* 6*d*; peaberry, 75*s* to 80*s* 6*d*; 180 bags Singapore sold sea-damaged 50*s* to 52; 170 packages Jamaica all sold—pale to middling coloury, 52*s* to 76*s*; of 1,800 bags Guatemala one-third sold, pale to middling dull, 50*s* 6*d* to 64*s*; coloury, 67*s* 6*d* to 71*s*; 30 bags Honduras, 57*s*; 300 bags La Guayra part sold at 56*s* to 62*s* 6*d*; 320 bags Bahia, 48*s* 6*d* to 56*s* 6*d*; of 1,900 bags Rio, 300 bags sea-damaged, sold at 48*s* to 54*s*; and 700 bags washed at 54*s* to 61*s*; 190 bags of Santos, good 62*s* 6*d*; and privately, 80 barrels Mocha at 81*s*.

TEA.—A sale, comprising 17,703 packages, assorted as below, was held on Friday last. 12,111 packages were "without reserve." 7,000 packages passed, but nearly half the quantity consisted of congous printed with "reserve prices." In these no sales were effected. The teas sold were chiefly the lower grades of red and black leaf congous, with a few parcels of sittings; prices show some irregularity, but are on the whole in favor of buyers. Siftings and broken leaf realised 4¾*d.* to 7*d.* per lb.; inferior black leaf, 7¼*d.*; common, 9¾*d* per lb. An invoice of common green teas sold at very low rates. Packages offered:—Congou 8,708; scented caper, 892, oolong, 493; souchong, 1,317; scented orange Pekoe 1,762; twankay, 71; hyson twankay, 74; hyson, 238; young hyson, 1,665 Imperial, 200; gunpowder, 1,396; assam, 1; Japan, 5; Java, 19; sorts, 862—total, 17,703 packages. Public sales, comprising nearly 18,000 packages. China were commenced to-day. So far only about 7,000 have been gone through; of these 700, offered without reserve, found buyers at rather lower prices for broken leaf congou and common to fair descriptions of green. At the public sales of China on Tuesday, 7,000 packages passed auction, of which about one-half sold at irregular and lower prices. Yesterday 10,000 packages passed, about one-half of which were disposed of at prices generally in buyer's favor. The deliveries in London estimated for the week ended May 1 were 3,303,872 lbs., which is an increase of 891,603 lbs. compared with the previous statement.

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OPINIONS OF THE PRESS

No C

The Centenary number of the *Calcutta Review* which has just appeared exhibits a marked improvement upon its predecessors It is more than not only increased in bulk, but contains a larger variety of readable articles on subjects of general interest, European as well as Asiatic — *Friend of India* April 1870

No CI

From our advertisement columns it will be seen that an event important in the history of the *CALCUTTA REVIEW* has lately occurred In the first time since that serial was set on foot a second edition has been called for No CI is the notable number, and we hope that every succeeding number in the century will deserve the same popularity — *Pioneer, September* 1870

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THE CALCUTTA REVIEW

No 102, (NEW SERIES)

CONTENTS —Indian Legislation since the Mutiny —The Future Peerage of India —Woman —The Nicobar Islands Serpent Worship —Topography of the Mogul Empire in the sixteenth and Seventeenth Centuries —Education in Bengal —Wahabis in India, No III —Critical Notices, &c

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Calcutta 1st February, 1871 Agent.

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Bombay Agency

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Bombay 1st October 1870.

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On Government Bills	6 per cent.
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INTEREST	
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THE undersigned will from the 1st February 1870, reduce his Commission from 5 to 2½ per cent for all orders to be executed via the Suez Canal.

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For landing, clearing, and forwarding Goods from Calcutta over 50 cases 8d. a case; of over 20 cases, 1s each

No 478

FORT WILLIAM

HOME DEPARTMENT —PUBLIC

The 26th January 1871

NOTIFICATION.

THE Governor General in Council is pleased to direct the publication of the following advertisement in substitution of the one published under Notification No 145, dated 11th January 1870 —

ADVERTISEMENT

The Government of India, after communication with various Agricultural and Horticultural Societies in India, and with persons interested in the subject has arrived at the conclusion that the only real obstacle to the development of an extensive trade in the fibre of Rhea or China-grass is the want of suitable machinery for separating the fibre and bark from the stem and the fibre from the bark, the cost of effecting such separation by manual labour being great

2 The demand for the fibre is now large, and, no doubt, might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown

3. The requirements of the case appear to be some machinery or process capable of producing with the aid of animal, water, or steam power, a ton of fibre of a quality which shall average in value not less than £10 per ton in the English market, at a total cost, all processes of manufacture and allowance of wear and tear included, of not more than £15 per ton The said processes are to be understood to include all the operations performed, after the cutting and transport of the plant to the place of manufacture to the completion of the manufacture of fibre of the quality above described The machinery must be simple, strong, durable, and cheap, and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation

4 To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offers a prize of £5,000 for the machine and process that best fulfils all the requirements named above

5. Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named

6 Owing to the delay that has taken place in maturing the preliminary arrangements, the Government of India has decided that the competition will not be held until the 1st April 1872, thus affording a much longer time than was originally intended for the preparation of machines and their transport to the locality appointed for the competition. The Government Rhea Plantation at Saharunpore, in the North-Western Provinces, has been fixed as the place where the public competition will be held, and the Government of India will provide one or more small steam-engines to work the machines during the public competition

7 All machinery, &c, intended for trial must be brought by the competitors, at their own charge, to the Saharunpore Rhea Plantation, and kept ready before the 1st April 1872, to be there worked under their own supervision, or under that of their representatives, for a sufficient length of time to enable the judges appointed by Government to determine whether all the conditions named have been complied with The prize machine is to be transferred to Government at five per cent above cost price, the patent right in any such machine to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of five per cent on the cost price of all machines manufactured under the patent during its currency

8 Arrangements have now been completed for the supply of dried Rhea stems to intending competitors, both in this country and in Europe, to enable them to form a correct idea of the nature of the plant which their machinery will be required to deal with Persons in Europe desirous to obtain small supplies of dried Rhea stems for the above purpose, should apply to the Secretary of State for India Intending competitors in this country, desirous of obtaining supplies of the article, must submit applications to the Secretary to the Government of India in the Home Department, in the Form A hereto annexed, prior to the 1st of March 1871, and those who are desirous of testing their machinery on the fresh Rhea at the Government Rhea Plantation at Saharunpore during the year 1871 must submit their applications to the same authority in the Form B. hereto annexed, prior to the 1st April 1871 The former will have to pay the expenses that may be incurred in packing and despatching the stems The latter will have to provide all labour and motive power necessary for, and to pay all expenses connected with, their experiments the fibre turned out by their machines during such experiments to become the property of Government

9 In order to enable the Government to arrange for the provision of a sufficient stock of fresh Rhea stems for the purposes of the formal competition in April 1872, it is necessary to ascertain beforehand the number of machines that are likely to take part in it, and intending competitors are, therefore, requested to submit, prior to the 1st May 1871, and in the Form C, also hereto annexed, notices of intention to compete

FORM A

APPLICATION FOR DRIED STEMS OF THE RHEA

To the Secretary to the Govt of India, Home Department.

Name of applicant	Profession or occupation	Address in full	Quantity of dried stems applied for	Locality to which it is desired that the stems be transmitted.	Name of nearest Railway station to locality entered in preceding column.

On hearing from the Superintendent of the Government Rhea Plantation, Saharunpore, the amount of the expenses to be incurred in packing and despatching the quantity of stems above applied for, or such lesser quantity as may be allotted to me, as also the cost of carriage of such quantity to *(here insert the locality to which it is desired that the stems be forwarded)* or to the nearest Railway Station, I promise to remit the total amount so required to the said officer, and I acknowledge that the packing and transmission of such stems will be entirely at my risk

(Date) *(Name in full.)*

(Place)

FORM B

Application for Permission to take Preliminary Experiments for testing machinery at the Government Rhea Plantation, Saharunpore.

To the Secretary to the Govt of India, Home Department

Name of applicant	Profession or occupation	Address in full	Brief description of machinery proposed to be tested	Date on which applicant if permitted, proposes to commence testing his machinery.	Approximate amount of green stem which applicant expects will be necessary for testing the machinery.

I acknowledge that, if permission be granted to me to test the above described machinery at the Government Plantation, such permission will be subject to the following conditions —

1st I am to provide all labour and motive power necessary for, and to pay all expenses connected with, testing my machinery

2nd I am bound to conform to such rules in regard to time and place of conducting my experiments, hours of working, and the like, as the Superintendent of the Plantation may lay down for my guidance

3rd —I shall receive only such quantities of green stem, and at such time or times as, with reference to the other claims upon him, the Superintendent may find convenient to allot me

4th All fibre, &c, turned out by my machines during these experiments with stems furnished by Government will be the property of Government.

(Date) *(Name in full.)*

(Place)

FORM C

Notice of machinery intended to compete for the Government Rhea machinery prizes at the trials to be held at Saharunpore in April 1872, and subsequent months.

Parties intending to Compete						
Name in full	Profession or occupation	Residence in full	Number of different kinds of machines which competitor desires to take part in the trials	Brief description of each kind of machine	Motive power required to work the machine.	Date by which the machines will be ready at Saharunpore for trial

In proposing to enter the above-noted machinery for the Saharunpore competitive trials, I do so under the full understanding that

1st —I shall be bound to conform to all rules and regulations in regard to all matters in any way connected with these trials that may be laid down by Government, or by the judges appointed by Government to preside over these, and that, failing to do so, I shall forfeit all claim to any prize, reward, or recompense from Government, and entirely disqualify my machinery for the competition

2nd All fibre, &c, turned out by my machinery during the trials with stems furnished by Government will be the property of Government

(Date) *(Name in full)*

(Place)

Offg. Secty. to the Govt. of India.

Printed for the Proprietor at the *Perseverance Printing Press*, Bombay.—Published by Messrs. WYMAN & Co., Calcutta—15*th June* 1871.

THE

SUPPLEMENT TO THE
"INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, SATURDAY, 21ST OCTOBER 1871. [No. 3.

Advertisements.

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Flat Valises in every make.
Overland Trunks in all sizes
Leather Hat Cases, round and square
Square mouth Leather Bags.
Japan Uniform Cases in all sizes.
Railway Trunks of every make
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Hats and Caps of every description.
Silk and Wool shirts in all sizes.
Stout Flannel shirts, new patterns.
Warm Flannel sleeping suits.
New Algoa Sleeping suits.
Lambs' Wool Undershirts
Warm Merino Undershirts.
Lambs' Wool Drawers (long and short.)
Warm Merino Drawers (long and short)
India Gauze Undershirts.
India Gauze Drawers (long and short)
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Boots, shoes, and slippers, in every make.
Wool Mufflers and scarves.
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Llama Jackets & Garibaldis in great variety.
Berlin Wool Vests, in all styles.
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Tooth and Violet powder
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Wincey and Mohair Frocks.
Under-clothing in all sizes.
Fancy Merino Hose in every size.
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Fancy Merino Socks in every style.
White Merino Socks in all sizes.
White Cotton Socks in every make.
Striped Merino and Cotton Socks.
Knickerbocker suits for Boys.
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Trimmed Hats in all styles.
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Berlin Wool Vests in all sizes.
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3 Flannel Shirts.	1 Railway Portmanteau.
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HOSIERY—	Fine Merino Half Hose, per doz	16	0
	Fine Super Merino	16	0
	Knickerbockers, Ribbed, per pair	4	0
HOSIERY—	Fine Merino Under-Vests, ½ dozen for	20	0
	Fine Super India Gauze	20	0
SHIRTS—	Badham's India Cloth, six for	30	0
	Badham's Silk and Wool, six for	50	0
	Badham's Pure all Wool, six for	18	0
	Badham's French Cambric, six for	25	0
COLLARS—	Shakespeare, per doz	5	8
	Dux, per doz	5	8
	West End, per doz	5	8
	Pall Mall, per doz	5	8
HATS.	Black Felt Ists	6	0
	Black Felt Worthing	5	12
	Black Felt Derby	6	0
	Black Felt Cantab.	6	0
	Drab Felt Cantab	5	12
SCARFS.	Duke of Edinburgh	2	12
	The Campbell Bow	1	4
	The Windsors	2	8
	The Roman "Satin"	2	12
HANDKERCHIEFS.	Fine White Cambric, Hemmed, per doz	5	0
	Fine White Cambric, Hemmed, Coloured Borders	5	0
	Fine Irish Cambric	10	0

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TERMS which are moderate, and inclusive with lists of successful pupils, on application.

[PUBLISHED MONTHLY AT BOMBAY.]
The Masonic Record of Western India.

The objects of this Journal will be to chronicle the passing events in the Masonic world, to record the Proceedings of the different Lodges and Chapters in Western India, to give an impetus to the extension of the Order, to advocate the Cause of Masonic Charity, to encourage usefulness, impart instruction, and in every way promote the interests of the Fraternity.

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EDITORIAL.

THERE are some vacancies on the Staff of Contributors to the *Madras Mail*. Gentlemen possessed of the requisite ability who are desirous of discussing current topics from a liberal and independent standpoint, are solicited to place themselves in confidential communication with the Editor, from whom all information can be obtained as to the requirements and honorarium of this Journal.

Madras, 7th June 1871.

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The *Jurist* is very neatly got up and printed, and the price is so moderate as to bring it within the reach of everybody interested in legal matters. We are sure that it only requires to be known in order to command the same success in Bengal that it has already deservedly attained in Madras and Bombay.—*Calcutta Review*, April 1870.

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AGENTS.
THACKER, SPINK & Co., Calcutta.
THACKER, VINING & Co., Bombay.
CALEB FOSTER, FOSTER-PRESS, Madras.

* The P. C. Judgment, in the January *Jurist* 1870, was only one month old.

THE OBSERVER,
A WEEKLY NEWSPAPER AND REVIEW,
(Published every Saturday in Calcutta.)

OPINIONS OF THE PRESS.

If the liberal spirit and the thoughtful and scholarly style which mark it throughout are sustained hereafter, it is destined to occupy a high position among Anglo-Indian Journals.—*Englishman, February* 6.

There is clear purpose, special knowledge, and literary skill visible in its articles.—*Pioneer, Feb* 14

It is well written, well arranged, well edited and well printed.—*Lucknow Time, Feb* 8

The articles are ably written, the tone moderate, and it is altogether an acquisition to the Indian Press. *Mofussilite, Feb.* 9

In print and style it is superior to any other Indian paper, and its articles are of the highest class.—*Indian Church Gazette, Feb.* 11

The favourable critiques that have appeared in different papers, fully bear out our own opinion respecting this neatly-printed and ably-edited hebdomadal.—*Bengal Law, Feb.* 15.

The project of a master-mind, and the offspring of a master-hand.—*The Progress, Feb* 10

It promises to be one of the best conducted Indian weeklies.—*Hindoo Patriot, Feb* 6

Indeed, the paper bids fair to be a first class journal, and as such we wish it all success. *The Bengallee, Feb* 11.

We wish the *Observer* every success, and trust he may have many readers.—*Rangoon Mail, Feb* 18.

It is very well got up and compares favorably with any of the Indian weeklies we have seen.—*Penang Argus, Feb.* 12.

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CALCUTTA REVIEW.
(The only Quarterly Review in India.)

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To the Editor of the "Times of India."

DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India, I must ask you to correct an error which appears in your notice, if it has not already been corrected. I did not serve in Affghanistan. The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother, now Brigadier-General Edward Kaye, C. B., who thus commenced a long career of good military service. The best service which I ever rendered *to* India, or indeed *to* India, was the establishment, single-handed, of the *Calcutta Review*, which has done far more for Indian literature than anything I have written under my own name. In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours; and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave. I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and general subjects, have given us valuable articles on the army. Some from the pen of Sir Henry Lawrence, who wrote with the spirit of prophecy of the coming storm of which he was one of the noblest victims.—*Address of His Excellency the Commander-in-Chief, at a meeting held on the 18th May 1871, at the United Service Institution of India, Simla.*

Price per No... ....Rs. 5 | Price per Annum in advance with Postage Rs. 17.

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, SATURDAY, 21ST OCTOBER 1871. [No. 3.

Agricultural Gazette of India.

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ANSWERS TO CORRESPONDENTS.

"We intend to start a Farm to supply the wants of a large Cantonment, will you kindly give us your advice:— first,

"What area should we occupy?

One hundred acres of good loamy soil, one-fourth of this area, or about 25 acres to be "wet land." You should at the same time arrange that you may get 30 or 40 acres of the adjoining land should it eventually become necessary to extend your farm.

"What Capital would be needed?

About 7,000 rupees, to be expended in the following manner:—

Permanent Improvements.

	Rs.	A.	P.	Rs.	A.	P.
Levelling, Fencing, Road making, &c.	1,500	0	0			
a—Buildings	2,000	0	0			
				3,500	0	0

Tenant's Capital.

b—Working Cattle 20	600	0	0			
Feeding Cattle 25	300	0	0			
Sheep 100	200	0	0			
Pigs and Poultry	150	0	0			
Implements and Carts	600	0	0			
c—6 Months' Labour Bill	800	0	0			
d—6 Months' Food for Stock	500	0	0			
Manure	200	0	0			
6 Months' Rent	75	0	0			
Contingencies	75	0	0			
				3,500	0	0
				7,000	0	0

"What will be the gross annual expenditure?"

	Rs.	A.	P.	Rs.	A.	P.
Interest on Permanent Improvements, at 7½ per Cent	262	8	0			
Interest on Tenant's Capital at 5 per cent	175	0	0			
Rent	150	0	0			
Labour, &c.	1,600	0	0			
Food for stock	800	0	0			
Seed, manure, and contingencies	312	8	0			
				3,300	0	0

"Will such a Farm pay?"

Yes, if conducted like any other business, on sound commercial principles.

(a.)—These will consist of a Cottage for the Overseer containing 3 rooms, the necessary out-offices, &c.; Cattle shed containing 40 loose boxes; Sheep shed, Pig styes, Granary, Tool store, Poultry house, Cart shed, &c.
(b.)—Probably after the second year, a less number will suffice.
(c.)—This includes an allowance of Rs. 50 monthly for an Overseer.
(d.)—As you must purchase nearly all the food you need at first starting, this item is perhaps heavier than it need afterwards be.

I wish to grow yellow Cholum (Holcus Sorghum) as a fodder crop. At what stage in its growth should I cut it? And how many crops of fodder will one sowing yield?

Cut it just before the flower appears, or what is better, when about ⅓rds grown. If you cultivate between the rows, and can occasionally water it, you may get 6 cuttings during the season, giving a total yield of about 25 tons per acre, but this greatly depends on your soil and manure. Under dry cultivation you may expect 3 cuttings at least in the season. It is best to sow with the rains.

Last season I put down yellow Cholum for fodder: I obtained two good cuttings when the rains commenced, when contrary to my natural expectation, the crop entirely failed; how do you account for this?

The explanation is very simple, you cut through the thick tubular stem of the cholum, thus forming a verticle tube in which the rain water collected, and this water remaining for some time gradually rotted the stalks and killed the plants.

I wish to sow some cotton seed, is it necessary that I should confine my sowings to black soil.

Certainly not; if you can get plenty of manure, almost any soil will yield a fair crop of cotton. We noticed in the Report of the Madras Experimental Farm that a soil containing as much as 90 per cent. of sand yielded, last season, 120 pounds of clean cotton per acre, while the average of the Madras Presidency is only 70 pounds; but unless you can get manure, you had better confine your sowings to the black soils

---

When would you sow Carolina Paddy seed?—Would you transplant or sow broad-cast? In either case, what seed is needed? How long would it be before the crop was ready for harvesting? What is fair yield of straw and grain?

We must answer you briefly, as you do not mention where your land is situated; we answer, generally sow at the time when it is customary to sow country paddy in your district. You must decide for yourself whether to sow broad-cast, or to transplant; as a rule, it is less costly to sow broad-cast, but broad-cast crops are irregular and are always longer on the ground. We prefer to transplant. For broad-cast sowing you will require about 45 pounds of seed per acre; for transplanting about 25 pounds of seed per acre. A broad-cast crop would require at the least 5 months to reach maturity. A transplanted crop would be ready for the sickle 4 months after planting. A fair yield is about 3,000 pounds of grain and 5,000 pounds of straw per acre.

I have a fat bullock that weighs 400 pounds, if I kill him, what weight of beef may I expect?

Assuming that the bullock is in good condition, and that the weight you mention is its gross live weight, you may expect to get about 164 pounds of good marketable beef.

What is a fair daily allowance of food for a pair of working cattle?

5 Pounds of grain (maize, cholum, gram, cumboo, &c.)
5 Pounds of oil cake.
80 Pounds of straw (maize, cholum, gram, cumboo, paddy, &c.)

LETTERS TO THE EDITOR.

To R. Knight, Esq.,

Editor Agricultural Gazette of India.

Sir,—Might you not press upon the notice of Government, the propriety of their sending you Returns concerning the agriculture of every district of India similar to those you have just published from Berar. You might possibly induce them to direct the undertaking of such experiments in *every* district: the results to be annually made public, in one prescribed form, and attached as an appendix to the annual Administration Reports when it would be available to all.

In addition to what has been given in the Berar returns, columns, should be added, showing the rental paid for the land experimented on, and the costs of cultivation: (1) Ploughing, (2) Harrowing, (3) Sowing (4) Weeding, (5) Draining, and any other, &c. With such data available, deductions of some value would be possible.—Believe, &c.

X. Y. Z

THE MASTER'S EYE MAKES THE HORSE FAT.

To the Editor of the

Agricultural Gazette of India.

DEAR SIR,—I send you a specimen Report of a Coffee Company, Limited, in which I have an interest, in the hope that you will be able either yourself and by some of your correspondents, to show up the extravagance of the working expenses in the hands of an Agent which preclude the possibility of any dividend. You will suppress the name of the estate of course, and all matters and references indicating the locality or parties concerned. No imputation is implied. The system must be exposed, which brings Companies to grief. I have no hesitation in saying that the estate has been systematically done, and that the proprietors have not had "*th[illegible]kings* except, perhaps, for one or two years of late." No very reliable data have ever yet been given as to the ordinary cost, including management, weeding, pruning, and handling, *per acre*, and curing, pulping, garbling, and all the expenses *per ton* of getting in a crop. Some approximate estimate is much wanted, and as you are devoting the columns of the *Agricultural Gazette* to an analysis of the industrial resources of India, I trust that the large subjects of the management and economical working of coffee estates may find a trustworthy exponent of first principles under you auspices. —I am, dear Sir, yours faithfully.

A VICTIM OF AGENCY.

Dr. The Balance Sheet of the "SHUCK" COFFEE COMPANY, (Limited), *made up to 1st April* 1867.

CAPITAL AND LIABILITIES.

Capital.	Rs.	A.	P.	Rs.	A.	P.
Due to the Shareholders on 2000 shares of Rs. 50 each				1,00,000	0	0
Debts and Liabilities of the Company.						
For balance of advances	8,480	0	0			
Due to Messrs. D'Souza and Co. for garbling crop and other charges	2,109	7	8			
Due to the Jackals on the Estate	303	0	0			
				10,892	7	8
Total...				1,10,892	7	8

I hereby certify, to the best of my belief, that the above contains a true account of the Capital and Liabilities, and of the Property and Assets of the "Shuck" Coffee Company (Limited), as the same stood on the 1st April 1867.

T. NEWMAN, *Auditor.*

Cr. PROPERTY AND ASSETS.

Block.	Rs.	A.	P.	Rs.	A.	P.
Cost of the Block of the Estate				82,200	0	0
Crop 1866-67.						
Estimated value of the season's crop on 100 acres 33 tons, at Rs. 540 per ton	18,481	7	0			
Less Advances obtained upon it	8,038	1	0			
				10,443	8	0
Debts owing to the Company.						
Advances made at the Estate				620	12	0
Cash.						
In hand				836	4	0
Profit and Loss.						
Balance at debit thereof being losses for few years				16,791	14	11
Total..				1,10,892	7	8

We do hereby certify, to the best of our belief, that the above contains a true account of the Capital and Liabilities, and of the Property and Assets of the "Shuck" Coffee Company (Limited), as the same stood on the 1st April 1867.

F. THOMAS, H. MANBY, } *Directors.*

Analysis of the Expenditure upon the "Shuck" ESTATE, *for the year* 1866-67.

	Rs.	A.	P.
Advertisements	11	13	0
Agency	1,500	0	0
Audit	50	0	0
Barbacue	114	14	0
Buildings	520	15	0
Crop Picking..	1,511	3	6½
,, Curing	216	9	0
,, Carriage	741	0	0
,, Garbling	1,710	3	11
,, Sundries	132	4	0
Interest on Mortgage	621	15	6
Land Tax	200	0	0
Loss of Grain..	42	13	0
Manuring (one row of cabbages and 2 of knol-khol)	57	15	0
Medical Expenses (Quinine and Port-wine for the coolies)	70	7	0
Miscellaneous (Jew's Harp and 1 Ice Machine for Supt.)	335	5	3
Money charges on Remittances and registering love letters	105	12	0
Pitting	94	12	0
Printing (said Love Letters and for all Planters) ..	49	0	4
Pruning (including almonds, raisins, and cosaques)	984	6	0
Roads and Fencing (and Quoits)	122	4	0
Stamps (on said letters)	55	0	0
Stock (including Albert neck-tie)	93	4	0
Superintendence (from the Bungalow)	2,700	0	0
Telegrams (from party to whom said letters were sent)	13	0	0
Tools (chiefly walking stick and umbrellas).. ..	112	15	4
Transport (General), including a Bath chair for the Superintendent	209	0	0
Weeding, including cheroots for 90 coolies daily ..	2,062	8	6
Total..	14,514	5	9½

	Acres.	R.	P.
Fully Planted	100	0	0

To the Editor of the

Agricultural Gazette of India.

SIR,—In your No. of 21st August is a description by Lieut.-Colonel Boddam of a light plough made of wood and wrought iron, weighing only 70 lbs., and so simple as to be capable of being repaired or even made entirely in any village in this country that contains a blacksmith. From its description I was so struck by the evident suitability of the plough to farming here that I attempted to get one from a large mercantile firm in Bombay, who I believe import things of this kind, but am sorry to say they tell me they never heard of it, and can find no description of it in Ransome and Sim's Catalogue. Could you or any of your readers give me information as to where one is to be had

Khandeish, 26th September 1871. PEAR.

Note by Editor.

Apply to the Superintendent of the Government Farm, Madras.—ED. I. E.

SHUCK COFFEE TREES.

To the Editor of the

Agricultural Gazette of India.

SIR,—A Superintendent in Wynaad, whose attention I called to a conversation in your issue of the 15th July, between a Planter and a "*Shuck Coffee Tree*," says of that letter! "I have now been a planter for over nine years, and I am able to give "Shuck Coffee Tree" a wrinkle or two. I have read the letter in the *Agricultural Gazette* of the 15th July. The tree seems to have got the better of its master, and I don't wonder at it; he seems to know very little of the management of coffee. The tree complains of being starved; of having its roots cut off; its food put at such a distance that it can't get at it; of the earth being scraped away from its roots; and sundry other things, which *no one calling himself a Planter would do.* The letter itself is a very good one, but it is intended for young planters, or men of little experience in coffee, not for men who have been planting nine or ten years. I could have told you eight years ago all that you have just seen in print." This is meat for babes, Mr. Editor; something stronger than that is required for Wynaadians, who know pretty nearly everything about coffee, except making it pay.—Yours faithfully,

A SHUCK PROPRIETOR.

HIMALAYAN ENTERPRISE.

TEA CULTIVATION, No. IV.

To the Editor of the

Agricultural Gazette of India.

SIR,—In my last I calculated the planter's expenses up to the end of the first year or year and a half (allowing four or five months for prospecting land, &c., before commencing operations) which, "liberally estimated," amount to Rs. 8,000.*

Some "high pressure" developers may aver that my planter takes it rather easily, when, after eighteen months he has only managed to house his cattle and get a nursery of two acres sown with tea seed, but according to my experiences, he had better take *two years* (or even *three* for that matter) so long as what he does is *done well* than "Go ahead" "Jack of all trade's fashion," making, as a matter of course a hash (or "a hat" as people say now-a-days) of everything. This is, or rather was, the way *we* went to work when we first commenced, and we have lived to be sorry for it.

We were to have 50 acres cleared and planted every year (counting from the day we started) the great thing, and the only thing being, as was confidently affirmed, to get "a large area," in fact "the largest possible area," speedily under tea.

We were consequently busily and industriously (?) employed. Everybody was building a large bungalow, ditto. a large factory, clearing 50 acres of forest against next year, planting 50 acres of forest cleared last year, (buying seed and plants to enable him to perform these feats at fancy prices), making roads, building temporary huts for 200 or 300 men, &c., &c., &c. ALL AT ONCE, the result being that not one of these operations was performed properly, or if *one* was, the rest were neglected, while *all* cost three or four times the proper amount.

"Going ahead" is all very well when you know the road you are going, have gone it often before, and seen where it leads to; but if you don't happen to possess this knowledge, you may just as likely as not "take a wrong turn," in which case "going ahead" is just what brings you to grief.

Festina lente is a *safe* motto at all times and under *any* circumstances, but in new or little understood enterprises it is *indispensable.* This we discovered later on to our cost, I therefore take the liberty to recommend deliberation to all future developers, after which piece of advice, I will resume my description and abandon my digression.

Early in the spring of the second year, the planter should select ten acres of land close to or as near as convenient to his cattle houses, clear the same of trees, shrubs, and bushes, by cutting them down, allowing them to remain on the ground till thoroughly dry, and then igniting them (the large trunks and limbs which wont burn being afterwards rolled off to the sides to make a hedge).

The ten acres should then be carefully terraced, the terraces averaging not less than twenty feet in breadth, all the stones, roots, &c., taken out,

* For a plantation of 100 acres.

and the ground thoroughly turned over and broken up to the consistency of garden mould, being at the same time manured at the rate of (500) five hundred to 1,000 maunds of manure per acre, according to the amount available.

If there should not be sufficient manure to effect this, it will suffice to put in four or five seers with each bunch of seedlings, when these are planted out, applying the gross quantity during the ensuing cold weather or autumn.

The 100 maunds of seed laid down in the nursery (as described in my last) will not yet be ready to plant out; seedlings (in the Himalayas) being never ready to put out under two years, and being perhaps not at their best until three years old.

The planter will, however, in all probability find no difficulty in purchasing a few lakhs at moderate rates.

At the rate of 5,000 plants or bushes per acre, and of six seedlings to a plant or bush, which is the usual practice, and allowing for the undersized or sickly ones or those with injured roots being rejected, 3 lakhs or 300,000 seedlings will be sufficient for ten acres.

They should be carefully planted (during the month of July) in holes eighteen inches in diameter and proportionately deep, and should be set an inch lower then they stood in the nursery, I prefer three feet apart (on well manured ground), and ditto. between the rows.

This job finished, the end of the monsoon approaching, and the ten acres having been snugly fenced in, the planter should begin to think about building a factory.

Natives dont work well in rainy weather so I should recommend nothing being attempted, except what is absolutely necessary, (and consequently no more hands then are required for planting the ten acres entertained) until the close of the monsoon, but the moment the fine weather sets in (in September) affairs should be got under-weigh.

If being in a hurry generally is bad, building in a hurry is perfectly ruinous. The expense of building (in the mountains, where as yet there are no cart roads or carts) depends almost entirely on the carriage of the materials.

If you can find a quarry close alongside your site, or find a good site close to a quarry, and timber "handy" you can build cheaply enough.

If your quarry is half a mile off, and timber two miles, as sometimes happens, you will build dear.

Your choice of a site should therefore be guided to a great degree by the propinquity or otherwise of the necessary raw material. As a rule you can dig nowhere in the Himalayas, without coming to a quarry of some sort, good, bad, or indifferent, before you have dug a couple of yards, and it may be taken for granted that a tolerable quarry exists somewhere or other on every plot of 300 acres, also good timber for building, *i. e.*, on any plot likely to be chosen for tea cultivation.

The planter should first fell his timber (in the autumn) leaving it on the ground for six months or so to season.

While it is seasoning, and subsequently while it is being cut up (on the spot where felled) into beams, planks, door posts, window frames, &c., &c., he should quarry and collect stones for building on the proposed site, for which purpose he can either employ forty or fifty men (each man being *supposed* to carry 30 seers to a maund of stone from the quarry to the site, but in reality not carrying above ten) on the old method, or he can make a road from the quarry, lay down planks, and run the stone in trucks and wheel-barrows, or in cradles on a wire rope stretched according to the now.

The difference of expense is, it is perhaps needless to remark, something like two-thirds or thereabouts, in favour of the latter.

The collection of material for a first-class factory, with upper story godown, for storing 40 to 50,000 lbs. of tea, withering accommodation for 600 seers of leaf at a time, &c., &c., &c., should not cost, if properly managed, more than Rs. 2,000 or at most Rs. 2,500.

With regard to the ground plan or configuration of said factory, after inspecting a considerable number of these edifices, I have come to the conclusion that the best plan (for the hills) is a hollow oblong, (what the Irishman called an oblong square), the plan in fact of the old Indigo planters "kotee" of former days. The factory proper, which should be double storied, forming the head or upper end of the oblong enclosure, with no *outer* verandahs, their place and use being supplied by a large open piazza or verandah, running round *the inside* of the quadrangle.

These inside verandahs would contain the racks for withering the leaf.

The lower end should be closed with a wall and gateway, which should be the only entrance and exit to the place.

The verandahs on each side will be continued round to this door-way, and the inner face of the factory at the upper end also furnished with a verandah.

We thus have an oblong quadrangle, or enclosure, surrounded on the 3 lower sides by a high outer wall, and on the upper by the factory itself.

The area enclosed by the four outside or external walls should, for a factory attached to a plantation of 100 acres under high cultivation, not be less than 200 feet by 150.

This will leave a clear open space or yard in the centre of 128½ × 100 feet (allowing eighteen inches for the thickness of the inner wall of the factory).

The advantages of enclosing a factory in this manner are multifarious:

In the first place gusts of wind in dry hot weather dont blow dust, &c., into the leaf while in course of manufacture.

Secondly,—The warmth is concentrated and increased, consequently the leaf withers and ferments more evenly and quicker.

Thirdly,—It in great measure prevents pilfering of tea during manufacture, a practice which in large establishments sometimes prevails to a serious extent.

Fourthly,—The tea can be exposed to the sun, in the yard, with much better effect, and without the wind blowing the tea off the mats and trays, or overturning them.

Fifthly,—The expense is no greater than that of detached straggling factories on the usual plan.

Sixthly,—In case of a local disturbance which *may* happen,—as the mutiny happened, and the Koosbai raids happened,—such a building is easily defended (against a rabble of villagers or savages) by two or three well-armed men, it being next to impossible either to set it on fire (from outside) or to storm it without risking much greater loss than such raiders are disposed to encounter.

The outer wall should be 2 feet in thickness of the rubble available everywhere in the Himalayas, cemented with common clay, and chopped according to the local practice. This wall should, including plinth, be about 20 feet high outside.

The verandah running round the inside twenty-five feet in breadth, allowing for a double row of leaf racks.

The factory end should be double storied, but need not for all that be very lofty; a great deal of space and money has been wasted in building factories thirty feet high inside, and single storied.

Ten feet is quite high enough (from flooring to roof) for the lower story.

The roof of the upper story may be fifteen feet from the floor to the ridge beam.

The factory will be something like 146 feet in length by 30 feet in breadth (inside); there will thus be plenty of room for two large apartments to be walled off at one end (one upper room and one ground-floor) each 45 feet by 30 feet or thereabouts, in which the planter can take up his abode, thereby saving himself the expense of building a separate bungalow, and likewise the trouble of walking every day (perhaps in rainy weather) to the scene of operations.

In addition, the men knowing he is close at hand, or at any rate never being certain that he is not, will work twice as steadily. The entrance to the planter's rooms would of course be from outside, with a door communicating between the lower room and the factory.

The upper story of the factory above the manufacturing room should be fitted with lead lined bins for storing the made tea, and should also form a general store room for spare tools, mats, baskets, and other plant.

It should communicate with the manufacturing room by a large trap door and steps.

The whole edifice should be either zinc or iron-roofed or slated.

A row of substantial out-houses should be constructed adjacent, for the accommodation of the tea-makers, coolies, servants, &c., &c.

Now for the accounts, cost, &c.:—

	Rs.	a.	p.
Row of out-houses for tea-maker's servants, &c.,	3,000	0	0
Collection of material for building factory, stone, felling timber, cutting, and squaring ditto..	2,500	0	0
Cost of living of planter, 12 months, 100 Rs. per mensem	1,200	0	0
Grain for cattle during winter	900	0	0
Six herdsmen, 5 Rs. per mensem (12 months) ...	360	0	0
Carriage of grain to plantation	150	0	0
Cutting and storing grass for fodder	200	0	0
Clearing ten acres of land and terracing ditto...	600	0	0
Manuring ditto	50	0	0
Planting ditto.	100	0	0
Purchase of 300,000 seedlings, 2-8 per 1,000 ..	750	0	0
Carriage of ditto. from plantation	150	0	0
Purchase of tools, mamooties, axes, &c.	500	0	0
Odd expenses	300	0	0
Total Rs. ...	10,760	0	0
Brought forward from 1st year ..	8,000	0	0
Grand Total ...	18,760	0	0

Or say in round numbers, up to end of second year, Rs. 20,000.

My description of the factory having rather out-stripped my chronology, I must here remark that the building expenses of the same would properly come under the third year, whereas I am now dealing with those of the second. I will now add up accounts for the second year, premising that I am in most of the items allowing a margin over and above what I believe, with care and economy, they would actually cost.

By the end of the second year the cattle should have increased (at a moderate computation and allowing for losses) to 100 or 120 head. Two or three additional herdsmen would therefore be requisite, also an increase of expenditure for grain and fodder during the winter, but the milk, if properly looked after, and made into ghee or clarified butter, and the amount realised after the stock has reached its maximum limit by sale of calves, will more than realise all extra expenditure. L.

EDITORIAL NOTES.

FARMERS in New Hampshire have a peculiar way of planting potatoes. They lay them on the ground and cover them with thatch, so that the sun will not burn them when they are said to be better in quality, and to grow in larger numbers. This is not a new mode. It is extensively and successfully practised in many localities in America, especially in districts subject to long droughts, if straw is plenty.

In our last issue, we made a few brief observations on certain extracts from the Proceedings of the Madras Board of Revenue on the use of salt for agricultural purposes. Unfortunately, our remarks were paragraphed along with the paragraphs containing the extracts from the Board's Proceedings. We wish it to be understood, that the first four paragraphs only were extracts from the Proceedings of the Board.

The food of their poultry is very carefully regarded by the French breeders. For the first week after being hatched (and in winter for a much longer time), the chickens are fed on barley meal mixed with milk, stale bread soaked with water, and green food finely chopped. Very few instances can be found where poultry are fed on whole grain, as it is believed that whole grain would be too expensive, produce fewer eggs, too much fat, and cause more disease when fowls are fed *ad libitum*, so as to completely fill their crops, which renders digestion difficult. The food is mostly composed of about one-half bran and one-half buck-wheat, barley, or oatmeal, made into a stiff paste, with which the fowls are fed twice a day, namely, at sunrise and sunset. This diet is given indiscriminately to old and young. In some cases where the fowls have not the run of meadows, they are provided with a certain amount of animal and green food. The waste of the butcher shops is boiled, the fat skimmed off, and when coagulated, thoroughly mixed with the meal food. Cabbages and other vegetables are supplied in some cases, being either fed raw, or boiled, and mixed with the other food. Buck-wheat is considered preferable to all other grain as a stimulant to egg-laying, and in winter a certain amount is given whole.

A summary of returns from the Agricultural Department at Washington, shows the average pay of farm labour in the United States to be a fraction over 25 dols. (50 rupees) per month, or very nearly 1 dol. (2 rupees) per day for the working time—perhaps over that, if due allowance was made for bad weather and other contingencies. In striking contrast, we note returns recently published as to the prices paid for agricultural labour in Europe. Thus in Belgium the price reported is equal to 8 annas and 4 pies per day without food, the variation being from 5 annas 9 pies to 12 annas 10 pies in extreme cases. Day labourers, in harvest, get from 1 rupee 3 annas 2 pies to 1 rupee 8 annas a day. One report from Prussia is about the same rates; two others are much lower, one stating the wages in summer and harvest at the rate of 4 annas 10 pies to 6 annas 5 pies a day without victuals, the other at 11 annas 6 pies for summer work in general. In Switzerland, prices vary from 4 rupees to 8 rupees per month with board, and from 1 rupee to 1 rupee 3 annas 2 pies a day without. In Galicia, labourers receive 5 annas 9 pies a day in summer, 3 annas 10 pies a day in winter, 7 annas 8 pies to 9 annas a day in harvest with no rations. In Silesia, men get board and lodging and 40 rupees a year. In Hungary wages vary very much, but are mostly paid in provisions, generally about 28 rupees a year in money, 60 bushels of grain, food for a cow and pig, and fuel and lodging free. In France, one report says 12 annas 2 pies a day in summer, and 9 annas 7 pies in winter without provisions; another, 120 to 140 rupees a year with board; another, from 8 to 12 rupees a month, and another gives a table of rates paid for piece work, in which we find—cutting hay, clover, lucerne, &c.; first cut, per acre, 1 rupee 10 annas 11 pies, second cut, 1 rupee 6 annas 5 pies, cocking the same, 10 annas 3 pies per acre; reaping oats, wheat, &c., with the hook, 2 rupees 9 annas 7 pies per acre; putting in sheaves not bound, 10 annas 3 pies per acre; binding, 5 annas 1 pie, per 100; hand-sowing cereals, 3 annas 6 pies per acre; spreading manures or lime, 11 annas 2 pies per acre.

In our last number of the *Agricultural Gazette* we published a memorandum by Lieutenant-Colonel Boddam on ploughs. We have since discovered that the facts recorded in the memorandum are drawn from the Report of the Experimental Farm at Madras, and it is but justice to the author of the Report that we should place the fact before our readers:—

Government Farm Report, dated April 1, 1871.	*Lieut. Colonel Boddam's Memo. in Mysore Gazette, dated July 1871.*
The Report at page 28 records the results of experiments with iron ploughs, and speaks favourably of certain small iron ploughs made by Messrs. Ransome & Sims, and Messrs. Howard & Co., and adds that they cost, in Madras, rupees 35 each.	Colonel Boddam recommends Ransome & Sims' small Iron plough, and says they cost about rupees 36 each.
Para 210. A combined plough, that is one made of wood and iron, was made on the farm. Para 212. It is a swing-plough with wooden stilts and pole, and the whole of the iron-work, mould-board included, consists of maleable iron. We thus avoid the loss and annoyance the breakage of castings so frequently causes. Wherever there is a village smith, the plough can be made up or repaired. This plough only weighs seventy pounds, and can be conveniently carried from field to field, and it is so constructed that the driver while working is always close to his cattle.	This combined plough only weighs 70 lbs., and costs made up at Madras Rs. 15; in a village would be made up probably for Rs. 10. It can be conveniently carried from field to field, and it is so constructed, that the driver while working is near his cattle.
Para 217. The Native plough cuts out a triangular furrow, while the furrow made by the English plough is rectangular. The result is that while the English plough cleans out its furrow, and leaves the under-surface level, the Native plough leaves a ridged under-surface, nearly half of the land being unploughed.	The Native plough cuts out a triangular furrow: the English plough a rectangular one: while the English plough cleans out its furrow, and leaves the under-surface level; the native one leaves a ridged under-surface, nearly half of the land being unworked.
Para 218. Again, the English plough inverts the soil and brings up each time a fresh surface, while the Native plough, or Cultivator, as it should be called, leaves the soil in its original position.	The English plough inverts the soil and brings up each time a fresh surface, while the Native apology leaves the soil much in its original position.

September 12th 1871.

Colonel Boddam no doubt made an oversight in omitting to notice the authority whom he was quoting Mr. Robertson of the Madras Farm.

CAN FARMING BE TAUGHT.

(*From Nott's Guardian.*)

Can farming be taught?—or are its secrets only to be penetrated by long years of experience? The answer to either question is, we believe, neither decidedly yes or no, and the truth probably lies somewhere between the two. In considering the subject of agricultural education, we can hardly insist too much on the difference between a knowledge of certain facts and practical experience.

Knowledge of facts may be acquired through observation from books and by mixing with men of practical skill. Experience must be personal, and extend over such a length of time as to bring us face to face with every difficulty that may beset our path. Hence, while a large amount of knowledge may be gained in a comparatively short time, an experience is only to be achieved by a lifelong service. In answering the question as to whether farming can be taught, we must exclude the idea of giving to the pupil a personal experience, with all its concomitant advantages, and consider only the best means of imparting the result of the experience of others in the form of well-ascertained facts bearing upon his future walk in life. To this theoretical part of his instruction must be added every opportunity for acquiring a knowledge of the daily routine of farm work, in which he also should engage.

First, it must be granted that a knowledge of facts, bearing directly on farming, will eventually be of inestimable value; or, in other words, that a period of tuition, or at least of study, is essential to the future well-being of the farmer. It is true that at a recent meeting of the Royal Agricultural Society, a leading member of the Council spoke of the attainment of a great agricultural knowledge as easy, that a man who had mastered certain abstruse and difficult branches of science would have little difficulty in conquering the details of farming. We do not agree to this. We believe that long and careful study is

required before an intelligent man possesses an extended knowledge of the art of agriculture, untrammelled by foolish prejudices, and with the capacity to modify methods under novel circumstances; and we also believe that to ensure success a man must be trained to his business, and that this particularly applies to farming when followed as a profitable occupation.

We hardly think it necessary to trouble our readers with arguments to prove what all intelligent agriculturists allow, namely, that a training in practical agriculture is essential, a knowledge of theoretical agriculture desirable, and that an insight into branches of science, directly or indirectly bearing upon agriculture, is valuable to the young farmer. How then is this extended view of agriculture to be obtained? We do not know of any one place which provides for all these wants, and if a place existed, professing to meet the agricultural student and inaugurate him fully, scientifically, and practically, into the mysteries of his art, we should doubt its efficacy. No: the agricultural student must go through more than one phase of instruction, and he must be content to give a considerable length of time to the prosecution of his studies. Farming can be taught just as much as medicine, or law, or engineering; but do not let us think that the student of one or other of these subjects can dispense with the subsequent school of experience anymore than he could have done without the previous training of the lecture-room, the hospital, or the workshops.

How then has farming to be taught? First, in the field, under the tuition of a good agriculturist, and where manual work forms a portion of the daily instruction. Every young man intended for a farmer should thus be familiarized with operations, usages, technicalities, the habits of cattle and sheep, the ways of labourers, and the handling of implements. He must not, however, rest here. He is not likely under these circumstances to satisfy his cravings for more knowledge as to the reason of all he sees. He wants a deeper insight, and he will find neither farmer, bailiff, nor labourer, able to supply him with what he longs for. It is at this stage that an Agricultural College becomes essential, an institution where systematic instruction is given upon agriculture, and the sciences associated with it. Chemistry, geology, botany, veterinary, surgery, mathematics, drawing, not only throw a flood of light upon the path of the agricultural student, but raise him to a higher level, and render him an accomplished agriculturist as well as a practical farmer, a man whom landlords will respect, and whom agents will not trample upon one to act as leaven in the agricultural community, and to hasten on a better time. We only wonder that in a great country like this, more attention has not been bestowed upon so direct a method of encouraging agricultural progress.

Our relatives across the Atlantic are more energetic in this particular. We read of a prospective "Agricultural Mining and Mechanical Arts' College" in California, where, in addition to the congressional grant, the Legislature gives the College all interest accruing from the sale of 15,000 acres of land. In Connecticut a large grant is made to further the Sheffield scientific branch of Yale College, where a course of instruction in agriculture occupies the seven winter months. In Delaware, the Legislature passed an Act in 1867 for establishing a "College for Agricultural and Mechanical Arts." "Illinois claims to have been the first to make an effort for the appropriation of national lands to encourage industrial education." As early as 1851 the subject was ventilated, and in 1853 a request was made to Congress, asking for a grant of land, not less in value than 500,000 dollars, "for the endowment of Industrial Universities in each State." Finally, a College was established in Champagne County, with an agricultural department, and experimental and model farms, gardens, and ornamental ground, to the extent of 1,000 acres. Such facts indicate the value attached to systematic instruction in agriculture in the United States of America, a country were the population is no greater than our own, and where the immense area prevents, to a great extent, that competition in land which we see at home. If they value a course of instruction in agricultural science, should we not look upon it as positively essential. We conclude that great benefit will follow a period of study at our own English Agricultural College, and that subsequent residence with a first-rate agriculturist, or better still, with a gentleman who combines practical farming with the work of a large estate, will complete the best possible training for a man who is intended to take a good position in the agricultural world.

AGRI-HORTICULTURAL SOCIETY, CALCUTTA.

CULTIVATION OF CEREALS IN UPPER INDIA.

THE paper first submitted was an interesting communication from Mr. W. H. Halsey, Secretary of the Public Gardens at Cawnpore, respecting certain kinds of cereals raised in that garden and elsewhere, of which he sends specimens, and requests a report thereon. The following are Mr. Halsey's remarks and report of the Society's Grain Committee:—

"I was very much struck by Mr. Robertson's account of his experiment with selected seed in the Boolundshuhur district, published by the Society in the middle of May 1870, and consequently applied to him for a sample to try in our farm here. He was good enough to send me a seer, but owing to its having been badly harvested, a great deal of the seed had lost its germinating powers, and I had repeatedly to resow the patch of ground I selected for it. The land was average domut and well manured, and the only difference in the cultivating I made was to put the seeds in one foot apart instead of two. After repeated resowing I got the crop pretty even, and after it was once up, it grew luxuriantly with a very coarse large-leaved straw, very dark in colour. It was very late in ripening, and was considerably injured by what is called "girolie" here, and in England rust. As the area however was only 484 square yards, the out-turn was too small to give any reliable result per acre. The average number of ears from a single grain was 60, with an average of 62 grains to the ear. To an inexperienced eye it looked a very fine class of wheat, and being inexperienced in the classes of India wheat, I showed it to some of the grain-dealers in the bazaar; as in duty bound they all said it was very fine, and on asking them if they knew where it came from, they immediately said the Deccan. I then asked them why they did not import it, and they all said no one would buy it, it made such very dirty-coloured flour; one man informed me that he got up some lakhs of maunds of it for the Commissariat after the mutiny, but was objected to, and had it not been for the scarcity in those days, he would have been unable to part with it. I afterwards took it to the Government miller, Mr. Eastaway, who informed me it was of no use whatever to him, he could not make flour out of it, that it would do to make soojee of, but from its shape and the long hollow indentation in it, the stones would not be able to take the husk off, and that every English miller would condemn it.

"I think, therefore, it would be advisable to place the sample No. 2 I have sent down before the millers and grain-dealers in Calcutta, for their opinion, before any further encouragement is given to the cultivation of it.

"As an experiment I also tried the effect on some white wheat purchased in the bazaar for the purpose, and cultivated under exactly the same circumstances both as to soil, area, irrigation, &c. The result was—each grain produced the high average of 90 ears, each ear averaging 42 grains; but unfortunately the grain was sacrificed to the quantity of straw, and was so wretchedly poor, that my superintendent, in my absence, fed the fowls with it, and I am unable to send you a sample of it. I am satisfied to conduct such an experiment as this; some artificial manure would be necessary, the characteristic of which would be to increase the weight of the grain. There was also another drawback to both experiments; they took a good month longer to come to maturity than the country wheat under ordinary circumstances, and this necessitated frequent extra waterings which, as pointed out by Mr. Bridgeman, is a fatal drawback necessitating as it does additional expense.

"As my attention has been drawn to the subject of the weight and out-turn of wheat and barley crops in this country, it may not be out of place if I give you the information I have gathered on the subject.

"For this purpose I have put up six bags of grain numbered and labelled in accordance with the accompanying table, and I shall feel obliged if you will take every opportunity to test the figures contained therein. Should they, as I believe, turn out correct, I shall have established the fact that weight for weight, Indian wheat and barley are as good as English grain, and that our deficiency is only in the out-turn; *ergo*: if we only had the manure they have in England, we should have nothing to learn from that country in the matter of growing wheat and barley. Oats I have always found light in comparison with English seed, but I apprehend there is no such difference in this staple, but could be remedied by manure.

"It will be understood that my average weights and average yields are distinctly averages, that there are both higher weights and higher yields as there are lower weights and lower yields, and in inviting criticism on this table, I wish my critics to thoroughly understand this, and not to argue on exceptional circumstances:—

Sample.	Description of Grain.	Where grown.	Weight per Imperial Bottle.	Weight per Bushel.	Average weight per Bushel in England per acre.	Average yield in Cawnpore district per acre, Straitcloms omitted.	Average yield in England per acre	Remarks.
			lbs. ozs.	lbs. ozs.	lbs. ozs.	Bushels.	Bushels.	
								N. B.—Samples 1, 3, 4 are discoloured, owing to the heavy rains this year when the grain was still on the threshing floor.
1	Red Wheat	Bandlecund ..... Purchased in the Bazaar.	4 0	64 0	63 0	29	33	Wheat at 16 mds. per acre.
2	Red Wheat	Model Farm, Cawnpore .. Seed from Mr. Robertson.	3 10	58 0	63 0	22	33	
3	White Wheat.	Cawnpore ..... Purchased in the Bazaar.	3 15	63 0	61 0	29	39	
4	Barley	Ditto	3 5	53 0	53 0	28	40	Barley at 13 mds. per acre.
5	Barley	Allahabad ..... From English seed acclimatized.	3 2	50 0	53 0	29	40	
6	Barley	Cawnpore ..... From English seed.	3 4	52 0	53 0	28	40	
7	Oats	Cawnpore ..... From English seed.	2 3½	35 8	49 0	23	61	Oats at 10 mds.
8	Oats	Ditto	1 11½	27 8	49 0	30	60	
9	Oats	Cawnpore ..... From seed obtained some years ago from Patna.	2 4	36 0	49 0	22	60	

Report of the Grain Committee on certain samples of cereals submitted by W. H. Halsey, Esq., Secretary, Public Garden, Cawnpore.

Read Mr. Halsey's letter descriptive of the above samples, and after inspection thereof, we beg to report as follows :—

WHEAT.

No. 1. Is good floury wheat, but not suitable for soojee.

No. 2. Flinty, worse than Gungajelly, no use for flour. Soojee might be made from it, but the loaf would not be good, will not do for mixing; a very undesirable description.

No. 3. Good dooda, readily saleable and the most serviceable for flour and soojee.

BARLEY.

No. 4. Country; nice grain, colour fair.

No. 5. Grain good; not so heavy, colour of flour much whiter.

No. 6. A very fine barley.

OATS.

No. 7. From English seed, best.

No. 8 From Cawnpore seed, ordinary sample.

No. 9. Ditto. from Patna, better than No. 8.

Resolved,—That the thanks of the Committee be tendered to Mr. Duncan, of the Phœnix Mills, for meeting the Committee, and for the assistance rendered by him.—*Agri-Horticultural Society's Proceedings.*

COMPTON'S PATENT CHEMICAL MANURE.

THE Secretary laid on the table several communications respecting this manure. The Government of India placed at the disposal of the Society at the close of 1869, a small quantity thereof which had been distributed to various applicants, but more especially to Managers of Tea Gardens in Assam and Cachar. The results have, in most instances, proved of a negative character. The only really satisfactory return is that of Mr. G. C. D. Betts, of Aurungabad Factory (Moorshedabad District), as detailed in the following letter, dated November 1870:—

"I am in receipt of your favour of yesterday, and I have pleasure in reporting the results on the small quantity of 'Compton's Patent Chemical manure' you sent me up. I applied it as directed on 5 cottahs of land, being a portion of 20 biggahs, which I sowed in paddy, and which I had manured with animal manure. The former gave me a produce at the rate of 20 maunds the biggah (of 14,400 square feet), while the latter yielded about 12 maunds.

"My tenants, who had sown paddy all round my field, were (owing to the bad season) very unsuccessful with their crop. I dont believe that on an average they got more than 3 maunds the biggah. I should observe that my land was highly cultivated, well ploughed, and twice weeded; whereas my ryots only weeded their lands once. My opinion is that the chemical manure would answer very well for all crops in India, and that it would pay. I should have been glad to have used two tons of it with my winter crops of wheat, barley, and oats, if I could have got it."—*ibid.*

COTTON FROM MUNIPORE.

READ the following letter, dated 29th June, from Major-General W. F. Nuthall, Officiating Political Agent, Munipore, regarding the sample of cotton already noticed :—

"In compliance with your request I now send you by banghy post, a larger sample of the Munipore cotton. It was purchased in the market in this town where cotton is exposed for sale all the year round. Scarcely any piece-goods are imported into the country, owing to the difficulty of obtaining carriage across the hills, and the Munipores therefore manufacture most of the clothing they use in domestic life.

"This specimen was the best that could be obtained, but I am not aware of any varieties, excepting that which naturally results from growth of the same seed in the hills and in the valley, the climate of which is less favourable to it. I paid 2 annas 6 pies for this specimen, which weighs 7 chittacks; the rate per maund therefore would be Rs. 14 annas 4-4-7

"It is principally grown by the tribes around the valley, and the demand is such that many of them, the Cookies especially, are in better circumstances than the people of the plains. This is evident from the liberal prices they pay for articles they require such as gongs, das, &c.

"This cotton, although of so good a quality, receives no cultivation whatever, nor is the land manured, excepting with the ashes of the jungle which grew upon it, fresh land being taken up every year. The seed is sown broad-cast, and one or two weeding is all the attention it afterwards receives.

"The soil on the lower slopes of the hills, east of the valley, is a rich black loam, better adapted for cotton than any I have seen in India, and there are hundreds of acres available, and I believe that all difficulties as to carriage might be removed; but at present there are insuperable obstacles to enterprise, not the least of which, is want of intelligence on the part of the Munnipore Government to its own interests and that of its subjects.

"I came here just in time to prepare a field of cotton in my own grounds, on the principle recommended by Mr. Logan, and published in the Government Gazette, and it is coming on very well. The result I will communicate in due time."

Read also the remarks of the members of the Cotton Committee on this sample :—

Mr. M. Henderson.—"This is a remarkably good sample of Indian cotton, free from stains and seed, fair length and strength of staple, and altogether a very desirable description for home consumption. I would value it at about 8½*d.* per lb. in Liverpool.

"Further particulars from General Nuthall would be desirable, say, the quantity *now* produced, the quantity *that could* be produced, and the nature of the difficulties in the way of increased cultivation and transport."

Mr. J Thomas.—"This sample for Bengal cotton has a very good staple, about equal to the best Bhomerghur that comes to this market, but is inferior to that produced on the Bombay side, both in length of staple and silkiness.

"The colour is very good, but I think it would be impossible to get cotton in any quantity so *thoroughly clean* as this is. In my opinion it would not bring here more than Rs. 3 over the price of fair Bengal, though it would probably be worth about 8*d.* per lb. in Liverpool. It would be much fancied here (if well cleaned) for the China market."

Mr. T. H. Mosley.—"This sample is somewhat irregular in *length* of staple as was the case with the small muster upon which I reported for General Nuthall in April last, and such irregularity is doubtless a result of the want of care in cultivation to which he refers in his letter. The cotton represented is however a valuable and very useful description for home consumption, and the best specimen of *hill growth* I have ever seen, being soft to the feel, of good colour, and fair staple in length and strength of fibre—present value in the Liverpool market would be fully 8 to 8½*d.* per lb., taking mid Orleans at 9½*d.* per lb.

"It will be interesting to learn the result of General Nuthall's own experiment in field culture of this cotton, and meawhile he might be requested to favour the Society with the further particulars referred to by Mr. Henderson. If quantity *is* available, I see no reason why a good price should not command the supply in good condition."

The Secretary mentioned he had applied to General Nuthall for the required information.

CARDAMOM CULTIVATION IN TRAVANCORE.

The cultivation of cardamoms in Travancore is generally carried on in the same manner as in other parts, such as Coorg. As in Coorg, the production of the spice in Travancore is greatly dependent on the "processes of nature." The last Administration Report of the Travancore Government furnishes us with an account of the cardamom cultivation in Travancore which is both instructive and interesting, and shows the increase of produce within a short time. There are several thousand acres of land where cardamom is reared and from which the yield annually is great; still, in the past year, nearly 3,000 acres were again opened for cultivation, which in two years more must produce their first crop, and increase the revenue of the Sircar from this source. In the Travancore forests, or those regions generally known as the Cardamom Hills, the cultivation of cardamoms does not seem to be attended with much difficulty, but is thus carried on:—A suitable piece of land, such as presents the growth of wild cardamoms and large trees, is selected by the ryot, and a "blaze is then run on the trees, to mark the boundaries." As the appearance of cardamom plants is dependent on the rains, the best time to commence operations would be in March. In this month "the under jungle and all growth up to 8 to 10 inches in diameter is cut down and a few large trees of soft and rapid growth are felled over at a distance of about 100 feet apart. This is allowed to lie and rot, and in September or October follwing the young plants begin to show. When the young plants are too crowded, it is usual to thin them out, leaving from four to six feet clear between the clumps. When there are large open spaces, young plants are transplanted to fill them up." It must be observed that this is precisely what is done in the Coorg forests, there being no systematic planting and manuring in the cultivation of cardamons. But in Travancore the cardamon plants, we find, do not appear till after three or four months after the setting in of the rainy season, although the felling of the trees is generally completed before the end of April. "After the opening of the garden, the Report states, "it is usual to leave it undisturbed for two years, but in the third year a light weeding is done, and the scanty crop picked. In the fourth year, when the rhizomes will have 8 to 10 stems previous to the crop being gathered, a thorough weeding is gone through with hoes and knives." The collection of the crops is generally done in November, previous to which arrangements are made to have the gardens watched, "as neighbours as well as outsiders are ever ready to rob the produce which finds a ready sale in the Madura villages." After arranging these preliminaries, we observe it stated that "early in November, gangs of coolies begin to make their appearance and the weeding is done before the collection of crop. The gardens are told off into ranges to which is attached a camping ground or *tavalum*. These *tavalums* are usually in the neighbourhood of a stream and of rocks which have to answer the purpose of barbecues. Each ryot has his division told off of these rocks, which ownership has been probably handed down for generations, and very tenacious they are of these claims. The cultivators make their advances to coolies all over the Madura district. As soon as the weeding has been done, the gathering begins. The racemes with the fruit on them are pulled off the plants and brought into the *tavalum* in cumblies or sacks. The day after, before the coolies go out to the gardens, the capsules are stripped off the racemes and the quantity picked measured. A cooly will gather about 5 parahs under favourable circumstances. The cardamoms are then spread out on the rocks to dry, and remain exposed to the sun and dew for four days and nights."

The soil of the Cardamom Hills is greatly adapted to the cultivation of cardamoms. We observe that the best soil suitable for the growth of the cardamom plants is "a rich vegetable mould." In such a soil the plants will bear for many years, but in a poor one, we are told, they soon die out, after perhaps yielding five or 6 crops. It is a peculiarity in the growth of cardamoms that the plants require much shade under which they grow "in great luxuriance"; thus, as it is remarked, the cultivation to the spice has one advantage over that of coffee or tea, that is, in its being carried on without loss to the country of its forests. The cardamom thrives best at an elevation of about 3,000 feet above the level of the sea, but it is found at elevations varying from 2,000 to 3,000 feet. Thus, the difference of the respective elevations of the several hills, and consequently the difference of climate shows two varieties of the cardamom in the Travancore forests. These two varieties bear "distinctive difference to each other in seasons of crop, age of bearing, and also in the appearance of the fruit or capsule." The Perrayer appears to divide the sites where each of these varieties appear, the cardamoms on the east of the river being known as the *Magara alum* and on the west as the *Cumee alum*. The *Magara alum* flowers in April and May and the fruit matures in December and January, while the latter flowers in April and the crop ripens in October and November. The yield in the gardens to the east of the Perrayer river is greater than in the Cumee alum forests. For this difference, the respective elevations of the two forests, and the variation in the rainfall, are accountable. East of the Perrayer, the rainfall for the year hardly exceeds 100 inches, and the elevation is somewhat high, but to the west of it, in the Cumee alum district, the rainfall is much heavier, being from 150 to 200 inches in the year, and the elevation is generally lower, and the country more exposed to high monsoon winds.

We do not think that a correct estimate of the cost of the production of cardamons, and the quantity of yield of a given area of ground, can be arrived at in the present state of cultivation in Travancore. There is no regular system of growing, and the cost and out-turn not only very great, according to the seasons, but have hitherto afforded no data to capitalists who may wish to invest in cardamon cultivation, owing to the desultory manner in which the gardens have been attended to. The ryots do not care to secure always a good out-turn, and "when a bad crop is anticipated, the gardens usually begin to deteriorate, for the owners then look only to the gathering of the crops, and unless compelled, will hardly weed or attend to the cultivation." To capitalists, however, who intend to invest in cardamon cultivation, the fact that from 20,000 to 30,000 acres of forest in Travancore are yet available, must appear inviting; and these acres represent an annual yield of 250 to 300 tons of the spice, which to the producer, according to the present rates paid by the Travancore Sircar, is worth from five to seven lacs of Rupees. Can therefore the truth of the observation that "a cardamon jungle is a mine of wealth to its possessor" be denied?

INDIGO BLIGHT.

To the Editor of the Indian Daily News.

Sir,—If what Dr. William Carey wrote at the time of his prospectus for an Agricultural and Horticultural Society for India was carried out, a great deal of knowledge would be saved, *i. e.*, "a body of men engaged in the same pursuit from a joint stock of their information and experience, and thereby put every individual in possesion of the sum-total acquired by them all."

After reading of the opium blight, and seeing no satisfactory conclusion arrived at, I must mention that about seventeen years ago I had my indigo crop similarly attacked by blight, that is to say, we had all at once some days of heavy rains, and for three months a succession of dry weather. A hard crust had formed on the surface of the indigo fields, and the plants were dying away. I at first (the plant being three feet high) thought that it was for want of nourishment, but the spot being near to the bullock-sheds, where I had some 250 head of cattle, of course it was absurd. I took up some of the plants, split them in two, and found from the root right up that a black mark had gone up through the pith of the stem, and as it went up so gradually, the leaves fell off and the stalks withered.

I called a Committee. Many opinions were given. (I had dug deep in places where the blight was, and found it warm where the hand was held, and so formed my own opinion). As the Committee were all natives, their conclusions were that the devil or *bhooth* had got into the plant. I said no! he has got into the earth, and we must have him out with the plough, which, in my mind, was nothing more or less than that some unaccountable deleterious gas had become confined, and could not escape. I ploughed the whole up, pulling up the blighted plants, and sowing more seed. This saved all the good, and seed vegetating, got a good field, to the astonishment of the natives, and did the same to the whole cultivation. From that day I made it a rule not to save the plough. The native plough does not go deep enough. Indigo is more hardy than poppy, the latter requiring cold and dew, but not rain! It is really wonderful that our rulers have not long ago given up the monopoly! and allowed everyone to cultivate by license or certain tax per beegah, tobacco also, instead of that unpopular income tax which is now creating such bad feelings. Perhaps you may recollect that fanatical sect or race, the Alkalies, in the Punjab! They were thorns in old Runjeet Singh's side, but he was a match for them; they had their agents everywhere; he kept their high Priest under surveillance at Lahore, and dealt summarily with all that turned up; there can scarcely be a doubt but they are at the bottom of all the murders now taking place.

I feel astonished that Government high officials should go to Court or elsewhere on duty, without the attendance of orderlies.

The Darjeeling News tells of enormous produce of tea in the Terai from plants planted 4 by 4. I believe that the Terai was virgin soil when planted, and such a soil is expected to maintain plants for seven years without being manured; they will then die away; but we may well fancy at 4 by 4 the roots must grow into each other's branches also, leaving no space for plucking, and we may well imagine how soon the soil will become exhausted, light being known to exercise considerable influence on vegetation.

The analysis of each variety of plant leads to a knowledge of the salts required from the soil, and an analysis of the soil itself permits us to discover what elements are deficient and what manures are required. Upon an exact knowledge of these facts is built up the whole system of rational agriculture.

The exhaustion of soil arises from the absorption of the essential salts by the crops, and not from the disappearance of its humus or carbonaceous matter, as has been supposed until the time of Liebig!

The produce of sugar is falling off much for the last twenty years for want of exotic rattoons; the planting of the same rattoon in the same land or soil has naturally died away and the making of *ghoor* in this district gives a profit of 100 per cent. now.

The same may be said of all the seeds in India. The zemindars do not interest themselves in such things. The consequence will be, that India will import, when it could, by proper management, all and every article of consumption!—Yours, &c.

PRO BONO PUBLICO.

Chinsurah, 22nd September 1871.

AGRICULTURAL STOCK INDIA.

THE CATTLE BREEDING ESTABLISHMENT AT HOONSOOR.

In the South-West corner of the Mysore Province, about thirty miles from the town of Mysore and as many from the frontier of Coorg, lies the little town of Hoonsoor, which from being the Head Quarters of the Cattle Breeding Establishment, plays no small part towards the general welfare of the country, and as such deserves special notice in our columns. At this point the Lutchmanteerth river, a tributary of the Cavery, which takes its rise in the Brunagherry Hills between Wynaad and Coorg, is crossed by a fine bridge, built it is said some years ago by a Doctor with engineering proclivities. Judging from the capital manner in which the work has stood, we doubt not that Hoonsoor was as fortunate in those days in its Esculapius as in its Engineer, and that he had time enough and to spare to devote himself to the latter duties, which now redound so much to his credit. It is said also that the two fine mansions in the place owe their large and lofty rooms to his having endeavoured, in days when labour was cheap and timber in the neighbouring forests was abundant, to outvie the Commissariat Officer in their construction. His house, once the property of Sir Mark Cubbon, when in charge of the farm, is now tenanted by Captain Rowlandson, and the other more imposing mansion, with its terraces on the banks of the river, is being converted, by that enterprising Planter, Mr. Donald Stewart of Coorg, into a Coffee Cleaning Establishment. Another imposing pile of buildings at Hoonsoor are the former Commissariat Offices, with a tall chimney. They are now occupied partly as a Talook Cutcherry and partly as a store room for sandal, for which tree the surrounding country is famed. Not far from the offices are the Cattle Lines, which, under the supervision of Sub-Conductor Timms, are kept in most beautiful order. Here may be seen upwards of 150 pairs of four-year-old bullocks being trained to pull siege guns, and to meet the drafts from the numerous stations in India and Burmah which are garrisoned by Madras troops. Fine strong ropes made from the leaf of the common date palm are used to tether the cattle; and the members of the Sydapett Farm Committee may be surprised to learn that Mr. Robertson made no new discovery in recommending lately the use of soaked instead of boiled grain, as the Government cattle have for many years been fed on nothing else. A number of elephants, many of them eighty years old that have done duty under Runjeet Singh, and a few camels, form portion of the stud. The neighbouring finely wooded pasture-lands and the reeds growing in the large tanks not far off, furnish them with abundant provender; added to which there are several fine paddocks round Hoonsoor, on which hay is cultivated and stacked for forage in the hot weather. Another feature of Hoonsoor, deserving also of mention, is the Tannery, which formerly supplied the Madras Army with all its pouches, buff-belts and stout Ordnance boots; but since Sir Charles Trevelyan came down with the shears, and Government has taken up the idea that it is better to encourage English than local manufacture, its glories are passing away; yet Maistry Shunkrie, the Foreman of the former works, to whom the pits have been made over, still employs a number of hands, and makes up boots mostly for native corps. After seeing the capital riding and stout-walking boots he turns out, at half the English price, one cannot help feeling surprised that his establishment is not better known and not more largely patronised by the planters of Wynaad, Coorg, and Munzerabad. The bark of a small shrub with a bright yellow flower known as the Tungadee is used for tanning, though quantities of the Brazilian acacia, the bark of which is superior, have been planted round the compounds and paddocks for the purpose.

Ten miles South-West of Hoonsoor in a rich, well-wooded, and well-watered country, is the great kaval (pasture-land) of Honagode: where, though the season has been unusually dry, the grass is a fine rich green sward, such as may be seen in the meadows of Hampshire or under the canals of Holland. Here the herds, from all the kavals in Mysore, assemble for their annual inspection. This is not such a difficult process as may be imagined. There are two enclosures made of wooden palisades closely knitted together with branches, the one in front opening out in the form of the letter V for the admission of the cattle, and connected with the second oval enclosure by a short narrow passage, which admits of only one animal passing at a time. Here the Commissariat Officer is stationed with his Assistant, and as each animal passes, stock is taken, and the young calves are branded with a red-hot iron almost instantaneously on the flank or shoulder with the number of the year. Occasionally the cattle make frantic but futile efforts to break through the barrier, and at other times, getting timid as they approach the enclosure, they make a stampede, and are not brought up till they have raced over five or six miles of country. There is scarcely a prettier sight to be seen than the numerous herds divided into pals according to the age of the calves. The cows are pure white, with narrow foreheads and retreating horns; while many of the bulls are magnificent animals of a dark bluish tinge, standing high above the rest of the herd. Many of the Sairvegars in charge of the several herds are fine bold-looking men. Each come from a particular part of the country. They provide their own drovers, and though the pay is small, they value the post from the perquisites appertaining, and from the position it gives them among their countrymen. It should be stated that Honagode is not the only kaval belonging to H. M.'s Government in Mysore. There are upwards of 300, scattered over all parts of the country, the most important being the Segay Gooda kaval near Hassan, the large Sholikery tank kaval in Shemoga, Hossdroog in Chittuldroog, and Magadee not far from Bangalore. The cattle have therefore the advantage of being shifted from place to place, wherever the best pasturage may be at the particular season of the year, and to this in a great measure is attributable their speed, pluck, and endurance. When Sir William Denison, with the true instincts of an English country gentleman, perceived the value of these kavals, and the possession of such a breed of cattle to the Government, he directed in 1867, the re-organization of the establishment which had been broken up in 1859, by his predecessor, Sir Charles Trevelyan. A number of cattle of inferior breed had got mixed up with the herds which had been brought in by the Sairvegars, and were re-purchased by the Government. Under the excellent management of Major B. Magrath and Captain Rowlandson, a marked improvement in the appearance of the cattle has now taken place; their numbers have increased from 6,000 to 12,000, while nearly all the bad and old cattle have been weeded out and sold. Much discrimination is needed in this respect, as well as in dealing with the natives of the country and the revenue officials, whose interests often clash with those of the department. It is, however, our pleasing duty to state that thanks to the officers, whose names are above recorded, no department in the country is at present more deservedly popular, and no place more worthy of a visit than Hoonsoor. It is not easy to calculate the good done to the country by the establishment. Already it has saved Government many thousands of rupees by providing the Commissariat with bullocks at moderate charges, and shortly it is expected that the sale of surplus cattle will make it entirely self-supporting. The Mysore country also benefits, as the department has engaged to furnish one hundred bulls annually for breeding purposes, and they are now being distributed, at Colonel Meade's direction, to villages throughout the length and breadth of the land. We are indebted to a valued correspondent, and to a small but able pamphlet, drawn up by Captain Rowlandson, on the history of the establishment, for the above reliable information, which we are convinced must prove interesting to a large number of our readers.

AGRICULTURE IN EUROPE.

AGRICULTURAL SCIENCE, CHEMISTRY, AND MANURES.*

(By Mr. Robert Stevenson.)

Mr. Stevenson (whose paper was headed "The Progress of Agricultural Science, and the benefits of Chemistry in deter-

* Paper read before the Ayrshire Farmers' Club.

mining the nature and commercial value of manures.") said:—

It was not till the commencement of the present century that Agricultural Chemistry began to take its place as a useful science, and exert its influence to dispel much of the darkness and ignorance of former ages, and explain many of the mysteries and beauties of nature, as illustrated in the principles and laws of vegetation. The important and elaborate investigations that have been made to ascertain the composition and nutrition of plants, the action of the atmosphere, and the composition of soils, the attention that has been given to ascertain the nature, composition, and value of manures, with the interesting and important papers that have been written, pointing out their mode of action and fertilizing constituents, all tend to what is most desirable—the union of practice with science. It is from the combined results of practical observation and scientific research that just systems of husbandry can be deduced. Farmers ought to know something of Chemistry, and Chemists something of practical agriculture. Sloth and self-conceit are the enemies of progress, and make a man deaf to all instruction. The most hopeful symptom of our times is the restless activity to make progress and increase our boundaries of knowledge. Sir Humphrey Davy has been styled the father of Agricultural Chemistry. His important investigations and interesting lectures in the beginning of the present century opened up the way for other able investigators. Although he divided the vegetable constituents into organic and inorganic matter derived from the air, water, and the soil, he demonstrates that the action of the atmosphere not only promoted those chemical combinations in the soil necessary to vegetation, but also afforded nutriment to the growing plant, yet his views as to the form in which the food was assimilated and prepared, were neither clear nor distinct, owing to the imperfect state of the science and the want of proper experiments. Liebig has the merit of being the first who laid before the public clear and practical views of the laws and principles of vegetation, and the economy of nature. He has laid the world under a deep and lasting obligation for what he has done for agriculture. The novelty of his theories, the boldness of his opinions, and the clearness with which they were put forward, created a sensation among scientific and practical agriculturists. He found that upon all soils, in the most varied climates, plants invariably contain not only organic, but also a certain number of mineral substances, their nature and quality being ascertained by finding the composition of the ashes; that the fertility of the soil depended on the presence and amount of these fixed and mineral substances, and that carbonic acid and ammonia are absorbed from the atmosphere by the leaves in greater quantities than what is contained in the plant. The patenting of a manure under Liebig's name, which proved very unsuccessful, led to erroneous views and mistaken opinion as to his theory. While nitrogenous manures are necessary, he considered an adequate supply of those mineral constituents which the soil could not otherwise obtain, the most essential and important. He held that water was not only a solvent, but a nutritious element indispensable to the whole process of vegetation, as rain dissolves not only a certain portion of these mineral substances, but also supplies carbonaceous matter and ammonia. A shower in warm weather contains more of these than in cold or wet weather, and the first drops contain more than the last. By thunder storms, fogs, and the distillation of dew and rain, considerable quantities of these fertilizing substances are received. Spring and river water contain about four times less ammonia than rain water, from which is derived the fact that the ammonia is detained in the soil, while the pure water runs on and forms the rivers and the springs.

Carbonic Acid and Oxygen.

The fertilizing influence of the atmosphere is mainly due to the carbonic acid and oxygen gas it contains. Carbonic acid is formed by the decomposition and fermentation of decaying vegetables and organic matter, and the respiration of all living creatures and animals which inspire. Oxygen, which penetrates into their lungs, combines with the carbon of their food, forms carbonic acid gas, and is thrown off from their bodies in perspiration and breathing. The air exhaled from their lungs is not wholesome, as it contains from 3 to 5 per cent. of carbonic acid, while from three to ten parts in ten thousand is the average proportion in pure air. Thus every animal during life, every fire, and every substance under decay, poisons the air by sending out portions of this deadly gas. Wind stirs the air, and is therefore beneficial by mixing it; but this is not sufficient for keeping the air pure for animal life. The plant is the great purifier of the air. As fast as animals and other carbonaceous forming agents emit the poison, the whole vegetable world absorbs and decomposes it by means of energies received from the sun. In the dark, plants are mere filters. Then their power over this gas is gone. From sunrise to its going down, they actively perform their task of retaining carbon, of which they form woody fibre, and give back oxygen to the air, so that they both purify and enrich it. The animals form carbonic acid for the use of plants, and plants give out oxygen for the use of animals. In this way are balanced the animal and vegetable kingdoms. Plants do not take in a visible quantity of food into a conspicuous aperature like the mouth of an animal, but by means of innumerable minute apertures in the extremities of the roots, furnished with a substance like a sponge, called spongioles. Plants have no stomach, but in the soil through which the radicals spread, their food undergoes a preparation analagous to that which the food of animals is subjected to in their stomach. Their leaves are furnished with a porous texture for imbibing, and tubes and cells for assimilating and absorbing the carbon acid gas from the atmosphere. Thus do we see the wise and intimate relation between animals and all living vegetables. As the water is distilled from the ocean, carried by the clouds and again deposited upon the earth as rain and dew, so those substances which all animals and living creatures breathe, are stirred by the wind, carried through the atmosphere, and again deposited upon the earth as nutriment for the growing plant.

Exhaustion of the Soil.

Soils may be considered as consisting of matter in three distinct conditions. The first may be termed the active matter of the soil, existing in a condition capable of being dissolved in water, and available for entering into the circulation of plants: these are the materials which influence the immediate fertility of the soil, and regulate its productive character. The second is called the dormant matter, being insoluble in water, and therefore unfit for immediately entering into the structure of the plant; but when acted upon by the chemical agents of the atmosphere and the soil, gradually changes to a soluble condition, and assumes an active and nutritive character. The third condition is the gritty or stony portion, the type of the original rock from which all soils are produced, being the fractured particles which have withstood the atmospheric agency for a longer period, but which gradually becomes broken up into a smaller and finer state, and changes into the condition and appearance of the dormant matter. In all soils there is a progressive advancement. Should that which is stored up in an insoluble condition be prematurely dissolved by artificial means, and those that are carried off by the plants not be restored, the soil will ultimately become exhausted. Hence the effect of raising crops from nitric acid and sulphate of ammonia alone, is more like living upon capital than interest, their action being more of a solvent and stimulating nature than direct food for the plant. While we pride ourselves on the increased produce we obtain, we are apt to forget that it may be at the cost of a future diminution of the crop. Should these substances be frequently applied without the application of phosphoric acid or farm-yard manure, the land will ultimately become exhausted. The air constantly shifting is always prepared to yield a supply of the fertilizing substances of the atmosphere, so that the exhaustion of a soil is often due to the removal of the fixed and mineral substances which it cannot otherwise obtain. Not that nitrogenous manures are unnecessary: on the contrary, if applied in moderate quantities upon some lands, they are highly beneficial. The present resources of the soil are thus developed, and made available as food and nourishment for the plant, although we do not consider that new sources of food are added to the soil. The power of bones to lighten strong land by their chemical action, and thus render it less adhesive, is small. If put on to a large extent, they would have some effect; but the small quantity usually applied renders this force insignificant. But they increase the productive capabilities of the soil by supplying phosphoric acid to the growing crops. As a general rule, manures containing ammonia are best adopted for soils of a cold and inert nature, bones being most beneficial upon those of a light, dry, and porous nature, which require a much larger application of mineral substances of a more firm and solid kind. The atmosphere penetrates freely through soils of this nature, and soon disintegrates and consumes the active matters contained therein.

Farm-yard and artificial Manures.

Manure is the term used to designate all vegetable and mineral ingredients which, applied to the soil, increase its productive capability, or, when exhausted by cultivation, restore its fertility. Manures act partly as food for plants, and also by their mechanical influence in assisting the operations of tillage on some soils; they frequently exert as favourable an influence as by the actual increase of the nutritive substances. Nature teaches us the course we ought to adopt in supplying us with farm-yard manure, which must ever be the great mainstay of the farmer. The fertilizing constituents are present in dung, in states of combination which are especially favourable, not only to the luxuriant growth of our crops, but also to maintain the future fertility of the soil. It is a universal manure, because it contains all the constituents which our cultivated crops require to bring them to perfection, and is suited for every de-

scription of agricultural produce. All plants require a supply of organic and inorganic elements for promoting vegetation. Ammonia, carbon acid, and nitric acid are volatile, and are found not only in the soil, but are supplied by the atmosphere—being distinguished as the organic element of vegetation. Phosphoric acid, sulphuric acid, potash, soda, lime, magnesia, chlorine, and sillica are all confined in quantity to the soil, being of a fixed or inorganic nature. The discovery by Chemists of the substances necessary to vegetation, led to the application of artificial manures. Their nature, properties, and composition, have naturally received a large amount of attention from scientific and practical agriculturists. It is not necessary that an artificial manure should contain all the constituents of the crop. This is a condition rarely, if ever, fulfilled. Those of soda, sulphuric acid, lime, and chlorine, are least necessary. Potash and magnesia are more important, though not essential. Nitrogen and phosphoric acid are absolutely indispensable. The fertilizing influence of Peruvian guano is generally attributed to the ammonia, but it is equally certain that much of it is also due to the phosphates it contains, being nearly one-fourth part of the whole. A mixture of salts of ammonia and bones, to make the amount of nitrogen and phosphoric acid equal to guano, is not so nutritious nor beneficial. Guano weighs from 68 to 70 lbs. per bushel, and leaves one-third of a white ash when burned; if more than this, adulteration may be suspected. Sulphate of ammonia, when pure, is colourless, dissolves easy, and with very little residue in cold water, and when heated over a lamp entirely volatile, contains about 24½ of ammonia, and from 2 to 4 of impurities. Nitrate of soda contains about 95 per cent. of the salt, and about 5 of impurities. Common salt, when sprinkled upon red hot coals, flies about with a cracking noise, but the salts of nitrate of soda do not so. Crushed bones or bone-dust may be adulterated with earthy mixtures. Their presence may be detected by mixing with water, when the lighter particles may be washed off, leaving the heavier sand and earthy matters at the bottom; or by burning a weighed portion in the air at a red heat; if the ash exceeds half the weight of bones, earthy or other matter has been added. Dissolved bones ought to be sour to the taste, and water mixed with them and allowed to stand should become distinctly sour.

Phosphoric Acid in Superphosphates.

Phosphoric acid is used by agriculturists in two different states of combination. It may be used in the form of the ordinary phosphate of lime, which is insoluble in water, such as exists in bones, coprolites, &c. But there is another condition in which, by the application of an acid, it is brought into a state of division easily dissolved in water, called soluble phosphates. In bones and all other substances, phosphoric acid is in combination with lime, but sulphuric acid, with its superior attraction for lime, withdraws it from the phosphoric acid, and forms with it sulphate of lime or gypsum, and leaves the compound commonly known as bi-phosphate of lime, which contains only a third of the lime existing in bone earth phosphate. Some consider that sulphate of lime, which forms so large a constituent of the analysis of superphosphate, is added by the manufacturers; but his efforts are more to keep it down, as a large proportion of it excites suspicion and distrust on the part of the farmer, it being impossible to produce bi-phosphate of lime without also containing one-and-half times as much gypsum. As the raw materials contain also carbonate of lime especially if coprolites, which, by the acid, is converted into sulphate, we often find a much larger amount. A point of great importance is to determine whether the soluble is always the most economical form in which phosphates can be employed. That it is often so cannot be denied.

An immediate profit being important, it can never be advisable to keep artificial manures lying in the soil for a length of time unproductive. But upon lands of a light nature, the insoluble phosphates in a high state of division, such as exists in bone-dust, are highly beneficial. The value of superphosphates depends upon the nature of the substances from which they are derived. Chemists are agreed that soluble phosphates are the same, from whatever source they are produced, although many practical farmers think differently, believing that those made from bones are of a higher commercial value, being more of an animal nature, and therefore existing in a different state of combination,—being smaller, softer, and more porous in their particles, and more fertilizing and sooner available for vegetation than when they are derived from coprolites. Experiments are urgently called for to determine the value of soluble phosphates derived from different sources. By using a large amount of sulphuric acid, a manure made from coprolites may yield a good percentage of soluble phosphates; but the insolubles are of little or no value to the land; owing to their hard and almost impenetrable nature, they require to remain a long time in the soil before they can be rendered soluble and available as food for the plant. All insoluble phosphates in manures derived from this source are of very little advantage to the farmer. Superphosphate should be purchased in the soluble form, and if the nature of the soil requires a part in the insoluble, mix it with bone-dust, which is more easily assimilated and dissolved. Concentrated manures and various mixtures ought not to be encouraged. The sale of manures would be much simplified, if farmers would purchase the several constituents in a separate condition, and mix them together according to the nature of the soil and the crop to which they are applied. Under the present system, more depends upon the intelligence and skill of the manufacturer than the knowledge and experience of the farmer. The more simple the form in which the substances are purchased, the less liability is there to deception. A farmer who has a knowledge of the intrinsic value of manures is enabled to guard himself against imposture by the aid of chemistry, in establishing a method of expressing the value of all the substances of manures, and insisting on the method of selling by analysis, accompanied with a guarantee of the substances they contain. The analysis should also contain the date of manufacture, and the signature of him by whom the analysis is made. But how few take the trouble to satisfy themselves that the manures received contain the substances guaranteed, or are commercially worth the price they were sold for. Makers of chemical manures buy the materials they use by analysis, and why should farmers be less alive to their own interest? The trouble is little, and the expense nothing, compared with the interests at stake. The honest manufacturer will assist and encourage the farmer to secure a genuine manure; because he knows that the result will be to his advantage. The dealer who under-values and considers analysis unnecessary, sells a manure that will not bear investigation.

Value of Manures.

The plan pursued by Chemists in the valuation of manures is simple and easily understood. All substances for the growth of plants have a definite commercial value; the quantity of each ingredient is estimated by its value, and the amount is determined by adding the whole together. No system of valuation can be made perfectly complete; for it is well-known that many samples can be produced at a cheaper rate and analyse well, while others do not analyse so well but show a better result in the field. Bones being rarely used alone, are generally mixed with bone-ash, or if a cheap manure, with coprolites and other substances The condition of a manure is also of the highest importance. A damp and ill-reduced manure is not so valuable as a carefully manufactured article in which the various constituents are brought into a dry and fine state of division. But Chemists have been able to form a general system which is a sufficient approximation to the relative value of these substances. Agriculture is much indebted to Professor Anderson for his many able reports and investigations, and the clear and comprehensive style of his writings and publications; and to Professor Voelcker and Messrs. Gilbert and Lawes for the many experiments undertaken to ascertain the nature of manures and the laws and sources of vegetation. Experienced Chemists have adopted a nearly uniform method of expressing the analysis—the different constituents being arranged under several great heads. All expressions, such as phosphate and carbonate of lime, sulphate of lime, potash, and soda should be rejected, because in place of giving an estimate of the value of a manure, they are only calculated to mislead and confuse the purchaser. In some analysis the ammonia is not stated separately, but given as sulphate of ammonia. Now ammonia is the substance determined, and there is no reason whey it should be calculated into sulphate, which contains only about 24½ per cent. of pure ammonia. Those who are not acquainted with the terms of chemistry are apt to be deceived as to the amount. Some manufacturers seem to consider that Chemist's valuations are too low, and have intimated their intention not to abide by their valuations. We consider that soluable phosphate is too high, especially if derived from coprolites, for which from £24 to £26 is sufficient value, while that of ammonia is too low. Ammonia in sulphate of ammonia, costs nearly £70, but this is the dearest form in which to purchase it. Potash, though valued at £20 per ton, is seldom found in manures in sufficient quantities to exert a beneficial influence, and except in particular cases, it is not customary to take it in. In order to ascertain whether or not a sample is genuine—without determining all the constituents—it is necessary to determine the quantity of soluble and insoluble phosphates and ammonia. The main constituents being right, it may be fairly assumed that the others will not differ materially.

Co-operation

We think the time has now arrived when meetings should be held and Committees formed to consider the best and most suitable manner of purchasing manures, so as to give encouragement to the honest manufacturer, and to prevent the imposition upon farmers of worthless substances in manures. Some counties have appointed a Chemist, not only to test their manures, but to teach farmers a knowledge of chemistry and scientific cultivation. Others advertise for a large quantity of

manure, offers are received, the manure tested upon delivery, and then it is divided out among the members. In some places a co-operative system of manufacture of manure has been introduced. To secure a large number of members, small shares are allotted, and are taken up both by landlord and tenant, and others interested in agricultural prosperity, and the whole is entrusted to the superintendence and inspection of a large and influential Committee. Co-operation has, of late, been very successful in many branches of business, and we see no reason to doubt its success in the manufacture of manure. The object of modern cultivation being to obtain from a given surface of land, a greater amount of vegetation than that which is produced by nature; requires the farmer to expend large sums for artificial manure, and his interest and success depend on the care and attention exercised in the selection and preparation of substances to impart fertility to the plant. We must be cautious not to overlook the benefit and importance of a superior tillage of the soil, being necessary for the luxuriant growth of the crop; so that not only the fertilizing influences of the atmosphere may be obtained, but that the roots of plants may have a freedom of action for searching after the food they require. The liberal application of manure, and the proper cultivation of the soil, must stand side by side as valuable co-operators in the same service. Husbandry being an operation of boundless variety, extending to many objects in nature, it is exposed to more casualties than any other branch of business, involving care, troubles, and anxieties; and these are neither few nor slight.

What bliss, what wealth did ever the world bestow on man. But cares and fears attended it? No one will insist that agriculture has reached its highest degree of perfection. Everything must be pressed into the service that skill and ingenuity can contrive, to increase the products of the soil, and lessen the cost of production, to meet the growing requirements of increasing trade and accumulating population. The experience and skill acquired by observation, may have been sufficient for the practice of the husbandry of the last century; but the position and practice of modern agriculture demand that the farmer should be more or less acquainted with the principles and progress of the scientific, as well as the practical department of his art. There are some who consider that the progress of agriculture is not in keeping with that of trade and commerce. But, be it remembered, that to increase their production they have only to extend their premises and increase their machinery. We cannot extend the boundaries of our farms without diminishing those of others. It is only by industry and superior cultivation that we hope to arrive at the desired end, as Providence, who rules the temperatures and the seasons, also determines the success or failure of our various operations. We feel assured that agriculture will never be found plodding on behind, but will always be in keeping with the progress and requirements of the age.

DISCUSSION.

Mr. Lees, Carngillan, said the proposal was well-worth considering, that the Society should arrange with a Chemist to get manures analysed. Farmers were very much imposed upon by manure agents; and it would be a great advantage to them to have a Chemist who would analyze any samples of manure sent to him.

Mr. Bone, East Sanquhar, agreed with Mr. Lee that farmers were much defrauded in this matter. Frequently they were not in a position to get the analysis checked, and therefore they had just to take the manure as it was sent to them. Generally speaking, he would say that bones and guano were the cheapest things to be got in the market. Although the price of guano had been raised, it was still perhaps the cheapest light manure they had. With regard to analysis it was not always to be trusted. He believed they were all pretty-well acquainted with a manure sold here, six or eight years ago, which bore as good an analysis as any in the market. He, one year particularly, having purchased a good deal of it, he made about thirty experiments, and he was sorry to say the great proportion of them were nearly utter failures. He afterwards ascertained that the manure was made from coprolites, which, he agreed with Mr. Stevenson, were of very little value to the farmer.

Mr. Wallace, Baraehead, said it was to their shame that they did not pay more attention to the subject that had been so well brought before them to-night. He thought their only safeguard in buying manures was to deal with respectable parties. He agreed with Mr. Bone, that they could not get on in this district without artificial manures. They would have to adopt a new mode of farming if they did not use them to stimulate their crops. He agreed with what had been said as to the value of bones, but at the same time he was of opinion that bones were not all of the same quality. Old dry bones, in his opinion, could not be of the same value as fresh ones.

Mr. Young, Kilhennie, thought the day was not far distant when portable manures would be bought more by analysis than they had been. He thought it was the best security they could have against imposition. He was satisfied that the greater number of manure merchants were very respectable men, and that if they did sell adulterated manures it was against their knowledge, and because they themselves were deceived. It would be well for them all to lay to heart the remarks made by Mr. Stevenson, about the careless way in which they attended to their farm-yard manure. It would be a good thing if the services of an analytical Chemist for the county could be secured. This had been done in Kirkcubright and other counties, with very satisfactory results.

Mr. Caldwell, Knockshoggle, said, if he was not mistaken, the Agricultural Association had a few years ago engaged a Chemist (Mr. Smith) to make analysis of manures.

The Chairman said that was quite true, and he was very little employed.

Mr. Caldwell said he agreed with the speakers who had said that the artificial manures chiefly to be depended on were guano and bones. Instead of buying the compounds which were offered for sale, he preferred to buy the substances by themselves, and then mix them to please himself according to the soil and crop. He remembered, two or three years ago, preparing a manure with bones and a little potash for potatoes. The mixture cost him upwards of £9 a ton. He was induced at the same time to buy 1 ton of potatoe manure, which he was told was far better than anything he could mix. The price of it was £10 a ton, but to oblige him it was reduced to the price of his own mixture. Well, the potatoes grown with that manure were worth from £2 to £3 an acre less than those grown with his own mixture.

The Chairman (Mr. R. M. Cunningham) said it was their duty, as agriculturists, to do what they could to ascertain the kinds of manures which were best suited to the district in which they resided. He would agree very much with some of the speakers in saying that they should keep to guano and bones. He was now much averse to prepared manures. He thought the farmer should prepare them himself. There might be something in what the manufacturer said, that he could mix the different ingredients better than they could; but it was so vital to them to have a good crop, that they should take the trouble of getting the substances separately, and mix them themselves. Mr. Stevenson had wisely recommended that they, as a club, should join together to secure genuine manures. One way might be to engage some respectable firm to furnish manures containing certain ingredients, or they might join together to import the raw material and get it prepared for themselves. He believed in this way they would have it much cheaper; and there was another advantage they would gain. When he used a large quantity of prepared manure, from a feeling of doubt he had about it, he had often applied double the quantity that was requisite to secure a good crop. Now if they got a substitute that they could rely on, they could apply it with more confidence, and this waste would be prevented. He agreed with what Mr. Stevenson said about their waste of farm-yard manure. He thought their landlords ought to do something in assisting them to provide covered courts and dungsteads. He believed it would be for their interest to do so, as it would enable farmers to put more and better manure on the land, and without this, land would come to be of less value than at present.

A vote of thanks having been tendered to the Chairman for presiding, the meeting separated.

ADULTERATION OF MANURES AND FEEDING STUFFS.

The Royal Agricultural Society of England is doing good work in publishing the names of the firms who by adulterating the farmers also cheat the country, as the application of the expensive trash deteriorates rather than fructifies the land, and prevents the husbandman from obtaining the yield he otherwise would. The Report of the Society's Consulting Chemist, though long, we give in extenso, as it refers to one of the most important matters in connexion with agriculture at the present day.

The following is the report:—

1. Last March I reported the following analysis of an artificial manure, which was sent to me by Mr. Catchpool, Feering Bury, Kelvedon, Essex:—

Moisture	9·65
*Organic matter	13·54
Phosphate of lime	4·99
Carbonate and sulphate of lime	48·77
Alkaline salts and magnesia (chiefly common salt)	3·23
Insoluble siliceous matter sand	19·83
	100·00
* Containing nitrogen	1·19
Equal to ammonia	1·36

In comparison with the price at which Peruvian guano is sold, this manure would be dear at £2 a ton.

Mr. Catchpool has since informed me that he bought this artificial manure from Messrs. H. Marshall & Co., Quay, Wivenhoe, Essex, as fish and bone manure, at £5-5s. per ton, and sent me the accompanying letter and copies of analysis, which he received from Messrs. H. Marshall & Co.

Quay Wivenhoe, February 27th, 1870.

EDWARD CATCHPOOL, Feering Bury.

DEAR SIR,—In accordance with your request enclosed, you have copies of analysis of our fish and bone manure.

We are exceedingly busy with it, and sending out from 20 to 30 tons per day. Sir John Tyrrell, of Bircham House, had 1 ton of our fish and bone manure, and tested it for barley and oats in a forcing house; and Mr. Lewin, his land steward, stated in Chelmsford market, on Friday, that the fish and bone manure beat all the others, and the only thing near it was Peruvian guano.

Your order shall have our best attention.

Yours faithfully,
(Signed) H. MARSHALL & Co.

COPY.

Result of analysis of fish and bone manure by Professor Voelcker, Analytical Professor to the Royal Agricultural Society :—

LABORATORY, 11, SALISBURY SQUARE, FLEET STREET,
London, October 21, 1870.

Moisture	14·74
* Organic matter and salts of ammonia	21 29
Phosphates of lime and magnesia	10·07
Sulphates and carbonates of lime	35 29
Alkaline salts	10·64
Insoluble matters	7 97
	100 00
*Containing nitrogen	3·62
Equal to ammonia	4·39

Fee received, £5-5s.

(Signed) A. VOELCKER.

COPY.

Result of analysis of soluble fish and bone manure by Professor Sibson, F.C.S., Professor of Chemistry in the Royal Agricultural College :—

LABORATORY, 11, EATON TERRACE, ST. JOHN'S WOOD,
October 20, 1871.

Moisture	12·58
* Nitrogenized organic matter and salts of ammonia	22·58
Precipitated phosphates	14·02
Insoluble phosphates	7·03
Sulphate of lime	27 63
Alkaline salts and magnesia	6·44
Insoluble siliceous matters	7 17
	100·00
* Containing nitrogen	3·00
Equal to ammonia	4·70

(Signed) ALFRED SIBSON, F.C.S.

FEERING BURY, KELVEDON, *March 16th* 1871.

MY DEAR SIR,—Thank you for your letter received this morning, also for the trouble you have taken. The same post also brought a letter from Marshall & Co., in which they write: "There is no necessity for you to correspond with Dr. Voelcker, as we are in communication with him." Is this statement correct. I cannot gather from your letter that you have heard from them. I shall be glad to hear.

Believe me to remain,
Yours faithfully,
(Signed) EDWARD CATCHPOOL.

DR. AUGUSTUS VOELCKER.

A sample of boiled bones sent by Mr. Barbour, of Bolesworth Castle, Chester, on analysis, was found to have the following composition :—

Moisture	5·76
* Organic matter	11·64
Phosphate of lime	40·47
Carbonate of lime, magnesia, and alkaline salts	13·53
Insoluble siliceous matter (sand)	29·60
	100·00
* Containing nitrogen	·94
Equal to ammonia	1·14

This sample it will be seen was largely adulterated with sand. I have not been able to learn whether it was sold as pure boiled bone dust, and at what price per ton.

3. In another sample, sold as pure and unadulterated bone dust, to Mr. Henry Straker, Riding Mill on Tyne, I found 28·66 per cent. of sand. This sample was taken out of the middle of one bag. Having reported the bone dust to be adulterated, Mr. H. Straker sent me a fresh sample taken from several bags, and then mixed before taking the sample, and requested me to make a full quantitative analysis, which yielded the following results :—

Bone dust sent by Mr. H. Straker, Riding Mill on Tyne, March 8th,—

Moisture	7·20
* Organic matter	19·17
Phosphate	41·56
Carbonate of lime	11·06
Alkaline salts and magnesia	5·92
Sand	15·09
	100·00
* Containing nitrogen	2·47
Equal to ammonia	2·99

Like the preceding sample, it was not pure and genuine bone dust, although it was bought at £8, 7*s*. 6*d*. a ton, as will be seen by the invoice of Messrs. Oliver and Snowden, seed and cake merchants, and dealers in Peruvian Government guano, nitrate of soda, tar, grease, and oils.

H. STRAKER, ESQ,
Riding Mill, Haltwistle.

Bought of Oliver and Snowden, Seed and Cake Merchants, &c.

Feb. 25, 1871 —67 bag of bone dust, 5 cwt. 2 qrs., at £8 7*s*. 7*d*...	£ 42 14 2
67 bags..	„ 1 19 1
	£.. 44 13 4

Stocksfield —Carriage not paid.

Mr. Straker sent me a copy of a letter in which occurs the following passage :—

You will probably remember also having had a sample of bone dust which I had bought as "pure and unadulterated," and which, on getting your analysis, I sent back. I heard in the train to-day that it was afterwards sent to a neighbour of mine (he told it to me himself), who also had it analysed, not liking the look of it, and the report was worse than yours; he too refused it, and they actually sent him a copy of your analysis to me, which I had given them in justification of my refusing it,—this they sent to my friend, to show how wrong his Chemist was. They offered to deduct 10*s*. a ton if he would keep it.

4. German potash salts : Kinite.—Mr. H. Straker also sent me a sample of kinite, which he had bought from Messrs. Keighley and Maxstead, of Hull, on a guarantee that the kinite should not contain less than 23 per cent. of sulphate of potash. I found, however, only 18 per cent. of sulphate of potash in the sample sent to me by Mr. Straker, on February 23rd 1871.

The sample was taken from a burst bag, and as it might not have fairly represented the percentage of potash in the whole delivery, Mr. Straker sent me another sample, which was a mixture taken from the middle of ten bags. The second sample of kinite, received March 8, yielded :—

Potash	10·35
Equal to sulphate of potash	19·15

Both the bone dust and the kinite were returned by Mr. Straker, as not being according to the guarantee.

5. British economical manure.

A sample of so-called artificial manure was sent to me by Mr. W. Levett, Glassenbury, Cranbrook, who informed me that the manure is called the British economical manure; that it is manufactured by Mr. B. Coverdale, 17, Devonshire Square, Bishopgate street, London, and sells at £12 per ton. Its composition was as follows :—

Moisture	12·89
* Organic matter and water of combination	8·07
Sulphate of lime	14·09
Silicates	10·78
Alkaline salts (sulphate of soda chiefly)	44·61
Sand	9·56
	100·00
* Containing nitrogen	·11
Equal to ammonia	·13

This economical compound contains a mere trace of ammonia, no phosphates whatever, and is a worthless mixture of green vitriol, crude sulphate of soda (salt cake), gypsum, and sand. It has already been mentioned in the quarterly reports, and its utter worthlessness pointed out to farmers. Mr. Levett states that he bought 1 ton, and some of his neighbours more than this quantity.

6. I would also direct attention to the composition of a

sample of British guano, sent for examination by Mr. Joseph Masters, Bingeworth, Evesham :—

Moisture	19·26
* Organic matter	26·61
Phosphates	29·83
Sulphate of lime	11·62
Manganese and alkalies	10·74
Sand	18·04
	100·00
* Containing nitrogen	1·50
Equal to ammonia	1·82

This British guano contained not quite 2 per cent. of ammonia and 12 per cent. of phosphates, and on the other hand a good deal of sand and gypsum. It is scarcely worth £4 a ton.

I have received no particulars of the price at which this manure was supplied, or the parties from whom it was received.

There have been several cases of inferior guano, and also, I regret to say, some that have been also adulterated.

7. Adulterated guano—A sample of Peruvian guano, sent by Mr. W. Lamin, Brestwood Park, Nottingham, was found to contain, in 100 parts :—

Moisture	15·22
Carbonate and sulphate of lime	5·54
* Organic matter and ammonia salts	25·43
Phosphates	18·62
Alkaline salts, &c.	8·84
Sand	26·35
	100·00
* Containing nitrogen	5·79
Equal to ammonia	7·02

It will be seen that this guano was adulterated with a large proportion of sand and earthy matters, which yielded only 7 per cent. of ammonia. It was sold at £12-10-8 per ton.

Bestwood Park, May 1, 1871.

DEAR SIR,—You wished me to inform you how I bought the guano I sent you for analysis. I enclose you the invoice. Mr. Wood, a friend of mine, assures me that he only gets 5*s.* per ton for selling it, calls it Peruvian guano, and he believed it to be good. He bought it from W. Shaw & Co., 15, Tithe Barn Street, Liverpool.—Yours faithfully,

W. LAMIN.

DR. AUGUSTUS VOELCKER.

P.S.—Mr. Wood did not sell the guano as best Peruvian, but said it was cheap at the price he sold it.

W. LAMIN.

A case of adulterated guano, supplied by the same firm at Liverpool, was mentioned in the last quarterly report.

8. Another sample of adulterated guano was sent for analysis by Mr. N. Basket, Braines Hall, Wetheringsell, Stonham, Suffolk, who paid for it £12-15*s.* cash. It had the following composition :—

Moisture	17·84
* Organic matter and ammonia salts	23·97
Phosphates	28·07
Carbonate and sulphate of lime	12·02
Alkaline salts, &c.	5·35
Sand	12·75
	100·00
* Containing nitrogen	4·94
Equal to ammonia	5·99

9. Fish and bone manure.—One of the most worthless artificial manures examined by me during the last quarter, was a sample of so-called fish and bone manure, sold at £5 per ton, delivered free, sent by Mr. N. Basket.

This compound, as will be seen from the subjoined analysis, yielded only one-third of a per cent. of ammonia (in round numbers), and only 3½ per cent. of phosphate of lime, and the remainder was not worth the carriage to any distance. Such a manure would scarcely be worth 10*s.* a ton, delivered free of cost on the farm.

Composition of a sample of fish and bone manure sent by Mr. Nathaniel Basket, Braines Hall, Wetheringsell, Stonham, Suffolk :—

Moisture	11·98
* Organic matter	8·88
Phosphate of lime	3·43
Sulphate and carbonate of lime	51·06
Magnesia and alkaline salts	2·70
Insoluble siliceous matter (sand)	21·95
	100·00
* Containing nitrogen	·21
Equal to ammonia	·27†

† The Professor has not received the names of the vendors of these manures, but has applied for them.

10. Concentrated fish manure.—A manure received from W. W. Gascoyne, the Lawn, Sittingbourne, was offered to him as concentrated fish manure, at £4-10*s.* per ton, but according to the subjoined analysis, it was worth only £2 per ton.

Composition of a manure sent by Mr. W. W. Gascoyne, the Lawn, Sittingbourne, called concentrated fish manure, April 21, 1871 :—

Moisture	17·48
* Organic matter	21·37
Biphosphate (equal to bone earth 2·06)	1·31
Insoluble phosphate	5·02
Sulphate of lime	20·64
Alkalies	1·14
Sand	33·14
	100·00
*Containing nitrogen	·69
Equal to ammonia	·83

Mr. GASCOYNE writes :—

The Lawn, Sittingbourne, May 9, 1871.

DEAR SIR,—The manure merchants are much dissatisfied with the result of your report, and will seek an analysis on their own account. The price they ask me for this manure is £4-10*s.* per ton ; they say it consists exclusively of acid, fish, and scutch : they cannot understand the 32·14 "insoluble siliceous matter," and 20·64 "sulphate of lime," but these must come with the scutch from the taupits.—Yours faithfully,

(Signed) W. W. GASCOYNE.

The names of the dealers have not been furnished.

11. Another very inferior manure was received from Mr. Edward Wadham, Milwood, Dalton-in-Furness. This manure had the following composition :—

Moisture	9·74
*Organic matter	29·90
Phosphate of lime	5·80
Oxide of iron and alumina	4·96
Carbonate and sulphate of lime	4·62
†Alkalies and magnesia	11·53
Sand	17·05
	100·00
* Containing nitrogen	1·37
Equal to ammonia	1·66
† Containing nitrate of soda	·72

I estimated its value at about £2-5*s.* a ton. In reply to my enquiries, Mr. E. WADHAM, writes as follows :—

Millwood, Dalton-in-Furness, May 15th 1871.

SIR,—Absence from home must be my apology for not having sooner attended to your favour of the 6th instant. Your analysis entirely confirms my suspicions. The article was purchased from one William Gradwell, of Barrow-in-Furness, and he charged £8-10*s.* per ton for it. I shall, of course, only pay him according to your valuation, and if he makes any difficulty about it, he must stand the consequences.—Yours obliged,

(Signed) EDWARD WADHAM.

Dr. AUGUSTUS VOELCKER.

12. Composition of a sample of patent blood manure sent by Mr. J. Minett :—

Moisture	19·24
Water of combination and organic matter	15·60
Biphosphate of lime (monobasic phosphate of lime)	11·10
Equal to the bone-phosphate (tribasic phosphate of lime) rendered soluble by acid	17·40
Insoluble phosphates	8·14
Sulphate of lime	[illegible]
Alkaline salts and magnesia	2·03
Insoluble siliceous matter	3·27
	100·00
* Containing nitrogen	1·62
Equal to ammonia	2·21

Slowley Hall, Arley, near Coventry, April 11, 1871.

DEAR SIR,—I have sent you a sample of patent blood manure by rail to analyse as No. 5, and enclose you a post office order for £1.

The price of the manure at my station is £10 per ton ; it is bought from a very respectable firm, and I should like to know whether I have value for my money.—Waiting your analysis, I remain yours truly,

JUNIUS MINETT.

A. VOELCKER, Esq.

Slowley Hall, Arley, Coventry, May 26th 1871.

DEAR SIR,—On the receipt of your analysis, I forwarded a copy of it and your letter to the firm the manure was purchased from, and enclose a copy of their reply, which I do not consider at all satisfactory. They enclose a receipt for £2, the difference of their No. 2 and No. 3 manure, and not had an analysis,

I should not have known their mistake (as they put it). I have not given the name of the firm, but will do so if you require it.

I am, dear Sir, yours truly,
JUNIUS MINETT.

DR. VOELCKER.

P.S.—On looking at the bags, I find they are marked No. 3. They have three prices for their patent blood manure: No. 1, £6; No. 2, £8; No. 3, £10; No. 3, I ordered.

J. M.

May 17th 1871.

COPY OF REPLY.

DEAR SIR,—Immediately upon receipt of your sample, we tested it, and find that it is No. 2 blood manure, and not 3. We exceedingly regret that such a mistake should be made, and for the future we shall brand the bags with red instead of black, so that no such mistake can occur. With forwarding towards 200 tons daily, a mistake such as this cannot be wondered at with workmen, as the only distinction on the bags is the letter 2 and 3. The price Dr. Voelcker puts upon it is simply absurd. The ammonia is 20*s.* per cwt.; the soluble phosphate, 6*s.* per cwt., which shows at once:—

17·40 Soluble, at 6*s.*	£	5	4	0
2·21 Ammonia, at 20*s.*	,,	2	4	0
Insoluble, all from Peru guano, 8·14 at 2*s* 6*d.* .	,,	1	0	0
Organic matter and sulphate lime	,,	1	10	0
£..		9	18	0

The standard for price is Nesbit's, and the price of ammonia is the market price.

We guarantee the No. 3, 20 per cent. soluble phosphate, 4 per cent. ammonia, that is 2 per cent. more than the No. 2

We are, dear Sir, yours truly.

The Commissioner have requested Professor Voelcker to write at once for the name of the firm who supplied this manure.

13. Adulterated rice meal. In the next place I have to report a case of adulterated rice meal, sent to me for examination by Mr. W. Stubbs, Bickerscote, near Stafford. This meal had the following composition:—

Composition of Adulterated Rice Meal.

Moisture	8·36
Oil	1·72
Protein compounds .	7·87
Starch, sugar, &c.	43·75
Woody fibre	11·14
Mineral matter	24·16
	100
* Containing nitrogen	1·26

Analysis of Ash.

Phosphate of lime	3·44
Magnesia and alkalies	2·80
Sulphate of lime	11·73
Silicia and sand	6·10
	24·16

It will be noticed that this meal was mixed with gypsum; and as it contained 24 per cent. of mineral matter, of 11 per cent. of indigestible woody fibre, it is no wonder we did not agree with Mr. Stubbs's stock. In answer to my enquiries respecting the name of the vendor of the meal, &c., &c., I received the following note:—

Dunston Farm, Penkridge, March 25th 1871.

SIR,—Mr. W. Stubbs, of Bickerscote, has laid before me your analysis of a sample of rice meal, from a lot purchased by him, also your letter requesting him to give the name and address of the vendor, and as he had some doubts as to how far this would render him liable in case it was published, I have prevailed on him to place in my hands the invoice and correspondence relating to it, to forward to you if I thought fit. I do so because I believe it is the only way to check the shameful impostures to which we are every day made victims. Mr. Stubbs wishes you to send the paper back to him at once, as he consumed 7 sacks of it before he had any suspicion of its contents, and which he has not yet paid for.—I am, yours truly,

(Signed) FREDERICK BYRD.

DR. AUGUSTUS VOELCKER.

(Copy of Invoice.)

Corn Exchange, Oldwinsford, Stourbridge, Charles Johnson.

TERMS CASH.

December 31, 1870—25 sacks No. 1 Rice meal, 14*s.* ..	£	18	2	6
25 bags not returned, 1*s.* each ..	,,	1	5	0
£..		19	7	6

MR. W. STUBBS.

14. Linseed cake, containing castor-oil beans.

The following letter was received from Professor Varnell:—

Beech House, Belton, Suffolk, April 23, 1871.

MY DEAR DOCTOR,—I send you two pieces of cake taken from a parcel I am feeding some bullocks with. It has made them ill, and I will thank you to examine it and inform me what it contains that is injurious to health. Some part of the lot has been damaged, I suppose, from having been heated in bulk, and I observe that a fine crop of fungi has sprung up on the surface of some of them, which I have thought may have something to do with the illness of the beasts, but of this I am not certain. It may contain in its composition, seeds and other matter which have done the mischief, but of this you will no doubt be able to inform me. It is possible that you may have had samples to analyse from the same lot of cake, as other farmers beside myself have had reason to complain.

A reply as early as convenient will oblige.

Yours truly,
(Signed) GEORGE VARNELL,
Member of the Royal Agricultural Society.

DR. A. VOELCKER.

Beech House, Belton, Yarmouth, April 29, 1871.

DEAR MR. VOELCKER,—I beg to thank you very much for your kind letter respecting the cake. With regard to the conditions under which it was bought and sold I am quite ignorant. All I know about it is, that a merchant in Yarmouth imported cargo of the cake, and sold it to some farmers, who very soon, I believe, complained that it made their bullocks ill. The merchant requested me to try some of this cake with some of my cattle. I therefore had a sack of it taken to my farm, and on the following day I gave three bullocks about 4lbs. each of it, which they readily ate, and on the following day they were all decidedly ill. The symptoms were indicative of considerable irritation of the mucous membrane of the stomach and intestines. They refused all kinds of food for nearly two days afterwards. As the symptoms in each animal were precisely the same, I did not think it necessary to test the cake any further, being satisfied in my own mind that it was unfit for food for cattle. I daresay, I shall be able to find out whether it was sold as pure linseed, and also at what price.

Beech House, Belton, Great Yarmouth, May 25, 1871.

MY DEAR SIR,—About the end of this week a gentleman will send to you, by my advice, three samples of cake for you to analyse. They are from the bulk of some cake I sent you small portions of a short time since; but he, Mr. Watting, an extensive merchant, fancies the said cake, *&c.*, the bulk is composed of two or more kinds, which he would be glad to ascertain. He has lately been feeding two or three lots of sheep upon this cake, and has detected that it injures them in anyway.

I remember you said in your very kind letter to me, you asked "who was the seller of the abovementioned cake, and the price it was sold at?" I have learned that the price was £10 per ton, but finding it produced disease in many cattle that were fed with it, he sold the rest of it by auction.—Believe me, yours truly,

GEORGE VARNELL.

DR. A. VOLLCKER.

A careful microscopic examination shewed not merely the presence of fungi, but also that of the husks of castor-oil beans. The cake, I need hardly say, is totally unfit for feeding purposes.

I have reason to believe that the same cake has done much mischief in Suffolk and Norfolk, inasmuch as I had samples of cake very similar to that sent by Professor Varnell sent to me for examination by non-members of the Society, who complained of the mischief done by the cake to their stock.

15. Another cake was sent to me by a gentleman residing in Essex, not a member of the Society, sold at £11.10*s.* as of best English linseed, which was composed chiefly of the screenings from rape seed, and which had caused considerable loss among sheep. This gentleman, not being a member of the Society, the names of the parties concerned cannot be given.

The next case on which I have to report is that of a sample of linseed cake, which was sold at £12·5*s.* to Mr. E. H. Davies, Palton, Wenlock, Shropshire, as best cake.

Its composition was as follows:—

Moisture	11·34
Oil	11·60
* Protein compounds	29·25
Gum, mucilage, starch, &c.	30·38
Woody fibre	9·53
† Mineral matters	7·90
	100·00
* Containing nitrogen	4·69
† Containing sand	1·40

Although this cake was not a bad feeding cake, it was nevertheless adulterated with pollard or similar starchy Mill refuse materials, and certainly not best linseed cake, nor worth £12-5s. a ton.

Mr. Davies writes to me as follows :—

Palton, Wenlock, April 18th 1871.

DEAR SIR,—The linseed cake which I sent to you for analysis, and which I have received, was bought from Mr. Burnet, of Broseley (agent). It is a cake made at Hull, but the maker's name I do not know. It was sold as a genuine linseed cake, and is stamped (best). I have had three different lots from the same maker—one lot stamped (pure), the other (genuine), and this which I sent you (best). It cost me £12-5s. per ton. I have fancied it was a good cake, my cattle eating it well ; but a neighbour of mine having bought some from the same person, with which he was not satisfied, I thought I would have it analysed to satisfy myself if there was anything in it except linseed. Although you state that the cake in question is adulterated with bran, &c.. still the composition is very similar, at all events compares favourably with that of a cake sold by Mr. Firmstone, Stourbridge, and which you state is a pure linseed cake of first-rate quality. To explain what I mean, I enclose your analysis of the two cakes, which, if it is not giving you too much trouble, I shall be glad to have returned.—Yours faithfully,

(Signed) EVAN H. DAVIES.

17.—Another sample sold as best English linseed cake was found adulterated with nut cake, and made from dirty linseed. It contained in 100 parts :—

Moisture	11·02
Oil	10.60
* Protein compounds	27·06
Gum, mucilage, &c.	29 20
Fibre (woody)	15·66
* Mineral matters	5·56
	100·00
* Containing nitrogen	4·33
* Containing sand	·98

Mr. Leggat of Bromwich, Titchfield, Hants, says in his letter to me :—"I have reason to believe the cake contains some ingredient highly injurious to stock, as I have during the last five weeks lost thirty lambs which have been fed on it.

(Signed) AUGUSTUS VOELCKER, F.R.S.

The report was adopted.

TOBACCO.

TOBACCO CULTIVATION AT DHARWAR.

READ the following letter from Mr. E. P. Robertson, Collector of Dharwar, in reference to the Tobacco Committee's report, submitted at the May Meeting, on his samples of tobacco: —

"I have to thank you for the printed papers containing the report on the tobacco sent by me.

"It appears to me that there must be some mistake, the tobacco containing little or no nicotine. Very many of my friends have tried the tobacco and pronounce it to be good with, however, the fault of being exceedingly strong. Now the strength of tobacco comes from its nicotine, and if the specimens I sent contain no nicotine, whence the strength ?

"I believe that nothing destroys tobacco so much as moistening it. How then is acetic acid and chloride of sodium to be used in the curing ?

"If the process of desiccation had been carried on too quickly, the tobacco would have been of either a green or greenish yellow colour. If too slow it would have been black, like much of the country tobacco.

"Referring to the report on tobacco by Dr. Forbes Watson, and his extracts from the treatise by Mr. Moss, I perceive that the amount of nicotine, in a great measure, depends on the extent to which the leaf is allowed to ripen. The greener the leaf, the more the nicotine. The amount of nicotine does not appear to depend on the curing.

"The soil the tobacco was grown in is a hardish red moorum soil, containing much iron, probably that may account for the colouring matter being so much developed.

"The tobacco of which the cigars were made was *precisely* the same as the leaf sent. It was submitted to *no process whatever* by the manufacturer beyond the simple process of rolling it up into cigars. It was taken from the same heap as the leaf specimen sent, and was made up at once before me in my verandah.

"I intend to have some of each description of the tobacco leaf analysed, and also intend to submit the soil in which it was grown to the same process.

"I have had some of the cigars packed up for some months to test how far they are proof against insects. None have been attacked by insects. Some Manilla cigars, some Trichinopoly cheroots, and some of 'Cope's cigarets,' all packed up at the same time have, however, been entirely destroyed by insects. As regards liability to attack of insects, the experiment has been quite in favour of the tobacco cured by me.

"I make these few remarks as I am anxious that we may at length arrive at the proper method of curing tobacco in this country. Thanking the Society for the kind trouble taken regarding the specimens sent by me."

TOBACCO CULTIVATION, BEING A BRIEF ABSTRACT OF DR. FORBES WATSON'S REPORT ON TOBACCO.

"The introduction of a system of cultivation and preparation of tobacco possessing first-rate qualities, requires so much care that it can only be successfully attempted by means of Experimental Farms." —DR. FORBES WATSON.

(*Supposing the area of ground on which the experiment is about to be tried to be an acre.*)

The seed-bed.

Enclose with a wall (brick) about one foot and a half high, a space five feet broad by twenty-five feet long. Dig out the soil, enclose to a depth of two feet, replacing the soil removed by two feet of strong stable manure. When this begins to ferment (to steam) cover with six inches of prepared earth and sow the seeds.

Sowing the seed.

To sow the seed more carefully, mix it with white-wood-ash, and scatter the whole equally over the surface of the prepared ground (the seed ought to fall about four to the square inch, but with so small a grain as tobacco it is impossible to be exact) and cover with an inch of good mould.

After-care for the seed.

After sowing, water the seed-bed with a fine-rosed watering pot. The sowing bed should be provided with a reed-mat covering, which after watering should be stretched across from wall to wall. This covering should be taken off (to allow the steam from the manure to escape and admit fresh air) for two hours every morning and evening.

Three days after the first sowing, the bed should be watered again. (N. B.—Water early in the morning.)

Pricking out.

In about a week the plants should appear, and when they seem to crowd, should be pricked out, at [illegible] distances of one inch each way round each plant, thus :—

. . . . . .

. . . . . .

. . . . . .

(N. B.—The spare plants should be preserved for filling up gaps in the rows when transplanted).

Planting out.

When the plants have developed four or five leaves, any one of which is an inch broad, may be transplanted. The seed bed should be watered in order to make the pulling up of the plants easy, and when pulled up the plants should be removed as quickly as possible to the site prepared for them.

The tobacco field.

This site (supposed to be an acre in extent) should be level ground and exposed : a fence six feet should be round it to protect it from jackals, &c. The soil should have been ploughed deep twice before the plants were put in and afterwards harrowed and rolled carefully.

The soil.

It should have a fine light soil with a firm loamy subsoil, manured with strong ammoniac manure, at a ton per acre, with a free distribution of vegetable remains.

Tobacco an alternate crop.

The site of the tobacco plantation should be changed every two years, as tobacco is a most exhaustive crop.

(*N. B.*—Sun-flower would alternate with it well.)

The plan of the field.

The plants should be planted in rows two feet apart, each plant two feet from the next, a pathway being left for the coolies between (not every row but) every two rows. A broader pathway (four or six feet broad) should intersect the plantation at right angles, forming at the point of intersection, a convenient space for heaping the leaves.

Watering.

When the plants have been set out, water well, (N. B.—The watering pots used should have very finely perforated roses), and

if any plants die, fill up the gaps with spare plants from the seed-bed.

Hoeing.

After a day or two, hoeing should commence. The hand is the best instrument, and the workmen should be told to kill every insect they see except ants, and to heap the earth carefully round the stems.

Pruning.

If the plant threatens to be very leafy, remove superfluous leaves, leaving about fifteen to a plant. When the flower buds are plainly noticeable, they must be picked off with great care. (N. B.—For fancy smoking tobaccos, the flowers need not be removed.)

After-care of the plants.

There is after this very little necessary. The plants, however, should be most carefully examined once or twice a week, and every insect and weed removed. Water should be supplied freely at intervals of a week, and to prevent the earth losing its humidity too suddenly, straw might be spread over it if the heat of the sun is peculiarly great.

Picking the leaves.

The leaves are of three qualities :—the lower, middle, and upper, and the first to ripen are the lower. (To "ripen" is really to assume a yellow tint and bend down towards the ground.) As soon as yellow leaves begin to appear among the lower leaves, they must be picked. In about eight days the middle yield will show signs of ripeness, and should be gathered, and in about eight days more the remainder may be gathered. It can, however, be easily known that the leaves are ripe as they detach from the leaf-stalk with ease. They should be picked with the hand, the leaf being pulled upward.

Care must be taken to have labour available to gather each harvest in at its time, for over-ripeness is fatal to proper curing.

Curing the leaves.

The only thing to be remembered in curing tobacco is that care must be taken not to allow the leaf to lose its moisture too suddenly, for thereby it becomes brittle too slowly—for then it is in danger of rotting. The rules on this head which hold good in Europe are however useless in India. The curing-houses again may be of any shape, provided only it ventilation is thorough, and that sunlight and damp are ally avoided.

When the leaves have been picked, they are placed in heaps (which must be turned at intervals until they fade and wither. By being in a heap, they keep their moisture, and though quite dead, do not lose their flexibility.

The leaves are then strung (on string or sticks) in the curing house ; after this they are exposed to the sun : they are then tied in bundles and heaped to induce fermentation. The details of the curing processes cannot be learnt from works on European tobacco cultivation, but may be acquired easily by the study of the *temperature* of this country, during every hour of the day, and every day of the year, and by a clear knowledge of what is required to be produced. Again, the arrangement of the leaves in the curing-houses so as to economise space, utilize ventilation, &c., &c., gives scope for the ingenuity of each cultivator, and cannot be learnt by rules.

One point however to remember is that the leaves must not stick together when strung.

Sorting the leaves.

When the leaves are dry without being brittle, dead and evenly coloured, but still pliant, they are said to be cured and are ready for sorting.

The importance of choice of manuring and watering.

The sorting of the leaves depends of course upon the local market for which the tobacco has been raised, but a safe rule is to keep for cigars all that can be kept for cigars, and to use the remainder for tobacco. Snuff, which requires the finest leaves of all, would not in India repay the manufacture. For natives of this country, the tobacco must be strong ; for the European market, it must be aromatic ; for any market, it must burn easily. It is evident, therefore, that very much depends upon the manure used, as the matters drawn from the ground must materially determine the strength and combustibility of the produce. A heavy soil, strong manure, and plenty of water, produce a strong and rank tobacco : by ripening also tobacco gains in nicotine. Sunshine, dry warmth, and a light soil give on the other hand mild and aromatic tobacco. It is from this evident that next to the manure employed the most important point is the quantity of the moisture, as the manufacture is for the native market, this should be full.

NOTES.

The midrib : how to dispose of it.

The great difficulty in curing tobacco is the disposal of the midrib which persists in either drying stiff or not drying at all. But why should it not be removed ? Not entirely, for then the leaf would be split into two, but only on the back of the leaf, where the convex and greater part of the midrib projects. The operation, though a delicate one, would become easy to any child after a half-hour's practice. The operator would take a leaf in his left hand, holding it between his finger and thumb at the stalk end. About half an inch from the end (the stalk end), he would make an incision in the midrib with the thumb nail of the right hand and turn up an end. He would then take hold of this with the finger and thumb of the right hand, and with an equable force pull off the midrib downwards towards the point of the leaf. As soon as it became very fine and there was a danger of the leaf being torn, he would nip the midrib off with his finger and thumb. By this the concave or nearly flat surface of the midrib would be left on the upper side of the leaf, while on the back of the leaf the only sign of the midrib would be a narrow *depression* running down the centre of the leaf where the troublesome midrib *had* been. The operators (who might easily be children) should be particularly warned *not to handle the leaf or to make a rent in it.*

The great care necessary not to handle the leaves.

Indeed, throughout all the operations of picking out, planting, hoeing, thinning, sorting, stringing, and midrib-scooping, every operator should be warned against touching the leaf, except near the stalk end and against tearing it. Care might be guaranteed by grading the wages of the operators according to results.

The sun-flower.

The sun-flower (*helianthus*) might be advantageously grown among the tobacco : 1*st*, for the shade it would give to the larger and coarser tobaccos required ; 2*nd*, for the admirable stringing rods (if string itself is not used) which their stems supply ; 3*rd*, as they would (if their leaves were ploughed into the ground) give almost the exact vegetable mould which is required by tobacco.

The Foresters' Gazette.

BOMBAY, 21ST OCTOBER 1871.

DR. KING'S REPORT ON RANIKHET.

RANIKHET has had a narrow escape from the fate of Almorah. The lapse of two years more would, in all probability, have left the former as cold barren as the latter. The soil consists of disintegrated micaceous rock, often naked except at the bottoms of the valleys [illegible] the path from ten to fifteen feet of fine brown loam, [illegible] decayed and decaying vegetable matter. Such a porous substructure can expect to enjoy good drainage, but at the expense of an over-abundant supply of water and scant vegetation. The forest trees found are the rhododendron, oak, and *cheer*. These two last are striving for sole possession ; and Dr. King, who has been giving the matter his full attention has pronounced that unless some check is placed on the latter, the beggarly *cheer* will soon jostle out his more imposing neighbour. This could be in every way undesirable, as the *cheer* gives next to no shade, and its leaves do not improve the surface soil in the same way as those of the oak do. If the oak were to be driven from the post it now holds, the water-supply, temperature and beauty of Ranikhet would all be sufferers. But existence of both *cheer* and oak has been threatened by the wasteful attacks of the residents and neighbouring villagers. The latter especially have no conscience in the matter, cut down far more than they can ever use and leave the surplus to rot. Even where forest laws have been enforced, they have been known to ask for forty days to build one of their miserable little huts ; and from this it may be inferred their reckless waste when unfettered. Ranikhet has now been taken by the Forest Department under its protection, and extensive nursery grounds are being planted out. Dr. King has suggested the following trees for timber :—the deodar, toon, kakar, walnut, larches, Scotch fir, ash, beech, elm, oak, and Spanish chesnut, together with several varieties of the eucalyptus and casuarina ; while for fuel he recommends the oak, rhododendron, utus, wild cherry, poplar, and the Australian acacias. These last two have been planted with great success on the Neilgherries ; they spread by suckers, and once established, can hardly be eradicated. Till these nurseries, however, have become accomplished facts, and even for some time longer, the denizens of Ranikhet will be badly off for building and fuel timber, as they are to get nothing but what the Forest

Department rejects, unless they care to go a long distance for it. We commend to all lovers of the gentle craft of forestry, Dr. King's report. It is a most interesting and exhaustive one, for which many a future inhabitant of Ranikhet will have cause to thank him.

TRANSMISSION FROM ENGLAND TO INDIA OF TIMBER TREES AND FLOWERING SHRUBS, HERMETICALLY SEALED, BY PATTERN POST.

Extract, paragraph 14, *of a letter from the Superintendent of the Botanical Gardens, North-Western Provinces; to the Secretary to the Government of the North-Western Provinces, No.* 393, *dated the* 20*th April* 1871.

Para 14—Timber trees and flowering shrubs, by Dr. Forbes Watson. Three tin cases, filled with timber trees and flowering shrubs and hermetically sealed, were forwarded from the India Office per pattern post. Many of the plants were in excellent order, and are now in a most thriving condition. This mode of transmitting plants is highly novel, and well worthy of being tried on an extensive scale with the finer kinds of flowering shrubs. But the cases ought to be forwarded from England in December, January, and not later, and the stems of the young plants ought not to be less than two-eighths of an inch in diameter. Leaden numbers ought to be attached to the plants to correspond with the numbers on the invoices. In the cases there were parchment labels, but most of them were destroyed by the moisture and heat.

The President read the following acknowledgment of the above communication :—

1. I have the honour to acknowledge receipt of your endorsement, No 2562, dated 12th instant.
2. I am desired to express the satisfaction of the Society that this first attempt of Dr. Forbes Watson in the transmission of timber trees and flowering shrubs, in hermetically sealed tin cases, per pattern post, has been attended with so much success.
3. Whilst recognising the great practical utility of Dr. Watson's novel mode of transporting trees, shrubs, &c., I am desired by the Society to point out that however great may be the facilities offered to Government Officers, such as Dr. Watson, for sending such cases by pattern post, the public are precluded from adopting it, as the Post Office authorities will not receive such packets or cases hermetically sealed or otherwise closely secured for transmission by pattern post. Until therefore some relaxation is made under this head,—there is a practical restriction on the adoption of this means of transport.
4. The Society would therefore suggest the propriety of having this restriction relaxed, first in favour of public bodies like the Agricultural and Horticultural Societies of England, India, and the Colonies.
5. The Society would be glad to be furnished with a list of the trees and shrubs sent by Dr. Forbes Watson, noting those that perished, as also to be informed whether the trees and shrubs were rooted plants or cuttings, and how they were packed, whether with moss or mould round their roots, or the ro[illegible]
6. If [illegible] process of [illegible] sealing the cases had the effect of rotting parchment, [illegible] excessive moisture and heat will destroy soft-wooded plants, as it does, [illegible] of time, cuttings even after they have been hardened, however carefully packed.

FRUIT[illegible] OF THE MALE PAPAYA TREE.

SUBMITTED the following letter from Mr. F. E. G. Matthews, of Nynee-Tal, on the above subject:—"Perhaps it may interest you to know that a male tree of Curica Papaya has at Kaludoongee, at the foot of the hills, produced some three or four fruits. Instead of being produced, as in the case of the female tree, on a short footstalk and close to the trunk, they are developed at the extremities of the long branching stalks, common to male trees when in flower. I examined a number of fallen flowers, but could perceive no change in their structure, apparently they possessed stamens only. I perceive this is what works on Botany speak of the Papaya as plants bearing unisexual flowers, i.e., staminal flowers, and flowers with pistils on separate trees. The so-called female plant of Papaya appears to me to be a perfect flower, having both stamens and pistils, and the flowers do *not* grow in racemes as in the male plant. Whether the fruits on the male plant will ripen, or whether they will produce seed, I am not able to say. I will have them watched. But perhaps the phenomenon of fruit on male trees is familiar to you.

Remarks by Mr. John Scott:—"In the normal condition of the Papaw-tree the flowers are unisexual and dioecious (the male flowers being on one plant, the females on another) though not unfrequently we find male individuals in which many of the central flowers in every cluster are either *truly hermaphrodite* (with stamens and pistil) *or female*, and then in all respects similar to those on the *female plant*. Now in the normal male flowers, the corolla is tubular, and bears ten slightly-exserted perigynous stamens, five alternate with the petals and longer than those opposite to them. In the hermaphrodite flowers the corolla has five distinct petals similar to those of normal female flowers, stamens five hypogynous (or inserted around the base of the ovary) and alternate with the petals, thus indicating strong systematic relations with plants, widely separated from it under the present classificatory arrangement. The fruit of these hermaphrodite flowers are usually about one-third less than those on female plants, in all other respects the same; the flowers are also prefectly self-fertile, as I have ascertained by artificial fertilization with own-pollen. Amongst the seedlings thus raised there is further a great predominance of male plants, and nearly all bearing a considerable number of hermaphrodite flowers. In some of the seedlings of the second generation, there is also a very marked reduction in the length of the panicle; thus as I have stated above, the panicles vary in length on the normal male plant, from 2, 4½ feet long; whereas in those bearing the hermaphrodite flowers, I frequently find them only 6 or 12 inches in length . . . . I shall follow up my experiments with those plants, fertilising individual flowers with own-pollen and sowing the seed of these generation after generation, with the view of establishing a truly hermaphrodite race: such as, we may theoretically assume, an early progenitor of the Papaw has been. This seems to me supported by the fact that though we do find occasionally hermaphrodite flowers on the female plants, we never do find normal male flowers; and thus as it appears to me does the occurrence of hermaphrodite flowers on the male panicles, (which with the superaddition of stamens are identical with the normal female flowers) indicate the more lately acquired character of the structure of the male flowers, and their extreme modification as compared with those of an hermaphrodite structure, goes far to explain the more permanent character of the morphologically less modified female flowers."

SARSAPARILLA.

PROPOSAL TO IMPORT ROOTS OF THE TRUE SARSAPARILLA.

READ a letter from Lieutenant J. F. Pogson, suggesting that the Society import roots of the true Sarsaparilla. The following is an extract of the letter:—

"Would it be so good as to bring to the notice of the Council of the Agricultural and Horticultural Society, that in consequence of the very high price of true Sarsaparilla, an inferior substitute is used in the hospitals and the chemists charge six rupees for a pint of 'Sarsaparilla,' which is as bad as 16 rupees for a lb. of extract of Saraxacum.

"It is admitted that Sarsaparilla is a blood purifier, and as it is of great value, the Society would confer a boon on India, if arrangements were made for obtaining either the seeds or suckers of the red Jamaica Sarsaparilla (*Smilax Sarsaparilla*) for cultivation in this country.

"There is a shrub in the plains, which bears an edible fruit, the size of a pea, and deep puce colour. It is called Meekoe by the natives, and 'Sarsaparilla' in Shakespear's Dictionary.

"The *Salsa* is also put down as Hindee for Sarsaparilla, of which the Arabic name is '*Ushba*.'

"In addition to these names, the hospital substitute is called '*Un-ununt-toma*' which may be another name for Sarsaparilla. But it is clear the genuine plant does not belong to India, though I dare say it would answer very well. If obtained from Jamaica, information as to soil and [illegible] should be given, *i e.*, whether it grows in the 'Blue mountains' or in their valleys and plains. This is another plant, which our [illegible] coffee planters should take in hand."

The Secretary mentioned that Mr Scott had kindly responded to his request in reference to Mr Pogson's suggestion, by sending a memorandum on the medicinal Sarsaparillas, which he now begged to submit. While thanking Mr. Pogson for his communication, the Council were not, all circumstance considered, disposed to recommend the Society moving in the matter. The following is Mr. Scott's memorandum :—

"The *Smilax Sarsaparilla* was introduced to the Botanic Gardens here by Dr. Wallich in 1838, and in 1840 he says of it that 'although a native of the southern parts of the United States of America, the plant does not as yet grow very freely with us.' It struggled on, I believe, for a few more years under culture in the conservatory, and ultimately died. It was subsequently introduced by Dr. T. Anderson with the same results, so that there is evidently little hope for its successful culture in the plains of India. This is the less to be regretted, however, as notwithstanding the name of the plant, it does not yield any of the Sarsaparilla of commerce, and there is no evidence that it ever did yield it. Dr. Wood remarks that its roots would certainly have been [illegible] up and brought into the market, had it been found to possess the same properties with the imported medicine—*Pereira*, while regarding this specimen, however, as

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EDITORIAL.

THERE are some vacancies on the Staff of Contributors to the *Madras Mail*. Gentlemen possessed of the requisite ability who are desirous of discussing current topics from a liberal and independent stand-point, are solicited to place themselves in confidential communication with the Editor, from whom all information can be obtained as to the requirements and honorarium of this Journal
Madras, 7th June 1871

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The articles are ably written the tone moderate, and it is altogether an acquisition to the Indian Press —*Mofussilite Feb 9*
In print and style it is superior to any other Indian paper, and its articles are of the highest class. *Indian Church Gazette, Feb 11*
The favourable critiques that have appeared in different papers, fully bear out our own opinion in respecting this neatly-printed and ably-edited hebdomadal.—*Bengal Times Feb 15*
The project of a master-mind, and the offspring of a master-hand.—*The Reformer Feb 10*
It promises to be one of the best conducted Indian weeklies —*Hindoo Patriot, Feb*
Indeed, the paper bids fair to be a first class journal, and as such we wish it all success *The Bengallee, Feb 11.*
We wish the *Observer* success and trust he may [illegible] *Rangoon Mail, Feb 18*
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To the Editor of the "Times of India."
DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India, I must ask you to correct an error which appears in your notice, if it has not already been corrected I did not serve in Affghanistan The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother, now Brigadier-General Edward Kaye, C B, who thus commenced a long career of good military service The best service which I ever rendered *to* India, or indeed *to* India, was the establishment single-handed, of the *Calcutta Review*, which has done far more for Indian literature than anything I have written under my own name In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours, and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave. I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and general subjects, have given us valuable articles on the army. Some from the pen of Sir Henry Lawrence, who wrote with the spirit of prophecy of the coming storm of which he was one of the noblest victims.—*Address of His Excellency the Commander in Chief, at a meeting held on the 18th May 1871, at the United Service Institution of India, Simla*
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THE

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Agricultural Gazette of India,

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, TUESDAY, 21ST NOVEMBER 1871. [No. 4.

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ANSWERS TO CORRESPONDENTS.

"About a month ago my Hurriallee grass seemed very healthy and promised a large return of hay. But, on going over the meadow, a few days ago, I was surprised and grieved to notice the condition of the [illegible] all but destroyed. Over a greater part of the ground only [illegible] remained, while the portion of the crop less injured [illegible] covered with [illegible] small caterpillars. What can I do to save the crop, and prevent their [illegible] depredations of the insects?"

First, cut down all the grass that remains [illegible] fouled by the insects it may be made into hay, but it must be [illegible] from the ground immediately it is cut; also cut down all the standing mid-ribs, or they will spoil your next crop of hay. Immediately on the removal of the grass, roll the ground heavily. If the land is divided into small beds [illegible] a roller cannot be used, dust the ground at the rate of 400 lbs. per acre, with a mixture compound of equal parts by weight of slaked lime and ashes. If these precautions are taken, you need have no anxiety about the next crop.

"I am in a district where dry crops are grown, and have a large number of horses to provide with fodder; what can I do? Will it pay to buy hay at Rupees 45 a ton, and cart it a distance of 250 miles? or to buy straw at 15 Rupees a ton, and cart it a similar distance?"

We certainly think that it will not pay to do either. Our advice to you is buy up 100 acres of growing paddy; cut it down just when the ear begins to form, and win it like hay for a couple of days in the hot sun. You should have a couple of tons per acre of excellent fodder, quite equal to the celebrated oat hay of Australia; while the cost will not exceed 15 Rupees a ton in your district.

"Can the eggs of poultry be transmitted per post?"

Yes; they can be packed in wool or cotton, and sent in a box by banghy post, but we fear they would not be of any value when they reached their destination.

"Tell me where I can get a good Chaff-cutter for cutting both coarse and fine straw; and mention the probable price?"

There are many manufacturers of Chaff-cutters in England; probably Messrs. Ransome Sims and Co., of Ipswich, or Messrs. Samuel Son and Co., of Banbury, could supply you; but there are many other makers equally trustworthy. These makers all turn out vertical-cutting machines; we prefer the machines with cylindrical cutters, made by Messrs. Ames and Co., of Boston, America. These machines are more easily worked, and do more work; they cost from 20 dollars to 50 dollars each, according to size.

1 Nov.

"I have a croquet-ground on which the grass is very yellow and sickly-looking, what manure can I apply? It must be something that will not stop our evening games, and must be free from smell."

Apply salt-petre at the rate of one pound to each 10 square yards of ground, after a shower of rain, or after the ground has been well-watered.

"What is the Botanical name of the grain called Tenney, in the Madras Presidency?"

Panicum Italicum.

"What will a good farm cart cost?"

The ordinary cart of the ryot can be made up for about 30 Rupees each, and large box carts (made of teak wood) at about 120 Rupees each.

"Can you inform this Department if the sugar-cane ever matures its seeds in the East Indies, and if so, what would be the probable cost per pound of the seed of one or more of the best varieties? I will be glad of definite information on that subject."

HORACE CAPRON,

Commissioner, Department of Agriculture, Washington.

Note by Editor.—In Southern India the cane is always, we believe, propagated by cuttings Some of our readers may perhaps be able to furnish a reply to Mr. Capron.—ED. *A. G. of India.*

LETTERS TO THE EDITOR.

To the Editor of the
Agricultural Gazette of India.

SIR,—In your No. of 21st August is a description by Lt.-Colonel Boldam of a light plough made of wood and wrought iron, weighing only 70 lbs., and so simple as to be capable of being repaired or even made entirely in any village in this country that contains a blacksmith. From its description I was so struck by the evident suitability of the plough to farming here that I attempted to get one from a large mercantile firm in Bombay, who, I believe, import things of this kind, but am sorry to say they tell me they never heard of it, and can find no description of it in Ransomes and Sim's catalogue. Could you, or any of your readers, give me information as to where one is to be had.

Khandeish, 26th September 1871. PEAR.

The ploughs referred to by our correspondent were supplied by the Government farm at Madras, and were made in the Implement Workshops attached to the Experimental Farm. They are fully described in the Farm Report for last year. We understand that Mr. Robertson has been obliged to raise the price to Rupees 16½ each, owing to an increase in the cost of the wood. Further improvements have been effected in the plough since the publication of the Report, a land-wheel has been substituted for the slade, thereby greatly reducing the draught; and the plough can, at an additional cost of Rs 5-0-0, be fitted up with knives, as a drill-cultivator.—ED. *A. G. of India.*

EGYPTIAN COTTON-GROWING.—N. W. P.

To the Editor of the
Agricultural Gazette of India.

DEAR SIR,—In your issue of the 21st August 1871, I observe some remarks about the Egyptian system of growing cotton which I first experimented on last season on a small plot of ground only ⅛th of an acre, and as there appears some misconception as to the number of seeds used, and the implements required for cultivating on the Egyptian system, I hope you will permit me to explain that it was, when I tried *wheat* on this Egyptian system of furrows, that only a single seed was used, but where cotton is grown, some 4 or 5 seeds are dropped into each hole.

When the plants have attained a height of 3 or 4 inches, then, by the doctrine of selection or election, or by whatever name you may call it, only the strongest and most promising plant survives, but unfortunately for the Darwin theory, this selection does not rest with the plants themselves with the cultivator, who pulls up the weakest plants.

This season, about 2 miles nearer Delhi than where I had my experiment last year, I had a field of exactly ¾ of an acre, or six times as large as the one last years and the cotton seed consumed in sowing this field was 3 seers 14 chittacks or 10½ lbs. per acre, so anyone counting the number of seeds in one pound, will perceive that several are put into each hole.

As to the necessity of using peculiar instruments, I would observe, that no new instrument is required, but what is in daily use by the up-country native cultivators namely, a plough to scratch the ground from 3 to 4 inches deep. A "myrah" or "bailan" that is a flat board or roller to level and smooth the field after it is ploughed, and what is called a "jindrah" for throwing up the furrows which the people are all in the habit of using where there is well irrigation, so as to make small bunds and thus divide the fields into small square patches of 200 or 300 square feet each, to economize the water.

These patches are called by the natives "khyras," and I believe if this khyra system was by *law* enforced where there is canal irrigation, much unhealthiness from waste of water would be avoided, and a much larger area irrigated.

The only other instrument used is the "koorpah" for weeding which everyone knows, so you see that only the most simple and rude implements are required, and it was from a previous knowledge of our Indian methods of agriculture, that when I visited Egypt, I at once saw that there would be no difficulty in introducing the Egyptian system, for it did not necessitate the introduction of any new fangled instruments. All that is required is to prove to the natives that the Egyptian system will *pay* for the extra *care* necessary, and our object is accomplished.

My experiment this season, I am happy to say, promises to aid in bringing this about; for the field above referred to of ¾ of an acre, though not manured but irrigated, the natives say will produce 15 maunds of "kapas" (uncleaned cotton) or rather over 500 lbs. of clean cotton per acre.

In this neighbourhood, a zemindar was persuaded to try a small patch in the corner of his cotton field, and when I went to see it the other day, he said: "Look Sir I have got four plants for your one, and yet your system is "doogna sida" or twice as profitable." In the neighbourhood of Umballa I had some ten small patches tried *without* irrigation, and the result promises on the whole satisfactory, for the yield is expected to be from 200 to 300 lbs., per acre, but this is greatly owing to the favourable rains this season, though sometimes there was too much, and at other times too little rain. The lessons I have had clearly brought out by these experiments are 1st, avoid land liable to be flooded; 2nd, avoid having trees in the neighbourhood of the field, 3rd, have men to watch the field who have an interest in preserving it.

Lastly, get water for irrigation if you can, and use manure also.

Out of these ten fields two were completely submerged during the late severe floods, and three more were injured.

Where there are trees, the squirrels and parrots are a nuisance, and from neglect of a chowkidar, my best field near Umballa was trodden down and almost destroyed.

Trusting that the information now given will be of interest,

I remain, yours faithfully,

Umballa, 16th October 1871. T. LOGIN.

Note. We have since heard from Mr. Login that his experimental field at "Rai" (20 miles from Delhi) had up to the 24th of October yielded at the rate of 185 *lbs. of clean cotton* per acre. The field is exactly ¾ of an acre, and the result of the several pickings had been as follows:—

		m.	s.	ch.	
Collected on 23rd September	.. .. ..	0	10	4	"kapas."
" 30th "	.. .. ..	0	19	0	"
" 7th October	.. .. ..	0	37	8	"
" 12th "	.. .. .	1	3	0	"
" 18th "	.. .. ..	1	15	0	"
" 24th "	.. . .	1	19	4	"
	Total ...	5	24	0	= 448 lbs.

Therefore, as 0·75 : 1 : 448 : 597¼ lbs. "kapas", and as 100 lbs. of "kapas" yield 31 lbs. of clean cotton and 69 lbs. of seed, the yield per acre up to the 24th ultimo had been 185 lbs. per acre.

EDITORIAL NOTES.

THE steam culture of sugar, says the *New Orleans Picayune* "seems to be a success, and the experiment on the Magnolia Plantation proves that the deep steam-ploughing has been peculiarly beneficial, as the cane has a dark green colour and thrifty look, though other plantations were suffering from the drought. The experimenter is very sanguine that the crop can be made, with steam cultivation, with one-third less mules, one-third less labourers, and will give one-third more yield per acre than under the old system."

A PROCESS has been discovered for the prevention of decay in wood, which it may be desirable to lay before our readers. As the result of a five years, experience, a paint is recommended, which at the same time possesses the advantages of being impervious to water. It is composed of 50 parts of tar, 500 parts of fine white sand, 4 parts of linseed oil, one part of the red oxide of copper in its native state, and finally, one part of sulphuric acid. In order to manufacture the paint from these materials, the tar, chalk, sand, and oil, are first heated in an iron kettle; the oxide and acid are then added with caution. The mass is very carefully mixed, and applied while hot. When thoroughly dry, the paint is as hard as a stone.

THE *Maine Farmer* reminds its readers of the following "great truths" in agriculture?—"The farmer who stints his fields, is as unwise and improvident as he who starves his working cattle: in both cases he is diminishing the ability of a faithful servant to be useful to him. The farmer who obtains from a field, not properly fertilized, ten bushels of grain, when by manuring he might have obtained twenty, is selling his labour at half its value. He who does not give back to his fields as much as he takes from them, sells their fertility in his crops, and the fertility of the soil is the farmer's capital. The farmer who will keep these truths in view, and act in accordance with the rules they suggest, will find his compensation in the increasing products of his farm, in the augmentation of his wealth, and in the promotion of general prosperity."

THE following notes concerning the periods of gestation and incubation in animals will be interesting to some of our readers:—

	Shortest period.	Usual period.	Longest period.
	Days.	Days.	Days.
Mare	332	347	419
Cow	240	283	321
Ewe	146	154	161
Sow	109	115	143
Goat	150	156	163
Bitch	55	60	63
Cat	48	50	56
Turkey sitting on ..... Hen Eggs	17	24	28
Turkey sitting on ..... Duck do	24	27	30
Turkey sitting on ..... Turkey do	24	26	30
Hen sitting on ..... Duck do	26	30	34
Hen sitting on ..... Hen do	19	21	24
Duck	28	30	32
Goose	27	30	33
Pigeon	16	18	20

"WHENEVER," says Mr. Mechi, "I use an artificial manure, I leave a portion of the field unmanured with it, and am thus enabled to judge by the crop if I am remunerated for the outlay. So various are the soils and conditions of each field, that such a comparative test becomes absolutely necessary, for where the whole field is manured, and no portion left undressed, no just conclusion can be arrived at. On this farm I have frequently applied bone-dust, superphosphate, blood manure, and other artificial manures, without the least increase of crop, while Peruvian guano, and especially our shed manure, are always profitable. As I know that on many farms [illegible] have been found very effective, the article must be [illegible] that render them inoperative [illegible] soil. No doubt shed [illegible] arising from animals fed with corn, cake, roots, and hay, malt-combs, and bran, contain all the elements for every crop. Possibly it may be that, having thus enough phosphates, the addition of more is not required or availed of by the plant. At all events, my case proves the necessity for comparative trials."

THE re-appearance of the potato disease in the British Isles, this year, is a serious misfortune. Whole acres in the west of England look black and desolate, instead of green and flourishing. Cobbett would have been charmed, could he have seen the blighted aspect of the "accursed root." The failure of the potatoe crop is a misfortune for England: it is a catastrophe for Ireland. There, we are told, the disease has already made frightful progress. Nine-tenths of the crops in Tipperary are already rotten, while no hope of saving the remainder is entertained. Since that terrible visitation which hastened the repeal of the corn laws, so great a calamity has not befallen Ireland as that which is now impending. There is, however, this consolation, that the cereal crops are reported to be generally abundant. The farmers themselves are not dissatisfied this year. Some of them at least pleasingly contrast the crops they are gathering now with the miserable harvest of 1870. Yet even under these otherwise favourable circumstances, the situation of the Irish people cannot fail to excite some measure

of harm. Potatoes are to Ireland what rice is to India. When potatoes fail, disaster is inevitable. We hope, however, there is yet ground for believing that the reported ravages of the blight have been exggerated.

A LATE article in *Blackwood* contains some interesting information concerning the status of the farm labourer in Prussia :—

"Prussia has been the favourite theme for the eulogy of English economists, yet what does Mr. Howard tell us that he found near Cologne? 'The men, as in France and other parts of the Continent, sleep in the stable with their bullocks and horses. The wages to farm labourers are paid all in money, and are from 1 shilling 2 pence to 1 shilling 6 pence per day in summer, and 1 shilling to 1 shilling 3 pence in winter,' and this after a rise of 25 to 30 per cent. within the last twenty-five years, and amidst agricultural operations on a splendid scale of expenditure. On another Prussian farm, where beet is largely grown and additional quantities bought for the distillery, the wages throughout the year are 14 pence a day: in the summer months the working hours are from 5-30 A. M. to 8 P. M. The women get 10 pence a day: and in this district of Germany, 'there are a great number of small holdings.' In Prussian Silesia, life uses the wretched labourer still more cruelly. In winter he has 4 pence a day, the spring raises him to an additional penny, and he attains his climax in summer, when 7½ pence to 10 pence constitutes his share of the rewards of the harvest."

IN agriculture, as elsewhere, the steam engine, says the *Builder*, is gradually but certainly effecting a mighty revolution. "The grand leading features of the scientific cultivation of the country, the collection and store of our ample rain-supply, the arrangement of a good system of irrigation and of drainage, the general utilization of sewage, the defecation, banking, and stocking of our rivers, and the systematic provision of artificial methods for drying the ingatherings of a wet August and September, have been little more than indicated, and that chiefly in our own columns. But the spreading use of the steam plough, the application of ingenious modes of economizing labour, the increased cleansing of land, the removal of weeds (even to the loss of the picturesque beauty of the scarlet chequering of our corn field by the poppy), the economy of time, no less than of cost, in ploughing, in sowing, in reaping, in stacking, and in thrashing, the introduction of new and lucrative crops, as that of beet (which in France produced a return of £9,000,000 sterling in the year 1869), the economy of their cost, the selection of the better qualities of grain for reproduction, all these improvements are silently making way. A sum fully equal to the national expenditure might, within a few years, be freely added to the annual income of those who live on and by the land, by the free employment of available means."

WE are told by the *Gentleman's Magazine* concerning the late Prince Consort's farm, that "Her Majesty has a private sitting room adjoining the Manager's house, in which are hung pictures of the prize cattle, which have been bred on the royal farms. The pictures are by Herr Keyl, a very skilful farm-yard artist. "There are from eighty to a hundred shorthorns in the farm, and forty to fifty of them are in milk. The dairy produce is all required for the castle and the farm; and when the Court is at Balmoral, 120 lbs. of butter are made weekly. A dozen Alderneys are also kept as creamstainers, and the great object has always been to retain the whole badger colour, as there is a better foreign sale for them. This, however, was found impossible of attainment as long as the Alderneys were tethered head to head with the shorthorns, and kept the roan and flecked colours perpetually in their eye. They are imported at an average of from 20 to 25 guineas, and increase considerably in size with the rich grass, besides growing rather lighter in their colour. No forcing can make them more than half-fat, when their milking prime is over, and seldom more than £10 can be got for them at the butcher's. In the height of the grass, one or two of them have yielded 16 quarts per day."

THE *London Standard* publishes the following interesting notice of a Scotch farm near Dunmow from a correspondent :—

"I lately visited a Scotch tenant-farmer near Dunmow, and the story of his farm may throw some light on the claims of Irish tenants for improving land. His farm, in round numbers, consists of 400 acres, and his present rent is £4 per acre, or £1,600 per annum. His grandfather entered this farm, ninety years since, on a nineteen years' lease, at £90 per annum rent. At the end of every nineteen years, the landlord's agent went over the farm and re-valued it, and they have continued there ever since, never having had a longer term than nineteen years in the land, and at the end of every nineteen years being offered the farm at the fair value to let, with all improvements thereon. They now pay, as I have said, £1,600 per annum, and it is fully worth the money if it were out of the lease to-morrow. From time to time the landlord has advanced money for buildings, but the tenant has always paid high interest on such advances, besides doing the haulage for the buildings. When they first took the farm, it was wild heather land; now it is one of the finest farms in the Lothians. Both parties are contented. The owners have seen their rent rise from £90 to £1,600, and the tenants have raised their own condition from tenants of a wild farm at £90 to that of tenants of a fine farm at £1,600, and their capital has increased accordingly. They are as independent of the noble lord who owns the land as he is of them, and voted against him at the last election."

"THE necessity of cultivating small properties has been fully recognized by the Prussian Government by forced sales. I am not an admirer of this system, yet it is far better than the concentration of lands in the hands of the few, as in England. It leads to a greater distribution of wealth and enables the Government to call, with a greater show of justice, upon a larger number to defend the country when in danger. I very much doubt, had it not been for the existence of this system, whether the men of Germany would have fought so well as they did in the recent war. The battalions of our own Cromwell were mostly composed of men of a class of yeomen now almost unknown. They fought as men only fight who have something to fight for. In Prussia, by the law of 1850, the smallest occupier of peasant's land acquires the proprietorship at twenty years' purchase, the amount being paid to the landlord, not in many, but in rent debentures issued by the authority of the State, and bearing four per cent. interest and gradually redeemable by means of the one per cent. difference, which at compound interest extinguishes the principal in a little over forty-one years. The Prussian peasant has, however, two other options: he may pay less by one-tenth to the State Bank than the rent he formerly paid to his landlord, in which case the purchase debentures take fifty-six years to redeem: or he may, if he can raise the cash, compel his landlord to accept eighteen years' purchase money of the annual rent. By this means nearly 100,000 peasant proprietors have been created in Prussia. Rent debentures, to the extent of many millions, have been issued to the land-owners, and in less than eighteen years more than one-eighth of the debentures issued have been entirely redeemed and extinguished."—"*The Land Question*," *in the Contemporary Review.*

WE take from an Ipswich Journal the following interesting and detailed account of a farm-steading lately erected by Mr. Webb, Combs. Our contemporary says :—"The entire block of buildings, forms a square about 170 feet by 130 feet wide. A passage runs though the whole width of the block of buildings, with a door in each of the side walls, and, on passing along it, one

has the barn on one side, and the yards, the stables, the neat-houses, and piggeries, on the other. This main passage, and all those leading from it to the offices first enumerated, are floored with asphalte, and are as clean as the floor of any well-ordered manufactory. At one end of the main passage is a large square room, occupied by a pair of stones, a powerful chaff-cutter, and other machinery, to be used in preparing food for the numerous animals in the homestead. This room is, in fact, a perfect model of a farming mill, and any kind of machine may be added with the greatest ease, and driven from the one main shaft, with no more trouble than adding a band or pulley, while the room itself is far more capacious than many mills in which a considerable amount of business is done. Next to this room is a place for storing hay or clover ready for the chaff-cutters. One or two handy men, with a few bushels of coals, may here prepare a weeks' food for all the horses, bullocks, cows, and pigs in the homestead in the course of a few hours, and that too without regard to the weather, and at a time when their labour would be of scarcely any value elsewhere. The portable engine made by Mr. Wilkins, Orchard Works, Ipswich, needs only to be removed a short distance—not many times its own length—in order to be in a position to bring its power to bear upon the threshing machine in the barn, and by this concentration of the work upon a small space, a wonderful saving of time and fuel will be effected. Mr. Webb now forms nearly 500 acres of land in Combs—rather more than the usual proportion of which is pasture, and this block of buildings will be the homestead for nearly all this large breadth of land. Formerly, there would have been a dozen men threshing all winter, cow boys, bullock men, and pig feeders would have swarmed in the yards and buildings, but here a day, now and then with the portable engine and threshing machine, will suffice to prepare the crops for market, and as to feeding and watering the animals, an active man bustling through the corridors in stable and neat-house and piggery, will be able to do as much with the appliances here brought to his hand as half a dozen could when water had to be fetched from wells and ponds, very often at a considerable distance, and when the stores of food were here and there and everywhere, but where they were wanted. Would there were more farm-steadings of a like useful description throughout the country!"

LAMPERY, in his "Notes of a Journey in the north-west neighbourhood of Pekin," published in the "Journal of the Royal Geological Society," says:—While staying at this house I had abundant opportunities of examining the farming implements commonly used throughout the north of China, and amongst them I was much struck with the seed-sowing machine in general use. It would be difficult to describe this apparatus without the aid of a model. Their plough is a very simple contrivance. The share resembles a shovel, with a mould-board on the upper surface to turn off the sod: both are made of cast-iron, and very simply tied on the wooden frame of the plough. There is no coulter required, as the soil is so loose and friable that it would be unnecessary, and the farmer is satisfied with mere surface-ploughing. Sometimes one bullock is sufficient to draw the plough, sometimes a bullock and mule or donkey, or pony, are yoked together. The field, when ploughed, is harrowed with a very simple harrow, consisting of a triangular frame of wood having a number of sharp-pointed iron prongs, about 8 inches in length, projecting on the underside. This harrow is usually yoked to a bullock; the driver, standing on the upper surface of the frame, gives it weight and hold to the ground. It is drawn over the ploughed field until the clods are broken into a tolerably even surface, and all the roots of the previous crop have been removed. Another harrow is now applied; it is made of strong wattles plaited together. The driver stands on this, while a bullock draws it over the field in all directions. These operations effectually pulverize and level the soil; but the Chinese farmer does not rest satisfied with this ploughing and harrowing for the cultivation of the future crop, whatever this may be. As soon as it makes its appearance above ground, he commences working the soil about the growing crop with a hoe of a particular shape, and as he knows that the produce of the crop will be equivalent to the amount of labour bestowed on this work, he is unceasingly employed at it. One great result of this careful tillage is the remarkable absence of anything like a weed in their fields.

In districts remote from large towns or villages, the farmers are necessarily but badly supplied with materials for fertilizing the land; they are, consequently, economical of it, and carefully collect it on every opportunity. In land set apart for winter-wheat, small quantities of stable manure are harrowed into the soil in the first instance, and while the crop is growing, men may be seen with baskets suspended from their necks walking up and down the field, scattering in a powdered substance, as if they were feeding hungry poultry. This is the oil-cake made from the Chinese bean (dolichos), cotton-seed or cessamum, in process of pressing out the oil. The enormous production and consumption of these substances make them considerable articles of trade throughout China.

NEW GRANARIES—AMSTERDAM.

ALL new granaries have this as the fundamental principle upon which they are based, that in order to prevent heating and fermentation in large bodies of grain, it is needful that the air have free access to all parts of the mass. This is ordinarily obtained by turning and tossing the grain by manual labour; in fact, the corn is thrown through the air, instead of the latter being forced through the corn, as is done in Mr. Devaux's granaries.

The chief points in a good granary are:—

1.—Economy of space, as it is well known that the cost of a granary is almost directly proportional to its cube contents.

2.—The substitution of machinery for manual labour. This involves necessary arrangements for receiving, delivering, distributing, and ventilating the grain.

3.—Arrangements for storing the corn, so that a current of fresh air may be forced through the grain, thus arresting at once the further progress of heating and fermentation, or the devastations of weevils. We may lastly, classify under the fourth head, the remaining conditions, that of preventing effectually the approach of rats and mice, and the reductions of fire to a minimum. These conditions are fulfilled, in our opinion, in the most perfect manner yet known by Mr. Devaux's system, a short description of which we will now give:—

In size, the bulding itself occupies the least possible space, having no floors proper, but passages about 3 feet wide running all round and across it at the basement level, and at about [illegible] level of the top of the bins. The bins are rectangular from 4 feet to 10 feet square on plan, and from [illegible] feet high, according to what is [illegible] desired. The sides are formed of sheet-iron, closely perforated with small holes, and stiffened with cast-iron and tie-rods. Running up the centre of each bin is a tube about 2 feet in diameter, also of perforated sheet-iron: and between the tube and the outer casing the grain is placed, which is consequently exposed to the air on two sides. Although the grain be in the worst possible condition, all that is necessary is to turn a moderate blast into the centre tube, when the air would push through the perforations right through the body of the grain, escaping ultimately through the perforations in the outer casing. A few hours of this treatment is quite sufficient to restore the worst samples to proper condition, although the heat may have previously generated to such an extent as to render it impossible to keep the hand in contact with the iron bins.

Having given the principle of construction, we now proceed to explain the means of receiving and distributing the grain, such as are adopted in the Trieste granary.

This granary was constructed for the Lombardo Venetion Railway Company, and is capable of storing 100,000 quarters of wheat. The Austrian military authorities, appreciating the advantages of the system, had large granaries erected in Verona and bakeries attached of sufficient extent to supply the Austrian army of 50,000 men with bread daily.

The granary is divided into three blocks, the space allowed in the centre one being 830,000 cubic feet, whilst the two side ones are each 695,000 cubic feet. The bins, 7 feet 3 inches square, by 42 feet high, with a centre tube 1 foot 9 inches in diameter, are grouped in fours and ranged in rows with a 3 feet passage between. The total number is 486. The grain is delivered in railway waggons for the accommodation of which there are nineteen docks, at a level of 22 feet above the bottom of the bins. Hoppers are placed between the docks, connected by

troughs to seven elevators, which raise the grain to a height of 8 feet above the top of the bins, and shoot it into distributing troughs, nine in number. By the action of 15-inch diameter archimedian screws, the grain is moved along the troughs, the screws being broken in by couplings at short intervals, so that in filling a near bin, the whole length of the screw is not required. Doors are placed in the bottom of the troughs, and shoots provided, each communicating to bins.

Following the course of the grain after having undergone the process of ventilation, we find that at the bottom of each bin a door is placed for the purpose of projecting the grain on to an endless band running beneath the floor. These bands or creepers, of which there are eighteen, carry it to another set of elevators, and by them it is lifted into a hopper placed a little above the delivery staging. Weighing machines are placed under these hoppers, and the remaining portion of the work, such as weighing the grain and tying the sacks, can be finished at leisure.

Such is a brief description of the process patented by Mr. Devaux, which, although doubtless imperfect in many of its details, nevertheless has shewn itself to be the only one of real benefit to the public.

We would strongly recommend anyone interested in the corn trade generally, whilst in London, to pay a visit to the granary lately erected on this system at Canada Wharf, Rotherhithe; although only about half the size of that at Trieste, it will show to satisfaction the various processes above described.

The practical success attendant on the processes already patented, gives clear evidence of the latent capabilities of the system, and we will not be surprised if we hear shortly that a step further has been taken towards improvement in this direction, doing away with that waste of power which at present exists to such an extent.—*The Farmer.*

IMPROVEMENT OF MADRAS AGRICULTURE.

We have much pleasure in publishing the orders of the Government of Madras, establishing Experimental Farms in various parts of that Presidency in connection with the Madras Farms, and we must congratulate that Government on the steps they have taken in abolishing the Committee under whose management the Madras [illegible] were formerly placed, an example we hope to see followed in other Presidencies. We have no faith in Committees and Honorary Secretaries as practical managers of agricultural details. These undertakings should be directed by professional men, men who have been trained in the college, and in the field in all matters relating to agriculture. It is true that the Madras Farms have, during the past two years, yielded most satisfactory results; but it is, we believe, universally admitted that this success was but the result of the gradual withdrawal of the Committee from the active management of the farms, the Committee during the past two years having confined their action almost exclusively to the financial affairs of the farms. In the order, under consideration, we find no reference to the Committee, an over-sight which, we [illegible] have been rectified; for whatever opinion we may hold as to the fitness of directing agricultural operations, we cannot for a moment doubt their claim to the hearty thanks of the agriculturists of this country for their exertions in the cause of agricultural progress. In starting this extensive scheme for improving the agriculture of their Presidency, the Madras Government have, we think, done wisely in setting it free from all amateur influence. Mr. Robertson must stand or fall with this experiment; he will have many difficulties to contend with in overcoming the prejudices of native cultivators, and we think it highly desirable that his action should not be hampered by any interference on the part of those amateur farmers, who, in this country, crop up so plentifully when any scheme for agricultural improvement is about to be put into operation.

We do not despise amateur farming, but we object strongly to have a strictly professional matter, like agriculture, placed *under* the influence of amateurs; and we again congratulate the Government of Madras on the steps they have taken. Their order is as follows:—

The Government have recently reviewed the report of the Sydapet Farm Committee for 1869-70 and 1870-71, and have recorded their satisfaction with the very valuable results which have been attained under the skilful management of Mr. Robertson, the Superintendent.

They consider that the time has now come when the Government may, with confidence and advantage, extend their operations over a wider field, and afford to the agricultural interests of this Presidency those benefits and aids which are being extended to them in other parts of India.

Two courses are open to Government for this purpose. They might inaugurate operations on a large scale, and endeavour to exhibit the results of high farming over wide areas, with expensive machinery and establishments in a manner to attract the ryots; but they are confident that no real good would be derived from such a course, and that it would rather tend to discourage enterprise. They prefer the less ambitious method of establishing model farms of moderate size in several localities, with the view of demonstrating to the ryot the practicability of effecting sensible improvements by means quite within his reach.

The distinct objects at which the Government would aim may be epitomized as follows:—

(1.) To ascertain, by experiment, the proper use of rotation in crops in this country.
(2.) To introduce the system of root or green-crops in lieu of fallow, without artificial irrigation.
(3.) To introduce new crops.
(4.) To provide new kinds of seed and fresh seed for the crops now cultivated.
(5.) To make experiments in the use of water for the cultivation of crops now termed "dry" crops, and for raising grasses and other crops to be used as fodder.
(6.) To make experiments in the use of lime and other manures—mineral and animal.
(7.) To introduce new and improved implements of rural labour.
(8.) To improve the working cattle, sheep, horses, and other varieties of live-stock in the country.

It is evident from the foregoing that the scheme will be mainly one for the improvement of dry cultivation, and although wet cultivation is incidentally affected with reference to seed and implements of labour, still the main objects of inquiry and experiment are dry grains and unirrigated products, cotton, silk, tobacco, indigo, wool, &c. There can be little doubt that the cultivation of rice and of the sugar-cane is well practised, and a due economy of water is the only point which need attract attention at present in regard to it.

Regard being had to the number of objects in view, as above indicated, the Government consider that the proposed farms should be—

(1.) Of considerable area.
(2.) In different climates and at different elevations.
(3.) And placed conveniently with reference to water supply, minerals, markets, and communications.

The area the Government consider should not be less than 200 acres for each farm, for although it may not at first be expedient to reclaim and cultivate more than 100 acres in each, still the additional cost of securing the larger area will be immaterial, and the command of means, for future expansion, is eminently desirable. The extent not immediately required for Government purposes, might probably be leased out at yearly rents, or might be used for pasture, growth of firewood, &c.

The localities which for the present approve themselves to Government, for the Experimental or Model Farms, are the districts of Bellary, Coimbatore, and Tinnevelly. Should it hereafter be deemed desirable to add a fourth farm, it might be placed in Salem Baramahal, or perhaps, by preference, in Ganjam, where it would be accessible to the people of Vizagapatam. These districts are comparatively backward, and inhabited in part by Oriyas, the least developed of the people of the plains, and in part by hill-tribes, almost destitute of any culture. But the districts have great capabilities; the climate is far more temperate than what prevails in the rest of the Presidency, and is probably specially suitable for the culture of indigo.

The primary object of the Bellary farm should be the cultivation of cotton, and the experimental use of varieties of seed, methods of culture, and mechanical processes; but a portion only of the area should be of the "black cotton soil," and the remainder should include other varieties of soil adapted for miscellaneous tillage. It will be an essential condition of selection that some portion of the area shall have means of irrigation either from a well-supplied tank or from reliable wells, or at least that water shall be attainable at such reasonable depth as to allow of wells being sunk and worked without extravagant expense.

In Coimbatore, the special objects should be silk-culture, the growth of tobacco and cotton, the breed of sheep, and perhaps the breed of horses, and, with these in view, attention will be directed in the selection of a site to the suitability of the soil for the cultivation of the mulberry and of tobacco, and to a command of water for raising green crops for the sustenance of live-stock. The farm should, by preference, be at a high elevation.

In Tinnevelly, the position will be selected partly, but not chiefly or exclusively, with reference to experimental cotton cultivation. The farm will be for general experimental cultivation, in which cotton will have a part, and in which regard will also be had to tobacco, senna, &c.

In selecting the sites for these farms, the Government do not desire that the requirement of first-rate quality of soil, of whatever category, should be insisted on. It will be sufficient that the land be of fair average quality, that its situation shall enjoy at least an average rain-fall as compared with the rest of the district, and that there shall be some partial water-supply, obtainable from a channel, a tank, or from wells.

A site will, of course, be selected conveniently placed as regards roads and existing or projected railways, and, if possible, within easy distance of a fair market for the farm-produce, including meat.

The neighbourhood of limestone of a quality fit to be burned for agricultural purposes, would be desirable but not indispensable. The experiments made at the Madras Farm in the use of lime are encouraging, except as to cost of preparation.

These District Experimental Farms will be placed in connection with the Sydapet Farm, and under the superior management of Mr. Robertson, in whom the Government possess an officer admirably fitted for the post, and who adds to his other acquirements, as a scientific and practical agriculturist, the great advantage of several years' experience of India, popularity with natives, and a thorough appreciation of the fact that the experiment, to be successful, must be economically conducted.

Mr. Robertson's present engagement expires on the 10th October 1871, and from that date his salary will be raised to Rupees 700 monthly, with horse allowance of Rupees 30 monthly, and his travelling expenses, when absent from the Presidency on duty. He will retain his residence on the Sydapet Farm, free of rent.

Mr. Robertson will come under the Uncovenanted Service Rules, regarding leave of absence and pension, and his service will date from the commencement of his original engagement. His duties will be to have the superior management of all the Government Farms which may be established now or hereafter. The Superintendents in immediate charge being his subordinates, to prescribe the course of operations, and to train the apprentices who may be placed under him for the superior charges. The Government have entire confidence in Mr. Robertson's competency for his important duty.

The general supervision of the agricultural experiment will be placed under the Board of Revenue, through whom Mr. Robertson will, in ordinary course, submit his reports and address Government.

But his reports on the individual district farms he will forward to the Board through the Collectors of the districts to which they refer, so as to keep those officers informed of the progress of the local experiment, and to allow them the opportunity of recording any remarks they may wish to make.

Mr. Robertson will understand that the Government expect him to consult fully with the Collectors as to all action in their respective districts.

The direct management of each farm will be conducted under Mr. Robertson's orders by a native Superintendent on a salary of Rupees 150 monthly, rising to a maximum of Rupees 250 by annual increments of Rupees 25.

To provide the necessary agency, the Government resolve to establish four native apprenticeships at once, and to attach to them salaries of Rupees 40 monthly, with lodging on the Sydapet Farm, and to instruct the Collectors of Bellary, Coimbatore, and Tinnevelly, to select for them from the ryot-class of their respective districts, or from some class connected with the land, each young man, of age between 18 and 20 years, of good constitution, and possessing a colloquial knowledge of English, who may be willing to enter into the engagement. The posts of Farm Superintendent will be given to the best qualified apprentices at the end of 3 years' training.

The Collectors will also proceed to select in their respective districts one or more blocks of land, either waste or cultivated, extending approximately to 200 acres, and fulfilling the conditions above specified to serve as an experimental farm.

The land being indicated, Mr. Robertson will be deputed to visit the site and report upon it. He will submit to Government through the Board of Revenue—

(I.) A rough estimate of the cost of establishing an experimental farm of the dimensions prescribed, contemplating, in the first instance, the cultivation of 100 acres.

(II.) A general estimate of an approximate character of the probable permanent charge which will be incurred for establishments, including his own salary, at the Government Farm at Sydapet, and at the three provincial farms, making provision for four students at the Sydapet Farm.

(III.) Proposals for the reclamation and management of the three projected farms, until they can be placed in charge of their permanent Native Superintendents. It may be presumed that the requisite buildings could not be raised, and the necessary improvements perfected in less than two years from the present time.

As to the source whence the funds for this agricultural experiment shall be derived, the Government are of opinion that the surplus Cattle Trespass or Pound Fund furnishes a suitable and sufficient provision.

Act I. of 1871 provides that this "surplus shall be applied, "under the orders of the local Government, to the construction "and repair of roads and bridges and to other purposes of public "utility;" and the Government consider that the object in question is a most appropriate purpose on which to employ part of the funds.

The Budget for the current year estimates that an unapplied balance of Pound Funds of Rs. 77,000 will remain at its close, after allowing for a liberal allotment for roads and bridges, and the demands on the balance for the experimental farms cannot possibly be large for the remainder of this year. The contribution from this source for roads, &c., in aid of Local Funds will not hereafter need to be on so liberal a scale as hitherto, and the Government do not doubt that ample means will be available for developing the present scheme.

They commit it to Mr. Robertson and to the Board of Revenue and district officers, with the confident anticipation that no efforts will be spared to ensure success, and in full hope of valuable results being attained for the improvement of the country.

(True Extract.)
(Signed) W. Huddleston,
November 1st, 1871. Secretary to Government.

AGRICULTURAL STOCK—INDIA.

BREEDING HORSES IN THE DECCAN.

Dear Sir,—In your paper of the 4th instant, I see an article from the *Madras Times* on breeding horses, on the Australian principle, in the Deccan. Considering the enormous price at which the stud department put their horses into the ranks, the enterprising gentlemen will, I have no doubt, meet with the good wishes of the Indian Government, as well as of private individuals, if they can manage to breed a good description of horse for less, or a better animal for the same price, at which walers can now be obtained in Calcutta. I hope they may succeed; that they will beat the stud department there can be little doubt, but they must beat their brother-settlers before they can call it a complete success. By the latest accounts from Australia, settlers have to drive their horses great distances to market before they can get £8 or £9 a head for them; and taking their passage, &c., to India into consideration, I believe they can be sold to Government for about Rs. 400 each. Settlers who breed sheep and cattle in Australia must have a certain number of horses on their runs, and the surplus ones that they could dispose of every year may be said to cost them actually nothing, if sold on their runs and unbroken, which is the best way to bring them to India, as it is very often the rough handling they receive before embarkation, under the name of breaking, together with their being mounted too soon, that turns them into confirmed buck-jumpers. I understand that horse-breeding in Australia does not pay nearly so well as sheep and cattle. I believe it is sheep first, cattle second, and horses lowest of all. Now, what is to be saved by breeding in India? I suppose the passage, about £20, and stable expenses at the ports of embarkation and disembarkation—the latter [illegible] the Government or people wanting horses [illegible] Deccan for them. The gentlemen deputed to examine the country, and see if there was anything to prevent horse-breeding on the Australian principle," has, I have no doubt, gone well into the matter; but it surprises me to hear that horses can be kept out in the sun and rain for eight months of the year without any attendance or other food than the grass which they may pick upon the Rumna. They might live, but would they be in the condition that young stock and brood mares ought to be in? It is well-known that for the first six weeks after the rains commence, there is no nourishment in the grass, and it therefore is more likely to cause disease [illegible] benefit. I therefore think he must add considerably to his "four months' store of grass and food;" but even grass and food for four months of the year make 20 months' feeding for every five-years-old which could not come to one farthing less than Rs. 6 per mensem, or a total of Rs. 120: this is for hay and grain alone, the latter at 30 seers for the rupee, and allowing each animal 2 seers a day. I don't know the description of country, 6,000 acres of which has been, or is to be, granted for the purpose; but many of the Rumnas in the Deccan have no trees or shelter of any kind; in which case, until they were planted and grown up, sheds would have to be built, besides the expense that would be incurred in supplying the stock with fodder, water, &c., during the four months before-mentioned. The loss of foals, not to say colts, and even horses, by wild beasts, ought also to be taken into consideration in comparison with a country like Australia, where the only animal to fear is the native dog, about the size of a jackal. If all these little matters, and many more that could be mentioned, do not run away with the £20 passage-money from Australia to Calcutta, I, for one, would be very glad to see the idea carried out.

Squatter.

AGRICULTURE IN BENGAL.

PURNEAH.

To the Editor of the Indian Daily News.

Sir,—As you have often invited the opinions of your correspondents on the subject of agriculture, and as I find your invite has not been responded to, I will take it on myself to make some observations on the subject.

Before I proceed, I will here remark that I have for many years made experiments on a small scale, but on testing those experiments on a larger farm, I have invariably found that the results did not correspond with my expectations. A great many obstacles present themselves in practical farming which are not met with when tried on a small scale. I would have to occupy a great deal of your space if I were to enter into details, and will, in consequence, be compelled to make my remarks as concise as possible. The subject proposed is whether drill sowings are not better than broad-cast sowings, and whether they could not be generally introduced among the Indian cultivators? My reply to the first is, that drill sowings would not be more profitable than broad-cast sowings in the present state of Indian agriculture, and the retrogressive policy of the Indian Government in agricultural matters; and, 2ndly, that the cultivators would not adopt them. The whole subject hinges on whether it will or will not pay best; and Indian agriculturalists, I mean the ryots, have voted against it. And, when I further inform you that I consider the native cultivator is (with all his ignorance and superstition) in a better position to give a sound opinion on the subject than Europeans can do. You will perceive that my opinion is decidedly on their side; you must not suppose that I have adopted this opinion lightly or in haste. I have had my years of garden experiments and years of prejudices and contempt for the Indian agriculturist, and though I can still have enthusiasm left to labour for great improvement, yet this has all been toned down by experience. There is no use in talking of improving Indian agriculture. The Indian Government must be enlightened; they must come to know their duty, and how to act with justice and impartiality (in place of frittering away their time) in exciting class prejudices, and getting up Philanthropic Baboo shows to be exhibited to an ignorant and credulous public in Europe. I have already diverged from the subject I set out with, but this can scarcely be helped, for it seems childish to be discussing the subject of improvement when improvements are practically prohibited; for how can we expect the cultivator to expend money on improvements when he knows his doing anything of the kind would subject him to rack-renting, extortion, and oppression. Now with this preface I will come to the subject, and say that just now broad-cast sowings pay best with some crops, and sowing in lines pay best in other crops. Tobacco is sown in lines. Agoony paddy is transegular distances. Indian corn would answer well if sown [illegible]. The subject as to whether indigo would pay best, if sown broad-cast or by drill ploughs, has been decided in favour of broad-cast sowings in this district, though I am in favour of drill sowings which are in use in the zillahs west of those crops that are irrigated, such as onions, are sown in lines. The Buddie paddy reaped in August is sown broad-cast, and in consequence of the many weedings and rackings it has to receive, it would not pay to add the expense of drill-ploughing.

Wheat, oats, and barley are sown broad-cast; a little extra seed is cast to make up for bad seed, or to allow plants to be [illegible]ut, if the crop is too vigorous.

[illegible]m you that it is not good to have the land too [illegible]manured for wheat, in which case there will be all straw and very little wheat.

In consequence of the oppression and rack-renting, the system of agriculture carried on here is a very improvident one; one-tenth of the land, under a more improved system, would yield as much as this zillah does at present. Providence is looked to for a good crop; the country is ripped up, and seed sown over 50 or 100 acres of land, by a single cultivator with two or three ploughs, and then it is left to take its chance. He has not the means to manure or irrigate his lands; nor has he the heart to invest money in it. It would take a large capital to work so large a farm, yet the owner has not a farthing to bless himself; he borrows money to buy his plough bullocks from a mahajun at 33 to 75 per cent. interest, and pledges all he has, and a portion of the crop. Providence does not send the looked-for rain or sunshine, and the wretched cultivator does not reap sufficient to pay his rents, and the interest on this money borrowed under a more favourable system. A cultivator, with much larger means, would be content with 5 or 10 acres of land, and as there is always water to be had in this district at a depth varying from 10 to 16 feet from the surface, he would irrigate his fields from pucka wells or tanks, he would not require so much manure for his small farm as is necessary for the wild wastes, he now cultivates his well-kept farm of one-tenth its former size, he would not require so many men to weed it as it does now, which is never thoroughly weeded, and he would find that nearly every season would more than compete with the long-wished-for season he now looks out for, when timely rain is considered a God-send.

Providence has given both water and sunshine. The last Government or its servants, the zemindars, cannot touch; but the sea of water that flows on at 16 feet from the surface must not be touched, else the minions of the State will pounce on the unfortunate wretch, and squeeze the last drop of juice out of him.

4 Nov.

I must here remark that one great advantage drill-sowing has over broad-cast sowing is, that it can be sown at the depth required, while broad-cast sowings may fall on the surface, and seed be wasted; but a general introduction of any improvements in agriculture must be preceded by an improvement in the land tenure, &c. If we wish to introduce the *Chinese Garden Cultivation* into India, we must introduce their land tenure also, which is nearly identical with the Indian land tenure abolished in 1793, *viz.*, that the land belongs to the cultivator as long as he can cultivate it, and as much as he himself can cultivate, no other class of people in the country can deprive him of his farm, nor retain any mortgage on the same. If the cultivator is not able to cultivate his lands, he must give up all, or a portion of it, to those who can. Government claim one-fifth of the produce of the soil as their share. Now, Sir, let us suppose for a momont that if Government were to introduce such a system into this zillah, and fixed the land assessment at an average of 8 annas a biggah (or 2 Rs. 8 annas a biggah for the total produce), why the zillah would give double or treble its present revenue at once, and relieve agriculture. We could, if settlements were made for thirty years, then expect to see improvements. However, there is one thing I must add here, *viz.*, that if Government did take over the land into their own management, I am certain they would make the blunder of allowing a small number of individuals to set up as small zemindars, who would submit the land, and perpetuate the present evils lot. It were better to perpetuate the present system than to introduce a worse one. If agriculture is to be improved, no one must stand between the cultivator of Government. Government must receive the rents directly into their own hands, and see that no one monopolises more land than he can cultivate satisfactorily. The land should belong (as it did) to the public at large. Government are the trustees, and the cultivators farm as much as he can find capital to work; he should hold it in perpetuity, if he can cultivate satisfactorily, and pays the pergunnah rate fixed periodically.

When all this is done, and no class, caste, or creed distinctions are made, you will find the natives will just keep a chalk ahead of the Europeans, who wish to set up as agriculturists in India. I do not mean to say that they will turn out as good farms, but they will turn out more profitable ones.

On a highly-cultivated farm, drill sowings has its advantages, but under its present system it has no advantages, and would be more expensive than broad-cast sowings.

I think you will not be surprised at the surperstition of the natives in agriculture, as well as their great dependence on Providence, when I assure you that they have good cause for it, for be they ever so industrious, if the winds are not favourable, they will not have a good crop. To make myself fully understood, I must here inform you that the prevailing winds have a great deal to do with the agricultural out-turn in this district. Every good native agriculturist well knows that if the east wind prevails in October, November, and December, when his Agoony paddy is coming into blossom, and the grain is forming on the ears, that the paddy crop will be a total failure; the east wind is favourable for the growth of the plant, but bad for the formation of the grain. If the east wind prevails during the time, when wheat, oats, or barley are in ear, there will be a short crop, or a total failure. On the contrary, if the east winds prevail before the plant comes into blossom, and if the west wind prevails while it is in blossom, we shall have a first-rate crop of grain. The west winds are necessary to bring the Agoony paddy, wheat, &c., into full ear. However, should the west wind set in in October, and last until April, I should pronounce it a bad season, for though it is favourable to the Agoony paddy, yet it evaporates the moisture of the ground so quickly, that the crops sown, during the prevalence of those winds, suffer for want of moisture, and are consequently stunted in their growth; the consequence will be a short crop in the good lands, and a failure in sandy soil, a heavy shower or two during the prevalence of the west winds restore the moisture to the soil, and a good crop will be obtained. When I further inform you that the west winds generally prevail from October to May, you will perceive how necessary it is to introduce irrigation into our agriculture, but for the prevalence of the east winds, I see no remedy just now. Judicious manuring might counteract the effects of this last wind. I never could get cotton to ripen during the prevalence of the east winds. Insects of all kinds increase, and infest the fields during the prevalence of this wind.

On the contrary, cholera prevails during the severe west wind. I mean, commits fearful ravages; it travels from east to west against the wind, and crawls along the hollows and beds of rivers, sheep die or become infested with vermin, which devours whole herds during the west winds. A kind of insect infests the dry fields which devour the young plants during the west winds; the insects die when the wind changes. Each of these winds bring scourges, which cause serious inconvenience if they prevail for any great length of time. The crops that ripen in May, June, July, and August, such as Buddie paddy, Indian corn, &c., on the contrary, thrive during the east winds

and suffer in the sandy soil from the west winds. I have only drawn an outline of the picture presented by the prevalence of the winds, which will enable you to form an idea of the powerful agencies that are at work to compel these people to depend on more than human aid in their agricultural aspirations.

From all this you will perceive how necessary it is for the cultivator to make use of extra seed to meet the vicissitudes of the season, even if drill sowings were used. This precaution should be taken, and it is only in case the Chinese plan of manuring the grown plant with liquid manure that drill sowings in lines would be advantageous, which would expedite the manuring.

The agricultural prospects of improvements in this country would occupy so large a space, that I can only attempt to touch on the subject very superficially.

We have had heavy rain during the whole of this month, and there is no prospect of clearing up. Most of the compounds have a great deal of water lodging in the hollows, which must cause a good deal of sickness when it begins to dry up. I am told the Municipal Commissioners are going to drain the southern part of the station. This drainage is very necessary. For about a square mile of the station has the rain-water lodged in the hollows. Without any outlet for the same, this portion of the station has been built during the last seven or eight years.
—Yours, &c., X.

Purneah, September 8th, 1871

(From the Hindoo Patriot.)

As the zemindars are now roundly charged by the Lieutenant-Governor and the press with want of public spirit, we have much pleasure in reproducing from the *Government Gazette* the following list of Public Works executed last year in this Province, at private expense, with the names of the donors, excluding all works below the sum of Rs. 300 :—

Names of the individual by who instructed.	Description of work.			
Shah., Baboo Bunwareeloll, Roy Bahadoor, of Chupra	A travellers' serai	1,50,000	0	0
Baboo Bunwareeloll, of Durbhanga	Re-digging Elliot's tank	14,500	0	0
Dewan Sahoy, of Hutwa	A tank	2,125	0	0
Gundhan Pershad Narain Sing, of Chyempore	ditto	2,000	0	0
Baugee Bhagut Byragee, of Bud bootolah	ditto	600	0	0
Sheeb Sahoo	ditto	1,000	0	0
Rampoy Roy	ditto	1,500	0	0
Kalichurn Mundle	ditto	1,000	0	0
Anuntololl Mundle	ditto	700	0	0
Nundo Gopal Banerjee	ditto	500	0	0
Modhub Mundle	ditto	400	0	0
Teelunder Chungdar	ditto	3,000	0	
Atun Sheik	ditto	1,000	0	
Sonatun Roy	ditto	450	0	
Shamoo Bebee	Cleaned a tank and made a masonry ghat	650	0	0
Rara Chunder Acharjee	Metalled road	500	0	0
Tumeezuddin, Munshee	Repaired kutcha road about a mile and constructing a bridge	300	0	0
Messrs. Watson and Co	An embankment	1,500	0	0
Ditto	ditto	1,200	0	0
Hurronnaum Chuckerbutty	A tank	400	0	0
Manickum Bera	ditto	300	0	0
Rayat Khan Bhuia	ditto	450	0	0
Ramgutty Shah		450	0	0
Kartamath Mahata, of Sydabad	A large tank	620	0	0
Gour Chundra Shaha, of Nobogram	ditto	415	0	0
Rameshur Mundle, of Dubdaspore	A kutcha road with a pucka bridge			
Jagobundhoo Roy, of Kanchutollah	A road from Kanchuntollah to Dholian, 2 miles long with 2 masonry bridges on it	300	0	0
Rance Brojo Sundaree	ditto	1,500	0	0
Nuffar Gain	ditto	1,000	0	0
Debee Sirdar	ditto	900	0	0
Kally Mohun	ditto	900	0	0
Santo Pramanick	ditto	875	0	0
Azmut Pramanick	ditto	850	0	0
Gazee Pramanick	ditto	825	0	0
Rahumut Pramanick	ditto	800	0	0
Mohun Shaha	ditto	800	0	0
Shumbhoonath Tagore	ditto	800	0	0
Kadar Pramanick	ditto	775	0	0
Sibloo Fukeer	dit	750	0	0
Shadoo Mundle	ditto	700	0	0
Kubeer Meeah Khandokar	ditto	700	0	0
Juggomohun Shear	ditto	700	0	0
Joykisto Nurosoondeer	ditto	650	0	0
Sreekisto Shaha	ditto	600	0	0
Alaton Shaha	ditto	600	0	0
Mochai Pramanick	ditto	500	0	0
Doyal Chand shaha	ditto	752	0	0
Rance Shurno Moyee	A pucka well	350	0	0
Ditto	A tank	350	0	0
Nya Mea	ditto	300	0	0

Of course the above list gives but a faint notion of the amount of private charity of the zemindars and other wealthy native gentlemen of Bengal. There is no record of the thousands and hundreds of thousands of rupees subscribed for schools, dispensaries, and hospitals, and numerous other public objects started every month in the capital and in the towns or cities in the interior, not to mention the religious and charitable institutions and ceremonies, which are peculiar to the genius of the people, and which are conducted with an unobstrusiveness, which a nation, looking to newspaper advertisements as the chronicles of charitable deeds, cannot appreciate.

PROPOSAL FOR AN AGRICULTURAL EXHIBITION IN 1873 IN BENGAL.

From the Secretary to the Agricultural and Horticultural Society of India ; to the Secretary to the Government of Bengal, dated Metcalfe Hall, 13th July 1871.

Sir,—At the last monthly general meeting of the Agricultural and Horticultural Society, held on the 15th June, the subject of agricultural exhibitions was discussed, in connection with certain interesting details that were then submitted regarding the last annual show of the Royal Agricultural Society of England ; and a resolution was passed to the effect that a communication be addressed to the Government of Bengal. It will be remembered that the first and, as yet, the only exhibition of an agricultural character that has been held in Calcutta, under Government auspices, took place in January 1864. It being important to know if any and what progress has been made in the different branches of agriculture during the last 7 years, and the facilities for sending specimens from various parts of the country having considerably increased in that time, I am directed by the Council respectfully to submit to His Honor the Lieutenant-Governor, the desirability of holding another exhibition in January 1873, on such plan of operation as His Honor may consider best, and to tender the aid of the Society in assisting to carry out the details of the scheme. The Council would, however, venture to suggest that prize lists should be previously prepared by a Committee specially appointed for the purpose, and that special encouragement should be held out to the rural classes for growing successfully articles which require special encouragement. The Council suggest that for the exhibition in the early part of 1873, should His Honor approve of the proposal, the expenses thereof might be included in the next budget. The Council further submit that the result of this exhibition will probably prove of special value to the recently organized department of agriculture, as well as to all [illegible] in the development of the agricultural resources of the country.

From R. H. Wilson, Esq., Officiating Under-Secretary to the Government of Bengal; to the Secretary to the Agricultural and Horticultural Society of India, No. 2195, *dated Fort William, the 26th July* 1871.

Sir,—I am directed to acknowledge the receipt of your letter dated the 13th instant, suggesting that another agricultural exhibition be held in January 1873, and in reply to state that, before passing final orders on the proposal, the Lieutenant-Governor will be glad to be informed if the Society has reason to believe that practical benefits have resulted from the last exhibition in the way of the improvement of agriculture ; and if so, I am to beg that you will be so good as to specify any that have come to the knowledge of the Society.

From the Secretary to the Agricultural and Horticultural Society of India ; to the Secretary to the Government of Bengal, dated Metcalfe Hall, 10th August 1871.

Sir,—I am directed by the Council of the Agricultural and Horticultural Society to acknowledge the receipt of your letter, No. 2195 of the 26th ultimo, and to offer the following observations. The Council are of opinion that the exhibition of January 1864 had the desired effect of enlisting the interest of the native zemindars, and of the community in general, in the objects which the exhibition was intended to promote. One great practical effect of the exhibition was that it enabled the Government and the community to form a comparative idea of the growth of the different articles, and the breed of live-stock in different parts of the country, and the consequent increased competition on the part of many to avail themselves of the improvement in the specimens exhibited by others. It is only by public exhibition that information as to the state of agriculture in the different parts of the country can be practically known, and the progress made accurately ascertained. It is improbable that all the benefits derivable from periodical exhibitions can be realized by such spasmodic, unsustained, and interrupted efforts as were made in 1864-65. This exhibition, it will be remembered, was followed in the succeeding year by local exhibitions in various districts of Bengal. These local exhibitions were more or less successful, as a stimulus to those interested in agricultural pursuits, and thus, in their turn, subserved the object in view. It was originally contemplated that another central

exhibition should be held in Calcutta in a reasonable period after these local shows, in order to test what improvement in agriculture, the breeding and rearing of stock, in the manufacture and use of agricultural machinery and implements had taken place, since the first central exhibition of 1864. Owing, however, to the famine in Orissa and subsequent distress in various parts of Bengal, any good effects which might have resulted from the institution of these exhibitions have been arrested in the hard struggle for life during the period referred to; and for these reasons the Council of the Society are not in a position to state what specific advantages actually have accrued.

As regards machinery, however, I am directed to bring to the notice of His Honor the Lieutenant-Governor the opinion of one of the largest exhibitors of machinery at the exhibition of January 1864, which is couched in the following terms:—"If such exhibition as that held at Allipore in 1864 had been steadily continued, it is our firm conviction the results would have shown themselves ere this." It could scarcely be expected, even by the most sanguine, that a single initiatory central exhibition, followed by a few local shows in the succeeding year, would produce any perceptible lasting benefits. In support of this view, the Council would draw attention to the case of agricultural exhibitions in England, where it has required a succession of annual shows to achieve some of the objects contemplated by the promoters. It is a question whether at the present day the Royal Agricultural Society could point out such an extent of improvement in the various departments of agriculture as might have been anticipated after the experience and encouragement of more than a quarter of a century. If therefore, backed by the great intelligence, skill, and capital of a large section of the community, the state of agriculture in England leaves still great room for improvement, it is but fair to assume that before any perceptible improvement can be looked for in the agriculture of Bengal, persevering and well-sustained efforts for its improvement must be made by the employment of means successfully availed of in England by district and central exhibitions of agricultural produce, stock, machinery, and implements.

From the Officiating Secretary to the Government of Bengal, in the Judicial and Political Departments; to the Secretary to the Agricultural and Horticultural Society, No. 597, dated Yacht Ithotas, Gowhatty, the 27th August 1871

I am directed to acknowledge the receipt of your letter dated the [illegible] instant, communicating the opinion of the Society in regard to the [illegible] which have resulted from the agricultural exhibition of 1864, in the way of improvement of agriculture, and with reference to your previous communication of the 13th ultimo, I am to state for the information of the Society that, with the census and cess work in hand, the Lieutenant-Governor is not prepared to pledge himself to an early agricultural exhibition. His Honor is of opinion that, without holding the proposed exhibition, the agricultural interests of the country may perhaps be improved in a humbler manner meanwhile.

SUGAR FROM BEET.

(From the Deccan Herald.)

WE have noticed the large establishment in Germany for the manufacture of sugar from beet roots, and the great success which has attended this experiment. Mr. Henry Bernard of Lille has just published a pamphlet on "La question des sucers" dealing with points connected with the drawback convention. There are great varieties of opinion with regard to what kind of produce yields the most saccharine strength. Mr. Bernard appears to attach more importance to the Cologne experiments than they deserve, for it is evident that they afford no clue to the yields given by beet sugar, as only 17 per cent. of that sugar was used in the experiment in the first class, 28 per cent. on the 2nd class, 19 per cent. on the 3rd class, and none on the 4th class. It is notorious that the French export refiners who have found out how to trick the provisions of the convention use beet root almost entirely. To those employed in the manufacture of sugar it is well-known that beet sugar gives a much larger yield in refining than cane sugar, and it therefore seems folly to mix an average of only 26 per cent. of beet sugar, and to take an average which is useless, if only beet sugar is used. Various are the opinions as to how sugar is to be tested as to strength, and with what duties it should be charged in France at present: as a matter of course, all duties are condemned by those who must now be heavily taxed to meet the expenses of the late war. Beet root sugar might easily be produced in many places in India where the beet thrives so well. But in the last number of the *Indian Economist* there is a letter published originally addressed to the *Sacramento Union*, in which the writer declares it as his opinion that sugar can be made more profitably from melons than from beets. If such be the fact, India might do much in the work of producing sugar in this way. In the cultivation of melons there is much less expense than in that of beets. The labour of hoeing, weeding, &c., is twice as great in the latter than in the former case. Then melons when gathered are ready for the mill, while beets have to be washed and their crown of leaves and rootlets cut off. Large quantities of melons can be sold for direct consumption whenever worth more in that way than for sugar; they yield their seed every year with no extra expense for cultivation. Beets require a second year, with land and careful culture, and gathering of the seed. Melon seeds will yield sixteen per cent. of their weight of excellent table oil. Beet seeds, beyond what are needful for seeds, are of no value. The yield per acre and the cost of manufacture are decidedly in favour of melons; they require less time, less bone-black, less machinery, less power, and less fuel, because no water is added, which cannot be said of beet juice by the ordinary process of extraction. The natural purity of the juice of melons is so superior to that of beets, that whilst the melons furnish an agreeable "food and drink," and a delicious sweet, the juice of beets is so acrid and herbaceous, as to be wholly unpalatable. The defecation and refining processes for melon juice and sugar are therefore attended with far less trouble and cost. That part of the beet which in many instances grows above ground, exposed to the sun, is of little or no saccharine value, whilst the hotter the sun and the drier the air, the better and sweeter the melon, and the larger, the sweeter generally; whilst the reverse is true of beets. Beet juice and pulp exposed to the air, will turn black in fifteen minutes, and fermentation commences immediately from the rasp. Melon juice and pulp will not blacken at all, and will not begin to ferment in the open air before the third day from the melon. Beets are remarkable for their power of extracting alkaline and saline substances from the soil, which injures their value for sugar. Melons are equally remarkable for letting these salts entirely alone in the soil. No centrifugals or presses are required to separate the juice from the pulp, as with beets; but all except the rinds and seeds go into the defecating kettles together. Cloth-filters, concentrators, and a vacuum pan are as necessary as for beets. The buildings are less costly, because requiring less strength to hold in position the centrifugals and other necessary machinery for beet sugar factories. The chemical processes of melon sugar-making do not differ materially from those for the making of beet sugar, except in their simplicity. Spirits in large quantities can be extracted from the fermented juice of melons and the refuse of the factory, and "pure cider vinegar" is made therefrom in ten hours that cannot be distinguished from the genuine article. The melon rinds, with dry grass or straw, make an excellent food for milch cows. These advantages ought to meet with attention from those who are in such a praiseworthy manner endeavouring to develop the resources of this country. If what is stated be true, the experiment of the manufacture of sugar from melons, which are so plentiful in India, is surely worth a fair trial.

5 Nov.

CAROLINA PADDY.

RESULT OF THE EXPERIMENTAL CULTIVATION OF CAROLINA PADDY SEED IN THE NORTH-WESTERN PROVINCES DURING 1870.

Allahabad Division.

Allahabad.—The Collector distributed the seed among Dr. Pilcher, Superintendent of the Central Jail; Baboo Pearee Mohun, a Pleader of the High Court; and a Mr. Carbery. Dr. Pilcher reports that his experiment was a failure; 17 chittacks of seed were sown, the yield was 12 chittacks and 15 seers of straw. The seed was sown on 1¾ biswas of land, which was not manured, but irrigated. He states that many of the ears were empty, but cannot account for this. Baboo Pearee Mohun planted his seed under the bund of a tank; the bund burst, and the whole was washed away. Mr. Carbery has not reported the result of his experiment, although repeatedly asked to do so. In this district the experiment has not been fairly tried. It can only be by chance if experiments of this kind succeed in the hands of mere amateurs, and if they fail in their hands, the impression must remain that there might have been some ignorance or mismanagement which would have been avoided, had the experiment been carried out by professional cultivators.

Cawnpore.—The experiment in this district has been a total failure owing to the rains having set in unusually early, and swamped the seed that was sown. The Collector is desirous of trying the experiment on various conditions of soil and cultivation. The Commissioner recommends that a good supply be placed at the Collector's disposal.

Humeerpore.—The Collector of this district alone is able to submit a report showing satisfactorily that under similar circumstances the yield of Carolina rice exceeds the out-turn from at least one kind of the ordinary country grain. His method of conducting the experiment was to sow an equal area in the same field with foreign and country seed, and to treat both alike. Unluckily, the amount of seed varied; but the out-turn was 18 seers produce out of 15 chittacks of Carolina

seed, and 20 seers produce out of 3 seers country seed. This was in Muhoba alone; the site selected was the bed of a tank, and probably this experiment was carried out under favourable conditions. In other places, the experiment failed: in one case, the crop was destroyed by cattle; in another, unsuitable land was selected. The Commissioner suggests that Mr. Harrison may be entrusted with seed to carry out further experiments in another season.

Jounpore.—The Deputy Collector sowed some seed in the Municipal garden, the result was 13 lbs. of clean grain out of 2¼ lbs. of seed.

Banda and Futtehpore.—In these two districts the experiments were a total failure: the heavy rain, early in the season, quite destroyed the growing plants.

The Commissioner of Allahabad, in submitting the above reports, remarks, that to have such an experiment satisfactorily carried out, it is essential to have a good supply of seed early, so that there may be no hurry in distributing it or in selecting fields for the purpose; he also states that simple instructions should be issued to the district officers. They should be directed to select at least six or eight localities, to choose land adapted for rice in general, and not to try what they can make out of unlikely kinds of soil, to sow half of each selected field with the Carolina and the usual country grain in equal proportions of seed, and to treat each alike, and then to report the out turn. If any difference in cultivation suggests itself, it should be carefully tried and reported.

Rohilkhund Division.

Bijnour.—The quantity of seed assigned to this district is reported as being very small: it was distributed among Mr. Tresham, a zemindar, and several natives. Mr. Tresham reports very favourably indeed of the result of his experiment, but the Natives seem to have been less fortunate. The Collector recommends that Mr. Tresham be allowed to try the experiment again this year on rather a larger scale. It may be said that the experiment has not altogether succeeded, for the yield is rather less than half that of country seed both in grain and straw; but, with care and plenty of water, which is essential, the result might be better.

Moradabad.—Ten pounds were sent to this district, which, when winnowed and cleaned, yielded 6¼ lbs. As the rainy season had been for some past years rather uncertain, the Collector thought it best to try the sowing in several rather than in two or three spots. Accordingly, the seed was distributed in various quantities to 12 respectable farmers, who appear in some cases especially to have taken considerable care in carrying out the Collector's directions. They were instructed to sow broad-cast about one-fourth of the weight usually sown with common country seed. The four best out-turns were given from sowings made in the first week of July, while the crop was cut in the third and fourth weeks in October. Of the 6¼ lbs., 11 oz. were swamped after sowing, leaving 5 lbs. 10 oz. sown in 13½ biswas pucca in ten different villages. The yield, on the whole, was 148 lbs. of rice, giving an average of 26 fold. One of the farmers, whose experiment was somewhat successful, wishes to try the sowing again next year with double the quantity he first received. The other six cases were rather feeble, and require no notice. The Collector has kept the present crop of rice, and proposes distributing the seed in larger quantities this year. The Collector will be glad to learn results of other districts and any direction the Board may be pleased to issue regarding the time which may be found to be the best for sowing, and the quantity which may have been found best for a certain area.

Budaon.—No experiments were tried in this district.

Bareilly.—The amount of paddy seed received in this district was 5 seers. Three seers of this was sown in the Deputy Collector's garden at Pilleebheet, the remainder by two landlords in Baheree. The experiments in the garden proved again the great amount of moisture this variety of rice requires. Two of the beds were more wet than the remaining two; in the former the stalks of each plant varied from 10 to 12, in the latter from 7 to 8. The head of an average looking plant, when counted gave 365 grains, of which 332 were good and the rest empty. The out-turn was above the average of country rice, but the produce is coarser than even 3rd class rice. The seed given to one zemindar germinated, but failed ultimately, and that to the other gave an out-turn in the proportion of about 2¼ pucca Bareilly maunds to the beegah, which is well above average.

Shahjehanpore.—Mr. J. Powell, of the Rosa Factory, reports that as he had no proper rice lands in this district, it was thought best to sow the rice in different soils under different circumstances, *i. e.* (1) *in low land liable to inundation*; (2) *on the side of a jheel where the land had not been previously well-worked*; (3) *in a garden plot.* The seed was first sown and afterwards the plants were laid out singly or in pairs: it was then found that each plant shot out from 6 to 10 strong stems. In the low land, liable to inundation, the show of plant was magnificent; but a flood came and entirely swamped a portion, and, in receding, left a slime on the leaves; these plants sickened, the ears came out weakly, and did not fill well. Where the plants were not altogether swamped, the return was excellent. By the side of the jheel the out-turn was not good; the plants were immersed in water at the time of seeding. In the garden, where the plants never had more than an inch of water on them, and where the ground was only just moist at the time of seeding, the crop was beautiful, a picture to look at, the grain of a bright golden hue, every ear pendent, stalks high and strong. Mr. Powell concludes that the rice is suitable to all lands which can be kept fairly moistened for two months, or that may have from two to four inches of water on during that time, provided the lands are properly prepared and weeded. The seed should not be sown until the end of July, as the rice matures early and should not be allowed to ripen before September.

Kumaon Division.

Kumaon.—Commissioner stated, in October last, that part of the paddy was then quite green, and he did not expect he would be able to report on the out-turn until the close of November. He now reports that in consequence of the great sickness at the important time, the seed was neglected, and that no satisfactory data can be given. The Commissioner tried some with servants to look after it, but they fell sick, and the wild pigs destroyed it.

Meerut Division.

Allygurh.—The Collector reports that the seed was made over to the Secundra Rao Talseeldar for trial, as that part of the district is most damp. A portion was given to two cultivators, who sowed it in marshuland, and who gave their best attention to its cultivation; but the result is quite a failure, the grain produced being very small, and stalk short and unhealthy. Mr. Chase is of opinion that the climate of Allygurh is not suitable to rice, and that it does not appear advisable to continue the trials of any paddy seed.

Dehra Doon.—Superintendent says that the plants that were transplanted throve best, but the continued heavy rain did not agree with the plant, or rather it was the absence of sun that did the harm. The average produce of Carolina paddy would be, by the results, about 15 maunds to the acre; ordinary country rice produce about 25 maunds. There can be no doubt but that the Carolina paddy would thrive well in the Doon, and would produce about 30 maunds to the acre if properly tended; but Mr. Ross doubts if it would ever come into much favour: it is coarse and utterly without flavour; none but the poorest of the poor would eat it.

Saharunpore.—Collector states that so small a quantity of seed was sent him that he distributed the whole (8½ seers) to one Kour Sein, of Harotee. The result is the same as that described in Mr. Webster's letter last year (1869). In vigour, amount of produce, and especially in strength and size of stalk, it far exceeds the Native rice. Kour Sein sowed also 9 seers of last years' (1869) seed in a field. The crop was a fine one, and quite as high and strong as the new seed crop, but the out turn was not quite so good. Mr. Jenkinson recommends that this experiment should be tried again next year, for in introducing a new kind of rice it is most important to ascertain whether the seed, produced in this country, continues equal to the imported seed, or whether it deteriorates, and states that it would not be fair to come to any conclusion on this point from only a single experiment carried out on so small a scale. The cultivation of this Carolina rice by Kour Sein has been so successful that the Collector is sure that if seed were obtainable, it would be very extensively sown, and that in time it would perhaps entirely take the place of the Native rice. The Collector further states that the Carolina rice is coarser than Native rice, but in flavour is only inferior to the best Native rice, and that the Natives are of opinion that it is equal to the 2nd quality of rice produced in the district, and will have no objection to take to Carolina rice.

Moozuffernugger.—Collector forwards a report drawn up by the Assistant Collector, and states that he is afraid the experiment must be looked upon as a failure; for the result on [illegible] land, four maunds from 12 biswas would only give [illegible] 6½ maunds per beegah, and this for good land and well watered would be an indifferent crop of ordinary Indian grain. The Collector himself saw the particular field to which reference is made, and before the paddy was cut it struck his eye as in appearance below the ordinary average. The Commissioner, in submitting the report, remarks, that there is so much similarity in soils, in humidity of atmosphere, and in water-supply in Saharunpore and Moozuffernugger that he would certainly suppose the results to be identical, whereas it will be seen that they are contrary. Mr. Lind concludes that the cultivation was carefully attended to in the former district, and neglected in the latter. Adverting to the objection urged by Mr. Ross in regard to the rice being coarse and without flavour, the Commissioner states that the nutritive qualities of the grain can best be ascertained by chemistry, but he can hardly fancy the zemindars of Saharunpore would be eager in enquiries after the seed, if the rice is so poor as described by the Superintendent of the Doon.

The Collector forwards another report by Mr. Cadell, the Settlement Officer, whose "experiments have been far more satisfactory, and offer a far better guide to the probable capabilities of the seed, under favourable conditions and with intelligent management, than the experiments which were made under the superintendence of the district officials, and which were reported on by Mr. Donovan." Mr. Palmer says that if seed is to be again distributed next season, it would probably be best to entrust direction of the cultivation to Mr. Cadell, and to confine the experiment to those estates in which, as agent for the Court of Wards, he is able entirely to control its working.

Benares Division.

Ghazeepore.—States that before the receipt of the Carolina paddy seed from the Board some was procured from the Agricultural Society, so that the amount sown in this district was larger than in others. Adds that the seed sown under his personal superintendence near the Cutcherry was a failure; that throughout the district it met in several places with unfavourable weather; but in many cases succeeded well and produced from 8 to 16-fold crops.

Azimgurh.—Collector states that the 13 lbs. of Carolina seed received from Commissioner's office, 8 lbs. was sown under the personal supervision of Mr. Sladen in June last. The seed was sown in land belonging to zemindars of a village adjoining the Collector's house; some in the manner in which the Natives sow their own rice, some in drills prepared after the fashion described by the American Consul in his memorandum submitted to the Government of India. Owing to the excessive rains the experiment was unsuccessful. The seed sown in the drills in damp ground was drenched by the rain and did not even germinate. The other seeds germinated, and the rice grew to some height, but rotted within a month from superabundant rain. The Collector adds that Mr. Sladen received about 5 lbs. of the seed this year for experiment, but that the fact was not brought to his notice, nor was

he aware of the existence of the seed till informed by the Commissioner. The season for sowing rice has now passed, but the result of the sowing the seed will be looked after by the Collector; at present it seems to be that the seed is not suited for a country where the rains are heavy and continuous.

Mirzapore.—Collector reports that the Carolina paddy seed received by him was distributed among several gentlemen, of whom only one furnished the result of his experiment, which was a failure. This gentleman states that "he sowed the seed in ordinary garden ground, but that it was attacked by a kind of insect which destroyed the grain by perforating the grain while yet in the milky stage, and leaving it quite empty. Of the two seers sown all the plants germinated; but the yield of the grain was 1¾ seers, or half less than was actually sown."

Goruckpore.—Collector states that last year the Carolina paddy seed was distributed to a Mr. Palmer and a certain zemindar in Deorea. Mr. Palmer reports that the result has not been good owing to the plants having been destroyed by inundation and flies, and that he will make a further trial this year from the small quantity of the paddy he has secured. The Deorea zemindar reports that the plants were destroyed by heavy rains, the plants being under water for some time. A further supply of paddy seed has been sent to the zemindar for this year's trial, being the half retained of the seed in 1870.

Benares.—Commissioner, in submitting the above reports, states that it is apparent that the season was unfavourable for the experiment, and that moreover from the Goruckpore and Mirzapore reports, it is evident that the seed, when sown, is liable to attack from insects. The system of distributing new varieties of seeds, &c., for experimental culture, unless to officers who take an interest in such matters, must, the Commissioner fears, prove a failure, and regrets now that he did not keep a portion for Benares, and supervise it himself. Is of opinion that to give a seer to one man and a seer to another, as was done in the cases reported, can never profit. Adds that there is a public garden in Benares, superintended by a skilled gardener; but that the institution lives from hand to mouth, depending on petty subscriptions; its value for experiments is consequently reduced to the lowest.

Extract paragraph 8 of letter No. 393, dated 20th April 1871, from the Superintendent, Botanical Gardens, North-Western Provinces.

Carolina Paddy.—This rice has been grown on a small scale; 3 lbs. were sown in a small plot of land in June last, and transplanted on to a kutcha beegah of land, and was cut down in October. The out-turn was 471 lbs. or about 6 maunds, equal to a yield of about 30 maunds per acre. An adjoining Native farmer, Kour Singh, obtained 32 maunds per acre. The straw was about 5 feet in height and most luxuriant.

OPIUM CULTIVATION IN CHINA.

From G. W. Caine, Esq., Her Britannic Majesty's Consul at Hankow; to the Secretary to the Government of India, Financial Department, Calcutta,—No. 42, dated British Consulate, Hankow, the 31st July 1871.

I HAVE now the honour to report on the cultivation of the poppy in this part of China under the heads mentioned in Mr. Wade's despatch of 15th June last

Question 1st.—What sort of crop (whether good or bad) has been gathered, especially in the South-Western Provinces, Yunnan, Szechuen, and Kwei-Chow; and in the North-Western Provinces, Kansu and Shênsi; and in the North, in Manchuria?

Answer 1st.—It is generally reported at Hankow by opium brokers from up-country that the crop of opium in Szechuen for this year 1871, is an unusually good one, the weather having been dry and fine.

Concerning the crops in Yunnan and Kwei-Chow, it is impossible to speak for certain, as but little of the drug arrives here directly from those Provinces. It may, however, be surmised that the fine weather existing in Szechuen, has extended to the neighbouring Provinces, in which case a good crop may be expected; and, indeed, there are abundant signs of a hopeful feeling existing in Hankow amongst native opium merchants as to this year's crop. No information has been able to be obtained here about crops in Shênsi and Kansu, but the Mahomedan rebellion, which has so long existed in these Provinces, and which has only just been suppressed in one of them, Shênsi, will have effectually prevented any very extensive cultivation of the poppy. Concerning Manchuria, nothing whatever is known here.

Question 2nd.—Any particular circumstances that have affected or are likely to affect the out-turn?

Answer 2nd.—The unusually fine weather which existed in Szechuen during the beginning of the year, and of which the low condition of the waters of the Yangtse here up to July was a proof, would be eminently favourable to the opium crop, nor have any allusions been made to ravages arising from blight or disease.

Question 3rd.—Is cultivation of the poppy generally and especially in the writer's own vicinity extending, or the reverse?

Answer 3rd.—In the Province of Hupei in which Hankow is situated, the area of cultivation appears to be much as formerly. The chief opium district is in the west of the Province, bordering on Szechuen in the prefectures of I-chang and Huh-an-fu.

Here a considerable quantity is grown and called Chico-tu. It is said to be of excellent quality, but the quantity produced only just suffices for local consumption, though the article is much sought after when it can be obtained, and a heavy price is paid for it. It is likewise stated that at several places in the country, the peasantry cultivate small quantities of opium by way of making a few cash. The quantity is infinitesimal in amount, and can have no effect on the opium market; but it may be a straw showing how the wind blows. It is doubtful, however, whether the soil of this Province is fertile enough to render opium cultivation profitable, and tea, the staple of Hupei, and possessing the double advantage of being profitable and legal, will probably prevent any great extension of poppy cultivation. In the neighbouring Provinces of Hunan and Honan, some attempts have been made towards the cultivation of the poppy; but the large imports of foreign and native opium into these Provinces show the amount to be but slight. A beginning, however, has been made, and the cultivation of the poppy may, in the fertile country of Honan, be profitably extended; but the Province of Hunan can never, from the poverty of its soil, become a formidable competitor for growth of opium. In Szechuen, nearly half the Province is already appropriated for opium, and the cultivation of it being profitable, it may safely be supposed it will be extended further if possible; but the soil of West Szechuen being less fertile than that of the east portion, any further increase will be impeded. Of increase or reverse in the Provinces of Yunnan and Kwei-Chow, no statistics are obtainable, except that, so far back as 1836, the fertile spots in that Province are mentioned, in a memorial addressed by Choo-Tsun to the then Emperor, as being appropriated for the growth of the poppy; and it may safely be stated now that the produce is very considerable, though the Mahomedan rebellion existing there would be a check to any great extension. An estimate made in 1869 gives piculs 20,000 for annual yield of Yunnan, piculs 15,000 for Kwei-Chow, and piculs 6,000 for Szechuen. These figures, however, are open to criticism, for it seems remarkable that the Province having the largest export of opium should produce the smallest crop.

Question 4th.—Any action of the imperial or local authorities affecting opium?

Answer 4th.—No direct action has been lately taken against its cultivation. Heavy transit dues and an increased land tax are the only means used.

Proclamations are, of course, continually being issued by local Magistrates, exhorting people to cultivate cereals and abandon opium for more useful crops; but, as the officials are the chief consumers of the drug, and, in addition, derive a considerable revenue therefrom, these proclamations are intended only as a means of exacting more money from the cultivators.

Question 5th.—Is the consumption of native opium extending in the interior and in the treaty ports, and how is it affecting the consumption of Indian opium, and whence is the native opium procured which is consumed in the writer's vicinity.

Answer 5th.—The consumption is decidedly on the increase, and more native opium comes down here every year; but it does not appear as yet to have any effect on the foreign drug. The total of opium-smokers is becoming larger every year, and their number increases much more rapidly than the amount of native opium produced. It may even be stated that the increased consumption of the native article has a favourable effect on the sale of the foreign drug. Its cheapness increases the number of smokers, and they, having acquired a taste for the drug, betake themselves ultimately to the best kind they can procure, which is, of course, the Indian opium.

It is stated here by foreign firms that, until the production of opium equals the demand, and the area of cultivation bears a more equal proportion to the increasing number of consumers, no fears need be entertained for the Indian opium, and even then the superior quality of the foreign drug would continue for some time to give it an advantage. The want of rapid modes of transit is a further disadvantage, and the Indian may be expected to hold its own for some years, and its sale perhaps rather to increase than diminish.

The following table shows the import of opium into Hankow for the years 1868, 1869, 1870:—

Opium imported.	1868.	1869.	1870.
Malwa	Piculs 3,007	Piculs 2,441	Piculs 3,536
Patna	„ 98	„ 202	„ 215

Szechuen is the greatest producing district for Hankow, almost the entire importation coming from that Province. The quality is not first-rate, but its cheapness makes it popular with the poorer classes. Some is also imported from Yunnan, but the long distance, the difficulties of transit, and the heavy taxation, prevent any large importation. Its quality is said to be excellent, nearly equalling that of Indian opium, and the

conterminous Province of Hunan is largely supplied with it. It is, however, a significant fact that this Province is likewise the largest importer from Hankow, as a centre of the Indian drug, so that the best native opium would seem, under the most favourable circumstances, unable to compete successfully with the more tasty article. The Yunnan opium is undoubtedly the most formidable rival the Indian drug possesses, but the cultivation of it having been in existence for the last 50 years, the maximum of extension may have been attained. It is largely imported into Hunan and Szechuen, and Chueng-ching-fu, in the latter Province is a central depôt for the Yunnan opium as Hankow is for the foreign. From the expense of carriage and taxation Szechuen can now hardly be reckoned as a consumer of the foreign drug, though, in former years, some little was sent. The Yunnan opium has to some degree taken its place from its being both excellent in quality and cheap and close at hand, but the opening up of a port in Szechuen to foreign steamers would probably have the effect of increasing import of foreign opium.

Question 6th.—What the relative prices are of native and of Indian opium, and whether anything is known that is likely to affect them?

Answer 6th.—The prices ruling in Hankow market are now, for—

Yunnan, 1st quality,	Tls. 380	per 100 c.
Kwei-chow		
Szechuen old	320	,, ,,
new	296	,, ,,
Foreign opium from 500 to	540	taels per chest.

Indian opium is consumed chiefly by the wealthier and official classes, its dearness having always prevented its becoming a common article of consumption with the poorer classes. The native article is consumed by the poor exclusively as inferior teas are in England, and the great extension of opium cultivation in China has been induced to supply a demand which the more expensive drug was unable to satisfy.

The rich continue, and will continue, to smoke the best that can be procured, and, unless the foreign drug becomes so adulterated as to become inferior to the native opium, it will continue to hold its own in the market. The price of foreign opium has remained nearly stationary here for the last two or three years, ranging from 500 to 550 taels per chest, nor is there much expectation here of its being lowered. The price of the native article has a slow, but very slight, tendency to decrease, the increased production being compensated for by the increased and increasing number of consumers, and, until the one has overtaken the other, no important reduction can be expected. The following prices of various kinds of native opium, given by Baron Richtofen who traversed the Province of Honan in the spring of 1870, may prove interesting, but their accuracy cannot be vouched for:—

1st	Kansu	900 to 1,000 cash a tael.
2nd	—Shensi	800
3rd	—Honan / Shansi	600 to 700
4th	—Szechuen	400 to 500

1,100 cash = a dollar = 4s. 3d., and 16 taels = 1 catty, 100 of which make a picul, equalling 133⅓ lbs.

Question 7th.—Any facts regarding the position of Persian, Turkish, or other opium (not Indian or indigenous) in the market?

Answer 7th.—A large foreign firm at this port imported some Turkish opium, but it being found unsaleable here, it had to be returned to Shanghai.

THE COTTON TRADE BETWEEN THE NERBUDDA VALLEY AND CALCUTTA.

From Harry Rivett-Carnac, Esq., Cotton Commissioner; to the Secretary to the Government of India, Department of Agriculture, Revenue and Commerce,—No. 5428, dated Allahabad, the 4th October 1871.

I HAVE the honour to acknowledge the receipt of your letter No. 5, dated 13th July, regarding the trade in cotton between the Nerbudda Valley and Calcutta, and desiring me to investigate the matter and to report the result of my inquiries, for the information of His Excellency the Viceroy and Governor-General-in-Council. I would now desire to report that, on this subject being brought to my notice, early in the year, I caused inquiries to be made, and that ascertaining, as will be explained in a later paragraph, that the exports alluded to by the Officiating Chief Commissioner of the Central Provinces were inconsiderable and admitted of satisfactory explanation, I did not pursue the subject further. On the receipt, however, of your despatch under acknowledgment, it appeared desirable to obtain the latest information on the subject for transmission to the Government of India, and, as I was on the eve of starting for a tour in the Central Provinces and the Berars, I delayed a detailed report, until I could re-visit the cotton districts, and obtain from the Railway Companies the tabulated statements of traffic, taking up, at the same time, the whole question of the trade of the Central Provinces with Bombay and Calcutta,—a subject which has been treated of at length in my memorandum, copy of which was submitted with my letter No. 5312, dated the 25th ultimo. These circumstances will, I trust, account for the delay in replying to your despatch under notice. Further inquiry has confirmed me in the view that, although some trade in cotton does doubtless continue to exist between the Nerbudda Valley and the East, still that there is no ground for supposing that the trade is "shifting towards Calcutta;" but that, on the contrary, this trade with the East is on the decline, having been affected already by the completion of the main line of the Great Indian Peninsula Railway between Bhosawul and Jubbulpore. Nor, indeed, unless I read the letter incorrectly, do I understand Colonel Keatinge to desire to convey that the trade is shifting towards the East. The Officiating Chief Commissioner noticed that cotton was being sent from the neighbourhood of Nursingpore in the Nerbudda Valley to Calcutta, which place is much further from Nursingpore than is Bombay, and this circumstance very naturally struck him as being peculiar. But, as I shall now attempt to show the quantity sent from this quarter to the East was not larger than that sent in former years, whilst the existence of a trade between the Nerbudda Valley and Mirzapore and Calcutta is a circumstance that can be readily explained.

First, in regard to the quantity of cotton sent from the Nerbudda towards the east during the past season.

The following figures of the traffic by road have been furnished to me by Mr. Grant, Commissioner of the Jubbulpore Division:—

Statement of the cotton exported by road over the outer boundary of the Jubbulpore Division, during the following months of 1871.

January.	February.	March.	April.	May.	June.	Total.
Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
402	719	3,404	2,340	2,528	674	10,048

Total maunds 10,048,* or about 2,000 bales of 400 lbs. each. The traffic ceased altogether at the commencement of July.

Now, these exports by road were not made up exclusively of cotton sent from the Nerbudda Valley, but included all cotton sent eastward by road from the Central Provinces and Berar cotton-growing country. Some quantities were sent even from Oomraotee to Mirzapore, as explained in a [illegible] of my memorandum on the railway traffic already referred to—

"This year, even a consignment of Oomraotee cotton was sent from Oomraotee to Mirzapore on bullocks by a Brinjaree Naik of Berar, who not caring to keep his bullocks idle, loaded them with cotton, and brought back sugar and glass-ware from Mirzapore."

and the whole quantity sent by road, of which the Nerbudda consignment formed but a part, amounted to only 10,048 maunds, or 2,000 bales of 400 lbs. each, or in other words, from 700 to 1,000 cart-loads. The quantities of cotton sent from the Nerbudda Valley eastward by railway, from the 1st of January 1871 to the 30th of June, were as follows:—

	To Cawnpore.	To Mirzapore.	To Buxar.	To Calcutta.	Total.
Khundwa ..		50			50
Garrawara ..		156			156
Nursingpore		315			315
Chundwarrah		512		136	648
Jubbulpore ..		5,258	15	6,970	12,245
Total Maunds ..		6,297	15	7,106	13,420

or about 2,700 bales of 400 lbs. each. Adding these figures to the exports by road already given, we have a total of 23,471 maunds, or 4,700 bales, sent eastward by road and railway during the season.

The figures given below shew the exports of cotton in maunds in this direction during former years:—

	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.
By road	75,000	41,353	38,645	21,104	12,685
By rail		17,403	10,652	4,249	13,656
Total Maunds	75,000	58,756	49,297	25,353	26,170

and these figures would seem to indicate a gradual falling off, for reasons to be noted later, in a once important trade. That

* The maunds used throughout are of 82 lbs. each.

some trade in this staple should continue to exist between the eastern part of the Central Provinces, is only natural from the following circumstances. In the first place, it is to be remembered, that, until quite recently, the whole trade of this tract was with Mirzapore and the East. Until the completion of the railway, not only the Nerbudda Valley, but even the old Nagpore Province and some portions of the Berars, were entirely cut off from Bombay, and, consequently, transacted the whole of their business with Mirzapore and the North-West Provinces. To Mirzapore the cotton of that part of the country used to be sent, and in exchange, copper, spelter, sugar, European piece-goods and the comprehensive *kerana* of the natives used to be imported by such trading towns as Jubbbulpore, Nagpore, Hingunghat, and Oomraotee. The large firms whose head-quarters are at Mirzapore had, and in many cases still have, their agencies at these towns, with subordinate branches in all the circles of supply of which these towns are the trade centres. And, as explained in my letter on the Wurdah Valley Railway, the cultivators being under advances to the agents of these firms, the produce is gathered in and disposed of by the mahajuns who have been for long years in the habit of sending annually large consignments to Mirzapore. In the Berar country, the effect of the opening of the railway communication with Bombay has been to induce some of the Mirzapore firms to open branches at Bombay. The native agents in the up-country markets send down the cotton to that port, or sell it on the spot to the European agents who are now established at all the marts to the south of the Southpoorahs, and who supply the European firms in Bombay. In the Nerbudda Valley the state of the case is somewhat different. The completion of the main line of the Great Indian Peninsula Railway on the north of the Southpoorahs is of such recent date, that the effect has not yet been fully felt, and the trade thus still continues to run to some extent in its old channel. But everything seems to indicate a change which is not likely to be long deferred.

The following extract from the letter of Mr. LeMessurier (Agent of the Great Indian Peninsula Railway) to the Chamber of Commerce, Bombay, given in the Appendix to this Report, explains still more fully the reasons for the exports towards the east. Mr. LeMessurier says :—

"I was at Garrawarra myself about the date referred to in Colonel Keatinge's letter, and I had a conversation with the agents who were sending their cotton by cart from near Garrawarra to Mirzapore. The reason for doing this was, that if the bullocks and carts thus occupied were not employed at a particular time in going to Mirzapore, they would be at home idle, as there was no work for them, and that the saving between sending by rail from Garrawarra to Mirzapore *viâ* Allahabad, or by cart *viâ* Meyhere and Rewah to Mirzapore, was equal to eight annas a doera only,—time being [illegible] of no value ; and they contrived to return from Mirzapore with [illegible] other places on the road.

"Mirzapore, as the Chamber is well aware, is the mart to which all the Central Province produce has found its way for very many years; and the agencies are so firmly established—the whole trade being in the hands of the Hindoos—that we cannot possibly alter the course of such trade in one season, particularly as boats on the Ganges are even now competing with the East India Railway as carriers of cotton from Mirzapore to Calcutta."

There is yet another reason for the cotton of Central India finding its way to the East. Of late years, cotton-spinning and weaving mills, worked by steam power, have been established at Cawnpore and in the neighbourhood of Calcutta. A certain percentage of cotton of a superior quality is required in these establishments for the finer class of goods manufactured there ; and the cotton of the Central Provinces suits this want exactly. The consequence is that consignments of cotton are annually sent, not only from the Nerbudda Valley, but also from Hingunghat, to these mills. The figures of the exports for the past two seasons are given below : —

	1869-70	1870-71.
	Cawnpore.	Cawnpore.
Wurdah ..	1,040	3,670

and the figures given in paragraph 6 of the exports to Calcutta are, to a great extent, to be accounted for by the requirements of the mills there. And, lastly, the cotton of the Nerbudda Valley—a cotton rougher in substance and shorter in staple than that grown south of the Southpoorahs—is in great demand for the China market, as will be seen from the following extract from the letter of the Bombay Chamber of Commerce given in the Appendix. The Secretary writes :—

"The Chamber are further of opinion that the white short-stapled cotton grown in those districts of the Central Provinces and the North-West of India, which is suitable for, and principally exported to China, will continue to find its way to Calcutta as the chief port for the export of Indian cotton to China.

"Seventeen and twenty years ago, about a third of the quantity of the cotton exported from Bombay went to China. All this is now changed ; and though the quantity of cotton exported from Bombay has, within half the period, more than double the portion now exported from this port to China is an inconsiderable item in the aggregate quantity."

To what extent the cotton trade done by Calcutta and Bombay with China is still sustained, will be seen from the figures given below ; and it is to be noted that whenever the price of cotton in Europe falls, the demand for Indian cotton for export to China is comparatively brisk.

Exports of cotton to China during the following years reduced to bales of about 400 lbs. each.

	Total exported to all Ports.		Exported to China.	
	To 30th June.		To 30th June.	
	1870.	1871.	1870.	1871.
Calcutta	50,502	1,54,300	24,502	51,304
Bombay .. .	8,12,22)	8,84,044	35,785	30,028

The above remarks will, I hope, shew that the exports of cotton from the valley of the Nerbudda, noticed by the Officiating Chief Commissioner, were not caused by any extraordinary turn in the trade, but were the results of a long-established trade which, under ordinary circumstances, is not likely to be entirely diverted for some time to come. But, on the other hand, as regards the quantity sent from the Nerbudda Valley towards Bombay, the following figures will speak for themselves :—

Quantity of cotton exported to Bombay from the Nerbudda Valley in bales of 400 lbs.

1867-68.	1868-69.	1869 70.	1870-71.
12,000	11,800	11,000	23,200

The increase, it will be seen, is marked, and is doubtless to be attributed to the opening of through communication by railway. I have purposely included in the columns given above, the stations of Nimar, which are just beyond the Nerbudda Valley, as it may be assumed, not unfairly, that much of the cotton of the valley was sent to these stations before the through line was opened by His Excellency the Viceroy in April 1870. Some of the cotton shown in the above statement comes from Central India, and strikes the railway at Khundwah ; but the figures of these exports have been retained as they are included in former statements.

Letter from the President, Government Farm, Sydapet ; to the Acting Secretary to the Board of Revenue, dated Madras, 29th June 1871.

Some discussion has lately arisen at the Farm as to how far cotton is a profitable crop when prices are as at present low, and the yield is so poor as the probable average yield per acre of ordinary native cultivation. I therefore requested Mr. Robertson, the Superintendent of the Farm, to institute a comparison from his own experience of the relative value of a cotton-crop and other dry grain crops grown on the same farms. The result which is given in Mr. Robertson's useful and accurate memorandum of the 20th instant will, I think, interest the Board and Government. It seems to me to be very suggestive in respect to the narrow margin on which the production of cotton in most parts of South India stands, when prices are not abnormally high, unless by improved farming the general yield per acre and the quality of the produce can be raised. Cotton is an expensive crop to grow, harvest, and clean for the market, and is highly speculative and unsafe. When prices are low, it can therefore scarcely compete with fair dry grain crops, which are not less remunerative and more easily raised. Indeed, it is said that cotton-growers have lost this year, and that contracted cultivation may be anticipated during the year before us.

It will be observed that the yield on the farm is about 120 lbs. of clean cotton to the acre, with fair manuring and good cultivation ; but the profits were scarcely, if at all, above those derived from ordinary dry grains under similar circumstances. The seed used was ordinary Cuddapah cotton. I fear, however, that 120 lbs. to the acre is considerably above the *average* yield of ordinary native tillage throughout the country. Mr. Carmac's estimate for the Central Provinces is considerably below this, and possibly 70 to 90 lbs. would be nearer the average yield of ordinary native cultivation. It will be in the Board's recollection that in a recent proceeding, the average yield has been estimated at 75 lbs. to the acre. With reference to Mr. Robertson's opening remarks I may observe that the price of cotton returned to the Board from the provinces, of which an abstract of the annual average is given below are probably not so accurate as they should be ; and I think that it were

advisable to call the attention of Collectors to the matter. I think also that the quantities of cotton should be stated as far as may be possible; and that these statements should be prepared in lbs., the form in which all Cotton Trade Returns are kept.

	Per candy of 500 lbs. Rs.		Per candy of 500 lbs. Rs.
Ganjam	162	North Arcot	124
Vizagapatam	149	South Arcot	107
Godavery	138	Tanjore	150
Kistna	115	Trichinopoly	119
Nellore	138	Madura	122
Cuddapah	127	Tinnevelly	127
Bellary	120	Coimbatore	113
Kurnool	115	Salem	181
Madras	118		

If I might hazard an opinion on this matter it is that the cotton-trade of India very urgently needs systematic attention to the development of agriculture in general in which cotton will take a natural and wholesome place, say, in a rotation where mixed husbandry is adopted in districts where the soils and climate suit it. The improvement of tillage in general alone can enable the production of higher qualities of cotton, and effect a more favourable average yield. And until some such result is produced, the distribution of highly cultivated and exotic seed is, I fear, of very doubtful utility in this Presidency. The general average of tillage is too low to assure success by this means.

STATEMENT SHOWING THE PRICES OF COTTON (CLEANED) PER CANDY OF 20 MAUNDS OF 25 LBS. EACH, EQUIVALENT TO 500 LBS. IN THE SEVERAL DISTRICTS DURING THE 12 MONTHS OF THE OFFICIAL YEAR 1870-71.

Districts.	May 1870.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
	Rs.	Rs.							Rs.		Rs.
...ur...	158	172	65		65			54	174	56	158
...apata	162	166	68		44			40	130	53	134
...ery ..	167	164	44		45			37	124	32	129
...a ...	139	155	41		119			103	102	30	91
...re ...	160	178	25		58			22	111	34	125
...gapah	241	187	25		65			23	140	40	140
...ry ..	163	130	28		15			23	92	37	95
...as ...	154	140			33			11	102	...	91
...lapur	140	90			40			40	100	...	145
...h Arcot					15				116	19	116
...h Arcot		150			...				96	92	76
...re ...	95	121			21				145	40	145
...nopoly	58	155			23				113	09	109
...ra ...	50	126			28				140	44	140
...velly	73	100			15				126	25	105
...batore	132	161			25				104	30	95
...berries	93	...			24				164		
...a ...		195									
...Canara											
...ar ...											

Memorandum

It is difficult to understand the extraordinary fall in the value of cotton said to have taken place in April 1871 in the Madras District:—thus, in the returns furnished to me, it is reported that while the value of cotton in March 1871 was 145 Rs. per candy of 500 lbs., it was, in the following month, worth only 95 Rs. or nearly 40 per cent. less in value. For the same month another district, South Arcot, reports an increase in value, amounting to Rs. 6 per candy. Five districts report no change in value, and the remaining districts show an average decline of less than 5 per cent. on the average prices of March.

Again, it appears strange that in two adjoining districts, Salem and Coimbatore, there should be such a large difference as 50 per cent. in the value of cotton; as there cannot be anything like this difference in the cost of getting the cotton of each district to market. If the cottons are of different kinds, it seems scarcely correct to classify them together.

In the Madras District the average of the monthly reports appears to be 115 Rs. per candy of 500 lbs., or about 3 annas 8 pies per lb.

The following "sets of crops" could be grown in this district in a fair season on soils similar to the best of those constituting the Experimental Farm. The results recorded are those actually obtained under fair manuring:—

Cotton and Maize (mixed). Occupied the land from September until June—

Average yield per acre—	Gross value per acre. Rs. A. P.
120 lbs. of Cotton	27 8 0
300 lbs. of Maize	6 8 0
2,000 lbs. of Straw	8 0 0
Total ...	42 0 0

Gingelly, followed by yellow Cholum. Occupied the land from July until March—

Average yield per acre—	Gross value per acre. Rs. A. P.
700 lbs. of Gingelly	20 3 8
750 lbs. of yellow Cholum	12 2 5
5,000 lbs. of Straw do.	10 0 0
Total ...	51 6 1

Gingelly, followed by Tenney. Occupied the land from July until March—

Average yield per acre—	Gross value per acre. Rs. A. P.
700 lbs of Gingelly	29 3 8
240 lbs. of Tenney	10 0 0
600 lbs. of Tenney Straw	3 0 0
Total ..	42 3 8

Cumboo, followed by Horse-gram. Occupied the land from July until March—

Average yield per acre	Gross value per acre. Rs. A. P.
670 lbs of Cumboo	13 6 4
6,000 lbs. of Straw	12 0 0
500 lbs of Horse-gram	10 0 0
2,000 lbs. of Straw	5 0 0
Total	

Gingelly, followed by Shawmay. Occupied the land from July until March—

Average yield per acre—	Gross value per acre. Rs. A. P.
700 lbs. of Gingelly	20 3 8
280 lbs. of Shawmay	13 8 0
600 lbs. of Shawmay straw	3 0 0
Total ..	40 11 8

Cumboo, followed by Green-gram. Occupied the land from July until March—

Average yield per acre—	Gross value per acre. Rs. A. P.
670 lbs. of Cumboo	13 6 4
6,000 lbs. of Cumboo straw	12 0 0
580 lbs. of Green-gram	20 0 0
Total ...	45 6 4

Gingelly, followed by Green-gram. Occupied the land from July until March—

Average yield per acre—	Gross value per acre. Rs. A. P.
700 lbs of Gingelly	20 3 8
580 lbs. of Green-gram	20 0 0
Total ...	49 3 8

Maize, followed by Horse-gram. Occupied the land from September until April—

Average yield per acre—	Gross yield per acre. Rs. A. P.
1,000 lbs. of Maize	21 10 8
5,000 lbs. of Maize straw	20 0 0
4,000 lbs. of Gram Fodder	8 0 0
Total ..	49 10 8

The foregoing figures apply to *our* soil and circumstances. Though the gross value of each "set of crops" does not differ greatly, it must be remembered that the cost of harvesting and preparing for market differs very considerably. Thus, in the first "set" the cotton will be costly to gather and clean. Again, many native cultivators are content with a *single* crop without actual figures. I can say little regarding the gross value of the different grain-crops raised by ryots; still, if their average return of cotton is only 70 lbs. per acre, worth 3 annas 8 pies per lb., or 16 Rs. per acre, it is pretty evident, that after paying expenses of gathering, cleaning, and carrying to market, they can have but a *very small balance* left to meet expenses of cultivation, rent, &c., a balance which must be considerably less than would be left by any grain crop, Varagoo perhaps, excepted.

20th June 1871.

P.S.—I am very anxious not to be misunderstood in these remarks. I do not say that cotton-growing is unremunerative, but that to grow cotton-crops, yielding only 70 lbs. of cleaned cotton, is so in this district.

AGRICULTURE IN ENGLAND.

ESTIMATES OF THE YIELD PER ACRE OF WHEAT, BARLEY, OATS, RYE, PEAS, AND BEANS.

Being the statements of leading practical farmers for the several Poor Law Unions—taking the average of heavy, medium, and light lands, and of good and inferior farming throughout every district for which an estimate is given.

County and Union.	Wheat.		Barley.		Oats.		Rye.		Peas.		Beans.	
	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.
KENT:—												
East Ashford	26	32	32	40	40	48	..	..	20	28	20	28
„ „	32	30	32	32	32	44	..	..	18	32	20	30
„ „	24	20	27	32	20	36	..	..	23	30	20	28
„ „	32	30	32	48	40	56	..	..	20	36	32	40
Average yield per acre..	28½	32½	30¾	38	35½	46	..	..	20¾	31½	26	31½
West Ashford	36	32	44	50	46	56	..	..	32	26	22	40
„ „	36	36	40	48	56	72	..	..	32	44	28	36
Average yield per acre..	36	34	42	49	51	64	..	..	32	35	25	38
Bridge	28	32	30	37	32	44	..	..	20	24	16	22
„	24	32	24	36	32	48	..	..	16	28	16	32
Average yield per acre..	26	32	27	36½	32	46	..	..	18	26	16	27
Bromley	32	..	..	..	40	..	..	..	..	..	..	..
„	34	..	40	..	40	..	..	..	..	..	..	..
Average yield per acre..	33	..	..	..	40	..	..	..	..	..	..	..
Canterbury	30	32	[illegible]	48	48	56	40	40	28	32	20	34
„	30	36	34	40	36	56	..	..	24	32	16	24
Average yield per acre.	30	34	35	44	42	56	40	40	26	32	18	29
Cranbrook—yield per acre	24	30	..	..	30	44	..	..	18	26	20	28
Dartford	28	28	24	24	40	40	24	24	16	16	16	16
„	28	30	30	40	40	60	..	..	20	30	..	..
Average yield per acre..	28	29	27	32	40	50	24	24	18	23	16	16
Dover	32	32	36	36	48	32	..	..	34	30	..	..
„	32	32	24	..	28	..	..	..	24	..	28	32
Average yield per acre..	32	32	30	36	38	32	..	..	29	30	28	32
Eastry	30	36	32	40	44	56	..	..	24	32	24	32
„	28	36	32	40	24	40	..	..	20	28	24	32
„	40	36	40	44	56	60	..	..	28	32	28	32
Average yield per acre..	32⅔	36	34⅓	41⅓	41⅓	52	..	..	24	34	25⅓	32
Elham	28	31	32	40	40	48	..	..	24	28	24	28
„	34	32	32	36	40	48	..	..	28	32	24	32
Average yield per acre...	31	31½	32	38	40	48	..	..	26	30	24	30
Faversham	36	36	40	40	48	56	..	..	24	28	24	28
„	32	32	34	40	40	40	...	...	30	32	36	40
Average yield per acre..	34	34	37	40	44	48	..	..	27	30	30	34
Hollinbourn	28	24	32	40	40	40	..	..	24	24	20	32
„	32	32	32	40	40	48	..	..	16	32	20	32
„	32	36	32	40	40	56	..	..	20	32	24	36
Average yield per acre..	30¾	30½	32	40	40	48	...	..	20	20½	21½	33½

County and Union.	Wheat.		Barley.		Oats.		Rye.		Peas.		Beans.	
	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.	Harvest of 1870, in Imperial Bushels per acre.	An Average Crop would be, in Imperial Bushels per acre.
KENT (*Continued.*)												
Lewisham—yield per acre	36	30	.	..	24	40	..	..	..	..	40	40
Maidstone	32	40	32	43	28	48	..	..	32	40	26	40
„	26	..	24	..	40	..	..	..	28	..	16	..
„	32	32	.	..	36	48	..	..	22	24	20	26
Average yield per acre.	30	36	28	43	34⅓	48	..	..	27½	32	20⅓	33
Malling—yield per acre.	28	36	28	40	32	48	..	..	24	32	20	32
Medway	28	.	36	..	40	..	..	..	20	..	24	..
„	24	36	32	44	40	64	26	32	16	32	..	32
Average yield per acre..	26	36	34	44	40	64	26	32	18	32	24	32
Milton—yield per acre..	36	36	36	40	40	56	16	16	20	32	16	32
North Aylesford	32	38	36	46	24	50	..	..	20	36	20	30
„ „	32	38	32	44	40	64	..	...	16	28	16	32
„ „	26	34	28	40	32	52	.	..	20	32	20	30
Average yield per acre.	30	36⅓	32	43⅓	32	55½	...	..	18½	32	18	32½
Romney Marsh	44	40	..	..	56	56	..	..	28	24	24	28
„ „	42	40	..	..	68	60	..	..	32	28	36	36
Average yield per acre..	43	40	..	.	62	58	.	..	30	26	30	32
Sevenoaks	24	28	32	40	30	44	..	..	28	32	24	36
„	28	32	.		32	36	..	..	20	30	16	24
„	24	28	34	40	32	44	..	..	20	24	22	30
Average yield per acre..	25¼	29⅓	33	40	31⅓	41½	..	..	22⅔	28⅔	2.⅓	30
Sheppey	40	40	56	56	48	48	..	..	24	24	24	24
„	44	40	56	48	64	52	..	..	24	24	22	24
„	40	40	44	44	54	54	...	...	30	28	28	40
Average yield per acre...	41⅓	40	52	49⅓	55⅓	51⅓	..	..	20	25½	24⅓	29⅓
Tenterden	32	28	24	24	32	36	..	..	24	16	36	40
„	40	34	...	..	20	40	..	..	20	32	16	32
Average yield per acre.	36	31	24	24	26	38	..	..	22	24	26	36
Isle of Thanet	28	32	32	40	40	56	...	..	24	32	20	36
„	42	44	48	48	44	56	..	..	32	32	16	32
Average yield per acre...	35	38	40	44	42	56	..	..	28	32	18	34
Tonbridge	30	36	32	40	40	52	..	..	32	32	20	40
„	32	32	..	..	40	52	..	..	24	28	20	28
Average yield per acre.	31	34	32	40	40	52	..	..	28	30	20	34
Mean yield per acre for the county of Kent..	31·4	35·8	33·6	41 1	38·9	49·6	20·5	28·0	23·7	29·6	22·9	31·6

Returns have not yet been received from the Blean, Gravesend, Milton, Greenwich, Hoo, and Woolwich Unions. But it would appear from the above fifty-two Returns for twenty-four Unions that in the county of Kent, which for soil and climate, is known as "the garden of England," every one of the grain crops is deficient in yield. Wheat is 2·4 bushels, or 7 per cent. below an average; barley is 6·5 bushels, or 16 per cent. below an average; oats are 10·7 bushels, or 21½ per cent. below an average; rye is 1·3 bushels, or 4½ per cent. below an average; peas are 5·9 bushels, or 20 per cent. below an average; and beans are 8·7 bushels, or 27 per cent. below an average.

The Foresters' Gazette.

BOMBAY, 21st NOVEMBER 1871.

CULTURE OF ORCHIDS.

(From the Englishman.)

Notes on Horticulture in Bengal from the pen of Mr. John Scott, Curator of the Royal Botanic Garden, Calcutta.

THIS paper, extending over 82 pages, treats fully on the culture of orchids in Bengal, and will amply repay perusal to those who admire this beautiful class of plants, while it will form a text-book to the few (whose number is however increasing) who take a pleasure in rearing them. Perhaps there is scarcely another tribe of plants which requires such close, constant, and patient care in rearing, if the owner wishes to bring them to perfection; and this may account, probably, for our seeing so few really good collections in Calcutta and its vicinity. When the cultivation of orchids first came into general notice, it was thought that they could be successfully raised under glass. This idea has, however, been exploded, and the thinly-thatched structures, similar to those used for *pán*-growing by the native betel-grower, have been adopted with decided success, as is fairly shown by the improved condition of the collection in the Botanical Gardens.

DEODAR PLANTING.

Note on operations in the upper Chenab division by Baden Powell, Esquire, Conservator of Forests, Punjab.

The situation of the existing forests, or rather remains of forests, is often so precipitous and inaccessible that even should it prove worth-while to construct lengthy slides and work out the timber, it will not be wise to make any expenditure for the purpose of replanting such places. The upper Chenab planting must therefore be, from natural causes, confined to the reproduction of existing forest tracts where the slope and aspect are favourable, and to the new plantation of such tracts of land as are available, under the necessary conditions, for successful growth. Fortunately, there is a considerable area of ground that might be selected without any injury to the grazing requirements of the somewhat scanty population of the valley. The Chenab valley is one where the deodar prefers the left or south side; but there is also deodar on the right bank, though of slower growth and (it is said) of better quality. After a careful review of the localities suited for planting, it is clear that there is the best situated and most easily available land on the right bank, much more than there is on the left. It will be an object of considerable importance to confine new plantations within reasonable limits,—to go neither too far up nor too far down the river,—for their supervision will become difficult. Moreover, it is of the first importance not to attempt planting near the extreme limit of growth as regards elevation, nor to go to the extremes of growth as regards latitude or longitude. Every consideration, therefore, points to confining the new plantations, and the operations for restoration of forests, to compact limits. I shall proceed first to notice the existing plantations; I shall then offer certain remarks on the treatment of deodar, and conclude with a list of the tracts, on either bank, which should be planted or restored. The existing "plantations" entirely of deodar are at Chau and Purti, on the right bank, and at Ajog, on the left bank, and opposite Purti. Operations were commenced in October 1866, thus:—

Purti	12 acres		October 1866.
Do.	13 "		March 1867.
Ajog	8 "		"
Do.	13½ "		October 1867
Chau	8½ "		" "

Those were all planted with the aid of water-trenches at 10 feet apart. Holes were made in the centre of the trench, each being 3 feet deep and 2 feet wide. In each hole 5 young plants were put (2 to 4 years old). The holes are 10 feet apart. In the autumn of 1866, therefore, 26,250 trees were planted in 5,250 holes, on 12 acres, and so on; and in all there were 55½ acres, with 24,280 holes planted with 101,926 trees, only one-fifth of which were supposed to remain ultimately leaving one tree with 10 feet space all round. The total expenditure up to the end of 1867 was Rs. 1,801, with a yearly cost of, say, Rs. 200 for maintenance. The planting cost is (including fencing and clearing) Rs. 29-2-0 per acre. The results of the 1866 plantings, examined in August 1867, gave a uniform result:—

11·2 per cent. of holes..	5 trees were alive.
31·4 do. do. ..	4 do.
16·3 do. do. ..	3 do.
7·0 do. do. ..	2 do.
2·6 do do. ..	1 do.
	all had died.
100	

The mortality among the four-year-old trees was much greater than that of the two-year-old. This is so constantly confirmed by other observations, that it may be laid down as a rule for observance that, in transplanting from natural forest seedling beds or from nurseries, two years' trees are as old as ought ever to be taken for transplanting. The Ajog and Purti plots are moraines found at the foot of the steep slopes of the hills or cliffs bounding the valley, and are at a very gentle incline. Chau is on a rather steep incline, but exhibiting the remains of cultivation terraces, which much facilitate the work. The elevation of the whole is about 7,500 feet, and I think it will be very desirable on the Chenab to keep to this limit where possible, and I should be disinclined to make plantations at any rate beyond 8,000 feet as an extreme limit. At the end of September 1868, 3,000 holes in each of the 3 plots were examined:—

In Purti 730 plants were dead (or 26 per cent).
In Ajog, 333, or about 11 per cent.
In Chau, 213, or about 7 per cent.

The general appearance of Purti was then rather sickly. Mr. Murray thought the soil was in fault. I saw it in 1870, and think clearly that the method of planting and irrigation is in fault; but of this hereafter. Young plants of smaller size, and put in in the spring, answered better; and at the close of 1870 there were not above 6 or 7 per cent. of blanks in any of the three plantations.

I now proceed to offer some remarks on the treatment of deodar. Some of these are necessarily only suggestions, requiring further ascertainment and observation; others seem to me to be sufficiently certain to be acted on. The thing that struck me most about the treatment of Chau and Purti was that it was in almost every respect *dissimilar* to what young seedlings undergo in nature. The Chau plot especially was completely *cleared* before planting. The trees were put at considerable distances apart, at the bottom of a trench, with water flowing over them.

In nature, seedlings are generally found under, and *always prefer, shady cover*, never have water flowing over them, and are invariably close together. I do not say that artificial irrigation may not be necessary in a dry climate like Pangi, but it ought to be strictly regulated, and the trees, I am convinced, ought not to be put at the bottom of a water-trench, but planted on the slope of a ridge formed from the earth thrown out of the trench, or planted between water-courses or trenches set to collect drainage water where the soil is open and easily permeable. The failure of the season 1868-69 at Purti, is, I feel confident, due to the trees having got into an unhealthy state owing to the system of irrigation and to their consequent destruction,—first by drought and then by an excessive flow. I expect also that planting too deep in the soil had a good deal to do with it. With pines especially this is to be avoided, and the older the transplant, the greater the evil. The soil, though sandy, is of a disintegrated schist, containing abundant mica and far from being innutritious. The place was also once covered with trees, and many survivors still show that the fault is not in the soil.

The complete clearance of ground is, I believe, a great mistake, and no plantation ought to be made without efficient shade and protection from sun and cold winds. It is never to be forgotten that there is a vast difference between choking by weeds of rank growth—becoming doubly so with the water channels—and the cover afforded by coppice of oak, hazel, "raus," *cotoneaster*, or even *indigofera*. These should only be partly cut away, so as to secure with the shade a free circulation of air and moisture by a clear upward space between the ground and the spreading branches. Hazel and oak coppice always secure this by the length of the woody stems. This is quite different from rank vegetation, which chokes the plants from the surface of the soil and upwards. When I visited Chau I could hardly make my way through a dense tangle of a climbing species of vetch, a *dipsacus*, coarse grass, and a variety of herbaceous plants as high as myself, and obliterating the trees, at their great distance apart, almost entirely. Expense has to be incurred every year in cutting down this stuff. The idea that deodar is prevented from shooting up, and its leader crooked and perverted by having to push its way through branches overhead, is beyond all question a fallacy. Anyone who has seen the luxuriant growth of young deodars, their delicate leader shoot pushing up straight and intact through the branches of oak coppice, at Simla, must at once recognize that the young trees, pretty close together and under thick shade (but not choked close to the surface of the ground), are in their most suitable situation, and rejoicing in it. Open plantations will generally succeed only where the soil is deep and natural moisture considerable, and a shade of trees is effected by natural position all round. On the upper Chenab I would plant trees in "quincunx"* (like the spots on a domino) under some of the hazel coppices, having done a very little thinning and clearing first. The trees should be of the size presently alluded to, the distance not more than 4½ feet apart, and freely

NOTE.—The only objection to this is that the thicket becomes difficult to penetrate and thin out when arrived at that stage of growth; lines and spaces must therefore be left to give access.

intermixed with *pinus excelsa*. Pot cultivation, from its great cost in the hills and otherwise, does not seem to answer on anything like a large scale. For artificial plantations I would generally make nurseries, in exceptional localities using natural seed-beds, if close at hand. But never transport seedlings for transplants in "kiltas": the shape of the basket causes all the earth to be removed from the roots, and exposes them to risk of injury.

I would suggest that the preservation of the fine outer skin of the root is of the first importance. Put in a number of small deodars with the root skin abraded, even in a slight degree, and they will surely die,—or live on for a time, the wound not healing, till a beetle larva attacks it. This I expect to be the origin of the cases of death in the Ravi plantations. For this reason, only small plants should be transplanted. It is perfectly certain that transplanting trees as old as four years, or anything like as high as 2 or 3 feet (as I have seen done), always results in a large percentage of failures, and in any but most exceptionally favourable cases of individuals, under excessive care, in a slow and unhealthy growth. The trees soon look yellowish, and the tips of the shoots become a delicate lilac. They then dry a red-brown, and the tree perishes. Healthy seedlings and young trees are always *blueish*, with a bloom like that of a grape on them. My idea is that when we are not able to supervise very closely the working parties, and are not able to adopt the "double nursery system" presently described, the transplants should be not more than four inches high, and should be transplanted in Pangi in the early spring. On the Ravi, transplants during the rainy season do not answer, and spring and autumn transplants seem to succeed best. Natural seedling beds are best utilized by taking them to restore cut-out forests, and to equalize reproduction. It will often be found that the seedlings occur in dense patches, leaving other places bare; also when dead wood and stumps are cleared out of the forest, there will be many places requiring to be filled up; and I believe this method of reproduction to be the most successful, and urge the largest part of reproduction works in each year being done in this way. For plantation nurseries, the following plan is suggested. It is of course necessary either to fence or to select a place where goats and sheep cannot possibly come. Plough it up and work the soil well and deeply, and sow good seed in October (or as late in autumn as the officer stays on the upper river) in the [illegible] and cover over. It requires no water, because snow melting in [illegible]ring effects all that is wanted for the shooting forth of the seedlings. [illegible] till October following, when the snow will again fall on the young seedlings. Two methods can now be followed. One is as follows:—In the spring following (this 2nd October) dig out with a spade one, two, or even three in a cluster, earth and all. The spade should be narrow-bladed, the lower edge being only six inches broad. The shorter distance the plants have to be carried the better, but do it in flat baskets or boxes—*never* in "kiltas." Put the little cluster into your plantation holes, which should be not more than 4½ feet apart. I have already observed about irrigation. The other method is what I first called the "double nursery system" (Germ. *Einzel pflanzung*). By this, *single* plants are taken, as before, out of the nursery (they will be about 4 inches high), and are thence separately put into a second nursery for the purpose of strengthening them. From this second nursery the single and well-grown plants—after a year they will be 10-12 inches high—are put out into their ultimate position. This system is now much better thought of, after many years of ex-

[illegible]ever, economical, and [illegible]

and the difficulty of always seeing each plant put in, it is perhaps less liable to cause failure by injury to the plants. It should be remembered that the remarks as to moisture, &c., apply to Pangi, where we have no regular rainy season beyond showers, occasionally heavy. Shade, therefore, and every means of husbanding natural moisture in the soil are of first-rate importance. In conclusion, the great is to *imitate nature* throughout as regards season of seed-fall and sowing, the effect of snow, and the position as regards shade, moisture, and subsequent growth. I am perfectly confident above all that it is best to plant close and thin out afterwards, and that the smaller the transplant, within the conditions above indicated, the greater its chance. The artificial reproduction of *P. excelsa* and ash (sunnoo) should always be kept in mind on the upper Chenab.

A general review of the prospects of the upper Chenab seems to lead to the conclusion that natural reproduction is taking place with perfect success in favourable localities; that this may be relied on as the mainstay; and that efficient protection is all that is necessary. The work that ought to attract the most of our attention for the next few years is the equalizing of reproduction over the whole of cut-out forests, by filling up blanks and dibbling in seed in the autumn. Work in new plantations should be concentrated, and I think no places is better situated than the Bara Bamal region on the right bank, and the opposite slopes on the left. Accordingly on the right bank the Kanun forest might be taken up at an early date; then take Bamal and the Chau plantation extension. I should leave the rest till these are thoroughly done. On the left bank I should be inclined to take up Nos. vii., viii. and ix. The remarkable level piece between Baranal and the Braknai should be taken up afterwards.

FORESTS AND WATER-SUPPLY OF ALGERIA.

(*From the Revue des Eaux et Forêts for September* 1870.)

BEFORE concluding the article which appeared in the number for February last, on the mountain-system and distribution of the forests of Algeria, I think it will be useful to reproduce the following passage taken from an article published by M. Jules Duval in the *Economiste Français*. It is impossible to set forth in a more striking manner the importance of the forests of our splendid African colony:—

"Owing to its situation between the 33rd and 37th degrees of north latitude, and its proximity to that great reservoir of torrid heat, the desert of Sahara, Algeria is constantly exposed to burning winds from the south and to prolonged droughts. The greatest risk is incurred by the Province of Oran, which is closest to the zone of the desert, owing to the obliquity of its littoral; the risk is less in the Province of Algiers, which is better sheltered by the mountains on the south; and is greatly lessened in the Province of Constantine, which is further removed from the fiery furnace of the desert, and better defended by the elevated barrier of Mount Aures, the surface being also more uneven and diversified by the spurs and peaks which radiate in every direction from the chain of the Atlas. As the effect of its geographical position, drought is the normal condition of Algeria—absolute drought during the six months of the summer, and dryness more or less prolonged even during the six winter months. The colonists talk commonly (almost every year) of exceptional droughts. They delude themselves: the only thing exceptional is abundant moisture.

"This dryness, however, so far from being absolute, is mitigated by the winter rains which go from west to east, increasing in intensity as they go: rather rare at Oran, these rains are frequent at Constantine and Bona. During the rains the average fall closely approaches that of France, and sometimes exceeds it; but the rains are almost altogether confined to the winter months—from October to March.

"Such, in its general characteristics, is the law of the climate of Algeria—a fixed, invincible law, which has its advantages along with its inconveniences, and which must be managed with intelligence, under pain of being defeated by it. This law is familiar to the southern races (for the climates of all the Mediterranean shores are very much alike), but it has never been understood by the administrators of the north of Europe, among others by those who live in Paris, where excessive humidity is the habitual character of the climate. Hence very grave mistakes.

"The economic consequences of this supreme law are in effect there.

"Since there is always a risk in Algeria of failure of the water-supply for agriculture, intelligent cultivation and policy should unite in the application of their entire force to utilize all the water which falls from the clouds, which flows over the earth, and which penetrates the soil. Since rain falls only in winter and is altogether absent in summer, the excess of the winter fall should be preserved for the necessities of the summer. Every influence favourable to atmospheric humidity should be developed by natural methods, *viz.*, by the conservation of existing woods and the planting out of others. The pasturing of cattle in the woodlands, which involves the destruction of the young trees, should be forbidden or checked with vigilant severity, at any rate on the highlands: means should be taken to prevent (or at least to punish the originators of) the fires which ravage the forests—profound forests which formerly nurtured the elephants destined for the Roman circus.

"In one word, successful administration in Algeria, as in all Northern Africa, in Morocco, Tunis, and Egypt, as well as in Greece and Italy, and the South of France and of Spain, hinges mainly, so far as the promotion of the physical welfare of the inhabitants is concerned, on an intelligent and careful utilization of the water-supply. Water, more water, and more water still, such is the pivot on which agriculture in these countries turns even more than on railways. Allied with heat, water endows the soil with prodigious fertility, while, on the other hand, soil of the best composition remains sterile without irrigation.

"This principle of public well-being required the construction on every water-course in Algeria of dams flanked by canals: yet, after an occupation of 37 years, there is but one in full work, on the Sig, which will endow with more lasting honour

the memory of General Lamoriciere than any of the battles to which he owed his military glory. A hundred other rivers, water-courses, or torrents, should have been thus dammed to ensure the harvests of a hundred plains. Nothing of the kind has been thought of, or, if thought of, nothing has been done. There has been a greater inclination to spend money in surrounding with fortifications the smallest village in the interior, and on the first opportunity of setting loose the dogs of war. Yet what a difference there is, even as regards the pacification of the country, between the effect of rifles and cannon, harrying and burning, and the effect of dams and canals, fountains and ponds, which would have enriched the natives as well as the colonists. The district of Biskra, in which alone what we call the *hydraulic policy* has prevailed, tells the tale of the virtues of artesian wells.

"Not only have streams of liquid gold and silver been allowed to run down to the sea, but Arab cattle and Arab fires have been allowed to devastate the forests, *i. e.*, to increase the natural dryness of the country; and when the Forest Department, understanding and doing its duty, endeavoured to repress these abuses, it was accused of odious interference with native customs: when just sentences were pronounced against the incendiaries, they were freely remitted as an act of grace. Following on this, Algeria was divided into longitudinal zones, which, for purposes of surveillance, separate the heads of the rivers in the south from their courses and termination towards the north. Thus, the forests, those precious sources of humidity, have everywhere, notwithstanding the wishes of Councils-General and in spite of the protests of the press, been more and more abandoned to devastation. The Arabs have reaped famine and drought as the result of scattering cattle and fire through the woods, a fatal expiation which, following the laws of universal order, creates evil, from evil as it brings forth good from good."

The agricultural future of Algeria depends upon the conservation of existing forests and the reproduction of those which have disappeared. This is a truth which is instinctively accepted, but has not yet been scientifically demonstrated. We shall endeavour to do this here, and to prove that the regulation of the water-supply is intimately connected with the condition of forest vegetation.

Northerly winds prevail on the whole African coast. The resultant average corresponds to N. N. W. In consequence of the position of the Mediterranean between France and Algeria, and under the regular play of the atmospheric currents, it happens that the same wind which keeps the sky perfectly clear on the southern coasts of France, brings rain to the opposite shores. This fact explains how certain years of drought in France correspond to years of fertility in Algeria.

The rainy season is comprised between the two equinoxes, from the month of October to the month of March. It is probable that if there were no mountains on the coast, Algeria would be as rainless as Egypt. In ancient times, the Greeks and Phœnicians attributed the inundation of the Nile to the northerly winds or etesians, which, by a supposed pressure, arrested the course of the river. Democritus, however, guessed the true cause (Diodorus Siculus, lib. ii) He says, in effect, that the inundations of the Nile are occasioned by the rains which fall in Abyssinia and the adjacent parts of Africa under the action of the northerly winds driving the clouds towards the south, where *they are arrested by the mountains.*

The distribution of the rains between the three provinces of Algeria is proportioned to the relative elevation of each. It has been proved that on the average twice as much rain falls in the Province of Algiers as in Oran, and three times as much as in Constantine. The belt of shore from the great Kabylia as far as Tunis, is exceptionally privileged. It often happens that the rain-fall is confined to a belt of country not extending further than 15 leagues from the sea-shore.

The rain generally comes in storms. The result is that a considerable mass of water is accumulated on the surface of the soil, which, instead of being absorbed, flows off rapidly. Nobody has travelled in Algeria during the rainy season without having witnessed some of those sudden floods which rush down the torrent beds in one mass, and with such rapidity that herds and even men are sometimes overwhelmed before they have time to escape. In denuded regions the smallest hollows in the earth are transformed in a moment into torrents which, directly the rain has ceased, disappear as rapidly as they formed.

The mountainous regions where the forests have been preserved, present a totally different aspect. The rivers rise and sometimes overflow in the lowlands, it is true; but the rise is gradual, not sudden and with a rush. It may be added that in many cases the inundations are caused by a heavy sea at the mouth of the river barring the current of the river and preventing the water from flowing off.

The fact of the rains being confined to a fixed period, to the almost entire exclusion of the remainder of the year, and the violence of the showers, demonstrate the important advantages which would result from having certain places of reception to contain the waters and prevent inundations.

The surest means, as shown by M. Jules Duval, of attaining this double end, are the conservation of the forests and the construction of dams.

The forests act in two ways,—as agents of absorption, and as agents of evaporation.

I have not to consider here the faculty possessed, more or less, by forests of retaining rain-water for the supply of springs. Such an important subject cannot be treated incidentally. I prefer referring my readers to the very remarkable articles on this question by MM. Marie-Davy and A. Mangin, published in the September, October, and November numbers last year.

Moreover, I think that in such matters there can be no absolute certainty. For instance, I will readily admit with M. Marie-Davy that on a plain or a gentle slope, an uncovered and especially a light soil should absorb a larger quantity of water than a wooded soil, which will be less cut up, and the surface of which commences by taking up to saturation all the water it can retain. But in proportion as the slope becomes steeper, the conditions change: for a certain quantity of water falling in a given time, absorption depends not only on the degree of *absolute* or *specific* permeability of the soil, but also on the rapidity with which it flows along the surface, this rapidity being proportionate to the volume. In this point of view, therefore, forests, by dividing the currents, of the water, and thus opposing a resistance to the flow, offer certain more favourable conditions of absorption. The greater the slope, the more considerable is this advantage over unwooded soil. Lastly, there is a degree, unhappily but too well-known, where such unwooded soil can offer no resistance to the movement of the mass of water, and is washed away. The advantage—I will even say the necessity—of forests in such conditions is unquestionable: well, this is in general the case with all the Algerian forests.

In Algeria the influence of the forests upon the regulation of the waters is shown, therefore, perhaps more than anywhere else, in two kinds of useful effects,—they retain, in the first place, for the benefits of the springs, a part of the water which, without them, would be drawn down with the vegetable mould into the valleys, and, moreover, by retarding the flow over the surface of the soil, they moderate the rapidity of the rise of the water and diminish the dangers of the floods.

This, however, is not their only influence. The
along with this, another not less considerable and not
influence upon climate by the continual
spread through the atmosphere.

Are we, in fact, to see nothing in the evaporation caused by trees but a cause of complaint against the forests, inasmuch as they expend for their own advantage and apparently merely to satisfy the necessities of their existence a part of the water stored in the depth of the soil? If the result were such that all the humidity was absorbed by the forest, and that no excess moisture could find its way to the surface of the soil, the charge would become serious; but the experience of every day proves, on the contrary, that water springs are found specially in wooded regions. And after all, even if it were demonstrated that forests, instead of protecting water-sources, are causes of their impoverishment, which my experience, as a forester, will not allow me to admit, it would remain, at any rate, to be considered whether it is not preferable that a part of the water of the soil should be spread through the atmosphere in the form of vapour to temper the excessive heats of certain climates. It suffices for this purpose to pass in review the countries afflicted at the present day with dryness, and it will be seen that the regions where there is an absence on wood are those which suffer most.

Herbaceous plants possess, it is true, in a higher degree than trees, this power of vaporization, but they cannot apply this power and live except with the aid of the water contained in the thin layer of soil accessible to their roots, and, as surface-water lasts *only for a time*, their action is limited to the period of their brief existence which terminates with the first breath of the southerly wind. The forests then can alone be relied upon as permanent agents of vaporization during the excessive heats of the summer.

The preceding considerations bring me naturally to another train of ideas.

As yet I have shown Algeria as she has been and not Algeria as she should be. In speaking of her forests, my intention has not been to turn to their advantage alone the interest and the merit of a solution. I have endeavoured merely to prove that in their existing conditions, they are not only useful but indispensable auxiliaries which ought to be protected against improper devastation and the traditional practice of firing. But this is only a partial solution of the great problem to be solved in Algeria. It is not enough to preserve the forests: the plains must also be utilized. What is wanted for this? Water. And to obtain water? Dams.

Who does not see at once the prodigious impulse these

works would give to agriculture? The cultivation of cotton* and the creation of artificial meadows could then be seriously taken into consideration. Has any attempt been made to calculate the quantity of forage which Algeria could have furnished to France during the years of drought through which we are passing, if her plains were properly irrigated?

Leaving aside, however, this economic aspect of the question, let us consider only the immediate influence which would be exercised upon the climate by these new methods of utilizing the soil.

I think it will be sufficient to call to mind a very interesting experiment cited by M. Marié-Davy in his article published in the *Revue* of the 10th September last. The learned professor remarked that, in a single day in July, a belt of turf vaporized 5k. 79 of water per square metre, equel to a height of 0m. 00579. "If the same evaporation," he said, "were produced over the entire surface of the soil during the whole of the year, the heat consumed in the operation would be equal to that which would be absorbed in the melting of a layer of ice about 15 metres thick. It is almost the half of the heat we receive annually from the sun, according to the calculations of M. Pouillet. The influence of evaporation upon climates can thus be appreciated."

It is shown also from meteorological observations taken in the Isthmus of Suez and discussed by M. Rayet, that the waters of the canal have modified the climatic conditions of the regions they traverse, by lowering the temperature, and sensibly increasing the number of rainy days.

I am satisfied to rest my case upon these quotations. They demonstrate conclusively the point I had to establish, and the necessity of the works so urgently demanded by all intelligent persons interested in the future of Algeria.

Special care should be taken that the exceptionally favourable circumstances in which the harvests in Algeria present themselves this year, do not cause the misfortunes and disasters of the preceding years to be forgotten. Algeria benefits by the atmospheric reaction caused by the dryness prevailing in France; but generally the contrary is the case. Here, unless I deceived myself, is a sort of equilibrium worthy of consideration.

I will add, in conclusion, that no enterprise will be more popular with the natives than works for the regulation of the water-supply. We have nothing to teach the Kabyles in regard to irrigation: the waters of their mountains are admirably utilized. If the Arab has as yet appeared less anxious in regard to these improvements, he is not to be blamed so much as the conditions of tenure among the tribes; for the Arab, on the contrary, has a sort of veneration for water. In his eyes there are three things in the world which make the happiness of the true believer,—beauty, verdure, and the good which flows. Water, he says, issues from Paradise; it is the source and symbol of happiness.† This is very poetic, but the Arab will never occupy himself in the amelioration of his ground by serious works as long as he is not sure of obtaining it. It is in this way that all the various questions connected with Algeria are linked together, and that finally the solution of the majority of the questions is found to be connected with the fundamental principle of the creation of individual, instead of tribal, tenure of property. In fact, this principle is now the conviction of all practical men interested in Algeria, and it has been made the starting point of the reforms which have just been promulgated.—*Gazette of India.*

* See M. Louis Reybaud's article in the *Revue des Deux Mondes*, liv. iii., tom. iii., 1864.

† *La Vie Arabe et la Societe Musulmane*, par le General Daumas, 1869.

Official Gazette.

BOMBAY, 21ST NOVEMBER 1871.

EXPERIMENTAL FARM—MADRAS.

ANNUAL REPORT OF THE MANAGEMENT OF THE GOVERNMENT FARM ESTATE, FOR THE YEAR ENDING 31ST MARCH 1871.

(Continued from our last.)

Effects of Cultivation.

THERE is a marked change in the appearance of our soils. Soils which when reclaimed only two years ago could scarcely rear a blade of grass, and consisted almost entirely of blowing sands, might now, as far as appearance goes, be classed as fair arable soils. Much of this is certainly due to heavy dressings of tank mud and burnt earth; still, I think, much more is due to deep cultivation and the liberal use of foldyard manure. The mere cultivation of a sand, that is the mere stirring of its particles, will do little to improve it; it is only when combined with manure that any real good results. On a good arable soil superficial culture with imperfect implements and without manure continued for a time, will exhaust the upper few inches of the soil; still, by cultivating deeper and by using better-constructed tools, it is always within the means of the cultivator to bring up to the surface a portion of the lower or less exhausted soil, and thus restore, in a measure, the fertility of his land; but the cultivator whose soil consists of sand resting on a sandy sub-soil which is even poorer and more hungry than the upper soil, cannot effect any good in this manner. In his case deep cultivation without manure will only make matters worse. The cultivator of a sandy soil such as this must put into his soil the food on which his crop must feed. He has the manufactory and the manufacturing appliances, but he needs the raw material for manufacture. The phosphoric acid, the lime, the potash, &c., must be put into the soil before plants needing these foods can be profitably cultivated. But this is not all; he must endeavour to alter the physical state of his soil, so as to lessen the evil effects of droughts and heavy falls of rain which alike act so injuriously on very sandy soils. But it is useless to attempt, by a single operation, to fertilize a barren soil. Such an attempt would end in a great waste of money. The work of improvement requires time, and it can only be effected in stages.

Our plan has been to apply a slight dressing of manure to *each* crop, and to crop the land as frequently as possible with, green crops. These crops, being cut in the green state, leave a great quantity of roots, &c., in the ground, and add greatly to the quantity of organic matter in the soil. True, we might have effected this more quickly by ploughing in the green crop, but the stock-feeder, on land like this, has seldom such a superfluity of green food as to justify this procedure. Another improvement, which has greatly benefited our land, is the open drains which have been laid out in different directions for carrying off surplus water during the rains. The more I see of dry land farming in this country, the more am I convinced that our crops suffer more from *too much* water than from *too little*. Water, in a stagnant condition, is more injurious than a drought. A drought may only affect one crop, but stagnant water in the land may affect many crops. Deep cultivation, with proper manuring, has greatly increased the capillary action and absorptive powers of our soil. Crops on this farm continue fresh and green long after the crops on neighbouring farms are scorched and dried.

The usual system of dry land management in this district which allows of crop after crop being taken off the land without a particle of foldyard manure being used, and is content if the cultivation of the soil is confined to a surface-stirring not over three inches in depth, is most suicidal. The great object of the cultivator of dry land should be to enable his soil to retain as much water as possible without its being stagnant or being actually visible to the eye. He should take care that no water remains on the surface of the land, and by deep ploughing and the liberal use of organic manures increase, as much as possible, the porosity of his soil; instead of this, the result of his operations is that his soil is rendered as little porous as possible; his lands during the rains are flooded and swampy, while, during the dry weather, they are baked and cracked. A soil which only contains twenty per cent. of water may be wet and swampy, while another which contains as much as thirty per cent. may appear much the driest. During very dry weather the crops on the former will suffer greatly, while on the latter the crop may thrive and suffer little.

Implements and Machines.

The large water-lift was taken to pieces, the elevator was sold to the Madras Municipality, and the shafting and gearing was returned to the Public Works Stores. The wind-mill and pump, the paddy-huller, the bone-crusher and the rotary screen have been transferred to the Public Works Department. A quantity of costly English agricultural machinery was received from the Oosoor Farm in September last, the details are as follows:—

3 Large corn drills.	2 Horse gears.
4 Winnowing machines.	2 Reaping machines.
2 Threshing machines.	

The winnowing machines, one of the threshing machines, and a reaping machine, can be utilized; but the remainder of machinery is useless here, and I fear useless in the present condition of Indian agriculture. Several of these machines are excessively heavy and cumbrous. Where labour is costly, these machines may be utilized; but they are useless to the Indian ryot in his present circumstances. If it will not pay to export them, there seems to me no other alternative than to take them to pieces and use them up in constructing simpler machines. It is very undesirable that any of these machines should be sold amongst Indian ryots; should any wealthy cultivator be sufficiently enterprising to purchase any of them, the experiment could only end in failure, and be more productive of harm than of good. The

following is the list of machines, &c., sold during the twelve months, and the districts into which they were sent :—

	Districts.		Districts
2 Reaping knives	Tanjore.	1 Iron plough	Rajahmundry.
1 Iron plough	North Arcot.	1 Iron plough	Tanjore.
2 Chaff-cutters	North Arcot.	1 Water lift	Madras.
1 Maize-sheller	North Arcot.	1 Iron grubber	Coimbatore.
25 Reaping knives	Neilgherries.	1 Norwegian harrow	Coimbatore.
1 Cake-crusher	Neilgherries.	2 Iron ploughs	Coimbatore.
5 Reaping knives	Madras.	12 Grass knives	Madras.
1 Iron plough	North Arcot	1 Iron plough	Madras.
1 Chaff-cutter	North Arcot.	1 Maize-sheller	Coimbatore.
1 Reaping knife	Coimbatore	1 Iron plough	Coimbatore.
1 Hand hoe	Coimbatore.	1 Iron cultivator	Coimbatore.
2 Scythes	Madras	2 Wheel-barrows	Madras.
2 Iron wheel-ploughs	Coimbatore.	2 Grass knives	Coimbatore.
1 Set of iron harrows	Coimbatore.	1 Water-lift	Ganjam.
1 Iron swing-plough	Coimbatore.	1 Water-lift	Bombay.
1 Chaff-cutter	Madras.		

Many of these were purchased as patterns from which others could be made by the native smiths and carpenters of the district.

A special grant of 1,500 rupees was made to the farm on the 26th March 1868, for the purpose of keeping up a stock of implements and machines for sale. Under these arrangements fourteen ploughs, one-and-a-half set of harrows, two water-lifts, three maize-shellers, and six chaff-cutters, have been disposed of in the Presidency. At the present time we have stock on hand worth rupees 180, a balance of rupees 1,061-14-5 in cash, and have advanced rupees 265-3-1 to an American Firm for agricultural machines, making a total amounting to rupees 1,507-1-6. The details of income and expenditure under this head will be found in the Appendix.

An implement workshop was commenced about three months ago. In it three carpenters and three smiths are employed in making ploughs, harrows, carts, winnowing machines, wheel-barrows, seed-drills, scythe-blades, grass-knives, &c., for sale, besides executing all repairs needed either on account of these farms or the general public. We have long felt the need of some such establishment. It was almost impossible to get repairs executed, and there was always a great waste of time and a heavy bill to pay. English implements, being made for horse-power generally, need to be altered before they are suited for cattle-power, and for the very primitive mode of yoking adopted here. These alterations could not be satisfactorily performed by men who had no knowledge of the practical working of these implements. Besides our experience in the field is constantly suggesting modifications in the working parts which could only be executed on the spot. We now have facilities to experiment with a view to determine the shape or description of implement best suited to the peculiar circumstances of the Indian ryot, and last, but not least, we can prove to the Indian cultivator that his local smith and carpenter can make up or repair any of our most useful agricultural implements. In the manufacture of implements and tools we use no castings of any sort, and thus remove one of the chief objections urged by many ryots against our English implements. The iron parts being all of wrought iron, repairs can be easily executed by any native smith. Iron castings, though cheap and effective, are a nuisance in a country where castings cannot be made. The unfortunate cultivator, whose implement is laid aside because a casting is broken, often has to choose between either abandoning the implement altogether, or spending as much as it is worth in conveying it to and from the nearest town in which the casting can be done, while he is put to a great deal of trouble and inconvenience. The accounts of these workshops are kept separately. The establishment will be self-supporting: no profit is sought; only the actual cost of the implement, plus five per cent. to meet contingencies; the sole object being to introduce a better class of implements and tools amongst the ryots. During the three months this establishment has been in existence, we have expended as follows:—

	Rs.	a.	p.
Workshop buildings	357	12	9
Plant	140	4	0
Materials and labour	617	13	0
Machines	874	12	0
	1,990	9	0

and we have received—

Loan from Experimental Farm as Capital	893	1	5
For machines, &c.	875	9	0
Materials and labour	231	15	4
	1,990	9	9

Liabilities.

Experimental Farm Loan	893	1	5
Out-standing bills	110	5	4
	993	6	9

Assets on 31st March 1871.

Buildings	357	12	9
Plant	140	4	0
Materials, &c	160	7	11
Stock on hand	140	13	6
Out-standing bills	136	14	9
Loss	47	15	10
	993	6	9

Five per cent. is charged on the capital invested.

The deficiency of rupees 47 arose, I think, in the cross transactions between the Experimental Farm and the workshops at the commencement of this new establishment, when the plant of the former establishment was taken over at a valuation. And doubtless many little odds and ends, consequent on the starting of a new establishment, were lost sight of in valuing the assets.

Ploughs and Ploughing.

The ploughs chiefly used here are those made by Messrs. Ransome and Sims of Ipswich, and Messrs. Howard and Co. of Bedford. Most of those are single-horse or pony-ploughs. Those by Messrs. Howard and Co. are made of iron; they weigh eighty-five pounds, and seem well suited for light soils. They cost about 35 rupees each delivered here. One of these ploughs, on a free sandy loam, gave the following results when tested by the dynamometer :—

Complete with Wheel and Coulter.

	lbs.
Ploughing a furrow 4 inches deep and 8 inches wide	168
Ploughing a furrow 6 inches deep and 9 inches wide	280

Without a Coulter.

Ploughing a furrow 4 inches deep and 8 inches wide	186
Ploughing a furrow 6 inches deep and 9 inches wide	308

Without either Wheel or Coulter.

Ploughing a furrow 4 inches deep and 8 inches wide	280
Ploughing a furrow 6 inches deep and 9 inches wide	336

When drawn along an empty furrow the dynamometer registered fifty-six pounds.

Thus the actual draught of one of these ploughs, when ploughing a furrow four inches deep and eight inches wide, is only 168 pounds; of this fifty-six pounds, or about thirty-three per cent., is due to the weight of the implement.

When used without the wheel as a "swing" plough, the draught was increased sixty-six per cent. Ransome and Sims' ploughs have long been used on this farm. The light iron [illegible] made by this Firm are very similar to those turned out by Messrs. Howard and Co., and do their work in an equally satisfactory manner. We have found one of their large ploughs—The Newcastle—very useful during dry weather, when the light plough would not penetrate the ground. This plough weighs 200 pounds, and though much too heavy for ordinary work, is nevertheless very useful under the circumstances just described. With this plough the dynamometer gave the following results :—

Complete with Wheel and Coulter.

	lbs.
Ploughing a furrow 4 inches deep and 10 inches wide	252
Ploughing a furrow 6 inches deep and 10 inches wide	392

Without a Coulter.

	lbs.
Ploughing a furrow 4 inches deep and 10 inches wide	280
Ploughing a furrow 6 inches deep and 10 inches wide	406

Without a Wheel or Coulter.

Ploughing a furrow 4 inches deep and 10 inches wide	336
Ploughing a furrow 6 inches deep and 10 inches wide	560

Complet .

Running in an empty furrow	112

Thus, when ploughing with a furrow four inches deep and ten inches wide, forty-five per cent. of the draught registered is due to the weight of the implement. A combined plough, that is one made of wood and iron, which was made on the farm, was tested in the field in which the iron ploughs were worked, with the following results :—

	lbs.
Ploughing a furrow 4 inches deep and 8 inches wide	182
Ploughing a furrow 6 inches deep and 9 inches wide	280
Running in an empty furrow	65

Thus thirty-two per cent. of the draught registered is due to the weight of the plough. It is a swing-plough with wooden stilts and pole, and the whole of the iron-work mould-board included, consists of malleable iron. We thus avoid the loss and annoyance the breakage of castings so frequently causes. Wherever there is a village smith, the plough can be made up or repaired. This plough only weighs seventy pounds, and can be conveniently carried from field to field, and it is so constructed that the driver, while working, is always close to his cattle. To plough an acre of land six inches deep and nine inches wide with one of these ploughs, the cattle will have to travel eleven miles, and the plough will raise and turn over 869 cubic yards of earth

in the operation. An ordinary native plough was tested in the same field; the following is the result :—

Ploughing 5 inches deep and 6 inches wide at the surface of ground, and one inch wide at bottom of furrow	140 lbs.

To plough an acre of land with this plough, the cattle will have to travel seventeen miles, while only 400 cubic yards of earth will be turned over. The foregoing experiments prove that one of these combined ploughs will, in ploughing an acre of land, turn over nearly 900 cubic yards of earth, while the cattle will only have to travel eleven miles, and will exercise a traction force equal to 280 pounds. A native plough will only require half this draught, though it will have to travel seventeen miles to plough an acre, and will only turn over 400 cubic yards of earth. The native plough cuts out a triangular furrow, while the furrow made by the English plough is rectangular. The result is that while the English plough cleans out its furrow and leaves the undersurface level, the native plough leaves a ridged undersurface nearly half of the land being unploughed. Again the English plough inverts the soil and brings up each time a fresh surface, while the native plough or cultivator, as it should be called, leaves the soil in its original position. It may be contended that as the native plough only does half of the work, and only needs half of the traction force required by the English plough, the ryot has only to pass his plough twice through his land to do the work of an English plough; but this is not the case; it will be necessary for him to plough his land over *several* times before it is in the state in which it is left by the English plough. Besides, there are several agricultural operations which the native plough, in its present shape, never can perform. And again, one English plough, with one man and an average sized pair of cattle, will do the work of two native ploughs, two men, and two pairs of cattle. Thus, the ryot for each English plough he uses, can dispense with the services of one plough-man and one pair of cattle. True, he may have to keep his cattle a little better than at present, but this will be money well expended. I may here remark that these deductions founded, as they are, on experiments made on a particular class of soil, can have no bearing whatever on soils of a different character. The cost of an English plough need not now create any apprehension in the mind of the ryot. The combined plough I have just been comparing with the native plough was made on this farm, and does cost 15 rupees; indeed we are making them up at this price; [illegible] with his own wood and cheap labour, could probably make them at 10 or 12 rupees each. These combined ploughs are as well suited for wet cultivation as for dry cultivation. Indeed I am acquainted with no plough so well suited for paddy cultivation. I have tried several forms of the native plough, and have even tried one with a mould-board added, but none worked so satisfactorily. One of these combined ploughs, when ploughing in puddle for paddy, gave the following results :—

	Draught.
Ploughing a furrow 6 inches deep and 9 inches wide	168 lbs.

While the native plough gave the following results :—

Ploughing a furrow 6 inches deep and 6 inches wide at surface, and 3 inches wide at the bottom of the furrow ..	200 ,,

The very defective construction of the native plough adds *very* greatly to its draught. Thus, in the hinder part of the plough there is a flat surface measuring eight or ten inches placed at right angle to the line of draught; this not only offers a great deal of resistance in the passage of the plough through the soil, but in wet land such an amount of mud collects on it and in the angle below the pole, that the plough is drawn through the land with great difficulty. This is not the case with ploughs provided with English-shaped mould-boards; these mould-boards offer no points for the accumulation of mud, and the plough cleans itself as it proceeds. A ploughing match was held on the farm last season amongst the native ploughmen. All used English ploughs of the Messrs. Howards' or Messrs. Ransomes' make. The soil was a light sandy loam. Each of the plots contained 1,000 square yards. The following are the results :—

			Minutes
1st	man ploughed his	plot in	81
2nd	do.	do.	92
3rd	do.	do.	88
4th	do.	do.	108
5th	do.	do.	109
6th	do.	do.	127

The land worked very freely, and the work was done early in the morning. The average width of the furrow was nine inches, and the depth between five and six inches. The work was performed in a very satisfactory manner.

Dynamometer Tests.

The dynamometer has been of great value during my recent investigations into the relative capabilities of certain agricultural implements. Amongst many others the following results were obtained :—

Iron Harrows.

Dead weight	84 lbs.
Breadth	7 feet.
Draught	324 lbs.

Iron Harrows.

Dead weight	62 lbs.
Breadth	4½ feet.
Draught	168 lbs.

Wood Cultivator.

Dead weight	80 lbs.
Breadth	27 inches.
Draught when cultivating 5 inches deep..	280 lbs.

Iron Drill Cultivator.

Dead weight	90 lbs.
Breadth	17 inches.
Draught when cultivating 3 inches deep..	200 lbs.

A Country Cart.

Dead weight	568 lbs.
Draught when drawn along a good level road empty..	42 ,,
Draught when drawn along a good level road with a load of 400 bricks weighing 1,500 pounds	84 ,,
The same when drawn along an ungravelled road similar to the sidings on the roads in this district ..	356 ,,

A Cart built on the English Plan.

Dead weight	1,074 lbs.
Draught when drawn along a good level road empty.	56 ,,
Draught when drawn along a good level road with a load of 400 bricks weighing 1,500 pounds	135 ,,
The same when drawn along an ungravelled road similar to the sidings on the roads in this district ..	356 ,,

Overseer.

The Overseer alluded to in last report has left the farm. Mr. F. Wilkins, who, as an Apprentice, had been employed for some time, was then appointed Overseer. He held the appointment until the first week in July, when he was appointed Overseer on the Model Farm, and was succeeded by Mr. J. G. Young, who also had received an agricultural training on the farm. Though not so well up in agriculture as Overseer Wilkins, he nevertheless has managed very satisfactorily, and promises, with more experience, to make an excellent Overseer. His practical knowledge of mechanics has been turned to good account in the implement workshops. He is a good Accountant, and has been of great assistance to me.

Ploughmen and Labourers.

The skill of our ploughmen is greatly improved; many of them can now handle their ploughs in a very creditable manner. They understand their construction, and can adjust them to the work they are called upon to do. They can also work the reaping machine, the threshing machine, and other agricultural machines and implements generally used here.

During the past year we have had a number of ploughmen under training; amongst others the following Noblemen and Gentlemen sent men to be trained :—

The Maha Rajah of Vizunagram,	The Zemindar of Ramnad, and
The Rajah of Venkatagherry,	The Jaghirdar of Arnee.
The Zemindar of Kulastry,	

Some of the men remained six months on the farm, while others a shorter period. This is a very satisfactory movement and worth every encouragement. The field labourers are also becoming more skilful; many of them can handle a digging fork or a dung fork very satisfactorily, and some can use the hedge knife, the sheep shears, and the shovel as well as any English farm labourer. Their attendance is more regular, and they evince a greater readiness to do work which before was considered detrimental to their caste.

Seed Distribution.

The following quantities of agricultural seeds were distributed gratuitously during the past year :—

	lbs.
Carolina paddy	11,203
Maize	1,238
Chinese sugar-cane	159
Yellow cholum	412

The farm paid all the expenses incurred in picking the seed, and also, in most instances, the cost of conveying it to its destination. The seeds were distributed in nearly every Collectorate in this Presidency. Instructions for the guidance of experimenters were issued along with the seeds, whenever such information was needed. There now remains in the granary, available for distribution, the following quantities of seeds :—

	lbs.
Carolina paddy	1,365
Maize	840
Chinese sugar-cane	341
Yellow cholum	1,088

The Appendix contains a detailed list in which is recorded the localities in which the seed was distributed.

REPORT ON THE ESTABLISHMENT OF A MODEL FARM ON THE GOVERNMENT FARM ESTATE.

THE northern portion of the estate which, since the Committee took charge of the property has always been rented by small tenants, was, in the early part of July last, set apart for the purposes of a Model Farm. The condition of the land was very unsatisfactory ; the greater portion was over-grown with weeds and bushes, and a very considerable area had been appropriated by the public. Not only was the appearance of the land very discreditable ; but, owing to the great amount of trespass caused, it was a nuisance to the neighbouring Experimental Farm. At no time had the rents been regularly paid ; but it had become very difficult to collect even a very small proportion. It was in vain that large remissions had been made ; the renters were men of very small means, and several were without any agricultural training.

Most of them held under a five-years' lease, two years of which were unexpired. During the early part of last year several of them petitioned to be allowed to relinquish their land ; but it was not until the month of July when a general petition was received from all the tenants, that, seeing no other chance of bettering matters, it was determined to write off all arrears, and to take the land into our own management.

Area.

The total area thus set apart for a Model Farm is 115 acres, of this area seven acres is occupied by the nullah, roads, buildings, &c. It is bounded on the north by the Cutcherry compound, on the west by the Mount Road and the Roshanbaugh village, on the south by the nullha and Commissariat slaughter-ground, and on the east by the river Adyar.

Soils, &c.

Nearly thirty acres can be irrigated ; twenty acres from the Mambalam tank by gravitation, and the remainder from the wells by picottahs, &c. The soils on this part of the farm differ very little, the majority consists of sandy loams, varying in colour from a yellow to a reddish brown. The dry soils differ greatly : about thirty acres is a blowing sand of the lowest type ; about forty acres is a sandy loam of fair quality, free and easy to work, but in a very impoverished state ; the remainder is a stiffish loam, with good deal of clay in its composition and a considerable amount of the red oxide of iron.

Rent.

To put the undertaking on a thoroughly commercial footing it was determined to fix the rent at the average yearly income of the previous four years, and to deduct the annual value of the fruit trees which had to be removed to facilitate the work of reclamation. The average income of these four years was found to be Rupees 535. The sale of the fruit-tree timber realized 2,721 rupees, and its annual value was estimated to be rupees 150. This sum deducted from rupees 535 leaves Rs. 385, the annual rent of the land. In addition to the land-rent there is rent charge on the capital expended by the landlord on improvements ; this is assessed at 7½ per cent. per annum, and will be repaid over 24 years. The total amount expended on landlord's improvements amounts to rupees 3,522-11-2 ; with the cost of some works yet to be done, the total will probably reach rupees 3,800, this at 7½ per cent. per annum will make a rent charge of rupees 285, or with the land-rent a gross rental amounting to rupees 670. But in addition to this we have to pay 5 per cent. on the capital employed in working the place, &c., which will make our annual liabilities under "rent and interest" to amount to about rupees 820, or above rupees 7 per acre.

Buildings.

The buildings are situated in a central part of the farm, and in close proximity to the main road. The site is rather above the level of the surrounding land, and is well drained by natural drainage.

Overseer's Residence.

This is a small three-roomed cottage : the rooms are small, but the house is furnished with back and front verandahs. It is a brick building with a tiled roof. The foundations are laid with chunam. The walls, from about one foot above the ground, consist of brick laid in mud ; they are pointed on the outside, and plastered inside with chunam. The verandahs are supported on brick and chunam pillars, and the floors are paved with tiles.

Cattle Sheds.

These are similar to those on the Experimental Farm. The roofs are supported on brick and chunam pillars, and consist of thatch over palmyrah rafters. The internal divisions and the outside fencing consist of palmyrah rails and posts. All the wood-work was thoroughly painted with coal tar. The sheds are divided into thirty-one loose boxes, each containing eighty superficial feet. The floors of the boxes are sunk two feet below the level of the surrounding ground. The straw-house, cart-shed, and pig-styes are similarly built. The grain-store and the poultry houses are built with materials similar to those used in building the Overseer's cottage. The total cost of these buildings was rupees 1,757-7-8.

Clearing and Levelling.

The timber was all sold by auction. The purchasers felled, and removed it at their own cost. The surface of the land was very irregular. Attempts had evidently been made at different times to bring portions under cultivation ; many of these attempts had been made in injudicious places ; the result was a broken surface on which it was scarcely possible to find a block of five acres fit for immediate cultivation. To bring this surface into a form fit for arable culture it was necessary to level many hollows and remove many hills, and, although a "*Commercial Farm*," we had no alternative but to perform a good deal of work of an unremunerative character, simply to give a more civilized aspect to the place. Its appearance is still far from satisfactory ; but the further improvement must be the work of time and the result of a better system of cultivation. A farm created from the jungle, and which has only been in existence about four months, can scarcely afford any very pleasing landscape effects. The total cost incurred for levelling was Rupees 1,204-15-5.

Roads.

It was necessary to make several roads in order that all parts of the farm might be easily approached. The total length of these roads is 1,650 yards. They vary in width from six to nine yards. They are the ordinary ungravelled farm roads, protected on either side by an open drain. For the convenience of the public it may afterwards become necessary to gravel these roads; but this can scarcely be the duty of a "Commercial Farm." The total cost of these roads was rupees 408-1-10.

Fences.

Eight hundred yards of fence was erected on the side of the Mount road. This consists of an open ditch and a raised bank. A corkapilly fence has been planted on the inner side, and the outside is protected by an aloe fence. About 1,200 yards of internal fences have been planted ; they consist of corkapilly. The total cost of fencing was rupees 142-11-3.

Live Stock

Nine pairs of draught cattle [illegible]oyed on the farm. This number will probably be [illegible]eat for its future requirements, that is, after it has been brought regularly under cultivation ; but for the next year or two, while we are carting manure, &c., the number will not be too great. A number of cattle were fattened and sold ; the general results were satisfactory. A larger number would have been fattened had there been any certainty that we would have sufficient fodder. Sheep and pigs will be added to the live stock of the farm as soon as arrangements can be completed for their accommodation.

Crops.

Owing to the very late season at which we commenced with the farm, we were not able to get all the land ready in time for seasonable sowing. On the piece of land completed first we obtained *two crops of paddy*, and we might have done the same with *all the wet land* had it all been ready for cropping. We may fairly estimate that this second crop would have been worth from 150 to 200 rupees to us. Having no manure, and the land being in a very impoverished state, we had to content ourselves with a low class of crops.

Manure.

We had no foldyard manure, excepting what our loose boxes provided. Ashes from the neighbouring village, tank mud, brick-yard refuse, and a quantity of yercum leaves were all the other manures obtainable

Our loose boxes promise to yield a good supply of valuable manure ; the only course open to us is to grow a large area of green crop for cattle and sheep food, and to make the place supply its own manure as soon as possible. It is useless to trust to purchases. The only foldyard manure available is wretched stuff, and not worth carting, besides being frequently full of weed seeds. I propose next season, as the experiments on the Experimental Farm were so satisfactory, to use a considerable quantity of saltpetre, lime, and bone-dust.

Implements and Machines.

Our stock of implements and machines is far from being complete. I propose making up, in the implement workshops for this farm, two or three ploughs, two or three carts, a drill cultivator, a seed drill, a winnowing machine, &c., probably the cost of additional machines will add a couple of hundred rupees to the amount of the tenant's capital.

Overseer.

Mr. Overseer Wilkins was appointed to take charge of this farm on the 4th of July 1870, and to his energy and practical knowledge must be attributed a very considerable proportion of the success that has so far attended this enterprise. I am glad to have this opportunity of expressing the satisfaction I have experienced in his general conduct, and with the readiness with which he has always carried out my wishes.

Labourers.

Nearly the whole of the labour performed in this farm has been done by Wudders, the ordinary tank-digger caste. Some of these men are now excellent ploughmen, and can perform many agricultural operations in a very creditable manner. This is the more remarkable as the members of this caste generally object to perform any work that cannot be done with the mamooties, and they possessed no knowledge whatever of agricultural work when we commenced the farm six months ago. They are good workmen, and will make useful farm labourers. They live in a village on the farm, so are close to the scene of their daily labours.

Model Farm Receipts.

	Rs.	a.	p.
From Experimental Farm—Tenant's Capital	2,776	0	10
Cattle	403	1	9
Guava fruit	381	0	0
Paddy	359	1	7
Sundries	101	10	3
Hay and Grass	42	8	0
Tamarind and Woodapple	25	0	0
Maize	24	5	3
Brinjals	20	4	9
Mango fruit	20	0	0
Poultry, &c.	12	6	0
Seed Grain	12	0	0
Plantains	9	10	6
Vegetables	6	13	3
Cholum	6	0	0
Tenucy	5	10	0
Total...	4,218	1	2

Model Farm Payments.

	Rs.	a.	p.
Cattle	1,611	3	0
Labour	1,219	0	2
Implements, &c.	461	9	0
Cattle food	267	11	9
Seeds	109	9	7
Mango, Cocoanut, and other Fruit trees	76	10	0
Sundries	74	4	9
Poultry	27	12	0
Sugar [illegible]	7	14	0
Manure	3	0	0
Half-year's rent	102	8	0
Rent charge on capital expended on Landlord's improvements charged at 7½ per cent. as advanced	94	6	7
Interest on Tenant's capital charged at 9 per cent. as advanced	69	8	4
Total	4,218	1	2

The Planters' Gazette.

BOMBAY, 21ST NOVEMBER 1871.

THE ESTATES.

LUSHAI EXPEDITION.

A FEW days more, and the Lushai Expedition will commence. Vigorous preparations are meanwhile progressing on all sides. Commissariat arrangements are reported to be as complete and well-planned as practicable. Arms and ammunition are being served out to the Troops and the Police, and the latter is being thoroughly exercised in the use of the new rifles. Elephants are being shipped to Chittagong from Calcutta, and steps taken to send a similar batch to Cachar from Dacca. Mynadhur, which is separated from Monierkhal by the Bhoban range of hills, by about four hours' journey from that place, is now occupied by a detachment of the 44th N. I., and will, it is supposed, form the base of operations in Cachar. Captain Birch is to have the command of the Sylhet Contingent, a portion of which has already been told off to several parts in the frontier. Another Contingent, composed of a fine set of hill men levied in Sylhet, will shortly start for Chittagong *via* Comillah. The *Pioneer*, *Colgong*, and another vessel, have taken up ammunition and Commissariat stores to Cachar. Colonel Davidson is there superintending personally the necessary arrangements in his department. General Bourchier is carrying on his preparations in his usual right gallant fashion, and everything promises a speedy and most successful expedition, terminating, it is hoped, in securing a safe and peaceful frontier for the future.—*Bengal Times.*

WE congratulate our planting friends, says the *South of India Observer* on the recent order of Government, regarding rent for lands on the Neilgherries. Grass land is to be rated at eight annas the acre, from the time of its being taken up, and sholah land to be free for five years, then to pay two rupees per acre. This is a liberal policy, and we are sure that Government, as landlords, will not be losers in the long run. It is of the utmost importance that European capital and enterprize should be attracted to these hills. There is no doubt that the planters on these hills have suffered severely. First, under the Waste Land Rules they took up land, and had to wait three and four years for a title; in some cases were unable to sell even a share of their estate, as no title was forthcoming. A succession of bad seasons, coupled with a scarcity of labour, was the next hardship they had to endure. Then tea seeds were procured at a great expense, and with difficulty; cinchona plants were also expensive. We know one estate, of one hundred acres, where the cost of plants and seeds amounted to more than 9,000 rupees, or 90 rupees an acre; no doubt, the above large expenditure will be recouped in time, but the fact remains that the expenditure has been incurred, and the planter must wait years for his return. Tea does not pay under five years, and cinchona seven, at least.

We are rather in favour of the free rate or cowle for the first five years, than that the rent should advance gradually year by year, until the maximum is reached. In this manner the burden of the rent is apportioned to the crop. But we highly approve of the present rates adopted by Government. More than a year ago we strongly advocated that the rent of grass land should be reduced to eight annas the acre, remarking that the first expenditure on grass land to bring it into heart was equal to at least 50 rupees the acre, but then to make up for this digging and manuring, the land is more easily worked than sholah soil; ploughs can be used, whereas in sholah soil the use of ploughs would be impossible.

Whilst the Government are anxious to relieve the planters, we wish at the same time that they could have assured them that cinchona cultivation would not be extended to the detriment of individuals who have embarked largely in this speculation. Unfortunately, we know that the Supreme Government are insanely anxious to give cheap quinine to their royts, at the expense of private planters. As we have said before, they have no more right to do this than to give their soldiers cheap tea of their own cultivation. If Government ever begins this kind of competition, where is it to end? If they are so anxious to be benevolent to their royts, let them contract with Messrs. Howard, for a large supply of quinine, and then let them distribute it largely amongst the royts, at a low rate, say two rupees an ounce; it will even then be cheaper to the royts than amorphous quinine, at one rupee the ounce. We can understand that under the above conditions Government would confer an immense boon upon a suffering people, and at the same time would not enter into competition with planters, whom they had encouraged to enter upon a speculation, which they now are doing their best to annihilate. Every industry of this kind should be carefully fostered by Government, and as far as our own Government are concerned, we believe they are fully alive to the fact. It is the mischievous policy of Bengal that we dread, and would avert if possible.

We hear that the assessment for Government land in Wynaad is to be levied in the fourth year, three years being free; this is only fair, and we only hope that this relief, coupled with a succession of good seasons, will bring the planters successfully through all their trials. The tea planters are fortunate; the consumption of Indian teas has risen from two millions five years ago, to nearly ten millions at present, and promises to increase, whilst at the same time prices are remunerative. Indeed, whilst we fear that through the action of the Bengal

Government, cinchona is a doomed speculation, and consequently these hills are largely damaged thereby,—indeed we look upon the man who plants another cinchona tree before the policy of Bengal is declared, as an enthusiast to be pitied,—we at the same time consider that tea will do much for these hills; it is a safe speculation, and may be calculated to return at least twelve per cent. upon the outlay, if only ordinary care is used, and very probably far greater returns will be obtained. But it must be borne in mind that there is not an estate on these hills, at present, of one hundred acres, that is seven years old, hence we are quite unable to say what a full yield should be over such an area. Tea in Darjeeling, we observe, according to the tables of the *Economist*, yields four hundred pounds an acre; and this is by no means an unusual out-turn. We need hardly say that here, one half of this will give twelve per cent. and more upon the money laid out upon an estate, if only ordinary care has been used. Five years is no doubt a long time to wait for a return; hence the wisdom of Government in reducing the present rate of assessment.

CINCHONA.

CINCHONA PLANTATIONS.—NEILGHERRIES.

In recent Proceedings of Government, a letter from Mr. Broughton, Government Quinologist, to the Secretary to Government, is published. The letter is a very interesting one, but too long for our columns. We gather from it the following information. Analyses of the bark of *C. succirubra* shows that up to May 1871, the total amount of alkaloids in the red bark had continued to increase, but the annual increments diminish in amount, a circumstance which indicates that the bark is arriving at its maximum of yield. The amount of quinine had diminished during past years in the red barks, although that of the total alkaloids had increased. During the last two years it appears that the amount of quinine has remained nearly constant, and probably in years to come, its amount will remain nearly stationary in our red bark. It also seems probable that the amount of obtainable crystallized sulphate of cinchonidine, is diminishing with the increase of age, although Mr. Broughton states, that with the present evidence, he cannot hold this to be quite clear.

The large amount of variation, according to circumstance of growth, met with in the bark of *C. officinalis* renders a precise determination of its *mean* quality a work of great difficulty. Analyses though comparatively useless to determine the alteration of the bark with age, are however, adduced to show the high quality of the barks,—"a low yield is getting much less frequent in their bark than formerly. Both the crown barks of Dodabet plantation, which consists entirely of this species, and those of Neddivuttum are improving in quality." These two kinds divide between them nearly the whole of our plantations. For European quinine manufacture, the bark of *C. officinalis* is admirably suited, as it is so rich in quinine. In addition, it is easy to work, and the sulphate of quinine crystallizes with great readiness and purity. It is especially the bark for export to Europe. A small quantity is now packed for sending to England, and Mr. Broughton trusts that from time to time its export may be continued. In Europe the price of the natural red bark will hereafter sink, when it is brought into competition with crown bark. How far, by careful special cultivation of the red bark, it may hereafter be possible to modify this result, it would at present be premature to speculate.

After the above kinds, the most important at present cultivated on the plantations is undoubtedly that of *C. calisaya*. The bark of a variety with broad leaves, which are red in the under-surface and of vigorous habit, is the kind which should be propagated; as it is the one whose cultivation can be most profitably extended. The bark of our *C. calisaya* is of excellent quality, and is better suited for quinine manufacturer's use than than that of *C. succirubra*. Mr. Broughton regrets that a larger number of the trees has not been planted; but as the yield of bark from the present plantations will shortly be so large, he does not recommend any considerable extension, even with this sort.

In a previous report it was remarked that in the barks of *C. succirubra* and *officinalis* a high mean temperature appeared unfavourable to the production of quinine, that alkaloid occurring more readily in the bark of trees grown at high elevations within certain limits. Mr. Broughton has met with a remarkable illustration of this principle also in the bark of *C. Peruviana*. The bark of this tree grown at Neddivuttum generally contains no quinine whatever, and at best contains it in so small an amount that it is with difficulty it can be clearly detected. But by growing the same species at the higher elevation of Dodabet plantations, its bark quite alters its character, and yields in analysis an amount of pure quinine, which readily crystallizes as sulphate. Indeed, the bark thus grown, far more resembles the bark of *C. succirubra* than a grey bark. Mr. Broughton considers this instance of a total change of alkaloid, by increase of elevation, a most interesting one.

The remainder of this letter is so interesting that we are compelled to give it in full.

The occurrence of several remarkable varieties among the trees raised from seed has directed my attention to the occurrence of hybrids among our species of cinchona. In one instance I was able, from the account given by Mr. C. Dawson, then Assistant Superintendent at Neddivuttum, to directly trace the origin of a very beautiful plant, which was found to be a hybrid between *C. succirubra* and *micrantha*. This plant was picked up a seedling under a tree of the latter. I analysed its bark and found its yield was poor, but represented a mean between the qualities of the two species. Examination among seedling trees led to the discovery of many other examples of hybridism, especially the cross-breeds between *C. succirubra* and *officinalis*. In 1870 I communicated a short memoir on the subject to the Linnean Society. The occurrence of the demorphic varieties, "*macho*" and "*hembra*" in each species of cinchona was shown in this communication to render cross-breeding highly probable; in the same manner, as has been shown by Darwin to occur in *primula*, *oxalis*, and other plants. I learn from the discussion which took place on the subject at the Society's meeting, that the fact of the tendency of cinchona to hybridism was considered proved. Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no one instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both their parents. I cannot but think that this ready hybridism between the species of cinchona affords an explanation of the occurrence of the numerous *varieties*, which have been recognized by botanists. I observe for instance, that a most recent classification gives 33 undoubted species, and nearly 80 separate varieties of cinchona. On our plantations there are several plants which, though certainly hybrids, would undoubtedly be made into species by a botanist ignorant of their origin. It seems therefore not improbable that several species, to which a separate name has been attributed, may be only South American hybrids. It is to be hoped that in any future botanical classification of the genus, this circumstance may be borne in mind. This fact of the interbreeding of the species renders the seed of a tree, surrounded with many others of a different kind, subject to considerable uncertainty of producing all plants like its parent. As a fact, the seeds of the variety I called provisionally "*lanceolata*" gave but few plants which resembled their parent, and consequently the *seedlings* had to be discarded. As the tree producing the seeds was surrounded on all sides by the ordinary crown barks, the variation in the seedlings becomes intelligible. In several preceding reports I have abundantly stated my convictions, and their grounds, for considering that living cinchona bark has its yield of alkaloids injured by exposure to sunlight. The experimental evidence of this already adduced, appears to me to be quite conclusive of the fact, so that further proof is scarcely needed. Further proof appears, however, in the circumstance of which I have been for some time aware, that the bark of opposite sides of the same tree differs in yield of alkaloids. This of course, is only fully apparent in trees that are equally exposed to sunlight on each side, which from the site of the plantations, does not generally occur. But the following analyses express the yields of the bark taken respectively from the north and south sides of a tree which is equally exposed on all sides. The bark was taken July 25th 1871.

	North side.	South side.
Total alkaloids	3·18	3·80
Quinine	0·62	1·40
Cinchonidine and cinchonine. .	2·56	2·40

As the sun has been on the north side of the tree for the last four months, the effect has been that the yield of alkaloids has been diminished 0·68 per cent. This decrease apparently consists of quinine, which is commercially the most valuable of the alkaloids. This effect has been produced in spite of its being the most cloudy period of the year.—*South of India Observer.*

CINCHONA IN JAVA.

According to the last published official report on the cinchona culture in Java (for the 2nd quarter of 1871), the number of cinchona plants of all ages, sorts, and sizes, have increased during that period from 1,730,705 to 1,741,525. In April and May, all the developed cinchona plants of the valuable sorts planted out in open ground were pruned, to the manifest advantage of the trees; this pruning yielded 2,485 kilo-

grammes of bark, which were forwarded to Batavia, in 30 boxes. The valuable kinds of cinchona trees have not yet been regularly turned to account, hence it is no wonder that the Java barks exported so far can stand no comparison with the American barks of commerce. A disease has for some time been affecting some of the trees, but it has been greatly on the wane during the quarter, owing to the favourable weather and the repeated besprinkling of the diseased plants with a decoction of tabacco and a solution of the poly-sulphuret of calcium. In May and June, an official commission visited the eight cinchona plantations with the object chiefly of helping to trace out the nature of the disease: a long and close investigation convinced them that it must be looked upon as arising from parasitic vegetation, whose origin cannot be pointed out with certainty, because it shows itself very irregularly under varying circumstances.

Letter from the Acting Collector of South Canara, to the Acting Secretary to the Board of Revenue, dated Mangalore, 13th June 1871, No. 806.

With reference to the Board's Proceedings dated the 7th March last, No. 728, (Miscellaneous), I have the honour to submit the report therein called for on the experimental cultivation of cinchona in this district. In the month of December 1869, my predecessor, Mr. Thomas, in accordance with the arrangement sanctioned in paragraph 2 of the Proceedings of Government, dated the 20th September 1869, No. 2610, obtained from the Superintendent of the Government Plantations at Ootacamund, 53 plants of the cinchona succirubra. The plants suffered a good deal in transit. They were sent to Nagodi as soon as received, and were planted on the 27th December 1869 on a plot of land about 1¼ acres in extent, which had been previously selected and enclosed for the purpose. A gardener was entertained on a salary of Rs. 7 per month, and the Patail of the village was entrusted with the general care of the plantation. Owing to the damage sustained by the plants in transit, several of them never showed any signs of vigorous life, but thirty-eight survived transplantation, and, with the exception of two, which have since died, are now in a thriving condition. The height and girth of the thirty-six plants which are now growing are as follows:—

Height.	No. of plants.
6 feet high	1
5 do.	20
4 do.	15
Total..	36

Girth.	No. of plants.
4½ inches in girth	1
4 do.	2
3½ do.	3
3¼ do.	[illegible]
3¼ do.	[illegible]
3 do.	[illegible]
2½ do.	5
2¼ do.	2
Total..	36

The Head Assistant Collector, who occasionally visits the plantation, informs me that while the plants are in as good condition as can be desired, the leaves suffer a great deal from a large green caterpillar. The gardener goes round daily and removes the insects, but in a large plantation it would be impossible to keep the caterpillars down in this way, and I intend therefore to send a specimen to the Superintendent of the Neilgherry plantations and to ask his advice as to the best method of preserving the trees from their attacks. Besides the plants received from Ootacamund four were obtained from Mercara, and put down on the same place in July 1870. Of these, three have survived transplantation, and are doing well, two of them being 3 feet high and one 2 feet. The girth of one is 1¼ inches, and that of the other two about 2 inches. Some tea plants were also put down, and are promising well. The height of Nagodi (about 2,500 feet) is, however, not sufficient for their successful cultivation. The experiment has up to the end of the last official year cost Rs. 227-3-5 in wages of the gardener and other sundry charges, the whole expenditure being defrayed from the Jungle Conservancy Fund.

Submitted to Government with reference to paragraph 3 of Government Order, 14th May 1870, No. 706, Revenue Department. As an experiment the plantation at Nagodi seems to have done well, but the Board remark that Major Beddome, in his letter recorded in the Government Order above quoted, advised that plantations should not be formed in South Canara, except as a mere experiment with a few plants.

Order thereon, 27th July 1871, No. 1,314. The experiment does not seem likely to be productive of very useful results. The Collector will consider whether it is worth-while to continue the employment of the gardener. The cinchonas could be entrusted to the Patail with the promise of an annual gratuity if they were well-cared for. They are now nearly large enough to take care of themselves. Private individuals might also receive seed and plants in time.

TEA.

The tea-planter will read with interest the second paper, in Part I. of Vol. III. of the Journal of the Agricultural Society which is contributed by Dr. George King, late Deputy Conservator of Forests, Kumaon, entitled *Remarks on the Pruning of Tea.* These remarks will probably be found useful by those engaged in tea-culture on this side of India, though the writer's experience has been gained by inspection of the gardens of the N W. Provinces. This paper appears very opportunely now, when, the manufacture having nearly ceased, the planter has to turn his attention to cultivation, and more especially to *pruning his plant.* Dr. King alludes to the fact of the neglect in former days of the commonest principles of horticulture as respects the culture of this important plant. A change has since taken place, and the result is apparent; but the more advanced cultivator will, nevertheless, derive several useful hints from the perusal of this paper, which indeed, we consider, should be in the hands of every tea-planter in India. We feel inclined to take up several subjects contained in this useful paper, but our limited space forbids. We must close our notice of it by extracting the following words of warning, which all owners of tea-gardens should lay to heart:—"Pruning, such as has been recommended, cannot be practised successfully on one set of bushes for ever. A time must arrive when they will cease to respond to the calls upon them, and to begin to yield but poor and small leaf, and little of it. Entire exhaustion will eventually follow, but we have yet to learn how long, under such a system, they will continue to yield *profitably.* With generous treatment they may probably do so, until they are 15 or 20 years of age, or even older; but the wise planter will provide for the future by laying down, year by year, new patches of bushes to succeed the old." The other papers in this number are short, but more or less interesting to the growers of tobacco, cotton, paddy, and other tropical cultures.—*Englishman.*

THE CHEMISTRY OF TEA.

(From the Lancet.)

The May number of Liebig's *Annalen* contains a paper, by Zoller, on tea, from which we abstract the following:—

It used to be believed that the different kinds of tea came from different species of the tea-plant; but the researches of Siebold, which have been confirmed by fortune, have demonstrated that one and the same plant, *thea sienis,* modified by climate, soil, and cultivation, furnishes all the tea which is in the market. Differences in the manner of preparing the leaves, and differences in the age of the leaves, also affect the quality of the tea, giving rise to differences in the commercial article.

Touching the influence of climate, it is worthy of notice that the tea-plant will bear a wide range of climatic variation without suffering serious deterioration. The richness of the soil and the mode of cultivation, however, exercise a paramount influence on the quality of the tea. In this respect the tea-plant is like the tobacco-plant or the mulberry-tree.

Again, the method of preparation of the leaves is a comparatively trivial matter, whilst the age of the leaves is of prime importance. The youngest leaves give the best tea. Hence the explanation of the high price of choice varieties of tea. Choice teas consist of the youngest leaves and to produce any considerable weight of young leaves a great number of plants are required; whilst the same weight of old or full grown leaves is produced by a comparatively small number of plants. Zoller shows that the age of tea-leaves may be ascertained by a chemical examination of the ash left on incinerating them. As the leaves grow they lose in potash and phosphoric acid, both absolutely and relatively, and gain in lime and silica. Examinations made at periods, fourteen days asunder, exhibit these phenomena with sufficient distinctness. In the practical examination of teas there is, therefore, a very simple and valuable rule: much potash and phosphoric acid together with little lime and silica means good tea, and the reverse bad tea.

Having received a splendid specimen of tea grown in the Himalayas by a friend of Baron Liebig's, Zoller set to work and made a chemical investigation of it, and obtained the following results. In 100 parts of the tea there were 4·95 parts of moisture, and 5·63 parts of ash. The ash contained in 100 parts:—

Potash	39·22
Soda	0·65
Magnesia	6·17
Lime	4·24
Oxide of Iron	4·38
Protoxide of Manganese	1·03
Phosphoric acid	14·55
Sulphuric acid	trace
Chlorine	0·81
Silica	4·35
Carbonic acid	24·30
Total	100·00

These numbers show very plainly high potash and phosphoric acid, together with low lime and silica. Zoller also made an infusion of this excellent specimen of tea, and communicates some interesting particulars. 100 grammes of the leaves was infused for a quarter of an hour in 3 litres of boiling distilled water, and the liquid poured off. Then a second 3 litres of boiling water was poured on the leaves and allowed to stand for a quarter of an hour. The 6 litres of infusion were subsequently evaporated to dryness, and the residue dried at 100° cent. and weighed. This dry residue was found to amount to 36·26 per cent. of the original tea leaves; the remark being made, that in the above described operation, the tea leaves could not have been perfectly exhausted of soluble matter, and that the real proportion of soluble matter in the leaves must have been still higher than the experiment indicated.

The tea leaves in their ordinary or air-dried condition contained 5·38 per cent. of nitrogen. The percentage of *theine* in the leaves was found to be 4·94. Theobromine was also detected.

A comparison of the analysis of the original tea leaves with that of the tea leaves after they have been exhausted with boiling water is given. After extraction, the percentage of potash in the ash is 7·34, whereas, before extraction, the percentage of potash was 39·22; showing how the analysis of the ash may be employed as a criterion to recognise adulteration of tea with spent tea leaves. A point insisted upon in this interesting memoir is that the greater proportion of the nitrogenous material in tea is not present in the form of *theine*. Peligot has shewn that this other nitrogenous material is a protein compound, being a substance like casein. Tea is therefore, to some extent, food, and Zoller points out that 100 parts of Himalayan tea contain, in addition to the 4·94 parts of *theine*, 13·7 parts of protein compounds.

TEA.

ENCOURAGING, as it must always be, to the promoters of European enterprise in this country, to see their efforts year by year meet with success in the manufacture of tea, it is some abatement to their ardour to learn by successive telegrams from home that there exists a hiatus in the confidence felt by dealers in the genuiness of the plant exported from Bengal. Not that our native product needs puffing or any other form of extrinsic stimulus to render it acceptable to the public of England. It has long since established a reputation for itself, of which, neither detraction nor the vulgar fallacy of its inferiority to China herb can rob it; still, it has been clearly demonstrated by results that the valuable and promiscuous cargoes that leave the shores of India for home consumption must go weighted with some better accompaniment than the popularity of a particular brand, to ensure them the favourable reception their claims deserve. Adulteration is commonly believed to be the chief disposing cause of this want of entire reliance on the predominant excellence of Indian tea over Chinese—a circumstance of some significance, when viewed in connection with the theory that the produce of our gardens undergoes dishonest manipulation previously to shipment for the London market. We need hardly point out the unfounded nature of such a suspicion. Bengal planters, managers, and joint-proprietors of plantations, and in fact all connected more or less with tea speculation, may be taken as a rule, to represent capital, intelligence, and last though not least, so much of honesty of principle as to be above the petty imputation of tampering with a commodity towards the improved manufacture of which their best energies and talents are directed. It is unprofitable as well as absurd to speculate on the probability of men sacrificing their interests to the mere love of sharping; for, admitting the fact that the purest manufacture is deemed the most valuable, we are forced to allow that the study of their personal benefit alone would keep manufacturers honest, were no higher incentive present. If then we ask ourselves where Indian, and especially Bengal tea is sought to be deteriorated by admixture, the reply suggests itself with unerring certainty—in London—and here we may follow the thread of our last article on this subject. Not unnaturally to the uninitiated the idea might occur that inasmuch as every chest of tea is lined with metal foil, no adulteration can be attempted without being followed by discovery and exposure. From the evidence of Dr. Normandy, however, it would appear that there is no such security. "A large tea-dealer," he testifies, "met me one day in Benchurch-street, saying, "Doctor, I want you to come with me and see what beautiful seams the lead of tea-chests is closed with. "He then tells us that the tea-chest as it comes from the warehouse is closed, and there is only a hole about the size of the hand, cut into the metallic sheet inside the chest, for the purpose of taking out a sample. Metallic sheets are cleverly and beautifully soldered together, the tea packed between them being protected by this means from damage by contact with any foreign substance; but it must not be supposed that the seemingly unbroken appearance of the sheet of metal is a criterion of the contents being unadulterated, Through the aperture which is made in the metal for the purpose of taking samples, the whole contents are emptied on a clean floor, and the tea is then mixed with whatever composition it may be thought fit to add, and worked up with teas of an inferior quality, and which, by themselves, would be unsaleable. To use his own words :—

"I sawthere a room, which was perfectly clean, boarded with very clean boards, and there were heaps of tea piled up against the wall; there was a rope against the wall, which served the following purpose :—The mixture of teas, and of magnesia, being made on the floor, as just stated, then the question comes, how the same quantity can be re-introduced into the original chest from which it was taken. It is done in this way:—A small quantity of tea is put into the chest, a man puts his foot within the chest, through the hole, grasps the rope against the wall to steady himself, and by a series of jerks, he succeeds in packing it up tight: and so he goes on with another layer, and process is repeated until the chest is eventually filled up as tight as if it had not been touched. This I know from personal observation."

As the rule is very general to drink milk and sugar with tea, the difficulty of detecting adulteration in tea is not small, except in cases where unpalatable substances are largely introduced, and in Germany the difficulty is increased by the addition of rum and vanilla, as the delicate flavour of the tea is altogether lost by their means, though it may be owned that no ordinary process of ingenuity could render the tea drank in Germany very much worse than it usually is.

Thus far we have the amplest testimony that adulteration is common in London, but we doubt, nay, we may be certain whether adulteration is possible before invoices are shipped for home, and the increase of manufacture would seem to suggest that even the simplest form of sophistication is deemed unworthy of attention in the centres of cultivation in Bengal. In 1865, the import of Indian tea to the London market amounted to 5,000,000; four years later it had swelled to 15,000,000 of pounds, or say in round numbers that during five years' importation in tea has steadily increased to three hundred per cent. With such results adulteration holds out no prospects of adoption, save by petty retailers, who may possibly under extraordinary pecuniary pressure, "sult" their invoices. But while we set our face against mixing a pure product with a foreign substance in this manufacture, we are not at all certain that a tea which fluctuates between the delicate and scented tea of China and the penetrating, pungent leaf of Bengal, would not find favour at home. While taste runs in minorities as it does in India, [illegible] majorities are often swamped by the veto of half-a-dozen known epicures, it is hard to exercise the public of the canons which it has accepted as infallible. Taste will have its way, and tea must keep pace with its changeful moods. Our planting friends will do wisely to look well at this side of the question. Excellent, or the reverse, fashion has [illegible] to dictate to be obeyed; and in tea as in everything else, the aristocracy of intellect and discernment must prevail.

Adulteration is, however, not restricted in its systems either to London or China. Various devices are resorted to, which show some semblance of affinity and may therefore easily be mistaken for each other. We find thus that there is a prevalent plan in China which so nearly resembles the theory of adulteration in India as to be often mistaken for the latter. We have shown that there is no adulteration, properly so-called in Bengal, and we cannot too often repeat the statement but as a theory —intemperately whispered perchance by one who had never seen a tea-plant has somehow to a small extent been afloat in the public mind of England; it may be as well for our planting friends to refute as fully as possible the mischievous idea by a full exposure of the system prevailing elsewhere. With this view we quote from a communication made by Mr. Medhurst, British Consul at Shanghai :—

"The banks of the numerous creeks are planted with willow-trees the young leaves of which are collected in April and May, very much in the way that tea-leaf is gathered. The produce is then collected in heaps on the hard threshing floors of the hamlets, and is allowed to undergo a mild fermentation in the sun. The leaves are then manipulated similarly to those of the ordinary tea-plant. They are sorted into kinds according to sizes, and are afterwards roasted in common tea-ovens. The appearance of the stuff after this treatment is not unlike that of genuine article, and is carried to Shanghai, and there intermixed with pure tea at the rates of from ten to twenty per cent."

The very promising picture held out to us in this statement is the reverse of comforting to the Bengal Planter. "Pure tea" made up of willow-leaves, may be to the palate attuned to such beverages, particularly grateful; to us, we confess it is not, especially when we remember the extensive and not unfrequently pernicious systems adopted by Chinese ingenuity to bring our Indian teas into a contempt, from which they feel they can no longer rescue Chinese varieties.—*Bengal Times.*

COFFEE.

COFFEE LEAF DISEASE.

SIR,—Why are planters so quiet about this leaf disease? Can it be possible that they look upon it as a matter of no consequence, or are they afraid to face the disheartening difficulty? That the disease is rapidly spreading—and that its ravages are most disastrous, no one who has ever seen a coffee tree can doubt. My experience of the blight extends only to the past few months—but I don't hesitate to say that trees *die* from the disease, or it may be from what *causes the disease*. I have seen a field of fine luxuriant coffee reduced to sticks in less than two months. I am no alarmist—what I have stated is miserable fact.

October 1871. Yours faithfully,
NEAR KANDY.

THE FLOWERING OF THE "YUCCA GLORIOSA."

(To the Editor of the Ceylon Observer.)

DEAR SIR,—Can any of your shrewd correspondents inform me what is the proper time for the flowering of the *Yucca Gloriosa?* In a compound in Colpetty there were some very fine heads early in the year, and now there are some eight or nine just bursting into flower—one of these plants having already borne a fine head in March last. These same plants were in flower when the Duke was here last year, but there were no blossoms in September. I am curious to know if the change in our seasons can have anything to do with this second flowering, having always believed that the *Yucca* is not over-fond of displaying its beauties—not even regularly once a year.—I am, yours, &c., YUCCA.

September 25th, 1871.

BUG ON COFFEE BERRIES.

SIR,—In your issue of the 23rd instant, you have it that I *suggested* coffee berries were sometimes sucked by a kind of bug. This is, however, no mere *suggestion* of mine, but a *well-ascertained fact*, in support of which please see (and copy if you like) my pamphlet on the *Enemies of the Coffee Tree*," published ten years ago, where (page [illegible], No. 6) you will find the insect in question duly noticed.—Yours faithfully,

J. NIETNER.

Fernlands, Poondaloya, 27th Sept. 18[illegible].

P. S.—Weather dry, coolies plentiful, estates in excell[illegible]rder, crop hanging back, no regular picking till November.

[EXTRACT REFERRED TO:—"6 *Strachia Geometrica*.—This is a bug, but of a different description from the brown and white bug, to which it bears but little resemblance. It is oblong-oval, angulated, plump, 5-16ths long by 3-16ths wide, of yellowish colour, marbled on the upper side with grey and orange. It is allied to the so-called green or fœtid bug. Mr Alexander Brown received this insect from Badulla and kindly forwarded it to me. It feeds upon the juice of the young berries, three per cent. or more of which were said to have been damaged from this cause. This is the only instance of coffee suffering from this insect that has come under my notice However, allied forms are found both here and in Europe, doing sometimes considerable damage to vegetables by destroying the buds. There is no fear of the insect ever becoming a *serious* nuisance on coffee plantations."]

ENEMIES OF THE COFFEE PLANT.

WE have recently had an opportunity of examining leaves and berries of the coffee plant, bearing unmistakeable signs of having been attacked by some insect whose ravages are fatal to the health of the tree, and destructive of a portion of the crop. The leaves are more or less covered with patchy discolourations, having all the appearance of being burnt by some strong acid, whilst the berries are punctured through on one side, and the internal stricture entirely destroyed. The following letters from the Director of the Botanical Gardens explain his views of the phenomena :—

Botanical Garden, Peradenia, 21st Aug. 1871.

"I have just been examining with some care the diseased coffee leaves and berries you have sent me.

"The red spots upon the leaves are undoubtedly examples of the fungus, about which a good deal was written in the *Observer* some months ago.

"The spots upon your coffee berries may possibly be produced by this fungus, or may be the result of an insect's puncturing.

"You should look carefully at the berries whilst they are upon the tree, and see if you can detect upon any of them the red powdery appearance of the *leaf* spots, taking care not to handle the berries, as any of the red powder (sporules of the fungus) which might be upon them would easily be rubbed off, and so escape detection. I cannot discover any upon the berries you have sent me, though some might have been present before the berries were gathered, and had been rubbed together in the bag.

"You should notice, too, if your coffee trees are infested with a kind of bug, green or brown in colour or perhaps reddish, of offensive odour when handled. There is a species of bug which seriously injures the paddy crop occasionally—by sucking the juices of the young grain, so it is not impossible that coffee may have a similar, enemy, as suggested by my friend Mr. Nietner.

"In cavities of the diseased coffee berries, I sometimes see cobweb-like fungus myselium, but this may be a secondary growth, and not the cause of the malady.

"Pray let me know the result of your further observations upon the spot. I will give the matter further attention, and examine more fully the structures in a disease state, under my powerful microscope, and you shall know if I am able to arrive at any definite conclusion."

25th August 1871.—"A further examination of your coffee berries pretty well satisfies me that the injury is due to the attacks of an insect. The mischief is certainly from the outside, as the bean is very frequently not at all affected, though there may be a large discoloured spot upon the cherry.

"The leaves are most decidedly attacked by the coffee leaf fungus which I first heard of from Madoolsema, but which is now spread throughout the coffee districts of the island, though doing most mischief, apparently, amongst the native coffee and in the warmer districts.

"I have just heard of native trees at Tumpane dying from the attacks of this fungus."

"Pray tell me if you detect the red dust like sporules upon the berries of your coffee. I cannot find that the berries are affected here, even upon trees much infested with the fungus."—*Ceylon Times.*

CEYLON PROSPECTS.

(From our Special Planting Correspondent.)

The weather is fine almost beyond precedent for the month of October. Dry it is, till the ground cracks, the leaves get brown, and even jungle withers. This was the case a month ago in the lower part of Matale and Kornegalle, where I was told they had no rain for three months. I see a correspondent in your issue of the 7th corrects my information saying they had 12 inches in that time. However, as I know the correspondent in question, I may tell you at once that it was not his part of the district, though low, that I referred to. It was lower still—that portion of Matale that stretches from beyond the Yattewatte pass to Matale. I passed over that road about the time I wrote, and certainly it looked all I said. The ground was baked and cracked. Coffee trees were dying out from excessive heat. The very paddy-fields looked sickly and miserable from want of water. The low-land and the road side shrubs drooped and shed their leaves. The grass was the colour of straw, and I regret to say that this may now be said of some portions of Matale proper, and of a great deal of Doombera.

Crops hang back in consequence, and considerably less has been gathered than at this time last year. We are told that more coffee has gone down by rail than to this time last year, this apparent anomaly is, however, easily explained by the fact that the late run of fine weather has pushed forward much old crops from the late districts, as well as considerable parcels of early crop from all districts. In fact, instead of having lots of wet coffee as we generally had in October, it had been dried and despatched as fast as gathered both last month and this, that is, our early picking has been mostly despatched. We are now having a lull, and are waiting, and hoping, and are longing for the monsoon. The North-East cannot be far off, as its usual precursor, lightning, has been vivid and frequent during the last few evenings, and thunder has been heard; while heavy clouds are seen rolling up from Dambool towards Matale. With the first few showers crop will ripen up fast, as there is a great deal in the yellow and slightly reddening stage which will come on with a rush when the new monsoon touches it.

Short crops were from the first expected; but they will be shorter still than many yet believe. Even late estimates have had to be revised since gathering began, and in many instances with a very serious diminution. And, what between the leaf disease which is spreading rapidly over whole districts, and short corps everywhere, it is enough to depress the spirits of the boldest believer in big crops. Hope is, however, a capital feeling, and without it many a timid spirit would be crushed. There are not a few planters who yet feel sanguine of their original estimates, or nearly, and who believe in the coming monsoon revealing much more pallam on their trees than was previously apparent. I am no alarmist, and do not wish to discourage such expectations. All I say is! "Wait and see." Our only consolation under such adverse circumstances is the fact that prices continue to keep up. Long may this be the case.—*Ceylon Observer.*

THE LEAF DISEASE.

THERE is no use says the *Ceylon Observer* avoiding the fact any longer that the leaf disease, to which allusions for many months back have been made in our columns, is a far more serious danger to the coffee attacked by it, than has been suspected by the vast majority of the planting and general community. From the lower districts around Candy and Matelle most discouraging reports reach us of the evident spread of the disease and the (quite as evident) serious results from its ravages. Some of our most experienced planters have at last taken the alarm and express themselves in no equivocal terms on the material injury inflicted on coffee fields in Nilambe and around Deltotte as well as in Lower Matelle. Nor can the appearance of the disease be attributed to poor cultivation, for some of the best managed estates in the country are suffering from it. The disease would seem to appear after a protracted drought, against which the coffee trees in the lower and older districts are not able to keep up their strength, even when well-manured. The age of the trees can alone explain the persistence with which the disease clings to highly-cultivated properties, and turns so many flourishing green fields into an apparent collection of dry sticks. Our special planting correspondent alludes to the subject, but not so particularly as some other writers in our columns. It would seem now that for several years back, the native coffee gardens in the lower districts have suffered so greatly as to be in many cases nearly killed out by the destruction of the leaves and vegetation on the trees. Unseasonable and protracted dry weather is undoubtedly the primary cause of the disease, but it would appear that having once got a hold on an estate—especially with trees past their meridian—it is a most difficult matter to shake it off, and especially to bring back a full growth of vegetation on the denuded bushes. Mention has been made to us of fields judiciously and elaborately manured last season in a manner which never failed to produce a marked effect in previous years, but which on this occasion has failed to improve in any degree perceptible trees which had been affected by the disease. The cause and effects of this coffee leaf disease are, then we think, worthy of more careful examination than has yet been accorded to them. The opinion of Mr. Thwaites of the Peradenia Botanic Garden, is doubtless correct that the disease only appears in very dry and exhausting seasons, and disappears with the return of a season of continuously wet and refreshing weather. He describes it as the coffee leaf fungus, and he first heard of it from the distant district of Madoolseema. The prospect of the disappearance of the pest in favourable seasons is satisfactory; but meantime, unless some means can be devised for keeping trees in heart, the danger is that old fields of coffee will become exhausted beyond recovery. The subject, therefore, is one for the immediate attention of the Planters' Association, and the question to be solved is how can highly cultivated but old coffee in low districts subject to drought, be kept free of the ravages of leaf disease, or best maintained in heart, until the return of wet weather drives the fungus away. On the result of such an enquiry hangs, we begin to fear, the ultimate fate of a considerable acreage lately considered amongst the more substantial portions of the coffee cultivation in Ceylon. It is a consolation under these circumstances to feel that, whatever other drawbacks may attach to high districts, they cannot possibly suffer from a disease brought on by protracted drought. Dimboola, Dickoya, and Maskeliya, on which the future of the Ceylon coffee enterprise so greatly depends, are never likely to be afflicted with leaf disease, and besides the large extent of forest land in private hands yet to be opened, there is enough crown land remaining in that direction to form two or three respectable districts, at least averaging the extent of the two or three lower ones overrun by the leaf disease. Six thousand acres of forest land will, we are assured, on most competent authority, be added this coming season to the cultivated area in these three districts, and the process of felling will go on until the districts are merged in one grand expanse of coffee, perhaps twenty miles long by an average of ten in breadth. We said in our last overland issue that he would be a bold man who would deny that the Government of Ceylon had all over the country at least a reserve of 100,000 acres of land suitable for coffee cultivation. This estimate has been disputed as too high, but when we remind our friends who would cut it down by one-half that over 35,000 acres have been disposed of since January 1869, they confess themselves staggered. Are we to be told that the Government cannot, during the next ten years, bring forward twice the extent of land added to the quantity in private proprietor's hands during the last three years? Eighteen thousand acres have been added to the *cultivated* area alone in three years; and on the authority of Mr. William Smith, of Dimboola, we may expect to find 30,000 acres more readily available for coffee in the forests, out of which Maskeliya blocks have been cut and stretching on through the wilderness of the peak. Notwithstanding these compensating circumstances, when the prospects of our lower coffee districts are under consideration, there can be no denial of the fact that at the present moment a large number of planters have up-hill work before them. We look back on a short crop resulting in a less export by 100,000 cwts. of coffee (worth on the spot perhaps £325,000) than during the last season, and we have to face the approach of another season in which the out-turn is not expected to be much better all over the country, although there are some satisfactory exceptions to the general cry of short crops. The good prices now prevailing, and the prospect of their maintenance, as well perhaps of even further improvement, serve greatly to relieve this discouragement, and fortunately there is in addition a superabundant supply of cheap labour together with cheap rice. We trust the hope of favourable weather during next blossoming season may not be disappointed, and that for 1872-73 a bumper crop may be the rule, and not the exception.

EXTRAORDINARY DELUSION AMONG COOLIES.

(To the Editor of the Ceylon Observer.)

SIR,—I am an old resident, and while I know how ignorant and credulous the natives, both Singhalese and Tamils are, I confess I have been lately much surprised at finding how prevalent in all this district is a general distrust or terror on the part of the Tamil men for their personal safety. The belief is that the deity of one of the temples, I cannot make out which, but a shrine at Kaludewell near Matale is spoken of with special significance, is calling for a human sacrifice, and that shortly such a sacrifice must be offered. Mr. Moir, of Suduganga, is mentioned as a gentleman careful of the safety of his coolies, and my coolies tell me that he has placed a guard over his estate to protect his people.

I have no doubt but that it is his coffee now ripening that Mr. Moir is protecting, but so do not believe my coolies, who are in a state of real alarm, and say that this belief is a matter of common talk about Matale. The thing is melancholy in these days of progress and enlightenment, and if you do not think it too absurd, you might give this a place in your columns.

Matale, August 25. PLANTER.

P. S.—I find I have much understated the requirements of the deity calling for sacrifices—1,000 human heads are generally supposed to be required—coolies in a gang for protection from a neighbouring estate have this morning passed my house on their way to Matale for marketing, armed with knives and cudgels.

[We have to thank our correspondent for sending us a piece of information so strangely curious. Ought not the missionaries to the Tamil coolies investigate the matter and endeavour to dispel the poor creatures's fear after the plan adopted by Mr. Murdoch many years ago with the Singhalese at Matura, when he challenged the native charmers, devil-priests, &c., to do their worst on him by spell and incantation through the agency of their 'gods' and 'devils.' But we suppose the same excuse would be made, that the native people's gods have no power over the white man.—ED. *C. O.*]

MARKET REPORT.

LONDON, *2nd October* 1871.

COFFEE.—Steady market, but less active 500 bags bold Native Ceylon sold from 61*s.* to 61*s.* 6*d.* Latest sales about comprise about 200 tons good ordinary native, price not disclosed A cargo of Bahia, 2,040 bags, per *Pleiades*, at 51*s.*, for a near port, one of Rio, per *Johann Maria*, 3,400 bags, half capitanos and half fair Channel, at 57*s.*; also for a near port, one ditto, per *Ada*, 3,037 bags fair mixed Channel, at 56*s.* 6*d.*, open charter, and one of Santos, per *Silver Stream*, 3,200 bags, at 59*s.* 6*d.* open charter. At auction, on Tuesday, 540 casks, 70 barrels and 250 bags plantation Ceylon chiefly found buyers at full prices 150 bales and 300 half-bales Mocha partly sold from 91*s.* to 92*s.* 6*d.* 510 cases and 800 bags plantation East India were nearly all taken out, there being little demand. At the auctions yesterday, of 120 casks plantation Ceylon offered, about 50 casks sold at 70*s.* 6*d.* to 72*s.* 6*d.*; peaberry, 82*s.* to 84*s.*, the remainder held for higher rates 1,300 cases Coorg sold readily at firm rates—small to bold dull, 68*s.* 6*d.* to 75*s.* 6*d.*; colonry, 78*s.* 6*d.* to 80*s.*; peaberry, 83*s.* to 84*s.* 6*d.*; 130 cases Mysore part sold—small, 73*s.* 6*d.*; bold, 85*s.*, peaberry, 84*s.* 6*d.*; and 250 bags Rio, ordinary, 63*s.* 6*d.*; grayish, 68*s.* colonry, 72*s.*; privately 200 tons native Ceylon sold for arrival at 63*s.*

TEA.—There has been a fair steady demand, chiefly for the better kinds of Congou. Yesterday 3,800 packages China all sold without reserve: Congou fannings, 5*d.* to 7*d.*; old black leaf, 9½*d.* to 9¾*d.*; ditto, good leaf, 9*d.* to 10*d.*; medium new black leaf, 1*s.* 5½*d.* to 5¾*d.*; new season's scented orange pekoe, 1*s.* 8*d.* to 1*s.* 9*d.* The deliveries in London estimated for the week ended October 9 were 1,827,068 lbs., which is a decrease of 11,906 lbs., compared with the previous statement.

INDIGO.—October Public Sales commenced in London on the 9th ultimo, and concluded 15th idem. The auctions passed with good spirit, showing an advance on the prices realized at the last quarterly Public Sales in July of 2*d.* per lb. on common kinds, and 10*d.* on good qualities, and no doubt still better results would have been obtained but for the advance in the Bank of England rate of discount; however, since the Public Sales concluded, prices have continued very firm, clearly indicating the strong position of the article. The estimated out-turn of the year's crop is now set down at 90,000 maunds, or about 15,000 maunds less than the estimate arrived at in August last. The local Public Sales will commence end of the current month, but they will be less interesting than usual, for already 35,000 maunds have been sold privately to arrive, leaving only 55,000 maunds to come under the harmer.

INDIAN TEA.—At a Public Sale held on the 30th ultimo 347 packages were offered, of which 123 were withdrawn, the remainder finding buyers at about previous rates. By private contract about 800 boxes of Deyrah Doon Souchong and Pekoe Souchong have sold at ten annas six pies, and 350 boxes of Pekoe at eleven annas six pies per pound all round price, also 200 chests of Kalabaree growth at fourteen annas per pound, average price. About four thousand packages are printed for Public Sale on Friday next, and further large sales are expected during the ensuing week. Advices received by telegram from London quote the market quiet, and prices easier.

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DEPOSITS.

Deposits of Rs. 500 and upwards are received for fixed periods, the terms for which may be ascertained on application at the office in Calcutta.

No Interest is allowed on Current Deposit Accounts.

EXCHANGE.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius, Australia, and New Zealand at the exchange of the day

Drafts are drawn for sums of £1 and upwards.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued

N. B.—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if a married lady, her own Christian name, not that of her husband, is required.

JOHN S. SCRYMGEOUR,
Agent.

Calcutta, 1st February 1871.

ORIENTAL BANK CORPORATION.

Bombay Agency.

EXCHANGE.

THE CORPORATION grants Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope

No Draft at six months' sight is granted for a Sum under £50. Sums under 20*l.* are only drawn for on Demand.

COMMISSION.

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent., and on the collection of Bills one per cent. and Postage.

The Corporation takes charge of Government Paper, Shares in the Bank of Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms:—

If to be remitted through the Corporation	Without charge.
If to be paid in India, a Commission will be charged of	¼ per cent.
On delivering Securities out of safe custody	¼ do
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869.

CHARTERED MERCANTILE BANK OF INDIA,

LONDON, AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies.

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The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Coconada, Ceylon, Hongkong, Foochowfoo, Shanghai, Hankow, Singapore, Penang, Mauritius and Yokohama.

INTEREST ALLOWED.

On Deposit Accounts payable on demand Interest will be credited half-yearly, on 30th June and 31st December, at the rate of two per cent. per annum on the daily balance, not exceeding one Lac Rupees.

ON FIXED DEPOSITS.

12 months	5 per cent.
3 do.	3 "

All letters should be addressed, and Hoondies made payable, to the Chartered Mercantile Bank.

NATIONAL BANK OF INDIA, *(Limited.)*

Bombay Branch.

CURRENT DEPOSIT ACCOUNTS.

Interest is allowed on Current Deposit Accounts at 2 per cent. per annum on the minimum monthly balances up to Rs. 1,00,000, but no Interest will be allowed on balances under Rs. 1,000.

FIXED DEPOSITS.

Deposits of Rupees Five Hundred and upwards are received for Fixed Periods, the terms for which may be ascertained on application at the Office in Bombay.

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta, Madras, and Hongkong. It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors,

Bombay, 1st July 1871. JAMES WINDRAM, Manager.

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RATES.

DISCOUNT.

On Government Bills	6 per cent.
On Private Bills and Notes	8 do.
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.
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Bombay, 15th July 1869.

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Fixed Deposits.—Interest is allowed on deposits of Rs. 100, and upwards on the following terms:—

On sums lodged for 3 months certain	3 per cent. per annum.
Do. 12 do.	7 do.
Do. 2 years certain	8 do.

Interest is allowed at 2 per cent per annum on floating deposits or Current Accounts, when the Balances exceed 500 Rupees.

There are many who have a dread of speculation, and yet who desire a *fairer* rate of interest than is obtainable from investment in Government paper and Railway scrip, or from fixed deposits in Joint Stock Commercial Banks Remittances can be made by cheques on any part of the world.

Interest paid half yearly in India or London.

A. B. L. WEBB,
Manager.

Darjeeling, Northern Bengal, 1st August 1870.

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On London—6 months' sight	1s. 10½d. per Rupee.
" On demand	1s. 10½d. "
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Ditto for *Italy* and *France*, payable in Gold without Commission	1s. 10½d. "

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Interest at *four per cent.* subject to six months' notice of withdrawal.

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E. J. HARDCASTLE, Manager.

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Bombay, August 1870.

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Agricultural Gazette of India.

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To the Editor of the "Times of India."

DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India I must ask you to correct an error which appears in your notice, if it has not already been corrected. I did not serve in Affghanistan. The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother now Brigadier-General Edward Kaye, C. B., who thus commenced a long career of good military service. The best service which I ever rendered *in* India, or indeed *to* India, was the establishment, single-handed, of the *Calcutta Review* which has done far more for Indian literature than anything I have written under my own name. In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours; and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave.

I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and general subjects, have given us valuable articles on the army. Some from the pen of Sir Henry Lawrence, who wrote with the spirit of prophecy of the coming storm of which he was one of the noblest victims.—*Address of His Excellency the Commander-in-Chief, at a meeting held on the 18th May 1871, at the United Service Institution of India, Simla.*

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India,

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, THURSDAY, 21st DECEMBER 1871 No. 5.]

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LETTERS TO THE EDITOR.

THE DISCOVERER OF TEA IN ASSAM.

To the Editor of the

Agricultural Gazette of India.

SIR,—In the issue of your *Gazette* of the 15th of July 1871, I find a letter from Mr. D. Bruce, of Assam, in which he states that "in the different treatises on the cultivation of Tea, lately submitted to the Agri-Horticultural Society, no mention is made of the name of the discoverers, while others again couple Lieutenant Charlton's name with the discovery." Now, Sir, I have not the pleasure of knowing Mr. Bruce, nor can I give any opinion upon the prudence he displays in quoting any statements contained in the "Tea Essays" submitted to the Agri-Horticultural Society. This I may say, however, that he must have been very diligent in his reading if he managed to wade through the whole of those Essays between the 1st of March and the 24th of May.

I have understood from the writer of at least one Essay, that he was perfectly aware that Mr. Bruce, the merchant, was the first to discover the Tea, and that he was duly recognized and rewarded by the Society of Arts, not by the Royal Society, which is quite another body.

I may mention that my informant further says that Moorcroft had brought the existence of Tea in India to the notice of the then Board of Directors in 1821, (so that Mr. Bruce was probably indebted to him), and I have pleasure in referring Mr. D. Bruce to "Moorcroft's Travels in the Himalayas," &c., (1821) in corroboration of this fact.

As Mr. D. Bruce says, however, Lieutenant Charlton brought the matter very prominently forward some years later, and his, and also Captain Jenkins' services were very properly recognized.

I trust, however, the controversy on these points will not be renewed, as it would certainly result in Moorcroft's being proved to be the first person on record to have pointed to the existence of indigenous Tea in Northern India.—I am, Sir, yours obediently,

2, *Whitehall Place, S. W.* VERITAS.

WATER. ITS VALUE, USE, AND ABUSE.

To the Editor of the

Agricultural Gazette of India.

SIR,—When a Government, like that of India, proclaims to the world, almost by sound of trumpet, that being Sovereign Landlord of British India, its duty and inclination towards its millions of tenants, induces it to foster and improve the neglected agriculture of the country, it tacitly admits that means and money are at its command for initiating, carrying on, and completing the important work it has undertaken.

With capital at command, improvements in agriculture resolve themselves into problems for practical solution.

Problem First.

Given canal water, of considerable purity; to find the best practical means for depriving it of its injurious powers as a solvent of valuable fertilizing mineral matter present in the soil, which is removed in solution to the subsoil, and is finally lost by percolation to the immense injury of the land and agriculturist.

In the Presidency of Bengal, starting from Cawnpore and halting at Peshawur, the vast interlying extent of country is more or less artificially irrigated. The Supreme Government of India has, at very considerable cost, constructed magnificent canals for enabling its *Ryots* to enjoy the full benefits of canal irrigation, and where this is not available, the agriculturists may sink "*Cutcha*" or "*Pucca*" wells at discretion, being when necessary helped with funds to enable them to do so. The money is advanced on the security of the crops, and in Revenue parlance, is called a "*Tuccavee*" loan or advance, which can be as well expressed in English as an "Agricule tural Loan."

The water derived from such wells is, as a rule, sufficiently impur to be unfit for drinking purposes, until subjected to clarification. But this defect renders it admirably adapted for agricultural purposes

The impurities contained in well water are alkaline and saline, and as such mineral matters are of vital value to growing crops of every description, the lands under well irrigation produce good crops from year to year, without becoming impoverished, because after each irrigation an addition of mineral matter is made to the soil, and as long as this is kept up, fertility is ensured, and will continue, until the source from whence the mineral matters are derived shows signs of exhaustion, which will be made apparent by the crops and produce becoming annually smaller in quantity and lower in quality. From a consideration of these facts, but one conclusion can be drawn, and that is, that the value of water, as a fertilizer, depends not on its purity, but on the percentage of suitable mineral matters held in suspension and solution.

With the exception of the Peshawur Canals, the water of the Ganges, Jumna, and Punjab River Canals, is remarkable for its purity. All these rivers have their sources at or near one vast fountain-head, situated in the Himalayas, being most probably fed by the waters of the "*Maun Surowur*" lake which, for natural purity may vie, for all we know to the contrary, with the water of the "Loka" in the north of Sweden. This singularly pure water contains only 1-20 (one-twentieth) of a grain of solid mineral matter in the Imperial gallon of ten pounds, or 70,000 grains, and is therefore capable of performing all duties expected from distilled water.

If the waters of the Ganges, Jumna, "*Barse Dooab*," and other Cis-Indus Canals, contain 14 (fourteen) grains of mineral matter per gallon, they may be considered as fit for all purposes, save that of irrigation. Water of such purity possesses the property of dissolving out valuable mineral matters present in the soil, which it carries off in solution into the subsoil, beyond the reach of the roots of growing-plants, and as this process is repeated, each time the land is irrigated, the immediate result of each flooding is a dimunution of fertilizing mineral matter. The richer the soil, the greater the proportion of mineral matter, and as each successive act of irrigation carries off a certain quantity, the land in a few years loses its original fertility, and after a while suffers a deterioration so great that wheat and corn crops will refuse to grow upon it. But this is not all, for as the impoverishment of the soil progresses, the grain harvested is found to be deficient in most valuable mineral matters, to list, the phosphates of soda, potash, lime, magnesia and iron. These are called the food phosphates, and as the continuous renovation and reconstruction of the wasted, and wasting portions of the animal structure (liquid and solid) depends absolutely on the presence and action of these important substances, their deficiency in the grain, consumed as food, produces poor or impoverished blood, followed by general debility, wasting diseases, impotence, and female sterility. The stamina of the population fails, death lays his hands on the rising generation and waits for the fever season to sweep off the adults of both sexes by the thousand.

The injurious action of canal water having been demonstrated, the question of finding a suitable and practical remedy for the evil complained of, may now be discussed.

The extreme fertility of the Holy Land (Palestine) in most ancient times, is a matter of history, but the reason of this remarkable fertility was unknown by the invading hosts of ISRAEL. Yet it is easy of explanation, for science has taught us that the lands, watered by

the Jordan, and by springs yielding water of the same quality, must of necessity be exceedingly fertile.

The Jordan rises in a grand mountain range, abundantly supplied with limestone, and as a matter of course, its waters are impregnated with lime, with which magnesia is generally associated, and if fossils are present, so is the phosphate of lime. These three mineral substances are the most valuable fertilizers in existence, and the fertility of the lands watered by the Jordan was no doubt due to their presence and agency. It has been proved by analysis (though I regret, Professor Johnstone does not give the details), that a gallon of water taken from the Jordan contains 73 (seventy-three) grains of mineral matter, *in solution*, and as lime, in the state of carbonate, must be the principal component, it is manifest that the poorest soil, if irrigated with Jordan water, cannot help being enriched with a considerable portion of the mineral matters present in every ten pounds of water absorbed by the soil.

The fertility of the waters of the Nile is well known, and from the fact of heavy cotton crops of superior quality being annually raised from lands watered and inundated by the Nile, it is evident that the direct fertilizers are largely present in suspension as well as in aqueous solution.

A consideration of these facts will, I think, convince almost any intelligent person that the purest canal water can only be deprived of its injurious qualities by being artificially impregnated with mineral impurities of a fertilizing nature. Of these, chemically speaking, lime is the most valuable, for it requires six hundred pounds of pure water to dissolve one pound, or 7·000 grains of carbonate of lime. Therefore, if a given quantity of soil is known to contain one pound of lime, the most sceptical person must admit that 1·200 pounds of water will dissolve and wash it out of such soil with mathematical certainty. But if the water applied is itself charged with lime, its solvent powers are checked, and in place of dissolving the lime present in the soil, it will deposit a considerable portion of its own lime, at no great distance below the surface, and part with nearly the whole of it before sinking into the subsoil. If any portion of the lime be in suspension, it will be retained in the soil. In either case the action is due to chemical affinity, for the existence of calcareous clays teaches us that lime and clay will enter into combination, and we know from experience that such soils produce sugar and cotton in the greatest abundance.

A gallon of water cannot dissolve more than 116½ grains of lime, and 13¼ grains of magnesia, consequently if a cubic foot of soil contained 30 grains of the former, and 4 of the latter, and the water 86 and 9 grains respectively, no portion of the lime and magnesia present in the soil would be dissolved by such water. In like manner if the water contained 73 grains of lime and the soil 30, the water which filtered through would not be charged with 103 grains of lime, because the clay present in the soil would retain as much lime as it could, and only allow the balance to pass through. Therefore, if only 20 grains of lime were withdrawn from the gallon of water, at each operation, it is evident that the soil in place of being impoverished, is enriched. Hence it follows that if a gallon of canal water can be made to take up even 50 grains of lime per gallon, in solution and suspension, that the lands so irrigated must be enriched in proportion to the lime deposited in the soil.

Before proceeding further I would wish the reader to bear in mind that one cubic foot of pure water weighs 62½ pounds, and as one pound of lime requires 600 pounds of water for its solution, we may, for the sake of simplicity, base our calculations on the rule of ten cubic feet of water (625 lbs.) to the pound of lime to be dissolved. Now, if the soil contained 2·400 grains of lime per cubic foot, the square yard of nine cubic feet would contain 21·600 grains, or 1¼ *seers* (3 lbs. 600 grains), and the acre 181¼ maunds, or 6 tons 14 cwts. 32 pounds. Large as this quantity seems, it only gives 1⅓rd grain of lime to the cubic inch of soil, to the depth of one foot.

The native zemindar would be driven wild if called on to lime his acre of land to the above extent. But, supposing the land naturally contained this quantity of lime per cubic inch throughout the acre, (and most fertile soils contain more), the constant use and abuse of canal water, of which the zemindar thinks he can never have enough will, in time and with the certainty of fate, dissolve the lime out of his land, and once it passes the 12 inch downward limit, or gets beyond the reach of the roots and rootlets of growing plants, he may bid adieu to plenty and prosperity, until he opens his purse strings and applies at least 7½ maunds of lime to each acre of land, under grain crops, and periodically irrigated with canal water.

The Hindoos who burn their dead and, wherever permitted, cast the unconsumed skeleton into the nearest river, stream, or "*nulla*," little know that all water below the locality holds the elements of the human bones in solution, and that the dissolving process will go on until the skeleton is fairly used up. The holy Brahmin, who would sooner die than eat wholesome meat, or drink water from a well in which a bone may have been thrown, for fear of losing his precious caste, thinks nothing of cooking his victuals, allaying his thirst, and washing his oily but sacred person with water holding the elements of human bones in aqueous solution. In further illustration of this subject I will cite a note from "Liebig's Letters." "A fat pig of full size having been wounded, died; it was buried on the slope of a rising ground undrained, and naturally moist, and when the grave was opened after 14 or 15 years, there was found a thin flat cake, white internally, where the body had lain, in length and breadth corresponding to the size of the pig. This I found to consist entirely of fatty acids nearly pure, and it did not contain even a trace of bone earth, (phosphate of lime is so-called by agricultural chemists), its ashes being quite insignificant in quantity, and consisting of carbonate of lime and a little silica, evidently from the external coating. The interior left hardly a trace of ash." From these facts we learn that both rain and river water will steadily act as a solvent, and completely dissolve the phosphate of lime coming under its action. The Engineer Officers of the late Indian army were remarkable for their great intelligence and scientific attainments. The great Durand, and the illustrious Napier, (now of Magdala), Cautley, of Ganges Canal renown, and other Indian or Company's Officers of note, have given us our canals, but as agricultural science, in the days of their manhood was in its infancy in England, it was not possible for them to foresee the evils resulting from the chemical action of potable water, when used for purposes of irrigation. The Canal Officers of the present generation are in no ways to be blamed for the unsatisfactory state of affairs, their duties being connected with the fair and effectual distribution of water, and not with its effects on soils of various degrees of natural fertility. The benefits of canal irrigation were great, and it only requires a little judicious management and expenditure to restore matters to their original prosperous footing.

I, as a practical agriculturist, have shown what the zemindar must do to rescue his lands from approaching barrenness, and as the Government compels him to use canal water, it will have to do its duty by the zemindar, and to supply him with water suited to the purposes of irrigation.

The Sewallick range, not far from Seharunpore, contains untold wealth, in the shape of fossil phosphate of lime, and from Hurdwar to Cawnpore, the Ganges canal is cut through soil, the upper portion of which abounds in good "*kunkur*" lime and "*marl*".

These most valuable mineral manures are available to Government, as Sovereign Landlord, free of cost. The jails could supply convict labour to quarry both, and similar labour might be used in the construction of stout basket work. Crates made of suitable sized jungle wood. These crates, when finished, should not be more than four feet in height, six in length, and two in width, and therefore capable of containing 48 cubic feet of matter. They will have to be made by thousands and ten thousands, and when ready they must be filled with eight cubic feet of broken fossil phosphate of lime, mixed up with forty cubic feet of lime kunker, *i. e.*, kunkur which will yield lime when calcined.

The crates so charged with mineral matter will have to be deposited in regular order in the canal, so as to be under water, and by being placed close to either bank, will not interfere with canal navigation or irrigation. Smaller crates, similarly charged, will be required for "raj bahas," and water courses. This part of the work accomplished, nature will do the rest; for, the constantly flowing water will dissolve portions of phosphate and carbonate of lime, whilst very fine particles of both will be held in suspension, and as these valuable mineral matters will in due time be deposited over lands under canal irrigation, the evils resulting from the use of pure water will cease and determine, and as a natural consequence will improve after each act of irrigation, the improvement or fertility being greatest, where the soil has been previously limed by the zemindar.

The same process applied to other canals will produce like results. But if the water is not improved in the manner indicated, the zemindar will suffer under great disadvantages, inasmuch as the expense of annual liming will be thrown on his shoulders, and he will have to pay for the water which removes the lime out of the soil, and by so doing injures his land, labour, and purse, at one blow.

Trusting your readers will excuse the length of this essay, I subscribe myself as their obedient servant,

H.

Note.—"Cultivators have occasionally informed me that the productive powers of their land have fallen off after a few years of canal irrigation." The writer further on observes:—"I am not prepared to hazard any decided opinion with my present knowledge, but I would back first-class land, sufficiently watered from wells, against the best canal irrigated fields, at all events, for a crop of wheat." *Vide* letter of "SHEFFIELD" to the *Pioneer*, republished in *The Indian Economist* of the 15th May 1871, page 277-78. "SHEFFIELD" is quite right, and if the land was previously limed, not only would the produce be very much greater, but infinitely superior in quality. H.

EDITORIAL NOTES

MR. MECHI remarks upon the subject of deep and shallow drainage:—"I observe that after a dry summer, the fields drained 5 feet deep at 30 and 40 feet apart, in stiff clay, do not discharge water through the drains so early in the season as those of 30 inches deep, at closer intervals. The reason appears to me to be obvious. The 60-inch drains take the surplus water from 6,000 tons of earth, the 30-inch drains only lay dry 3,000 tons. It is easy, therefore, to understand that when the autumnal rains come, the 6,000 tons take longer to supersaturate than the 3,000 tons. The deep-drained lands had only commenced running to-day (January 8th 1869) after the recent heavy rains. Are not those extra 3,000 tons more available for the roots of plants than the same quantity undrained under the 30-inch drains for, the roots of plants descend several feet.—P.S.—One inch depth of earth gives over 100 tons per acre."

THE accompanying letter of Mr. Mechi's is also important and interesting:—

"My best field (1 bushel of seed) yielded 7 quarters 2 bushels per measured acre of fine white wheat (club-headed rough chaff) sold

for 60s. per quarter. My whole wheat crop (73 acres) will average 6 quarters per acre. The peck an acre yields 2 bushels per acre less than the adjoining 1 bushel which was over 6 quarters of white wheat per acre. The peck an acre was put in as late as the 20th of November, which I do not recommend, but was determined to put it in the same day as the rest.

THERE is an interesting correspondence, remarks the *Lucknow Times*, in the last *Gazette of India*, on the results of experiments in the reclamation of "Oosur" land in the North-West Provinces. "Oosur" land is defined as affected by the "reh" efflorescence, in other words by the periodical deposition of saline incrustations on the surface. Lands so affected are left barren by the cultivators, and except when salts are manufactured from solutions of the surface scratchings, they yield no profit to the proprietors. Two sorts of experiments have been tried for their reclamation. The most successful of these would appear to be that of digging very deep under the surface and throwing up soil not affected with "reh." The other is that of deep, thorough drainage. Both of these experiments have been tried with some success, and it is recommended that the subject should receive further attention. We have no doubt some of the landed proprietors in Oudh might be persuaded to undertake experiments so simple as these described. "Reh" is simply a generic name for all saline efflorescences, consisting sometimes of an impure sulphate or carbonate of soda (khar), sometimes a *bonâ fide* chloride of sodium (common salt) and sometimes carbonate or nitrate of potash (sujji), but generally a mixture of these. The word "reh," however, is applied, at least in Oudh, to salt of potassium only.

IN consequence of the introduction of the metric system into Turkey, the population, we are told, is thrown into confusion. Tahsin Effendi, a member of the Ulema, and late Director of the University, has invented a simple card, bearing a circle and moveable bar. The circle is divided into two halves, one bearing the old weights, and the other the new; on placing the pointer to an old weight, the other end at once shews its equivalent in the new weights.

THE Canadian correspondent of the *Scotsman* says:—"The prospect for the crops this year is very good on this Continent, and especially so in the west. In Canada, the fall and spring wheat look remarkably well, and promise an abundant yield. The weather is uncertain—to-day tropical heat, to-night unseasonable coldness, but very little damage has been done by the sudden changes either to fruit or field produce. A wide breadth of wheat has been sown this year in anticipation of high prices growing out of the requirements of Europe. Indian corn is a little backward for the season, but has yet abundant time to bring up. Oats promise well, though in some places they have been injured by long spring droughts. These are evils of almost regular occurrence in some part or other of Canada, more especially in this (the Ottawa) district."

"CAN an Englishman own land in America if he purchases it from private parties instead of from the Government? So asks an intelligent correspondent. Yes. Land is bought and sold in America, just as horses, or cattle, or coats, or boots, or cords of wood are in England. Whatever a man owns in America, he owns entirely, and can do what he likes with. And an Englishman who buys American land, and pays for it, enjoys the same privileges. As every child of a family inherits an equal share of the estate, there is no danger of property accumulating in masses as in England. When a rich man dies, his land and personal property are held in charge by the State in which he lives, until his children are of legal age, and then the State sells the property to the best advantage, and divides the proceeds equally among the heirs. It is the same with a poor man. If a responsible executor is appointed, the State interferes only to the extent necessary to see that none of the children are defrauded. —*The Free West.*

2 DEC.

THE *New York Tribune*, referring to farming in the west, mentions that a Mr. Sullivan has, in Livingston county, Illinois, a farm 8 miles square, containing 40,960 acres—64 sections Government survey. This vast tract is subdivided into 32 farms of 1,280 acres each. "Each farm has a Captain and a First and Second Lieutenant, all under control of a Commander-in-Chief. There are 15,000 acres under the plough, over 10,000 of which are this season in corn, which looks superbly. The whole of the land was taken from the Government by the present owner some 20 years since at 1 dol. 25 cents per acre, and is now worth, with the improvements made upon it, at least 2,000,000 dols." The same journal, speaking of the immense scale on which cattle-raising is carried on in Texas, states that the entire number of cattle owned in Texas is nearly 4,000,000, while New York State, with her 4,000,000 of population, eight times greater than that of Texas, has less than 750,000 head of cattle.

AMERICANS are out-stripping themselves in the way of mechanical contrivances.

"Mr. John Scott, of Brooklyn, New York, is building a waggon to run by air or steam. It is 10-horse power, with three cylinders 8 by 5, and is self-sustaining. The cylinders work three piston-rods and two follower heads. The wheels are of Moaks' patent, and are beautifully constructed, the hubs being composition and the spokes dove-tailed in the hubs, which makes them very durable and strong. It is intended to plough, sow, reap, mow, cultivate, and roll. It is so constructed that all the farming implements from the main waggon can be detached. Mr. Scott proposes taking it to Missouri, where he will use it on his own land. All farmers who have seen it during its construction express the opinion —that it is what has long been wanted, and is of such a construction that every farmer can work his land by air or steam power, which is 50 per cent. cheaper than by mules.

"IT is related of an English farmer that he condensed his practical experience into this rule:—"Feed your land before it is hungry: rest it before it is weary: and weed it before it is foul." These words should be written in the heart of every man who desires to farm, and may go far to answer the question so frequently and so anxiously asked, does farming pay? The rule demands the exercise of the qualities needful for success in every occupation, untiring watchfulness and prudent care, knowledge, forethought, energy and economy, regularity, attention to little things, personal supervision and observation —this latter, a power requiring education and constant exercise. It may not be altogether amiss to say that this power of observation, although named last, is perhaps the most important to a farmer. In this wondrous world, this panorama, as it has been called, of thought and action, of forces, currents, growth, decay special beauties are presented to the agriculturist, but, alas! while many see, few observe. Millions see only and never acquire the habit of detecting good in what they see, so as to use it; or of evil so as to shun it. It is this power of observation, trained, exercised, which in agriculture has done so much, it has reclaimed exhausted lands, fertilized barren soil, improved tools and machinery, and raised the value of stock. To this may be traced the development of agricultural chemistry. The phenomena of vegetation, and the chemical constitution of substances had previously been observed. To young men about to enter on the noble profession of agriculture, the foregoing is of value. Too many enter on its pursuit with the idea that it is easily attained, that success is an affair very much of chance, of weather, of cheap or dear land, or of market values for products. While doubtless, there is an element of truth in such thoughts, it ought to be ever borne in mind that no occupation requires more constant exercise of mind and body; that the better and educated the farmer is, the more he maintains and increases his knowledge; the more he becomes acquainted with natural and physical science, the more his reasoning faculties will be aroused, and his ability to observe increase. His observations should be recorded and studied. There

is great practical utility in the well-known saying of Captain Cuttle, "when found, make a note of." With this enhanced power to observe, and to reason on the matters observed, the farmer will be in a better position, not only to follow the simple rule already given, but by taking avail of any of the adventitious circumstances named, he will elevate his noble profession and himself."—*American Paper.*

"At a time when so much is written on the subject of emigration, when our agricultural labourers are so continually allured by fairy visions of high wages and discomfort to leave fair wages and comfort, and when our farmers are exhorted to give up the position they now occupy, sometimes rather an unenviable one, we must confess, through uncertainty of tenure and excess of game to become landlords in some dismal swamp out west, it is pleasant to read such a pamphlet as has just been written by Mr. Robert Donnell, of Dublin, entitled "Farmers, their own Landlords" : A plain tract for plain people, shewing how tenants may get "Farms Rent Free." This publication has been written to illustrate some features of the Irish Land Act, which the writer supposes have not attracted much public attention, viz., the purchase clauses of that Act. The object of these clauses is, by the aid of Government loans on easy terms, to enable farmers to become their own landlords.

"In Ireland, under this Act, a tenant can borrow the larger portion of the ascertained value of his farm from Government, which is repayable in a term of years. Thus, A. occupies a farm for which he pays an annual rent of £32-8s., the estimated value being, say £750. He can borrow from Government £500, and thus, with £250 of his own, he completes the purchase. Government asks that its loan of £500 should be repaid by annual instalments of £25. In a period of thirty-five years the debt, principal, and interest is then extinguished, and the land belongs to A. and to his heirs for ever.

Formerly, he would have had to pay as rent £32-8s. This now ceases, and payments are as follows :- -

Head rent	£	3	10	0
To Government	„	25	0	0
	£	28	10	0

or less by £3-18s. than formerly paid.

It may however be asked, supposing A. has to borrow the £250 requisite, in addition to the loan from Government, to complete the purchase, how will his annual payments stand ?

The question is answered thus :—

Head rent	£	3	10	0
Government	„	25	0	0
Five-per-cent interest on £250	„	12	10	0
	£	41	0	0
Former rent	„	32	8	0
Increase of annual payment	„	8	12	0

But if, on the other hand, A. has possessed £250, for which he would receive from the bank, on an average, 2 per cent. per annum as interest, his position would be as follows :—

Head rent	£	3	10	0
Annual payment for 35 years to Government	„	25	0	0
Loss of interest on £250	„	5	0	0
	£	33	10	0
Former rent	„	32	8	0
Increase of rent or charge	£	1	2	0

Of course, the foregoing calculations would result more favourably for A., the less he had to borrow from the Government, and the more he had of his own. The Irish Land Act, if for no other than the purchase clauses of which this case is an example, is a priceless boon to Ireland ; and Mr. Gladstone, Mr. Bright, and the Liberal party may well be proud of their legislation in this respect. But while thus congratulating Government and the country in their endeavours to heal the wounds inflicted "during centuries of wrong" (to use an O'Connellism) on the Sister Island, we are led to ask if such an Act would not, in many respects, do good in Great Britain. Probably, such an Act for England and Scotland, modified to suit the different circumstances of the countries, would be productive of good to the farming interest, and in many instances, we believe, it would be of benefit to the owners of land. At all events, it might do much to soften the acrimony displayed by agitators on the land question, as opportunities would be given, whereby the number of landlords would be increased. What we desire is a modification of the laws of entail, and greater facilities for the easy transfer of land, such as are given by the Act under consideration. Under its provisions transfer is made by simply changing a name on the record, thus avoiding that worst of all human ills—an Attorney's Bill."

ENGLISH FARMING:

IRRIGATION AT STOKE PARK.

For many years we have recommended Mr. Brown's system of irrigation : it is much more worthy of our commendation now that he has placed his pipes below the ground, where covetous hands cannot steal nor horse-hoofs hurt the pastoral life-diffusing lead. We have received a report, the truth of which is attested by the owner of the farm, Mr. Coleman, which we subjoin. After personal inspection, we hope to give a fuller account next week.

This system of irrigation was laid down in the end of August 1870, upon 20 acres of pasture land, with a soil chiefly composed of a silicious clay, slightly calcareous, but from a want of loam, mould is liable to become crust-bound in dry weather ; it is, however, rich in the mineral constitutents of a productive soil, and may be classed with that of the well-known brick earth of slough. On the 5th of September, with temporary engine power, watering was commenced, the land was top-dressed with the British Rivers. Irrigation manures and irrigation was continued at night until the end of the month. Notwithstanding the lateness of the season, the soil dried up, and vegetation having disappeared from the surface since the previous June, yet on the twenty-third day after watering, a very thick set growth of about 9 inches of superior feeding grass was produced, and by the middle of October it became a large crop, which was cut and given to stall feeding cattle, and the land after was successfully grazed with sheep until the end of the year, while the adjoining pasture unirrigated, and in every other particular the same as that over which the irrigation had been conducted, remained unproductive, although rain to some extent had fallen during the autumn.

The value of the cut grass and the grazing upon the irrigated land may be estimated as equal to that of an average crop of turnips, as such grass, weight for weight, is equally rich in beef and mutton constituents, or its money value may be fairly put at £5 per acre for an autumn crop. In the spring of this year (1871), from delay in erecting the engine and pump now upon the irrigated land, operations were not commenced until the last week in March, and from five to six weeks of the best spring weather for watering and utilizing manure were lost in consequence, yet a very large crop of hay, chiefly perennial rye-grass was fit for cutting by the second week of May.

It was estimated by practical judges to yield 2¼ tons per acre, and from its having been secured in fine condition without getting any rain, it became the best description of good horse hay, and at the present July market price, its value in London is not less than £7 per ton, as hay not equal to it has been sold during this and the last month from £8 to £9. On cutting this crop, a portion of it on the same day was removed and made into hay with that upon the unirrigated land, which gave facilities for at once watering the ground from which it had been taken. This had the effect of producing a second crop of perennial rye-grass of a large growth, which was fit for the scythe in the second week in July, such a result is, as a rule, unknown to agriculturists. A portion of the ground was measured, and the grass weighed, gave a yield of 12½ tons per acre, or about equal to 2½ tons of hay ; while the unirrigated land, which had its first crop cut on the same day as the irrigated, only gave one-fourth of this weight as a second crop, although much rain had fallen during its growth, in the absence of which a mere fraction of this would have been the result ; proving that even in a season such as 1871, the coldest and wettest (from April to August) there has been since 1862, that this system of irrigation has a three-fold advantage over any ordinary means pursued by agriculturists in the cultivation of grass or hay. This arises from the facilities given by the system for tempering the soil, and utilizing manure by the necessary moisture for promoting a perfectly developed and large growth, and from the operation of watering being conducted during the night, at such a trifling cost, a continuous process is secured by its application from March to November. The quality of such grass being suitable for the production of beef and mutton, without help from "feeding stuffs," is guaranteed, from the fact of its having been made at Stoke Park into the best description of hay ; and this to the intelligent grazier, will be sufficiently convincing that it is not to be classed with such as that obtained by the "flooding system" from "water meadows," or that produced by "sewage irrigation."

The successful results obtained at Stoke Park by the British Rivers' Irrigation, since last September, undoubtedly warrant the step just taken by Mr. Coleman, in extending it over the whole of the pasture land upon his estate, to the east of the 20 acres put down last autumn. The under-ground system of the patentee has been adopted over the whole of it, and is one which recommends itself for every description of cultivation. Its distribution of moisture is that of a perfect rain shower, according to the power used over several acres simultaneously; and hundreds during the night, by the superintendence of an engine-man and a tap-boy, can be perfectly watered even during the hottest weather. The whole of the plant of which the under-ground system is composed, once laid down is, so to speak, as permanent as land: it is perfectly secure from injury in the grazing of sheep, cattle, or horses, and will not interfere with steam or the ordinary means in use for the cultivation of land. There is nothing to be seen above the surface which renders it peculiarly adapted for the watering of parks and pleasure grounds, and from the quantity of water necessary for irrigating being small, there is no place which possesses a well-spring with ordinary resources for storing the water during autumn and winter, but will enable its proprietor to irrigate many acres of land upon this system.

The estimated value of the produce upon the irrigated and unirrigated land, appended to this report, is for the cut grass and grazing of last autumn, with the hay crops in May and July of this year, which stand as the value for a seasons' growth. It may be considered that the unusually high prices in June and July for hay gives an exceptionally high value for the produce of an acre, but if put at the average, £4-10*s.* per ton for the last five years, and take into account the want of an average temperature for conducting irrigation during the spring and summer months of this season, undoubtedly one of the coldest there has been for the last ten years, with the lateness of commencing the irrigation at the end of March instead of the middle of February—will sufficiently account for the loss of from 1 to 2 tons of hay; this, added to that obtained and taken at £4-10*s.* per ton, combined with the autumn grazing from August to November, would amount to not less than £35, and is not overstating the value of an acre of irrigated land, from similar results having been obtained by this description of cultivation.

The item for fuel and superintendence in the report (30*s* per acre) is 50 per cent. more than it would have been, had 100 acres been under irrigation. The consumption of the fuel would not have exceeded 5 lbs. per horse power per hour, and for twelve hours' working during one hundred nights (about the average time necessary in a season) with coal at 15*s.* per ton, is under 5*s.* per acre, and the wages of an engine-man at £1, and a tap-boy at 10*s.* per week, from February to the end of September, and charging the whole of their time against the irrigation, is under 10*s.*; but the same superintendence with adequate engine power would work 500 acres in the same time and reduce this item of 10*s.* to 2*s.* and with a further saving of fuel, which would undoubtedly be obtained, the amount 30*s.* for it and superintendence, would then stand at 5*s.* to 7*s.* 6*d.* per acre, while that for manure, in comparison with the amount named in this report, would, for grazing and cropping, be reduced by one-half. The item for dung costing 16*s.* per load, includes the cost in London, cartage to, and with 20 miles of railway carriage, 2½ miles cartage to Stoke Park, labour in turning over the manure during its being further decomposed, cartage to, and spreading upon the land, and estimated value for the loss of weight, the manure sustained by the time it left London in August 1870, to January 1871, is an expenditure for manure upon the surface that no other system of cultivation, taking the risk of the weather, could have shewn a profit upon, such as the British Rivers' Irrigation has shewn at Stoke Park during the present season.

Particulars of value of produce and cost of production of grass and hay upon the irrigated and unirrigated land in Stoke Park:—

UPON THE IRRIGATED LAND.

Cost of production per acre.

	£		
Interest upon plant at 5 per cent.		1	10 0
Superintendence and fuel		1	10 0
Cost of top-dressing with British Rivers' Irrigation manure, September 1870		2	10 0
Ditto, with London horse and other dung spread upon the surface, 10 loads at 16*s.*		8	0 0
Ditto, with British Rivers' Irrigation manure in March 1871, ...		1	16 0
Ditto, in May 1871.		1	4 0
Cost of making first and second crop of hay		2	10 0
Per acre		19	0 0

Value of produce per acre.

	£		
Value of first crop of grass and grazing autumn, 1870. £		5	0 0
Ditto, spring crop of hay, 1871, 2½ tons at £7		17	10 0
Ditto, summer crop of hay in July, 2½ tons at £7 ..		17	10 0
	£40	0	0
Less by cost of cultivation per acre		19	0 0
Balance in favour of produce		21	0 0

UPON THE UNIRRIGATED LAND.

Cost of production per acre.

	£		
Top-dressing with British Irrigation manure, February 1871		1	16 0
Ditto, in May		1	4 0
Cost of making first and second crop of hay		2	0 0
£		5	0 0

Value of produce per acre.

Produce from June to December 1870—No value.

	£		
Hay crop cut in May 1871, 1½ tons at £7.. ..		10	10 0
Ditto, in July, fourth of the irrigated crop of 2½ tons, at £7		4	7 6
		14	17 6
Less by cost of cultivation per acre		5	0 0
Balance in favour of produce		9	17 6

Since irrigation was commenced upon the under-ground system for the autumn grazing at Stoke Park, in the second week of this month, favourable weather with a high temperature has prevailed, and an extraordinary large growth has been produced upon the irrigated land, considerably more than that obtained for a similar period during the months of May, June, and July of this season, while the whole of the park and hay land, unirrigated, are at this date scorched and dried up

THE SURFACE-MANURING OF WHEAT AND GRASS CROPS.

The present being a suitable period for applying ammoniacal manures to autumn-sown wheats, young grasses, and clovers, and meadows, a few practical suggestions as to the use of these manures may prove of benefit to farmers. Some persons may be deterred this season from purchasing these manures for surface application, owing to the comparatively high prices at which they are vended. The price of sulphate of ammonia is higher than it was in previous years. This has arisen owing to the demand for this fertiliser. In the case of Peruvian guano, from the great variations in quality and the general inferiority compared with the shipments of previous years, the ammonia furnished by this manure is uncertain in amount, and may otherwise be procured at a cheaper rate. Nitrate of soda is relatively cheaper than Peruvian guano, and the supplies apparently sufficient to meet any extra demand. The question, however is, will agriculturists be repaid for the outlay necessary to procure a sufficient quantity of one or of all these fertilisers for surface-manuring? There is sufficient evidence on record to show that a liberal use of ammoniacal manures, such as nitrate of soda, purchased at higher prices than those at present ruling in the market, is a profitable expenditure of money—the increase of grain, straw and hay, more than repaying the outlay. No doubt the question of profit or loss depends in some measure upon the price of grain after the manure has been applied to a grain crop, and in the case of manures applied to grass and meadow lands upon the price of hay. The experiments in growing wheat conducted in the county of Norfolk and recorded in the English Society's *Journal*, proved that an application of 1½ cwt. of nitrate of soda to the acre, gave an increase of from 6 to 7 bushels. There are also recorded in that Society's *Journal*, numerous experiments which prove that the pecuniary benefits arising from a liberal use of ammoniacal manures to grasses and clovers intended to be cut for hay are so considerable as to warrant their more general use along with other fertilisers. We know of unrecorded experiments which bear out an estimate, since made, that 1½ cwt. of nitrate of soda will generally increase the produce of hay made from a mixture of rye grass and clovers about 50 per cent., or about one ton per acre.

There are several reasons why farmers should not hesitate this season to top-dress nearly the whole of their wheat and young grass fields. It will at once be apparent to almost every farmer that autumn-sown wheat at the present time are backward in growth, and not a few fields are deficient in plant. Hence the necessity for the plants being stimulated by ammoniacal manures, so that in thin planted fields they may tiller and in both cases may form vigorous stalks. Judging from the present prices of wheat, and the accounts received from the Continent, more especially France, the wheat crop of Europe, in the ensuing harvest, will not exceed, if it reaches, an average. In France there is a much smaller area than usual under wheat, while in the forty departments which have been overrun by the German army the damage done is stated to be very great, especially in some of the best corn-producing districts. Not only have the wheat plants been trampled down, but a large portion of the land is still unseeded. Such lands can produce almost no corn. Besides the injuries arising from the inroads of the hostile armies, the severity of the frost experienced during the winter partially killed over a large area in the north-eastern departments, the wheat plants, and re-seeding with wheat has not generally been adopted. In England, the injury arising to the wheat fields from the severity of the frost has been so far mitigated by the very general sowing, recently practised, of Talavera and other early varieties of wheat.

All these circumstances, therefore, do not justify anyone in anticipating that the ensuing year will be one of cheap corn, more especially of wheat.

As regards the hay crop, the high prices which have been ruling in England and France have tended to diminish the amount of hay in Scotland. Although the prices have been comparatively high, considerable shipments have been made from ports in the Firth of Forth to French ports—the prices, delivered in France, being in some instances upwards of £9 per ton. The hay forwarded to England has generally been sent by railway. The amount of the hay crop of 1870, available for supplementing that of 1871, is necessarily unusually small; and the inference from this state of matters is, that prices will be rather above the average.

With these preliminary remarks, we proceed to give a few plain directions as to the application of manures to the surface for stimulating the growth of wheat and grass.

Nitrate of soda and sulphate of ammonia may be used separately at the rate of say 1½ cwt. per acre. A mixture, however, of nitrate of soda and sulphate of ammonia will generally prove more effective than an application of either of these manures singly, particularly if the land is situated in a somewhat moist climate. Common salt, at the rate of 3 to 4 cwts. per acre, may be added to the ammoniacal manures. If the nitrate of soda and sulphate of ammonia are to be mixed, they should be thoroughly incorporated and applied at the rate of 1½ to 2 cwts. per acre. In those cases where the fields are thinly planted, light harrows may be passed over them after the manure has been applied, a roller following the harrows to compress the loose earth at the roots of the wheat plants. If the surface soil, however, is very loose, harrowing should be avoided, and a heavy roller, such as Crosskill, passed over to compress the surface, so that the wheat plants may not wither under the influence of drying winds and alternate frost and thaw. In districts where the climate is humid, and the rainfall during the summer considerable, a mixture of sulphate of ammonia and guano from the Cincha Islands may be used to top-dress the crop in the proportion of 1 cwt. of sulphate of ammonia to 2 cwts. of guano to the acre. If first-class guano cannot be obtained, 3 or 4 cwts. of good superphosphates may be substituted with advantage. As a rule, after manures have been applied, the fields should be rolled.

In all cases where manures are applied on the surface to grain crops, it is advisable that one or more portions of the field should be left undressed, so that the actual results may be ascertained.

Young grasses and clovers, when in a growing state, quickly show the fertilising influence of ammoniacal manures, especially when the weather is damp and comparatively mild. It will generally be found profitable to top-dress young grasses which are to be depastured by sheep, as by this means the fields will keep a greater number of animals during spring—a time when food is scarce, particularly grass.

It is, however, when the grass crop is intended to be cut for hay that surface-manuring will prove most profitable. A mixture of nitrate of soda and Peruvian guano is generally to be preferred to either substance applied singly. Much, however, depends upon the situation of the field and the character of the weather during the months of May and June. Nitrate of soda or sulphate of ammonia appears to act more powerfully upon the young grasses than upon the clovers, while Peruvian guano stimulates the growth of the clovers as well as of the rye grass. Superphosphate of lime can often be substituted with advantage for Peruvian guano—the same money-value being applied per acre. An application of 1 cwt. of nitrate of soda, and 2 cwts. of Peruvian guano will cost from 45*s.* to 50*s.* an acre, being rather more than the average value of half a ton of hay. But as the increase in the weight of hay is seldom less than one ton per acre, the expenditure on manures will almost invariably be repaid—always provided the season is suitable for the action of these manures—that is, comparatively moist and mild. When the season is unusually dry and arid, the growth of both clovers and grasses is necessarily stunted, particularly that of the latter. This was the case in many districts last season, both in Great Britain and in Northern Europe generally. But in such seasons the market price of hay is usually above the average, and consequently, although the increased weight of hay may not come up to the expectation, the profit from the application is usually sufficient to warrant a more general adoption of the practice of top-dressing young grasses.

As regards meadows intended to be cut for hay, surface-manuring generally proves most profitable. The growth of grass is not only largely increased, but its nutritive qualities are augmented. The quantities of ammoniacal substances may be almost double the quantities allowed for young grasses. An application, therefore, of 2 to 3 cwts. of nitrate of soda may be used, or an equivalent quantity of sulphate of ammonia may be put on to force a luxuriant growth of the natural grasses. Phosphatic manures almost invariably exercise a marked influence on meadows, particularly when applied to those which have been occasionally cut for hay, and on which dairy stock have been depastured. Ground bones and bone-meal, or superphosphate of lime produced from bone-ash, will generally be found the cheapest source of phosphoric acid for application to meadows. Superphosphate of lime manufactured from mineral phosphate is more suitable for comparatively light soil than for clay loams. The quantity applied may vary from 3 to 5 or even 10 cwts. per acre.

PHOSPHO GUANO.

The application of which to various cereal and root crops in this country has been attended with success is now, we understand, about to be applied in "fresh fields and new pastures." The Directors of the Phospho Guano Company, (Limited), thought the guano would be a useful stimulant for the tobacco plant; but not wishing to describe it as such without competent authority, submitted it to the test of Professor Voelcker, Chemist to the Royal Agricultural Society of England. His opinion (which, it will be seen, fully bears out the idea of the Company as to its value in tobacco culture), dated the 26th August, we have now the opportunity of giving. The Professor says:—

In reply to your inquiry respecting the use of phospho guano to the tobacco plant, I beg to inform you that, in my judgment, phospho guano is a valuable fertilizer, which may be used with much advantage by Cuban planters.

It is no longer a matter of theory, but a well-established fact that manures rich in readily available phosphates improve the quality of every description of agricultural produce, and hasten the maturity of our crops.

I do not hesitate therefore to say that a manure so rich in soluble phosphates as phospho guano, will have a most beneficial effect upon tobacco, especially when grown on naturally unproductive soils, or upon land which has been too abundantly manured with animal organic matters, Peruvian guano or ammoniacal salts.

An excess of nitrogenous or ammoniacal compounds produces heavy, but imperfectly ripened coarse crops of tobacco. Phospho guano, on the contrary, promotes early maturity and a fine leaf, and thus it is particularly valuable when the planter aims to produce quality rather than quantity.

On light land, which has been much exhausted by the constant growth of tobacco, I would recommend phospho guano to be mixed with muriate or sulphate of potash in equal proportion, and if the planter wishes to grow rather a heavy crop than tobacco of the finest quality, he may, with advantage, use nitrate of soda and potash salts in addition to phospho guano.—*The Farmer.*

SEWAGE UTILIZATION.

Mr. Mechi writes to us describing a visit, on Thursday, to Mr. Hope, Breton's Farm, at Hornchurch, 3½ miles from Romford, from which town all its sewage flows through an 18-inch iron pipe, Mr. Hope paying to the town 2*s.* per head or £600 per annum, for 6,000 inhabitants using closets: and the cost of the town of raising all the sewage 25 feet at Mr. Hope's farms is, including coals, engine-driver's wages, and interests and wear and tear of engine, about £300 per annum. Mr. Mechi says:—

"My last visit to this farm, as recorded in your columns, was in September. Ever since then, in all weathers, the sewage has flowed constantly on the land, which consists of 120 acres of poor gravelly and sandy soil with occasional veins of stiffer soil.

I saw the engine-driver and farm men looking as healthy as need be, although he and the four sewage regulators are for ten hours a day in almost immediate contact with the sewage. There was the black sewage flowing over the land, and after passing through it to the drains, 5 and 6 feet deep, coming out as clear as the finest spring water. The day was very warm, so we all had a hearty draught of it without any inconvenient result. Mr. Hope uses it over again mixed with sewage, except when there is heavy rain. It thus appears that, in his case, the flood or rain water mixed with the town sewage does not over-dilute it, although the question is arising whether the sewage and flood waters of towns and cities should not be separated. I presume that would depend upon the nature of the soil to which it is to be applied, and also to the amount of town water supply. Every crop on the farm was looking the picture of healthy and abundant growth, and it was wonderful to see French beans growing on a portion of the land that was almost pure gravel. The temperature of the sewage during frost being many degrees above freezing, the irrigation after a night's frost melts the ice in the ground and enters the soil. Onions, carrots, cabbages, potatoes, strawberries, &c., were all promising, and a second cut of Italian rye-grass, 2 feet to 3 feet long, gave unmistakable evidence of the value of town sewage as a producer of food for man and beast. We are much indebted to Mr. Hope for permitting, so liberally, a view of these interesting proceedings. The Romford sewage amounts to about 250 gallons per minute, average of day and night. The engine, therefore,

puts on about 600 gallons a minute for ten hours. The engine-driver has 4*s.* a-day, and the engine consumes 11 cwts. of coal per day. The parish authorities attempted to rate Mr. Hope on the amount he paid annually for the sewage, but on his saying that he was content with this, provided they rated all the other farmer's and market gardeners on the cost of their manure, they saw the impropriety of it."—*Times.*

AMERICAN AND ENGLISH FARMING.

THERE are Americans who do not think that their country can "lick creation," who grumble, in fact, and make "odious comparisons" of themselves. Take, for instance, the following, by "G. G.," who writes to the *Albany Country Gentleman* :—

The agricultural condition of both countries should be dispassionately considered, and the difference of the customs accounted for, after which the prices made at the present day and in times past may be compared to shew what reason there may be to complain.

There cannot be any cause for grumbling in the east, for everything grown has a ready market, and all kinds of meat and dairy produce are making proportionately more than hay and grain, which state of the market is a premium for good farming : consequently, any man having capital or credit to obtain live stock, must be weak in his upper story if he sells aught for which he could make more by manufacturing it into meat or dairy productions.

Butter was sold in Orange county since 1860, at 16, 14, and 12 cents per lb ; and previous to that date it never went over 20 cents per lb. Cider was 2 dols. per barrel, and I bought a first-rate hind quarter of beef at 4½ cents per lb. ; and a year or two after, on Long Island, I bought the same quality for 6 cents. Now, the price of meat and butter is almost treble, and there are men to be found in the State of New York who reduce their live stock to sell hay. Can this be possible? some people may say. In days past pork was proportionately low in price, yet though the feeding of pigs, thoroughly fat, gives the greater quantity of the richest manure for the farm, how very few hogs are fed in the east. The western men who cannot get much more than half what the eastern men can sell theirs for, supply the great bulk brought to market—in fact the far western farmers do not obtain half the price for their pigs. Again, the English farmers buy American corn to help to feed their bacon, thus manufacturing what the American farmer impoverishes his land to grow and send to England, into manure for land as well as into meat for sale, and what makes it more surprising is, that the land the American exhausts and completely wears out, is his own, while what the Englishman improves and so highly fertilizes, is held only from year to year under his landlord. Does not this look very extraordinary? How can any intelligent man account for such incongruity!

An English tenant-farmer, paying a money rental half yearly, and liable to be noticed out by a six-months' notice, buys corn, brought 3,000 miles, to fatten animals, chiefly for the sake of the manure. An American Yeoman, owning his land and possessing capital to invest in other speculations, and in some instances living in first-class style, sells his hay and feeds no animals for the purpose of enriching his own property, the same as the English tenant does that of his landlord.

Let any sane man dwell on this subject a few minutes; in the first place, it proves that confidence, unusual in any other country, is exhibited by the English tenant, and consequently there must be more honour and nobility in the aristocracy of England than minds devoid of these qualities consider possible, and on the other hand, there must be little patriotism in any man who will set or follow such an example. For any man to sell hay at 15 dols. per ton, corn at 1 dol. 25 cents per bushel, &c., &c., growing no nutritious winter food, and his land requiring manure, seems imbecility.

You cannot argue with such men. They have no perception, "they have eyes, but see not; and ears, but hear not;" and the blind continue to lead the blind and will, till the country is ruined, and then what an up-hill fight it will be to regain the vitality sold out of the land! It is deplorable in the extreme to contemplate the evils inflicted by the present generation on future agriculturists.

Farming cannot pay where the land is so poor as only to grow half crops, and there are not half crops grown on much of the best land in the eastern part of the American continent, and on at least half of it, the crops do not yield one-third of what they would with a renovating system of farming.

The expense of cultivation would be little more under a good system than it is now ; there would be more labour in harvesting three times the bulk of grain and corn, of course, but let any of those farmers who do not like to see such writing as this in a newspaper, say whether there would not be more prospect of remuneration with three-fold crops, even though the expenditure is doubled. But when the farms are in a fertile state, when the land has been brought into a state to grow 75 bushels of corn per acre instead of 25, and grain, &c., to a comparatively increased yield, by the manufacture of most of it into meat, pork, &c., the cropping can be repeated oftener, so that not only will there be 75 instead of 25 bushels per acre, but the number of acres on the same farm can be doubled, as there will be such a vast increase of manure.

I have grown white turnips on this continent which had bottoms large enough to feed to hogs in July, which in hot weather are a wonderful help when given raw, just as they are carted from the field ; clover can be given previous to this time, and with a moderate quantity of corn or grain, the hogs will grow as fast again, and feed with the growth, for this vegetable food is what is wanted for pigs of any age to keep them healthy, and make them pay for feeding. Roots are required in this country quite as much as in England ; they can be grown and fed on the land in the months of September, October, November, and a part of December, and in the north there may be very fine white turnips for aught requiring them all through August. Do not let anyone say this is theory, for there is positively nothing stated here, or in any of my writings, which I have not carried out myself, or which I cannot practically illustrate again.

There is another matter to mention in the agriculture of America and England, which is of very much more importance than some may imagine ; it is the age at which animals are fed for the butchers. Cows and ewes are kept in the herd and flock too long, for it is very bad policy to fatten old cows or ewes ; it takes more to feed them, and when ready for market they make less money. English farmers are very particular in this respect. With swine, the error in America is in not making them heavier weights, for if farmers would fatten from the time of birth, instead of half-starving pigs the first six months of their life, every one of the pigs only weighing 200 lbs. would be 400 lbs. or more.

STEAM CULTIVATION.

THE following is the full text of the Memoranda made by Professor Wilson, of the Edinburgh University, and Mr. P. B. Swinton, Holyn Bank, upon the working of the Thomson engine and Fisken's system of steam cultivation, to the Highland and Agricultural Society of Scotland. They will be read with interest at the present time :—

The ploughing took place in a large field at Dunmore Park, which had lain about 40 years in grass, and was nearly level The soil was a strong clay, and in good order for ploughing. The engine is of 8 horse power, and weighs 7¼ tons, with vertical boiler and cylinders. It runs on three wheels with India rubber tyres, each 2 feet broad, and covers a space 7 feet wide. The steam-guage, when the engine was drawing the plough, indicated a pressure of from 120 lbs. to 125 lbs. per square inch. Five cwt. of coal and 700 gallons of water are stated to be consumed in a day of nine hours. The plough is a balance-plough, made by Gray, of Uddingstone, and is the first of the kind which has been constructed. The plough had three mould-boards. The engine travels on the unploughed land, dragging the plough behind it. The length of furrow was 12½ chains, or 275 yards. The furrows made by the plough were 6 inches deep by nearly 9½ inches broad, and were fairly turned, considering that the ploughman had not much experience of the work. A heading, 20 yards wide, was left at each end of the field for turning the engine. To travel the distance of 275 yards and to turn the engine, and attach it to the plough ready for the return journey, occupied a space of eight minutes ; and this required considerable activity on the part of the engine-driver, when turning the engine. The engine was driven by one man, with a boy to attend the fire, and watch the pressure and water-guages. The engine carried a supply of coals sufficient for four hours' work and four hours' supply of water. The plough was steered by one man, whose duty also was to hook and unhook the engine to the plough at the commencement and end of each journey. At the rate at which the engine and plough were working, viz., three furrows, 28 inches wide, and 275 yards long, or 214 square yards, in eight minutes, the time required to plough an imperial acre was within a small fraction of three hours; and supposing the plough to work nine hours a day which, taking the average length of days in the ploughing season, is a full allowance, it would turn over 3 imperial acres per day, or about what three pairs of horses would have done. It was observed that while the three ploughs turn over a space of 28 inches wide, the engine-wheels cover a space of 7 feet wide, so that the wheels of the engine pass three times over the land before it is turned by the plough. It was also noticed that the engine passing over the land depressed the surface about 1½ inch, and the soil was also compressed to this extent. The Highland Society's self-registering dynanometer, made by Messrs. Easton, Amos ; and Anderson, of London, was tried on

the engine and three-furrowed plough, and indicated a draught of 21 cwt. A common swing-plough, drawn by two horses, was tried to ascertain the difference in draught on the land in its natural state and where the engine had passed over, and it was found that the land, where compressed by the engine, required an additional power equal to the draught of 1 cwt. the single plough making 6 cwts. on the unpressed land, and 7 cwts. on that which the engine had passed over. The committee were desirous of seeing the engine and plough at work on stubble or ploughed land, but Lord Dunmore had no field on which it could be shewn. The committee would also wish to see the engine and plough tried in a field with considerable slope. Lord Dunmore handed to the committee the following statement of the cost of his apparatus, and of the daily expenditure in working it :—

Cost of engine, 8-horse power	£700	0	0
Cost of ploughs, three-furrowed	70	0	0
Cost of water tank	30	0	0
	£800	0	0
Interest on 8-horse power engine at 5 per cent. ..	£35	0	0
Depreciation in value and wear and tear, 7 per cent.	49	0	0
	£84	0	0
Allowing engine to be under steam, four days a week = 208 days, which gives 8s. 1d. as daily cost for engine ... . £	0	8	1
Ploughs, cost £70, at 5 per cent. on outlay, and 5 per cent. for wear and tear £7 per annum, and for 100 working days, that would be 1s. 5d. per diem	0	1	5
Tank would cost £30, which at 10 per cent. = £3 per annum, would give for 100 days	0	0	7
Engine driver's wages at 24s. for 6 days	0	4	0
Boys, at 1s. per diem	0	1	0
Ploughman at 2s. 6d. per diem	0	2	6
Coal at 4d. per cwt., 5 cwts.	0	1	8
Oil and waste	0	0	6
	£0	19	9

Autumn stubbles—in ten hours ploughing, we could do 7 acres easily equal to 2s. 9d. per acre; spring ploughing lea, 5 acres, equal to 3s. 10d.

Fiskens' system of Steam-tillage.

Having, together with Professor Macquorn Rankine, been appointed by the Society as a deputation to inspect the working of the "Fisken system" of steam tillage, we proceeded (April 10) to the farm of Offerton Hall, near Sunderland, in the occupation of Mr. H. M'Laren, where the "system" has been in operation during the past winter, 440 acres, we were informed, having been ploughed or cultivated on the farm since October last. Professor Macquorn Rankine was unfortunately unable to attend. The farm is of an undulating surface of about 500 acres in extent, and lying on the magnesian limestone. The fields appeared to have been deeply tilled, and the soils of varying textures were in a dry and friable condition. When wet, their tenacity would be greatly increased. There were no stones or other obstacles met with while the work was under our observation. Before giving the result of our inspection, it will be well briefly to describe the peculiarities of the "Fisken system" of working, as, although it has been before the public for several years, from various circumstances it has not hitherto taken a prominent position in the competitive trials of steam-tillage, which have from time to time been held. The "system" differs materially from the other "round-about" modes of applying steam power to tillage purposes. The engine which gives off the power may be placed in any convenient spot adjoining the land to be ploughed, on a roadway, or by a spring of water for instance, and the power given off is conveyed by means of light hemp rope (½ inch diameter) travelling at a high velocity —say 24 to 25 miles per hour—round the area to be operated upon, and communicating with two windlasses placed on opposite sides (headlands) of the land to be tilled. This high velocity, when communicated to the windlasses is, by a simple mechanical arrangement, reduced to any desired speed—say 2 to 3 miles per hour. This change of velocity being necessarily associated with the corresponding increase of tension of the ropes in the exact ratio of the rate of reduction of velocity (less, of course, the amount consumed by friction, &c). Thus an initial velocity of 30 miles an hour, when reduced at the windlass to 2 miles an hour, would correspond to an increase of tension (hauling power) equal to the rate of reduction—or 15 to 1. A strain or pull of 1 cwt. on the hemp travelling rope at the engine is therefore increased to a strain of 15 cwts. on the hauling rope (steel wire) working between the windlasses. In the transmission of power from the engine to the working implement, a loss will always take place, greater or less in proportion to the extensibility and elasticity of the travelling rope, and to the friction of the various moving parts of the engine and tackle. The implement—whether plough, cultivator, or harrow—is drawn by the steel wire rope backwards and forwards between the windlasses at any speed that may be desired. The mechanical arrangements of the windlasses enable the man in charge to haul them forward at the end of each "bout" and also to stop and start the implement at work the required distance with perfect precision, without communicating with the engine driver. Owing to some delay in reaching the farm, we found the work already commenced on a 14-acre field, of an irregular parallelogram shape, with a slight, but increasing gradient, along the time of working. The engine was placed near the entrance, and close to a watercourse, from which it pumped its own supply. The engine was one of Cleyton and Shuttleworth's 12-horse power double cylinder traction engines, with 8·25-inch cylinders, and 12-inch stroke, and having a "grooved" fly-wheel 5 feet in diameter round, and by which the travelling rope was driven at the same speed as that of the periphery of the wheel, itself. The engine consumed about 1½ cwt. of coal, per hour, when at full work. The travelling rope was ½ inch in diameter, and made of the best Manilla hemp expressly for the work, in lengths of 250 yards, each length weighing about 112 lbs. Five lengths were required for the field. The rope, 1,250 yards in length, and weighing about 5 cwts., was carried round the field at a height of about 3 feet from the ground on light porters, with friction pulleys placed at distances apart of 50 yards on the light and 30 yards on the slack side of the windlass. The proper tension of the rope was regulated by a lightening pulley under the control of the engine-driver. While at work we timed the speed of the travelling rope and found it varying from 35 to 40 miles an hour. The "hauling" rope was of steel wire, ⅛th inch thick, and 800 yards long, equal to a straight draught (furrow) of nearly 400 yards long. The implement at work was one of Fowler's reversing cultivators, working 7 times, and covering a breadth of 6 feet, and set a depth of 8, increasing to 11 inches. The field had been steam-ploughed with a 10 by 8-furrow in autumn, and was now being cultivated for potatoes. The distance between the windlasses (headlands) was about 200 yards, and the average length of furrow was 190 yards. The double "bout," including the turning at both ends, took from four-and-a-half to five minutes, according to the depth of working, giving a working rate of about 2 acres per hour. The wire hauling rope, we noticed, was allowed a trial on the ground, Mr. M'Laren considering that the friction and extra wear and tear of rope was not equivalent to the cost of porters and attendants. The work was done in a perfectly satisfactory manner, no hitch or difficulty was experienced in any of the movements of the implement or of the machinery. The fly-wheel made from 180 to 200 revolutions per minute, and the pressure increased from 60 lbs. to 75 lbs. per square inch, as the depth of working was increased. Every part of the machinery appeared to be under perfect and immediate control. At our request, the cultivator was stopped several times while working 11 inches depth, and started immediately, without any apparent difficulty or strain on the machinery. The number of persons engaged was four—two windlass men, one plough man, and one engine man. From these data it is seen that (at 70 lbs. pressure) the engine was giving off a power equal to about twenty horses, while the cultivator was at his work. Not having any means (dynamometer or friction breaks) at our command to see how this power was consumed, that is to say, divided between the working of the engine itself, of the "travelling" and of the "hauling" rope, and of the windlasses, we could only obtain information from one Mr. M'Laren, who gave us the following as the result of his practical observations :—The engine, when working at the rate of 160 revolutions per minute, required a pressure of 8 lbs. per square inch to set its own parts in motion, and an increasing pressure of 12 lbs. per square inch, or 20 lbs. in all, to give motion to the full length (1,600 yards) of the "travelling" rope. This would be equivalent to a consumption of rather more than 2-horse power by the engine, and of 3-horse power by the rope, or a loss of at least 5-horse power before the strain or pull reaches the windlasses. These details require to be tested by direct and careful experiment, as also does the power consumed by working the windlasses, before any just estimate of the effective force or actual working efficiency of the tackle can be arrived at. Another important element for consideration, which has a direct money equivalent in the calculations, is the time required to set and adjust the tackle, to take it down again, and shift it to another locality. Mr. M'Laren informed us that they could begin to work in two-and-a-half hours after the engine and tackle reached the spot, and that they could take all up again in one and a quarter of an hour, or about four hours in all. Mr. M'Laren also informed us that he had ploughed a field of 33 acres without having to shift the tackle at all, and another of 55 acres without having to move the engine which was placed advantageously close to a supply of water. We were also informed that the engine and the whole of the tackle had remained out in the fields during the whole of the winter, and certainly without any apparent deterioration to rope or machinery. The main advantages claimed for the "system," simplicity and economy of working arrangements of first outlay, and general adaptability to fields of varying size and shape appear to be substantially borne out by the practical success it has achieved on Mr. M'Laren's farm. Until, however,

it has been ascertained by direct and careful testing what amount of power is consumed by friction, &c., and what amount of time is consumed by the arrangement of the tackle, it is not possible to give any judgment as to the practical efficiency of the "system," or its comparative economical application. If the verdict on these points be satisfactory, we shall no doubt soon see another and a powerful competitor for public favour in the field of steam-tillage, and Mr. Fisken will be entitled to the thanks of the agricultural community for having successfully worked out a new mode of applying steam-power to the mechanical forces of the farm.

P. B. SWINTON, Holyn Bank.
JOHN WILSON, Edinburgh.

Edinburgh, April 28, 1871.

Note :—Although we have said that the rate of working of the apparatus, when under our observation, was about 2 acres per hour, it is right to mention that, having left the field for about an hour, on our return we found that the amount of work done in our absence was only equal to 1¼ acres per hour. From whatever cause this arose, there did not appear to be any want of steam-power, as when the engine was stopped, steam immediately blew off from the safety-valve.

P. B. SWINTON.

AGRICULTURAL STOCK:

THE BULLOCK-FOLD,

BY J. J. MECHI.

THERE are several reasons why farmers prefer sheep to bullocks as the more profitable animal; when folded, all their manure is at once supplied to the soil; 13-14ths of it is urine, (by far more valuable than the soil), and it sinks at once into the soil, where its most useful portions are arrested and retained for the food of plants. There is, in fact, no waste and no expense in thus applying the manure, but with bullocks, in the ordinary farm-yard, there is waste of manure by rain or the drippings from untroughed buildings; then there is carting to a dung-heap, unloading, turning it over, refilling, and recarting, and a further waste by exposure and washing.

There is also a great waste of valuable straw, which might more profitably be used as food. All these evils and losses are caused by open farm-yards, the abolition of which I am endeavouring most strenuously to enforce. I know the difficulty of overcoming old attachments. I was going to say prejudices, but I cannot believe that my brother agriculturists will, in this enlightened age, sacrifice their pockets at the shrine of their prejudice. I am, therefore, about to prove in this paper that the bullock-fold, or covered yard, is almost as uncostly and beneficial to the farmer as the sheep-fold, and that it has very great advantages over the turning-out and roaming-at-large system; in fact that, as regards the health and progress of the animals, the quality of the manure and the cost of its application, the bullock-fold or covered and enclosed yard has an immense advantage over the ordinary open farm-yards with sheds.

I don't expect everybody to believe this. I remember the time when everybody did not believe in gas, steam, railways, or telegraphy, so I shall not be surprised or displeased at such a misbelief.

The health and progress of the animal, and the quality of the manure in enclosed and covered yards, depend upon certain arrangements, which I will detail; and it must be remembered that I am speaking with the authority of a practical experience of twenty-five years. At a recent agricultural meeting, when I recommended covered and enclosed yards, there was a general exclamation that animals there would be unhealthy, and so they would under the following conditions :—

One of the greatest curses of agriculture is want of ventilation, and it is this which causes farmers to believe in and prefer open air. The poisonous exhalations from our skins and from our lungs, as well as those from animals, must prove injurious to health, unless permitted to escape and to be replaced by pure air. Every public man and many private persons must know by their feelings, and shew it by their gaping that confinement in an unventilated room (shut up in a close box, in fact) is discomforting, distressing, and unhealthy. Fortunately for Britons, the open fire-place and lofty chimney cause a draught, and come in mitigation of evil consequences; but there are no chimneys in our bullock stalls and stables. Ninty-nine out of a hundred of even our new farm-sheds and stables have no openings in the roof, consequently farmers, from costly experience, prefer open yards and sheds for their horses, because they know that their animals would be unhealthy in these closed boxes or apartments. Louvre boards in the roof are of little use, for the air flows in at one side and out at the other, without entering the body of the enclosure. Again, one large circular or square opening in the roof will not permit the hot air to escape; but divide the opening into two parts or two circular openings, and you at once get a circulation—the hot and foul air going up one opening, and cold fresh air coming down the other.

In the case of the louvre board, I use a dependent board, about one yard deep, and I can see by the steam that the fresh air entering at one side of the louvre boards drives the air or steam downwards, and forces it up and out at the other side, thus causing constant change and circulation of air.

I have also openings of about 9 inches by 3 under the wall plate, and above the animals, which increases circulation in hot weather. Candles go out where there is no circulation of air for want of fresh oxygen, and we are only living candles or fires on a larger scale. I, some time since, quoted an interesting instance of the evil effects of want of circulation of air. A well-known Yorkshire agriculturist had a long enclosed shed for his calves, and very successful he was as regards their health. The shed had a door at each end, and somehow or other one of these doors would be frequently left open, so after some years, one doorway was built up and closed. Once so lucky with his calves, now a change took place, and many losses happened. No one could account for this unfavourable change, but at last it was thought that the building up of the door might have had some influence, so that was re-opened and the calves again prospered. In my place of business, in Regent street, where we burn fifty gas lights, the heat and effluvia were annoying and injurious to our goods and health, until we adopted Watson's ventilators, which at once put us all right. They consist simply of a tube divided vertically, with a dome to keep out rain; we know in a few moments, by our feelings, whether they are open or closed.

The diseases in our pigs are often caused by want of circulating air; they hurdle together and poison the atmosphere, especially on soft barley straw, which permits no air to pass under them. On boarded floors with openings, or sparred floors, no evil results can occur, because the air circulates beneath and among them, and the impure air is carried away. When I had 300 pigs closely packed on sparred floors with a deep space under them, I never had disease among them, although many farmers thought there would be. Shut up horses in a close stable, and some of them will get farcy or other complaints. A putrescent, unchanged air, must prove injurious to both man and beast. One fertile source of lung-complaint, fever, and disease in cattle, is variation of temperature. Woolly animals are less subject to it than hairy ones, and one of the great advantages of the enclosed and covered yard-system is equable temperature.

I remember dividing a lot of cattle, putting six of them in a barn, the rest in the enclosed shed with sparred floors. The barn door was opened once a month for threshing, the animals got cold and lung-complaint, the others in the shed were perfectly healthy.

As autumn approaches with its wet days, cold nights, easterly winds, and hoar frosts, there also comes ill-health among our cattle. This is not the case in well-ventilated, enclosed, and covered sheds. At this season of the year, while animals are putting on their winter great-coats, they should be most carefully housed. The losses by turning out horses, as well as cattle, is very considerable and alarming in its total. In the shed, with sparred floors, I have not lost an animal for twenty odd years, and scarcely any in the others. During the cattle plague, with seventy cattle, young and old, we escaped the disease, although our neighbours suffered.

But while commending bullock-houses, a word of warning is necessary. If you litter heavily, as in the open farm-yard, you will have fermentation and disease. Straw should be used very sparingly just enough to keep the animal clean. He will tread it down into a wet paste, and thus exclude air which otherwise would, with loose heavy littering, produce fermentation, fire-fanging, and disease. We seldom remove the manure until it is 18 inches deep, short, and fit to go at once on the land. I prefer a shed that will hold a score of bullocks. Short-horns soon agree together. In single boxes they cannot tread the litter close to the sides.

Drafted ewes fatten quickly in houses, the food prepared and brought to them. At Tiptree it would be a vain attempt to fatten them in the open field on the roaming-at-large principle. This is contrary to the general impression, but there is no mistake as to the fact, and as to what is the more profitable mode. In feeding stock, we should study nature. A good pasture contains a great variety of grasses, varying in composition at time of ripening, &c. Let us take the hint and supply a variety to our shedded animals. Mr. Horsefalls' admirable practical and chemical practice in the matter of stock-feeding is recorded fully in Vols. XVII. and XVIII. of the Royal Agricultural Society's Journal, and deserves, and will repay, a careful study. For growing animals, variety of food adapted to their wants is indispensably necessary, for their frame must be built up with all the requisite materials, or they will never be perfect and profitable animals.

My animals, whether in the field or in the house, are fed on cake, hay-chaff, straw-chaff, corn (ground), malt combs, bran, roots pulped, or green food cut into chaff, a little condiment, and rock-salt to lick. In these we have matter for the formation of bone and muscle, and other portions of the body.

Our ideas in regard to stock are still very pastoral. When I

say that I have only one-twelfth of my land in permanent pasture, I am asked, "then, how can you feed your stock?" I reply, "with beans, oats, clover, tares, mangold, turnips, and khol rabi, supplemented with the straw of all the crops cut into chaff, and aided by cake."

It is worthy of notice and remembrance that the Prize Oxford Farm of 800 acres had only 80 acres of poor, ill-conditioned pasture, and that the praise and prize were given for the well-managed and productive arable land. The live stock question is a vital one for agriculture. The hundred and odd candidates for our Agricultural Benevolent Institution almost invariably preface the causes of their misfortune by "losses on live stock." Nor can I wonder at this when I see and know how inefficient and improper is, too often, its management. A sudden change of wind to the north or east, hoar frost on the food, and other causes of disease and death, to which exposed animals are liable, inflict immense loss on agriculturists, and should warn our land-owners to provide the means for preventing such casualties, and farmers should learn to believe in the use of them.

I have named the bullock-fold because it is the same in effect as though the bullocks were folded on the land. Nothing is wasted, for all the manure, solid and liquid, is supplied to the soil, and at the smallest cost. No artificial manure can compare in cost or effect with this.

It appears to many remarkable that there should be scarcely any smell from the manure. If there was, it would be a sign of improper and excessive littering. The manure is so trodden and compressed that air is excluded, and heat, fermentation, and smell prevented. When, however, the manure is broken up by forking it into carts, its smell and power are unmistakeable.

INDIAN AGRICULTURE.

LORD NAPIER ON NEILGHERRY FARMING.

The following Minute by His Excellency the Governor, dated Ootacamund, September 22, No. 134, is published:—

The Government possess, in the Superintendent of the Experimental and Model Farms at Sydapet, an experienced and discriminating Agriculutrist, whose services they are about to employ on a large scale in the improvement of husbandry throughout the country. The scheme for the institution of provincial farms, which the Government have sanctioned, has reference to cultivation in the plains, and with reason, for the plains have the first claim on our attention. The hill ranges of the Presidency do, however, also offer a legitimate subject of inquiry in this respect, and the Neilgherries, as the seat of the Government Sanitarium, of an increasing planting interest, of an independent English population, of large establishments for the support and education of English and East Indian youths, and of a Native population, embodying a cultivating and a pastoral tribe, would justify a special investigation. With this view I would direct Mr. Robertson to proceed to Ootacamund, when he can best be spared from his employments at the Presidency, for the purpose of reporting to Government on the productive capacities of the district, and I would direct his attention to the following points in particular, but not limiting him to these:—

To the capabilities of the hills for the purposes of breeding horses, horned cattle, and sheep.

To the facilities which these hills may afford for the institution of small farms on the European system, worked in part, at least, by European labour.

To the improvement of the husbandry of the hill-people.

It may be doubted whether the Neilgherry Hills would ever be well-adapted for breeding horses cheaply of a superior quality, such as are demanded for the Army. Horses would not be able to run out with safety in all parts of the plateau during the whole year; they would require protection at night, artificial fodder, and skilled superintendence. Good stock might, no doubt, be bred by private parties as a matter of taste, but it may be doubted whether Government would find such an undertaking profitable. Nevertheless, the question of horse-breeding on the hills is one which may deserve to be examined by a person more competent to decide it than I pretend to be.

The horned cattle of the hills are either a degenerate sort of Native cattle, or a cross between the European and the Native breeds. The latter does well, but I question whether the proper European races have been selected. The European blood has generally been imported from Australia, and I suspect that the English short-horn is usually the parent of the Australian stock. No one would, however, in Great Britain turn out the short-horn stock at a high elevation in a moist climate. It has always appeared to me that the West Highland breed might prove to be well-adapted to these hills, either as a pure stock or crossed with the country cattle. They would ascend the highest steeps, stand very stormy weather, consume a rough description of herbage when there is grass on the ground, and be satisfied with a coarse sort of hay, under the simplest cover during the great heats, and the heavy stress of the monsoon. Mr. Robertson would, however, on a careful inspection of the grasses of the country and of the existing sorts of cattle, Native or crossed, and on due consideration of the temperature and rainfall, be able to decide whether an improvement in the breed of cattle on these hills is to be sought in selection or importation. The report at Wellington and the markets of Coonoor and Ootacamund offer a steady demand for beef, which is at present supplied, in a great measure, from the plains, though the pastures of the plateau would appear to be capable of supporting more numerous herds than are driven over them at the present moment.

A far greater boon to these hills, than a good breed of cattle, would be an appropriate breed of sheep, for, in addition to the meat supply, there would be wool for which a ready sale would be obtained in the country. The Native sheep of the adjacent plains in the Coimbatore District would be too delicate to run out on these mountains all the year round, and the crosses which have been, up to the present time, effected with European breeds have not, in my opinion, been judicious. There is little use in attempting to raise a mountain-breed of sheep by crossing the Native stock with the Leicester, in Southdown, or the Merino races; far less by turning out these breeds in the pure state under an uncongenial sky and on pastures altogether repugnant to their habits, What is wanted here is a breed of sheep inured to high elevations, steep ground, rough weather, a heavy rainfall, wet soil, and course grasses. The habits and qualities appropriate to the Neilgherries would be found in the Cheviot and black-faced breeds used on the borders of England and Scotland, which are hardy, and which yield good mutton and a heavy clip of useful wool. That sheep should be profitable here. It is indispensable that they should be able to run out the whole year in all weathers; that they should never require artificial shelter or artificial food, though it would be necessary to fold them at night for protection against the attacks of wild beasts. If any sheep would stand such hardships, it would be the black-faced Scotch sheep. I do not affirm that they could do so, but it might possibly be worth trying, and no one would be more capable of giving an opinion on the expediency of making the experiment than Mr. Robertson, after local inspection and consultation with the Commissioner and with experienced residents on the hills.

Some discussion has occurred from time to time respecting the possibility of appropriating portions of the Neilgherry Hills for the purpose of establishing European agricultural settlers; for the purpose, in fact, of creating a self-supporting English rural population. On a first view of the plateau, such an undertaking might seem promising to an inexperienced eye. The climate is fine for a large portion of the year, the temperature is congenial to the European constitution, the soil is rich, there are apparently large tracts of unappropriated ground, there is a market; these are conditions favourable to the production of cereal crops, garden-crops, fruits, and valuable commodities for exportation, such as tea and coffee; there is a friendly and fostering authority. A close inspection and analysis, however, tend materially to qualify such favourable expectations. Much of the good land on the warm side of the hills is subject to the rights of Native cultivators; the cost of building is excessive; the price of labour is high; clothing is dear; medical attendance and education would be costly and difficult of access; the sale of grain-crops, fruits, and vegetables would offer little money-remuneration compared to the wants even of a humble European family; the returns of tea and coffee-culture are slow and liable to great fluctuations. A poor man would find it difficult to establish and maintain himself, a richer man would prefer to go elsewhere. My own impressions are decidedly unfavourable to the hills as a scene of agricultural settlement for Englishmen; but I think that it would tend to the correction of erroneous impressions and to the formation of sound opinions that this question should be illustrated by the report of a person of unquestionable judgment and practical knowledge in such matters. The formation even of a limited-working and self-supporting English community on these hills, if it could be effected under favourable conditions, would not be without importance, either in a commercial or political point of view; and the basis for such a community might be found, in part, in the Male and Female Military Orphan Asylums, which are about to be permanently established on the Neilgherries. There is the land, and there are the people; the question is whether they could be made to suit each other.

The cultivation now practised by the Badagas display a considerable variety of small cereals adapted to the climate and the soil, an increasing application of manure, and more care and neatness in the weeding of the crop than is usual in the plains. It may be doubted whether a greater weight of grain or a greater amount of human sustenance would be raised by the substitution of European seeds or crops on a given area than that which is now obtained. The poverty of the cattle betrays, however, the want of root crops, artificial grasses, and green crops. The same defect is apparent from the deficiency of hay in the market of Ootacamund. The system of grain-cultivation is associated with long fallows. The principle of rotation or substitution of crops is imperfectly practised. Without entertaining any very enthusiastic hopes of a rapid improvement of Native cultivation under European impulse on the hills, it can scarcely be doubted that, under the exist-

ing revenue agencies, useful innovations might be gradually promoted, and the suggestions of Mr. Robertson would not be without value to the Commissioner.

Should the Government see fit to adopt the step here proposed, and sanction an investigation of the agricultural condition and prospects of the Neilgherries by the Superintendent of Government Farms, we should then be able to judge whether a Government undertaking, either for breeding stock or for the improvement of cultivation, by example, would be justifiable. Any attempts in these directions, which we might make, would never be of broad utility to the general population of the country, who are placed in circumstances radically different; but we have a duty to our own countrymen who have been cast, by necessity or choice on this portion of English territory, and we possess in the Lawrence Asylum, in its labour, power, and in the land attached to it, the elements and means of experimental culture.

ESTABLISHMENT OF MODEL FARMS IN DISTRICTS IN INDIA.

Demi-official from A. O. Hume, Esq., C.B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce; to Local Governments and Administrations, dated Simla, the 2nd November 1871.

I AM directed to forward, demi-officially, for consideration and for private distribution to all revenue and other officers who are interested in such matters, copies of a brief note drawn up by the Secretary to Government in this Department on the subject of agricultural reform.

2. It must be distinctly understood that the Government of India at present neither accepts nor negatives the proposals and conclusions embodied in this note. The object in circulating it is to obtain, demi-officially, the freest possible expression of opinion from all officials interested in such subjects, both as to the means which this note suggests, and as to any other means which their experience may lead them to recommend, for improving and developing the agriculture of the empire.

3. This note probably possesses little claim to originality, and is unquestionably very imperfect; but it may yet serve as a nucleus round which much valuable information and many useful suggestions may readily crystallize.

AGRICULTURAL REFORM.

Although it would occupy some considerable time and space were I to attempt to elaborate the details of the scheme I advocate, a very few words will suffice to convey some idea of the project.

I must premise that my first contention, derived from my personal experience, is that large farms intelligently managed will, even in this country, after the first two or three years, cover all their expenses and give fair interest on any capital employed. Further, that this will be the case where land has to be rented from private proprietors, and that *a fortiori* this will be the case where the land belongs to Government and is either unassessed or only liable to the moderate jumma that Government impose.

The farms must be of considerable size,—not less certainly than 1,000 acres,—or they will not pay from their profits the cost of supervision which, if the scheme is to possess any real vitality, must be of a high order.

Briefly, what I contemplate is at least one large Government Model Farm in every district of the country, where all existing staples shall be grown, at first in the most approved local native fashion, and year by year on improved and ever-improving systems, and from seeds year by year improved by selection, and, where necessary, by interchange with other similar farms, where cattle, sheep, and poultry-breeding shall be cautiously, but perseveringly, carried on, and where locally unknown staples and breeds should be gradually introduced, acclimatized, and popularized. The whole of these farms should be closely connected with each other. Their supervisors encouraged not only to vie with each other in results, but to visit and communicate with each other in the freest manner possible. Liberal prizes should be offered for those supervisors who make their farms pay best, and, besides these, provincial exhibitions should be held with numerous prizes for excellence of produce, whether agricultural or animal, equally open to the farms and to the agricultural population generally. A special Agricultural Journal should be started for the record of all done at these farms, all experiments, all failures, all successes, so that all might know what all were doing, and so profit mutually by each other's experience.

With due care in the selection of the men to begin with, it would be impossible under such a system but what some man possessed in an eminent degree of all the capacities requisite for the development of agriculture, should be evolved, and real and important progress effected.

Directly it became, on the whole, an acknowledged fact amongst the people of any district (and the people have eyes as well as we have, and can appreciate good crops and better methods of tillage just as well as we can when they *see* them) that their model farm was really growing better crops, or growing crops similar to their own, cheaper, or breeding better stock, or turning out better seed than they were themselves able to do, sons of well-to-do cultivators, peasant-proprietors, and the like, who concern themselves personally with practical agriculture, should be allowed and invited to reside at the farm, and familiarize themselves with the system there followed, and the methods of caring for the stock there bred. All that showed capacity and intelligence and deserved it should be furnished, at cost price, with improved seed or stock to start with on their own lands.

Each farm should, in fact, become at once a practical school of agriculture and a source of supply of improved "materiel," whether vegetable or animal.

This is not an Utopian idea, it is susceptible of being carried into practice, if we only act boldly and judiciously, and on a sufficiently large scale. Nor is it sufficient to assert that it will repay indirectly manyfold the expenditure incurred: my contention is that in the long run it will directly and fully repay its own expenses.

The great difficulty, it will be said, will consist in obtaining supervisors, and at *first* starting this is unquestionably *the* rock upon which the adventure would be most in danger of shipwreck.

But it must not be supposed that I contemplate starting all these farms at once. I would select a single division of, say six districts, and in this start six farms. To each supervisor I would give two, three or four apprentices, intelligent youths, Country-born, English, Eurasian, Native, some of whom would, probably, become in time qualified to take charge of farms in other districts, under the supervision of their trainers, who, as time went on, could manage, especially near lines of railway, two or even three farms each. I would also, from time to time, bring out young men of a higher class, who after a year or so training, acquisition of the native languages, &c., would be competent to assume independent charge of farms, and undertake the training of apprentices, &c. Thus the scheme would grow and spread until the whole province was covered. Doubtless, once it was fairly started in one province and established as a success in a single division of that province, other provinces would desire to make a similar commencement. Some fresh men would have to be got out from Europe, some would be spared from the first province in which the scheme was started, so that in ten or twelve years we might hope to have covered the whole Empire.

But still the selection of the first men will be a most difficult matter. We require not merely a certain amount of scientific agricultural training, not merely a certain amount of practical knowledge as farmer and stock-breeder, but a strong healthy physical frame, energy, and industry, and a mind so far generally cultivated that it shall be capable of adapting itself to new combinations of circumstances, of applying its experiences to these, and thinking out for itself the new problems that will inevitably arise.

Some such men *are* to be met with and might be enlisted in our service if we paid them fairly to begin with, made them clearly understand that their promotion or increase of salary depended on their success, and held out to them the certainty of a considerable share in any net profits realized when once their farm had cleared itself of debt.

It must be borne in mind that I base my hopes of success on the large scale of my proposed operations. Many of our men would, doubtless, turn out average good creatures incapable of *originating* any important step of progress; but with a number, carefully selected to begin with, with emulation-prizes to gain, free inter-communication of experiences and ideas, and prospects of solid rewards, it would be impossible that here and there some man suited exactly to the needs of the country should not be developed, and one such man in a province, or in the Empire even, would leaven the whole.

I do not expect to get such a man at once, but even after the two first years, we should very nearly pay our expenses, and by that time some one or other of the men, though not, perhaps, what we hope for ultimately, would be qualified to lead and guide, and year by year, with careful administration the average results would improve.

Now about these men. The first thing I should set them down to do, would be to learn the language and the agriculture practised in the district in which they were to start their several farms, not to live fine gentlemen-like in stations, but out in some agricultural village amongst the people. They must, of course, be men young enough to rough it, unmarried, with the even tempers that so often accompany a well-organized physical frame, and with a fairly-cultivated mind. I would not let them start a farm of their own until they had thoroughly familiarized themselves with existing agriculture, and I would make them start their farms in general harmony with that system, with only such minor modifications (*e. g.*, improved supply of manure, &c.) as are patently desirable to everyone who has ever engaged practically in the work; and as I said before, each successive year should witness some cautiously-introduced improvement. As to the lands to be furnished for these farms, as a rule, I would not hire them. There are in many districts villages, the property of the State, which for years past we have been almost recklessly selling by auction; here and there we might find some of these situated to our purposes, and in no way, perhaps, could our men begin better their apprenticeships than as resident managers of such properties, which they might begin to take into farm after the first year. In other places, waste lands might be taken advantage of, and settlers brought thither to work on these by a system of inland emigration, which might help to secure, for the service of the Empire, the wealth that, in the form of working men, we are yearly lavishing on other colonies and foreign nations.

It will be said that after all the scheme promises but slow progress. That we are to wait a year for this; another for that, and this is perfectly true; a measure like this must be slow to be sure. We have the *inertia* of past cycles to overcome, but once we turn the corner, one single farm (possessing no exceptional local advantages) begins to pay in earnest, the progress will be as rapid as any reasonable man who knows the people and the country could expect or hope for. And now about funds. My idea is, that this scheme needs, for its success, the co-operation of both the Imperial and Local Governments. Of the gross expenses, a certain portion, say one-half, should be advanced as tuccavee by the State, to be recovered as a first charge from sale price of crops, &c. The other half should be contributed by local funds. The tuccavee repaid, all profits (except such share as might be allotted to the supervisor) should belong to the Local Governments. Perhaps we might even go further and engage, on behalf of the State, to pay the salaries of the men we got out until they got regularly into work, say for a period of two years each. There are even now, I believe, Local Administrations which accept these terms, and doubtless hereafter there will be many more. This is, indeed

I feel a sketchy outline of the scheme that I should advocate, but it will, I hope, suffice to give His Excellency some conception of my ideas.

TOBACCO.

Letter from the Government Quinologist to the Acting Sub-Secretary to the Board of Revenue, dated Ootacamund, 28th July 1871.

In accordance with the wish expressed in Board's Proceedings No. 2670, of July 3rd 1871, I have the honour to submit certain analyses of tobacco which I have received from the Board of Revenue or from certain Collectors. I beg to quote these in continuation of those contained in my report appearing in Proceedings of Revenue Board, No. 2778 of 7th July 1871. These analyses, I believe, complete an examination of the tobaccos of the Madras Presidency. An explanation of the meaning of the numbers will be found in report above referred to:—

Numbers.	Tobaccos received from	Percentage of Ash.	Percentage of Potash.	Percentage of Nicotine.
54	Kistna, Chebrole	19·03	15·36	3·53
55	„ Oodoomoodi (Lanka)	18·6	11·19	2·04
56	„ Umdapilly („)	17·85	15·38	1·38
57	„ Tattapoodi („)	19·53	8·72	2·22
58	„ Alamur („)	20·30	10·66	2·63
59	„ Kadar („)	17·97	11·36	4·27
60	„ Ankampalloo („)	16·63	12·14	2·56
61	„ Purshotmill („)	20·08	13·73	2·84
62	„ Narakamill („)	19·13	19·01	3·55
63	„ Kotoonga („)	19·18	17·69	3·81
64	Coimbatore Madhally	23·45	5·33	2·32
65	„ Satiamungalum (A.)	17·09	14·71	2·88
66	„ „ (B.)	21·34	8·87	3·74
67	„ „ (C.)	25·14	9·14	3·02
68	South Canara	17·30	5·6	4·98
69	South Arcot, (not labelled)	21·61	13·32	4·26
70	„ Manaloor Patay	4·84	8·63	1·86
71	North Arcot, Arcot	24·48	5·32	1·56
72	„ Arnee	22·08	2·05	3·55
73	„ Wandwash	24·32	2·74	3·13
74	„ Vellore	19·78	2·75	3·13

The tobaccos from the Kistna District grown on the Godavery are by far the highest in quality of any Indian tobacco that I have examined. Nos. 55, 57, 58, 60, and 61, are specimens of tobacco of real excellence. Nos. 57 and 58, though different in flavour, would be, I think, considered of equal quality with Manilla tobacco. It will be observed that tobacco from this district differs from that grown in most parts of South India, in containing a large proportion of potash in its ash. I have no doubt whatever that if seed of the better foreign kinds were sown in the soil that produced the specimens I have analysed, tobacco would be grown quite equal to the foreign kinds. Nos. 54, 56, 59, 62, and 63, are by no means of bad quality: but the latter differ somewhat in degree from that of the tobaccos that are most favoured in Europe. The general deficiency of organic salts of potash is undoubtedly the main defect of the tobaccos of this Presidency, and the remedy of this deficiency, by suitable cultivation and application of potassic manures, will be the first step towards the improvement of tobacco cultivation.

The specimens of tobacco received from Satiamungalum, close to the foot of the Nilgiris, are of good quality, and are the best I have received from Coimbatore. Satiamungalum is a place where the seeds of foreign tobaccos would have a great chance of success if cultivated like the native kinds, and if the native dislike to novelties in cultivation gives them fair play.

The only other kind of moderately good quality I have met with is that from Manaloor Patay in South Arcot. The employment of jaggery water in the curing of tobacco, though doubtless rendering the leaves more easy of manipulation, is detrimental to the quality of the tobacco, according to the European standard.

The greater number of the specimens of tobacco that I have received testify to the general want of care and attention in their drying and curing in comparison with the good foreign tobaccos. Full attention to the details of these processes will, however, be quite necessary to the production of good tobacco, more especially if it be employed in the manufacture of cigars.

Submitted to Government, in continuation of Board's Proceedings No. 2778, dated 7th July 1871, embodied in Government Order No. 1313, dated 27th idem.

The Board imagine that the specimens so favourably spoken of by Mr. Broughton, in paragraph 3, must have been received from the Collector of *Godavery* (who promised to send samples in his letter No. 397, dated 7th December 1870, recorded in Board's Proceedings No. 132, dated 11th January 1871). Mr. Broughton is requested to make inquiries on this point. The Board believe that tobacco is not much grown on the islands of the Kistna.

THE COCOANUT TREE AND ITS CULTIVATION.

The Cocoanut Palm is one of the most useful trees to man, since it is applicable to such various uses, and is productive for so long a series of years: still the means to be adopted for its propagation and further cultivation are so little understood, that foreigners take but little lively interest in it; nor do the natives, who are those principally benefited, care much to improve, or fully enjoy those blessings in their reach. Hence the advice and opinions of more than a thousand ryots of Travancore having been consulted, their experience has been made use of to draw up the following instructions, with a view to supply a deficiency, and draw the attention of any desirous of entering upon so important a source of profit:

The nuts for sprouting should be chosen from those fully ripe, having full large eyes and such as have been gathered from trees past the middle age—not however from aged ones—and from clusters containing few fruits. These, if carefully planted, are said to ensure the timely sprouting and steady growth of the plant as well as future luxuriance, longevity, and uninterrupting fruitfulness. Such nuts as are gathered from February to May are generally the richest in oleagenous properties, and hence should be preferred. Nuts taken from older trees have the eyes small, and the sprout will in consequence be thin, weak, and disproportionately long; and the future tree if able to bear fruit, will be irregular and deficient in produce. Those nuts which may be taken from trees of immature age will, if planted, rot away at the eye. And the plants, if any be successfully reared, on transplanting, will grow very rapidly and acquire bulk—but the fruit will drop before the kernel acquires consistency, the foot stalks break, and the trees entirely fail before mid age.

The nuts for seed should not, on being gathered, be allowed to fall to the earth, but be lowered in a basket or fastened to a rope. If let fall the polished cover to the fibres will be injured and collect damp about the nut, or the shell inside may be cracked and the water disturbed. These are fatal injuries, or even if the plants still grow, they will on being transplanted not make fresh shoots, may produce weak trees having their fronds constantly drying up, nuts rarely matured, and often are even without kernel in those which appear perfect. If the nuts are allowed to dry on the tree before gathering, the plants are liable to be lost, not having water inside to cherish the growth of the sprout (before the actual roots shoot into the soil).

The seed nuts, after being gathered, should be carefully kept for not less than a month before they are planted (in order that some of the moisture be absorbed, and the hard outer skin or rhind be rendered dry and water proof). If the seed be immediately planted, the outer pod with the containing fibres will rot, and there will be no sprout. The eye will rot or be a long time sending out the shoot, which will inevitably produce a weak, profitless plant. On the other hand, should a longer time intervene between gathering and planting seed, than prescribed, the capsules of the fruit will fall off, and consequently the exposure to damp and rain will affect the eyes, there will then be no plants, or very indifferent ones.

The seeds should be planted on an elevated plot or bed of land where water will not stagnate. The plants will be strong if the nuts are placed on the hard sandy court-yard of the farmers' dwelling house; or if placed in flower pots with good soil and sand in them, no damage will be done by white ants, and very few will fail to germinate. If, however, they are placed on a hard soil which roots cannot penetrate, and they are exposed to the sun, the water inside will dry up, damage will be done by ants, and those few that throw out shoots, will be weak, and on transplanting, the roots will break and the sprouts will be severed from the nuts. If, on the other hand, they are deposited on uneven ground or too moist soils, both the fibrous covering and the eyes will rot, and the seeds come to grief.

Nurseries should be somewhat exposed to the influence of the sun, though not too much heat—plants thus grown will even, though deficient in stature, be strong, and when transplanted will not fail nor suffer from heat. Should plants however have but little sun, no great harm is done; but if they be grown entirely under cover, insects will infest them, the stems will be long, tapering, and weak, the fronds will be often unable to sustain their own weight, and when transplanted, each successive hot season will affect the trees.

The planting of the seeds should take place from January to April, and also in August, provided the rains are not heavy, and then the planter may expect fruitful trees to be produced when grown, but nurseries formed during the heavy monsoon will generally fail, or produce trees which will yield small nuts. (Too much moisture of every kind is injurious to plants.)

The seed beds, where the plants are to be nursed, should be well dug to about two feet deep, and all stones, roots of trees &c., removed ; the cocoanuts should then be laid along flat on their side in the soil, in such a way that all but two inches of them be buried, the interval between the nuts being about a foot at least. Should the spaces be too great, the plants will have too many roots, and sun will not be shaded from them by the fronds which will be shown by the pale green of the leaf. But should the nuts be placed too close to each other, the young shoots will be then meagre and quickly spindle up ; the roots too will twist together and be broken when the plants are taken up to be transplanted.

Though manuring is of little use to the seeds before taken root, yet in order to prevent white ants, &c., a mixture of salt and ashes, or ashes alone should be put into the trenches made in the beds for receiving the cocoanut seed. Sand alone, or salt with ashes, sand and paddy husk, form another mixture to be placed between the earth of the bed and the seeds, which latter should be covered with the compost. Black salt, ashes made from the cocoanut husk, and fronds with sea sand, is the best mixture. If this precaution be not used, many of the seeds will be injured and the plants grow pale and weak.

Some, however, are of opinion that these composts should not be used in the *nursery*, as they tend to force the plant which, when transplanted, will then decline, but that the application is best *after transplanting*; and that in the nursery beds, black salt dissolved in water is sufficient to keep off white ants ; early manuring, in their opinion, lessening its after effects.

The next care is *to water* the nursery, which should be done only every second or fourth day, according to the dryness of the weather, simply keeping the soil moist ; for if the ground is too damp, rot is engendered, but if too dry the cocoanut water inside the nuts will evaporate and the shoots dry up.

A careful observance of these instructions will cause the cocoa *seed to sprout* generally within six months from the time they are placed in the ground.

Some place those cocoanuts intended for seed tied together in pairs by a strip of the covering on the cajan over the roof tree of the dwelling house, or on branches of jack-trees, freely exposing them to sun, dew, and rain. But when the shoots are a few inches long, they are taken down and placed in a nursery till transplanted. Such plants are seldom lost and make no great delay in yielding fruit.

Once the tender shoots begin to appear, no great care is necessary for manuring, but the greatest attention should be given that no cattle or insect, &c., injure the shoot itself, else the slightest blow or abrasion will cause a want of vigor ; but on the other hand, some suppose that unless either ashes alone, or mixed with salt and sands, or these separately be applied to the plants *every month*, a want of colour will be visible in the opening leaves, or ants and other destructive insects will be fostered. Plants are removed for *transplanting* generally in the second or third year, sometimes even in the ninth month, but rarely so late as the fifth year, but in ordinary cases if they be transplanted six months after the shoot makes its first appearance, their safe growth and vigor may be looked for. In low-lying lands, however, it is preferable to have plants of *one years'* growth, though they are more difficult in managing. The only benefit to be expected in transplanting older plants is that the planter looks for an earlier return, and in planting these on the banks of rivers or low lands formed from the wash of the monsoons, the crops will not be deficient. Plants left too long in the nursery and then removed are apt to have the fibrous supports at the foot of the fronds decay, so that these hang down, wither, and dry up, and new fronds and leaves do not make their appearance for four or more months, and these generally die prematurely. Some of the planters give it as their opinion that the transplanting may be effected from January to May and again in August, October, and November, (*i. e.*, omitting the wet months). Perhaps, however, the *general* rule should be that in low damp situations, planting may be effected during the hot season, in salt marshes and on hill sides during the monsoon. It is said that those trees planted from January to June will yield fruit for eight months in the year, and those planted in October for six months, while those planted in June and July in the heavy rains will scarcely be fruitful at all. The majority of reports, however, state the months of Madum and Chingum to be unsuitable for planting, and that different places and soils require different seasons for this operation, to be learned only from experience or observation of neighbouring gardens. Soils suitable for a cocoanut plantation are variously described as below, particularly pointing out that stony grounds, or those overlying rocky foundations, are to be avoided :—

1 Soils mixed with sand, either dark coloured or river-washed.
2 Where sand is mixed with clay, ferruginous earth, or black mould.
3 Clayey soils where the under strata consists of sand.
4 Sand and clay, even when mixed with gravel and pebbles.
5 The sea shore banks of backwaters, rivers, tanks, and paddy-fields.
6 Alluvium of rivers and backwaters, provided one and half cole of land is to be generally seen above water level.

7 Marshy land even in brackish soils (but not where salt is formed in crystals by evaporation).
8 All level lands exposed to the sea breeze where the soil is good as the valleys between hills, tanks, and ditches, which have been filled up.
9 Lastly, even the floors of ruined houses well-worked up, and any places much frequented by cattle and human beings on account of the ashes and salts of ammonia from the urine, &c., deposited day by day in the soil.

Sunlight is most beneficial to the cocoanut tree, it increases the number of successive fronds and the crops of fruit, while if much shade is caused by trees of other kinds, there is a tendency in the lower part of the cocoa stem to thicken, while the upper parts grow thin and attenuated with fronds at considerable intervals and little fruit.

Exposure to regular breezes is also beneficial, for the constant movements of the tree tops have a tendency to strengthen and enliven the whole tree. The difference is easily seen by comparison with those in sheltered positions.

The *holes or pits* into which the plants are to be transplanted, should be severally 12 yards or coles distant on backwaters, and where a deep alluvial soil is found 8 or 10 yards are enough. These distances are necessary, otherwise the trees not having room to expand their tops, repel each other and grow in diagonal positions, and are easily blown down or overset. Too close a neighbourhood also tends to draw up the trees into long feeble stems, shoots, fronds, and small fruit. In a level loose soil, the hole should be a cube, of a yard and a half, on hill sides 2 to 2½ yards, but in low grounds half or three quarters of a yard deep with one yard square is sufficient. If the pits are *not wide* and sufficiently deep, the roots soon appear above the surface of the surrounding ground, and the hold upon the earth is weak, nor is sufficient nourishment obtained, and the monsoon storms quickly overturn the tree where the soil is marshy though the hole need only be large enough to contain the seed and roots, and in a cold clayed ground, the holes are filled with sand and the plant deposited in it. Again, in low marshes, banks or terraces should be thrown up and consolidated previous to planting. Should in any of these cases plants of two or three years old be used, the pits should be at lest 2½ yards every way The pits should be dug from two to six months before planting, and then prepared first by having heaps of fuel and weeds burned in them, and subsequently by manuring. The fresh earth is supposed to be full of ants and worms and itself injurious to the new plant and to hinder growth ; on the contrary there are some planters who deny this statement and think the burning and manure not to be necessary. In low situated plantations new holes may be preferred and quick planting. No time should be lost in the removal from the nursery to the pits : indeed *the day* should not pass, in which case within the month new roots and fronds may be looked for, but where this proves impracticable if the plants are kept cool and in shade, four to six or eight days have been known to intervene, but followed by very great loss in the number of successful trees. Inside the pits smaller ones should be made and filled with salt and ashes mixed with mould, into which the young plants should be planted, with the nuts just covered with this compost. Some shade should be afforded, and care taken that the plants be not shaken or removed from their first position, and occasionally water should be sprinkled over them. The compost should be used when there is but a small proportion of sand in the soil. Ashes will suffice on the sea shore, and sand in marshy and loamy soils. The roots of a plant under a year which are broken (but according to many planters *all* found on the nuts in the nursery) should have their ends cut, as new ones are supposed to be hastened by the process. Turmeric and arrow-root are often planted in the same pits with the cocoanut, as they are supposed in some way to repel white ants, rats, &c. After the plants are in, little pandals or sheds with twigs and branches should protect them for the next six months, from too great heat of noon-day sun, this prevents withering of the leaves or any check to the growth of the roots.

On dry soils the plants should be *watered* twice a day for the first month, once a day will suffice for the next five, or until the monsoon showers come on, and once every two or three days during the dry seasons of three following years, according to circumstances. On hill sides it is usual to water during the hot weather even till the fruit buds appear ; and on sandy plains on the sea coast when the trees are in full bearing eight or ten feet of bamboo (with the divisions at the joints broken to from the pipe) is often driven down by the side of the cocoanut tree, and cool water from weed covered tanks is poured down to refresh the roots and lower soil. The soil round the young plant is often too kept damp by a bed of leaves, particularly such as will not be eaten by white ants. If the soil is naturally poor or of an hungry nature, salt, ashes, paddy husk, goat's dung, and dry manures may be applied for the first year, but in after seasons, fresh ashes, decayed fish, carrion or other refuse, is preferable, also oil cake.

(To be continued.)

IRRIGATION IN THE NIZAM'S DOMINIONS.

EXPERIMENT MADE AT THE SHAMEERPETT TANK, IN HIS HIGHNESS THE NIZAM'S DOMINIONS, TO ASCERTAIN THE QUANTITY OF WATER REQUIRED FOR THE IRRIGATION OF RICE CROPS.

THIS enquiry was first commenced under orders of the Government of India, conveyed in their Circular No. 87 of 1867. The Commissioners in Berar were requested to endeavour to ascertain by experiments and furnish the information required, but no satisfactory results were attained. In a letter No. 222-I., dated 31st May 1870, from the Government of India, it was suggested that, with the concurrence of the Nizam's Government, experiments should be made from the Hoossain Saugor Tank at Secunderabad, and permission was solicited from Sir Salar Jung, the Nizam's Minister. This was readily granted, but at the same time the Minister pointed out the difficulties that would be experienced in connection with that tank, on account of the numerous purposes for which the water was used, in consequence of the largely populated area which was cultivated therefrom, and suggested that the experiments should be made from some other tanks in the neighbourhood, mentioning that at Shameerpett. This tank is situated about nine miles from Bolarum, (14 from Secunderabad), and early in December last, I visited it in company with the Executive Engineer of the Division, Assistant Engineer M. Little, to whom the Surveys were entrusted, and Mr. Condasawmy Moodeliar on the part of His Highness's Government. The season selected for commencing work was at the time the cultivation of the second rice crops in the Deccan commences.

The tank is one of the fine old specimens found in India. It was constructed above 200 years ago at the same time as the Hoossain Saugor Tank was built, but it has been allowed to fall somewhat into decay; and has not, I understand, been fully utilized in the memory of living man. The collecting basin above it is about 75 square miles. When full, the depth of water at bund would be about 40 feet, the area covered by the water would be about 1,375 acres. The depth of water when full, over still of lower sluice, would be 35 feet, and the capacity up to 24 feet above our datum, amounts to 943,700,000 cubic feet, or 34,951,852 cubic yards, enough to irrigate 3,500 acres at the rate deduced from this experiment. Taking the average rainfall of 26 inches, and ·8 as co-efficient of discharge, the possible collection from the whole basin would be 134 millions of cubic yards, but as there are 32 other tanks of sizes above the Shameerpett Tank, it is probable that the full capacity of the latter would never be utilized. The breadth of bund at top varies from 38 to 50 feet. The outer slope is about 2 to 1. The inner slope, faced with coursed stone, is generally nearly perpendicular, but in places half to one. The sluices are of the common native pattern built on the inner slope of the bund, in three stages, all faced with cut stone, with steps leading down to the lowest sluice. This arrangement, though no doubt expensive, simplifies the difficulty of dealing with sluices under great heads of water. In each stage two circular holes (10″ diameter) are cut vertically, and communicate with a common masonry tunnel leading right through the bund. These tunnels are laid in solid ground one at either end of the bund. The holes are fitted with large beams of wood passing through openings in the platform above, which are raised according to the quantity of water to be discharged. By this arrangement never more than 10 feet head of water has to be dealt with. The timber used is of a wood called khyr or khyer, a species of babool, and weighs about 70 lbs. to the cubic foot. The botanical name is Mimosa Catechu, or Acacia Catechu. These sluices with ever-varying heads and discharging the water under such peculiar circumstances rendered it impossible to make any reliable calculations as to daily discharge from tank, and after a few attempts the idea of measuring the water used by this means was abandoned. The irrigation commenced in the last week of November, and the level of the water in the tank at that time was taken at the standard level or datum for our calculations. In consequence of the orders of Sir Salar Jung, every assistance was afforded to us in obtaining all the information we required. The plan adopted was very simple. The tank was surveyed accurately, a contour line being run round the level of the water as it stood at the end of November, and other six feet contours were run above that level, in case the water should have risen from any extraordinary causes, such as heavy rainfall, or bursting of reservoirs on higher level, and also to enable the full capacity of the tank to be calculated. At the same time the water was traced from the tank to the different portions of land under rice cultivation, each of which was accurately surveyed. Originally these were reported by the villages to be about 100 beegahs, or 75 acres, but they were proved to amount to 280·28 acres. When the irrigation was completed, the tank was surveyed below the datum level, and so the *gross* quantity of water that left the tank could be pretty accurately calculated, and this after all is the important object to ascertain, as wherever reservoirs exist, evaporation and soakage always dispose of a large quantity of water; and this tank may, from my experience of several thousands in the Madras Presidency, be taken as an average specimen. The bed of the tank is generally of a rocky nature, so no excess soakage took place. Any heavy rainfalls would have rendered our calculations more difficult, but fortunately from the middle of November to the end of May, the only falls at Secunderabad, which may be accepted for Shameerpett, were as noted below, * so all calculations on that account may be left out without affecting the results in any material degree. When the experiments were commenced, a very petty stream was found by Lieutenant Little to be running into the tank, but so small that he could with difficulty measure it, and so I have neglected also to notice that.

By way of arriving at some conclusions as to the *net* quantity of water required, we made arrangements for measuring the evaporation from the tank. On this subject I have never before succeeded in arriving at any satisfactory conclusion. I have evaporated water from pans and from pans standing in other pans, but I always felt the results were excessive, and that the evaporation from a large body of water was considerably less than that shown from pans, owing to the whole atmosphere immediately over the surface of the tank being moist. On the present occasion I ordered a water-tight tin box to be constructed, and sunk it in a timber raft, so that it might float with its edge slightly above tank water level. The box was then filled to tank water level, and the whole floated out a considerable distance from the shore, so that the water in the box was placed almost in exactly similar circumstances as the water in the tank. On two occasions careful measurements, were taken of the evaporation during the previous fortnight, other attempts were made, but frequently some trifle happened to render the measurements valueless. Between the 12th and 26th of January (14 days) the evaporation amounted to 2·12 inches or ·1514 of an inch per diem. Between the 27th January to the 10th February (15 days), the evaporation amounted to 2·67 inches, or ·178 of an inch per diem. Mean evaporation 165 of an inch per diem, and this with the colder weather of December, and the hotter weather of March and April, may be taken as a fair mean. The number of days during which irrigation was going on were 185. The water in the tank fell 11·07 feet. The results my be summed up as follows :—

Gross quantity of water consumed	...	2,531,750 cubic yards.
Area irrigated	...	280·25 acres.

During the period of cultivation, no rain fell worthy of notice. Gross quantity of water consumed per acre 9,042 cubic yards. The crop was, it is understood, an average one. It is worthy of notice that the season, not being a very favourable one, the water was husbanded and little or none wasted. Latterly it had to be raised by hand labour, the level of water falling below sill of lowest sluices. The cultivators had complete control over the water. The evaporation represented a depth of water in the tank of 30·5 inches; soakage cannot be determined, but for sake of calculations we may reasonably assume it to be the same as the evaporation, and allowing an average area of water, the loss would have been 1,162,577 cubic yards. This would leave 1,369,173 cubic yards as the approximate net quantity of water spread over the land, and which over 280·25 acres gives 4,890 cubic yards per acre, and represents a depth of 36·3 inches. These calculations made under exceptionally favourable circumstances, and with great care agree, I think, somewhat with calculations made in other Provinces. I believe from 7,000 to 10,000 cubic yards of water per acre, in the gross, are generally consumed for rice from tank irrigation, and a rainfall of 36 to 40 inches fairly distributed over a season is, I believe, sufficient to produce an average rice crop, without any artificial irrigation. The survey and measurements were undertaken by Assistant Engineer Lieutenant Little, under the orders of Lieutenant Cumming, R.E., Executive Engineer, Secunderabad Division, and have, I believe, been made with great care and correctness. The climate here is a dry one, and the general level of the country is about 1,800 feet above sea level. These are points that should be noted in comparing the results with experiments made in other districts. The total cost of the experiment was very trifling, or about Rs. 300.

From the Government of India, Public Works Department; to the Resident at Hydrabad, No. 650I, dated the 28th October 1871.

I am directed to acknowledge the receipt of your Secretary's letter No. 269, of the 23rd instant, submitting, for information, a memorandum by the Superintending Engineer, on experiments made at the Shameerpett Tank in His Highness the Nizam's dominions, to ascertain the actual quantity of water required for the irrigation rice crops. In reply, I am to state that the experiments seem to have been carefully conducted, and afford at all events a *practical* result as showing the *gross* amount of water that was

* Experiment made under satisfactory circumstances :—

Week ending	3rd March	.. ..	·26
,, ,,	10th ,,	.. ..	·2
,, ,,	14th April	.. ..	·7
,, ,,	21st ,,	.. ..	·29
,, ,,	3rd May	.. ..	·4
			1·87

actually expended on a given area in the cultivation of a particular crop, *viz.*, rice. I am to request that the thanks of the Government of India may be conveyed to Major Mayne and the officers engaged in the experiments, and also to Sir Salar Jung for the assistance rendered by His Highness the Nizam's Government in the matter. The papers will be circulated for general information, and published as a Supplement to the *Gazette of India*.

OBSERVATIONS.—The importance to which the irrigation works in Upper India have attained, is made evident by those in the North-Western Provinces alone furnishing during the year a gross revenue of nearly £315,000 and an expenditure of £240,000, making the entire annual transactions upwards of half a million sterling, while the area actually irrigated amounted to a little short of 1½ million of acres, the gross value of whose out-turn cannot, it is estimated, have been less than 5 millions sterling, exclusive of the fodder by which the cattle were sustained :—

	Acres irrigated.	Maunds produced.	Value at current market rates in pounds sterling.
			£
Sugar	97,553	2,009,329	1,056,385
Wheat	597,936	7,916,186	2,635,505
Barley	257,509	2,680,006	486,250
Rice	111,020	1,142,152	387,146
Maize	42,122	353,547	82,699
Millet	93,369	690,693	170,108
Pulses	73,354	601,574	173,532
	1,272,862	15,393,487	4,991,625

The year under review was a very favourable one for the canals, or, in the language of the Government of the North-Western Provinces, "the financial results of the year display an unexampled prosperity." There were 1,441,898 acres irrigated against 983,390 acres of the highest previous year's maximum, a gross revenue of Rs. 31,47,160 against Rs. 21,74,431, and a net revenue of Rs. 21,25,424 against Rs. 12,25,539 of the preceding year. The profits amounted to 8·21 per cent. on a total capital of Rs. 2,58,73,080, invested up to 31st March 1868, in all the irrigation undertakings of the North-Western Provinces, good, bad, or indifferent. These satisfactory results have already been acknowledged by the Government of India, as well as by Her Majesty's Government. The year was characterized by wide-spread scarcity, the mitigation of which, in all the districts within reach of the irrigated tracts, was very sensibly felt, and the areas under irrigation, and their situation relatively with the neighbouring districts, is clearly delineated on the map which is embodied with the report, and wherein it is observed—"The irrigated tracts of the Doab were the heart of the province from which surplus food flowed out by the railways westward to the Cis-Sutlej States, in which there was no harvest to reap, and southward by never-ending trains of camels and carts to Bundelkhund, Ajmere, and Rajpootana, where no grain was even sown. Under Providence, a famine was averted by the combined action of railways and canals." His Honor the Lieutenant-Governor records an observation to the effect that the failing supply of the Jumna renders a reconnoisance of storage sites in the Himalayas advisable, and specifies the river Tonse as presenting favourable conditions at certain points of its course. This is an important matter, especially in connection with the proposed extensions of the Western Jumna Canal in the Punjab. The results of the working of the two chief canals during three years are already shown in the present report. The ratio of cost of revenue management to gross revenue on the Ganges Canal was 14·79 per cent., and nearly corresponds with that of the Eastern Jumna, which is the best organized of the canals in the North-Western Provinces. The areas irrigated by the several canals in the three last years were as follows :—

Year.	Ganges Canal.	East Jumna.	Doon.	Other Canals.	Total.
1866-67	634,734	230,559	8,852	100,249	983,390
1867-68	533,456	182,544	11,988	33,492	761,480
1868-69	1,078,399	274,101	14,223	75,195	1,441,918

The whole area irrigated is 11½ per cent., about one-ninth of the gross cultivated area of the districts traversed. The proportions of "flow" and "lift" irrigation over all the canals were—

1868-69	Flow 69·4	Lift 30·6
1867-68	„ 68·0	„ 32·0

and show that to still one-third of the whole area the water has to be raised.

Ganges Canal.—The following table compares the results of the three last years :—

Years.	Capital at beginning of each year.	Profits from direct income only	
		Amount.	Percentage on capital.
	Rs.	Rs.	
1866-67	2,48,06,303	12,25,539	4·94
1867-68	2,52,35,018	8,67,806	3·44
1868-69	2,58,73,056	21,25,828	8·21

and the next exhibits the income and working expenses for the same year of the Ganges and Eastern Jumna Canals, the only important working lines as yet completed :—

	Year.	Gross revenue.	Revenue management.	Maintenance charges.	Total working expenses.	Percentage on Gross revenue.	Working expenses. Per cubic foot of discharge.	Per mile of canal.	Per mile of railway open.	Per acre irrigated.	Percentage of profit on capital sunk.
		Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.		
Ganges Canal.	1866-67	15,33,729	2,55,342	5,08,535	7,63,877	49·78	374	2,387	705	2·416	3·50
	1867-68	13,63,524	2,90,903	5,28,690	8,19,683	60·11	390	2,085	448	2·556	2·44
	1868-69	24,41,559	3,61,349	4,32,873	7,94,222	32·51	525	3,733	785	2·264	7·22
Eastern Jumna Canals.	1866-67	5,57,388	65,444	56,113	1,21,657	21·82	722	4,287	935	2·327	24·87
	1867-68	4,83,147	72,370	69,093	1,41,463	29·27	519	3,716	811	2·647	18·97
	1868-69	6,23,450	82,515	71,539	1,54,054	24·62	663	4,811	980	2·281	25·37

The succeeding table shows the cost of establishment, including accounts, employed during 1868-69 on original works, repairs, and revenue, and the percentage chargeable under each heading :—

Chargeable to	Share of Establishment. Executive.	Direction.	Total cost of establishment on each.	Expenditure.	Percentage on each.
	Rs.	Rs.	Rs.	Rs.	
Original works... ...	2,29,116	31,741	2,60,857	9,77,462	26·68
Repairs and plantations	59,097	12,377	71,474	4,35,386	16·42
Revenue management, including navigation	4,04,229	83,967	4,88,196	31,47,161 assessments.	15 51
	6,92,442	1,28,085	8,20,527	45,60,009	18·00

The working expenses on the Ganges Canal, which had hitherto been so large, owing to the great expansion of irrigation during 1868-69, were reduced from 49·78 to 32·51 per cent. on gross revenue; but on the Eastern Jumna Canal little room remained for expansion, and, consequently the working expenses only fell from 20·27 to 24·02. The conclusion drawn from thence is "that 25 per cent. about represents the working expenses of a fully developed and thoroughly efficient canal conducted on the North-West system." An instructive table is added, in which the increase of irrigation is contrasted with the decrease in rainfall. The percentage of the former varies from 28 in the Agra Division to 142 in Boolundshuhur, while the percentage of the rainfall varied from 30 inches in Bareilly to 67 in Etawah. The relative decrease of rain in Agra and Boolundshuhur differed only as 48·5 and 54·5 per cent.

The following table illustrates the areas irrigated relatively in the two seasons of khurreef and rubbee, showing not only how large a part was performed in the former season compared with that of previous years, but how much further a cubic foot of water was made to go—a fact which reflects great credit to the officers charged with the distribution of the water :—

Ganges Canal.

Year.		Area irrigated. Total.		Per cubic foot of supply.	Total water-rate.
1866-67	Khurreef	181,658		41·37	512,373
	Rubbee	453,076	634,734	103·55	893,660
1867-68	Khurreef	185,137		42·66	562,926
	Rubbee ..	348,319	533,456	98·39	675,564
1868-69	Khurreef . ..	344,267		69·63	814,631
	Rubbee	734,132	1,078,99	148·01	1,450,689

A question is raised by Major Brownlow as to the capacity to be given to canals in the North-Western Provinces in ralation to the volume available for the irrigation of the rubbee crop, and the advisability of supplying the plough waterings to the full extent of the volume available, as he considers that it was a speculative proceeding to distribute the 6,000 cubic feet available for this purpose in October, when the volume of the canal fell in January to 4,200 cubic feet. The remarks made by Colonel Greathed with reference to this point in paragraphs 33 and 34 are much to the point, and seem, at all events, to be borne out by the successful issue of the season's operations. The following shows the areas of some of the principal crops irrigated as compared with that of previous years, and that there is a steady, moderate extension in the cultivation of sugar-cane and rice, a two-fold increase in the rubbee grains, while the area under indigo remains stationary:—

	1864-65	1865-66.	1866-67.	1867-68.	1868-69.
Rice	22,466	23,154	30,539	36,365	43,355
Sugar .	50,159	58,416	46,338	55,232	60,654
Indigo	35,166	47,714	70,487	75,684	75,506
Cotton . ..	42,026	10,486	19,094	5,616	44,213
Wheat and barle .	338,071	362,679	400,444	319,715	699,582

Navigation.—The receipts from navigation, which is confined to the Ganges Canal, have increased 10·3 per cent.; but, according to the statement, the articles carried have increased from 27,000 to 45,600 tons. This quantity is, however, still very small compared with the length of the canals opened, *viz.*, 654 miles. In proportion, however, as obstacles are removed and greater facilities are offered, the traffic along the canal and its branches will doubtless increase.

Eastern Jumna Canal.

The extension of area on this canal was but 13,000 acres over the maximum previously reached in 1860-61, but it has now been so carefully worked for so many years that, as observed by the Chief Engineer, little margin remains for expansion. The profit on this canal for the year under review is said to have amounted to 25·37 per cent. on the capital, *vide paragraph 53 of the Report.* But though the absolute increase of area over that irrigated in the famine year of 1860-61 was only to the extent stated, yet the supply of water on the average throughout the year was less, and the duty obtained per cubic foot of discharge was the largest yet recorded, being 90·7 in the khurreef and 215·5 in the rubbee, or 306 acres in all. That one noticeable fact has received confirmation during this year's experience seems evident from the following remarks made by the Superintending Engineer, 2nd Circle, in paragraph 28 of his report: "that the contract system is one in which the interests of the cultivator are identical with that of the Government in the economical distribution of water, is fully borne out by this years' results."

Doon Canals.

These small canals do not improve much in their character as remunerative works, and the Superintending Engineer does not seem to anticipate much further improvement; but, at the same time, his remarks in paragraph 14 of the report are much to the purpose. He observes as follows:—"That the good done to a country by canals is not to be measured merely by the canal balance sheet, applies with two-fold force to the Doon Canals: a population has settled along these lines of irrigation dependent entirely on them, not only for water for their crops, but for water for domestic purposes. Close the Beejapoor Canal, and, in two years' time land now producing tea and cereals will be over-grown with jungle."

Jhansie, Humeerpoor, and Bijnour Irrigation Works.

These yield but an insignificant amount of revenue, and call for no particular remarks.

Rohilkhund Canals.

These canals are working at a loss, chiefly on account of the exceedingly low water-rates charged. A revision of these rates has been proposed by the North-Western Provinces' Government, and is now under consideration by the Government of India. The area irrigated amounted to 70,803 acres, or 2½ times as much as in the previous year. The increase was due to the prevailing drought, only 19·4 inches of rain having fallen during the year. The necessity for these canals is made apparent by the fact that rice forms so large a proportion of the cultivation. In the previous year the percentages of rice and wheat were 56 and 27 respectively, and during the year under review 40 and 36 per cent. A project was recently before the Government of India for remodelling these canals as well as raising the water-rates, and the Chief Engineer's opinion is that, seeing "the amount of deficit occasioned by ceasing to charge water-rate on canal water from natural streams has decreased from Rs. 27,169 to Rs. 4,947, there is every reason to push on the re-construction of these works." Section 6 of the Chief Engineer's report contains an interesting review of the effect of the drought in directing attention to the irrigation of the inferior food grains, nearly 77 per cent. of the total increased area consisting of "*jowr*" and Indian corn, the stalks and leaves of both of which serve as food for cattle, while the grain is consumed by human beings. The following remarks by Colonel Greathed graphically and significantly describe the superior effects of canal irrigation in the North-Western Provinces as compared with that afforded by wells: "But, besides producing food for the support of human life, canal irrigation created sustenance for cattle, which was produceable by no other means, and, at a crisis when wells failed in well-irrigated districts, and herbage and fodder depended on abundant water, the cattle of the Doab were saved, strong to labour in the work of the following harvests, whilst elsewhere those harvests also were reduced by the want of cattle which had been swept off by the drought."

* * * * * * *

"And, lastly, canal cultivators became rich whilst others suffered because they realized both large crops and high prices: the payment of land revenue was assured, the breaking up of communities, the resettlement of the social system of the country, the loss and dispersion of property, which famine entails, were averted, and a vast sacrifice of life prevented, which, but for the extension of canal irrigation, must have occurred in 1868-69, as it has occurred in the same districts in 1837-38. I trust these results may be pondered by those who recommend dependence on the irrigation to be obtained from wells in a year of serious drought." The amount of relief afforded by special irrigation works undertaken during the time of greatest pressure extended to upwards of two millions people and an outlay of Rs. 4,31,185. The only unsatisfactory matter is the delay in the submission of the report. His Excellency in Council also would have been pleased if something more had been said as to the efforts which it is believed are being made to check the waste of water which takes place over the wide districts, and which it is understood forms one of the greatest agricultural difficulties in the North-Western Provinces.

The Planters' Gazette.

BOMBAY, 21st December 1871.

CINCHONA.

REPORT ON ANALYSIS OF BARK YIELDED BY THE GOVERNMENT CINCHONA PLANTATIONS, MADRAS.

Extract from the Proceedings of the Government of Fort St. George, Revenue Department, No. 1686, dated 26th September 1871.

From J. Broughton, Esq., Government Quinologist, to the Secretary to Government, Fort St. George, Revenue Department, dated Cotacamund, 31st July 1871.

As in certain former reports I have the honour to adduce analyses, which express the changes in the composition of our oldest barks during the past two years. The following table expresses the amount of alkaloids in the trunk bark of the oldest trees of *C. Succirubra* in the month of May, the period of maximun yield in the respective years. The amount is expressed in percentages of dry bark :—

	1869.	1869.	1870.	1871
Total alkaloids	6·74	7·43	7·60	7·85
Total sulphates obtained...	6·06	6·43	6·00	5·15
Quinine	2·40	1·72	1 73	1 80
Cinchonidine and cinchonine	4·34	5 71	5·87	6 05
Sulphate of quinine obtained crystallized .	2·21	1.51	1·40	1·15
Sulphate of cinchonidine obtained crystallized	3·85	4·92	4·60	4 30

The above analyses show that up to May 1871 the total amount of alkaloids in the red bark had continued to increase. But as I had the honour to mention in a report dated 17th August 1868 (Proceedings, Madras Government, 22nd September 1868, No. 334, Revenue Department) as being highly probable to occur, the annual increments diminish in amount—a circumstance which indicates that the bark is arriving at its maximum of yield. The numbers which approximately express the annual increments during the period of my observations are 0·75, 0·69, 0·17, 0·25. The circumstance that these numbers do not accurately express a regular diminution of increment, is doubtless attributable to the difficulty which occurs in collecting in successive years a sample, which shall accurately represent the mean yield of the bark of a large number of trees, together with the difficulty in collecting the samples each year under precisely comparable circumstances. From certain results obtained in the comparison of the analysis of barks that have been treated with moss, with those of the natural unmossed bark, I am strongly inclined to believe that if the bark of our oldest trees has not actually reached the age of its greatest yield, it must have very nearly approached it. As this is a point of some importance, which cannot be held decided without positive proof hereafter being obtained, I here merely mention my personal opinion. In a report appearing (Proceedings. Madras Government, 22nd February 1869, No. 235, paragraph 4), I had occasion to mention that the amount of quinine had diminished during past years in the red barks, although that of the total alkaloids had increased. During the last two years, it appears that the amount of quinine has remained nearly constant, and probably in years to come, its amount will hereafter remain nearly stationary in our red bark. From the above analyses it also seems probable that the amount of obtainable crystallized sulphate of cinchonidine is diminishing with the increase of age. But with the present evidence I cannot hold this yet to be quite clear, since the determination of the amount of crystallized sulphates is apt to be modified by circumstances other than the real amount of pure alkaloid, which latter it only approximately indicates. The large amount of variation according to circumstance of growth met with in the bark of *C. Officinalis*, renders a precise determination of its *mean* quality a work of great difficulty. I here quote certain analyses of this bark calculated in percentages of its dry state .

Crown Bark from Dodabetta Plantation.

	I. Trees good growth, 7 years 6 months age	II. Trees of good growth, 5 years 9 months of age	III. Oldest trees.	IV. Trees of fine growth.
Total alkaloids	5·20	3·10	6·53	6 91
Quinine	3·48	1·62	4·18	4·71
Cinchonidine and cinchonine	1·78	1·50	2·35	2·20
Sulphate of quinine obtained crystallized ..	3·25	1·64	4·17	4 80
Sulphate of cinchonidine obtained crystallized	2·04	1·14	1·57	1·60

Crown Bark from Neddivuttum Plantation.

	Trees, 6 years 9 months of age.	Trees, 6 years 3 months of age, of good growth.
Total alkaloids	4·06	6·01
Quinine	3·03	4·19
Cinchonidine and cinchonine	1·93	1·32
Sulphate of quinine obtained crystallized	3·14	4.24
Sulphate of cinchonidine obtained crystallized	1·05	1.30

The above analyses, though comparatively useless to determine the alteration of the bark with age, are adduced as showing the high quality of the barks. Though it falls without my province to speak of the improvement in the growth of the *C. Officinalis* trees, yet I cannot forbear to remark that a low yield is getting much less frequent in their bark than formerly. Both the crown barks of Dodabetta Plantation, which consists entirely of this species, and those of Neddivuttum are improving in quality. The increase in the yield of alkaloid is quite apparent, although I cannot with accuracy express its actual amount. This increase is due to quinine, and at present it actually appears probable that hereafter the total yield of alkaloids will equal that of the red bark. These two kinds divide between them nearly the whole of our plantations. For European quinine manufacture, the bark of *C. Officinalis* is admirably suited, as it is so rich in quinine. In addition, it is easy to work, and the sulphate of quinine crystallizes with great readiness and purity. It is especially the bark for export to Europe. A small quantity is now packed for sending to England, and I trust that from time to time its export may be continued. In total yield the bark of *C. Succirubra* is the richest, but in its natural state at least, this consists mainly of cinchonidine, cinchonine, and occasionally quinidine—alkaloids which custom and the addition of fresh names, coincident with the first separation of these substances, have kept out of extensive theraputical use. The medical reports of the Cinchona Commissioners of the Indian Presidencies, and the report on the medical use of "amorphous quinine" appear to indicate that these alkaloids, and consequently red bark, is the kind that can be employed most usefully in India. In Europe the price of the natural red bark will hereafter sink, when it is brought into competition with crown bark. How far by careful special cultivation of the red bark it may hereafter be possible to modify this result, it would at present be premature to speculate.

After the above kinds, the most important at present cultivated on the plantations is undoubtedly that of *C. Calisaya*. As in my former reports the trees of Calisaya were very young, it is quite natural to find the amount of alkaloids in the bark has increased. The most remarkable point about the plants of *C. Calisaya* is the great number of varieties. These display almost every habit. As it was necessary to examine the bark of the trees of most marked character, in order to determine the kind most suitable for cultivation, these varieties have taken up much time. I have the honour to quote the analyses of several of these varieties. The alkaloids are given in percentages contained in dry bark :

Trunk Bark of C. Calisaya grown at Neddivuttum.

	I.	II.	III.	IV.	V.
Total alkaloids	3 95	3·03	5·28	4·16	5·36
Quinine	2·67	3·18	1·02		4 67
Cinchonidine and cinchonine.. ..	1·28	0·75	4·26	...	0·69

These represent fairly the different yields I have met with among the kinds of *C. Calisaya* raised from seed obtained from Mr. Money. They are, as a whole, of good quality ; but No. V., or the bark of the variety with broad leaves, which are red in the under-surface and of vigorous habit, is the kind which should be propagated, as it is the one whose cultivation can be most profitably extended. I have examined the bark of several other varieties beside those whose analyses are given above, but find them all inferior to No. V., and promising nothing remarkable in their qualities. The bark of our *C. Calisaya* is of excellent quality, and is better suited for quinine manufacturer's use than that of *C. Succirubra*. I regret that the larger number of the trees has not been planted, but as the yield of bark from the present plantations will shortly be so large, I cannot now recommend any considerable extension even with this sort.

In a report appearing in Proceedings, Madras Government, Revenue Department, No. 334, paragraphs 22 and 23, I had occasion to remark that in the barks of the *C. Succirubra* and *Officinalis*, a high mean temperature appeared unfavourable to the production of quinine, that alkaloid occurs more readily in the bark of trees grown at high elevations within certain limits. I have met with a remarkable illustration of this principle also in the bark of *C. Peruviana*. The bark of this tree, grown at Neddivuttum, generally contains no quinine whatever, and at best contains it in so small an amount that it is with difficulty it can be clearly detected. But the Superintendent of the plantations has, with great judgment, experimentally planted several of these trees at Dodabetta plantation, where they grow with much difficulty from the cold being too great for them. An analysis of the bark of one of these trees gave the following results, to which, for comparison, I attach an analysis of the bark grown at Neddivuttum: —

Dodabetta.		Neddivuttum.	
Total alkaloids	2·06	Total alkaloids	6·25
Quinine	0·79	Soluble in ether	0·41
Cinchonidine and cinchonine..	1·27	Cinchonidine	2·00
		Cinchonine	3·84
Sulphate of quinine obtained crystallized..	0·67		
Sulphate of cinchonidine obtained crystallized	0·94	Sulphate of cinchonidine obtained crystallized	1·60

Though the bark of *C. Peruviana* from Neddivuttum contained a small amount of alkaloid soluble in ether, it was not quinine. But by growing the same species at the higher elevation of Dodabetta plantation, its bark quite alters its character, and yields in analysis an amount of pure quinine, which readily crystallizes as sulphate. Indeed the bark thus grown, far more resembles the bark of *C. Succirubra* than a grey bark. I cannot but consider this instance of a total change of alkaloid, by increase of elevation, a most interesting one.

The occurrence of several remarkable varieties among the trees raised from seed has directed my attention to the occurrence of hybrids among our species of cinchona. In one instance I was able from the account given by Mr. C. Dawson, then Assistant Superintendent at Neddivuttum, to directly trace the origin of a very beautiful plant, which was found to be a hybrid between *C. Succirubra* and *Micrantha*. This plant was picked up a seedling under a tree of the latter. I analysed its bark and found its yield was poor, but represented a mean between the qualities of the two species. Examination among seedling trees led to the discovery of many other examples of hybridism, especially to cross breeds between *C. Succirubra* and *Officinalis*. In 1870 I communicated a short memoir on the subject to the Linnæan Society.* The occurrence of the dimorphic varieties *macho* and *hembra*, in species of cinchona was shown in this communication to render cross breeding highly probable, in the same manner as has been shown by Darwin to occur in *primula*, *oxalis*, and other plants. I learn from the discussion which took place on the subject at the Society's meeting that the fact of the tendency of cinchona to hybridism was considered proved. Since that time I have made numerous analyses of the bark of various hybrids that I have observed, but in no one instance have I found any of special excellence. In fact, it appears to me that these hybrids combine the bad qualities of both the parents. I therefore do not quote the analyses.

* Read March 3rd, 1870.

I cannot but think that this ready hybridism between the species of cinchona affords an explanation of the occurrence of the numerous *varieties*, which have been recognized by botanists. I observe, for instance, that a most recent classification gives 33 undoubted species, and nearly 80 separate varieties of cinchona. On our plantations there are several plants which, though certainly hybrids, would undoubtedly be made into species by a botanist ignorant of their origin. It seems, therefore, not improbable that several species, to which a separate name has been attributed, may be only South American hybrids. It is to be hoped that in any future botanical classification of the genus, this circumstance may be borne in mind.

This fact of the inter-breeding of the species renders the seed of a tree, surrounded with many others of a different kind, subject to considerable uncertainty of producing all plants like its parent. As a fact the seeds of the variety I called provisionally *lancolata* gave but few plants which resembled their parent, and consequently the *seedlings* had to be discarded. As the tree producing the seeds was surrounded on all sides by the ordinary crown barks, the variation in the seedlings becomes intelligible.

I observe that Dr. Weddell in his "Notes sur les Quinquinas" (Annales des Sciences Naturelles, 5 e. serie, Tomes XI. and XII.), and at the suggestion of Mr. Howard, calls the valuable variety I called *lancolata* above alluded to, *Cinchona Officinalis, Complandiana, Angustifolia* remarking that *lancolata* does not express so well as *Angustifolia* the peculiar shaped leaf. I would suggest that the name *Angustifolia* be, in future, adopted as the name of the variety.

In several preceding reports I have abundantly stated my convictions, and their grounds, for considering that living cinchona bark has its yield of alkaloids injured by exposure to sunlight. The experimental evidence of this already adduced appears to me to be quite conclusive of the fact, so that further proof is scarcely needed. Further proof appears, however, in the circumstance of which I have been for some time aware, that the bark of opposite sides of the same tree differs in yield of alkaloids. This, of course, is only fully apparent in trees that are equally exposed to sunlight on each side, which from the site of the plantations, does not generally occur. But the following analyses express the yields of the bark taken respectively from the north and south sides of a tree which is equally exposed on all sides. The bark was taken July 25th, 1871 :-

	North side.	South side.
Total alkaloids	3 18	3 81
Quinine	0 62	1 40
Cinchonidine and cinchonine	2 56	2·40

As the sun has been on the north side of the tree for the last four months, the effect has been that the yield of alkaloids has been diminished 0·68 per cent. This decrease apparently consist of quinine which is commercially the most valuable of the alkaloids. This effect has been produced in spite of its being the most cloudy period of the year.

TEA.

THE MANUFACTURE OF BRICK-TEA.

BY JAMES MACPHERSON.

THE commerce in brick-tea is so extensive among the people of Central Asia, that it seems wonderful so little should be known on the subject. Kiachta, frontier town in Eastern Siberia was, up to the year 1861, the principal mart for brick-tea; the monopoly, held by a first-class guild of Russian merchants, was abolished in that year, however, and in 1862 the frontier custom-house was removed to Irkutsk, since which time tea has entered the portion of Siberia eastward of Lake Baikal, free of duty. Moreover, the importation of sea-borne tea was legalized in April, 1862, in spite of strong protests from Kiachta; this was intended to put a stop to the contraband trade, and the high prices charged to consumers by the Kiachta monopolists. In spite of these things, however, 7,083,029 lbs. of brick-tea are known to have been imported at Tien-Tsin, for Kiachta, in 1868. This is only a fraction of the trade, as Kiachta is only one of the many marts for the article. Some attempts have been made, on the part of the Indian tea planters, to invite the Tibetans and others to deal with them, but (so far as brick-teas are concerned) without much success. This may be due to the general ignorance prevailing as to the proper method of manufacture. It is generally admitted that the coarser leaves are used. After the green leaves have been steamed they are kneaded into a pasty mass; this kneading, under the hands, effectually rids the leaf of the bitter juices which are so very undesirable; moreover, it prepares the leaf for the future compression in some way not clearly known at present. I am disposed to believe that this kneading process with the hands is a mere variety of practice, and that it is frequently set aside; in such case the leaves are pressed into moulds directly the steaming is completed. Mr. C. M. Grant, of Kiachta, (the well-known proprietor of the Overland North China Telegraph Agency), says the coarser leaves are moistened by steam, and then compressed in moulds in the shape of bricks, which are stacked so that the air may freely circulate and dry them; this is for green brick-tea; black brick-tea is fabricated from the refuse as black tea, or the siftings of the teas prepared for the European markets. In England the steaming process seems to strike the mind as a fallacy at first, but this arises rather from its being so very different from the ordinary descriptions of the method of preparation, than from any real defect or difficulty in the process itself. The allusions to the manufacture of brick-tea in the English language are exceedingly rare. It is mentioned in the *Asiatic Journal* (I think) that in the reign of Jin-Tsung (A. D. 1023-63) teas were of two kinds: the first kind called *Peen-tcha* was the leaves combined together in a mass in the form of a board, and then dried by the action of fire; the second kind was called *Sam-tcha*, being the leaves reduced to powder. Steaming seems to have been known long before this time however, and some Chinese authors consider it to have been the earliest known method of manufacture. Von Siebold mentions a method of steaming used in Japan for the preparation of green teas; he says the leaves are laid on mats, in a square box or chest, into which the steam is introduced from a kettle. There are undoubtedly a very great many methods, just as there are in the preparation of ordinary teas, and further information is very desirable as to the means employed by the Russian agents in the interior of Hupeh (Hu-kung) for steaming the leaf; also as to when the leaves are gathered for this tea, the description of mould in which the tea leaves are pressed, the mode of obtaining the pressure, the ordinary time employed in drying the bricks, and the temperature of the air and general state of the weather, &c. Full information on these subjects would be highly valuable to the Indian tea-planter, and benefit commerce generally.

[The Editor of *The British Trade Journal* will be obliged for any facts relating to the above subject, which gentlemen residing in the interior of China may favour him.]

ESSAY ON TEA.

The Judges appointed to consider the merits of the essays sent in response to the offer by the Council of the Silver Medal of the Society of Arts for the best treatise on the profitable production of tea, have sent in their report, upon which the Indian Committee passed the following resolution, which has been adopted by the Council:—"The Indian Committee, under the recommendation of the Judges appointed, is not in a position to recommend the Council to award the medal, but it gives commendation to the essay of Mr. James Macpherson, of 49, Hereford-road, Westbourne Grove, as containing much information as to the growth and manufacture of tea in India." The Judges were Major-General Henry Pelham Burn, Dr. Archibald Campbell, and Robert Fortune, Esq.

INDIAN TEA CULTIVATION.

Dr. Archibald Campbell writes as follows:—"I have the pleasure to send you a memoradum on the tea statistics of Lower Bengal for last year. It shows a total export of more than 11,000,000 lbs., being nearly 3,000,000 lbs. increase over the previous year. For the present year, even at the same rate

of increase, we may reckon on 15,000,000 lbs. as the amount of export. To this for all India, has to be added the produce of Kumaon, Dhera Dhoon, Kangra, and the Neilgherries. For Darjeeling, the memorandum gives the produce for 1869 only. For this year it may, I believe, be reckoned at more than double. In 1862, when the Indian teas were first exhibited in London, the total produce was reckoned at 2,000,000 only, so that the steady increase may be considered satisfactory. There is no doubt, I believe, of the great future that is in store for Indian teas, not only in England, as their excellent quality and prefect purity become better known, but in all the extensive tea-consuming countries north of the Himalayas, when the Indian Government takes real pains to procure safe and easier transit in that direction. In Assam, there are 290 plantations, containing 29,350 acres under tea, which produced last year 435,772 lbs. of tea. In Darjeeling, there are 44 gardens, having a cultivated area of 10,067 acres, which yielded 851,549 lbs. of tea in 1869. In Sylhet there are 22 gardens, having 2,240 acres cultivated, which produced 239,902 lbs. In Cachar there are 118 plantations, and 24,374 acres under plant; the produce last year was 4,000,832 lbs. of tea. The other districts such as Dacca, Chittagong, Hazareebagh, and Lohardugah, contain only a few gardens, have not furnished proper statistics. There are but few imported coolies in Sylhet and Darjeeling, but in Assam there were 21,667, but the returns are not satisfactory. Cachar had 14,776 labourers under contract, and 15,000 time-expired men. About 200,000 rs. were remitted to Cachar during the year. The quantity of tea exported from Calcutta was 18,434,000 lbs., against 8,789,344 lbs. the previous year, showing an increase of 2,644,651 lbs."

AGRICULTURAL STOCK AND TEA PLANTATIONS ON THE NEILGHERRIES.

From the Commissioner of the Neilgherries to the Secretary to Government, Revenue Department, Fort St. George, dated Ootacamund, 25th February 1871, *No.* 16.

G. O., 23rd January 1871, No. 112, directs me to place certain orders on the unanswered file for the half-year ending 31st December 1870, viz:—Order, 30th March 1870, No. 411, paragraphs 5 and 6. Order, 19th December 1870, No. 2072. The last-named order was replied to on the 25th January 1871. I now reply to the first Order.

I. "Desiring to be furnished with any suggestions for adopting "measures calculated to improve the agricultural stock of the Neil-"gherries, and for assisting in procuring a superior description of "plant for stocking the tea plantations."

The first part of the order respecting agricultural stock was replied to in my letter to the Board of the 6th November 1869, No. 58, in answer to proceedings of the Board, No. 745, of the 3rd February 1869. I now forward copy of that letter and its enclosures. With respect to tea planting, I have been for some time in correspondence and consultation with most of the Neilgherry tea growers, with a view to place before Government a definite proposal for the encouragement of tea cultivation up here. From the tenor of the various replies I have received, I have somewhat changed my opinion as to the way in which Government aid had best be given. I find that the tea planters are nearly unanimous in thinking that it is not so much seed of a superior description of tea plant that is wanted here, as the knowledge of some economical, manageable, and effective mode of manufacture. By this time, after repeated failures, the varieties of China hybrid and indigenous tea plants have been imported, and are established on the Neilgherry plantations; and some of the proprietors are prepared to supply as much tea seed as is likely to be wanted for some time to come, and object, not perhaps without reason, to Government interference with their market. Great difference of opinion prevails (as was to be expected) among those interested in tea growing on the Neilgherries as to the way in which Government might render aid. On the whole, however, the suggestions offered may be reduced to four:—

I.—That there should be free tenure of the land for a certain number of years.

II.—That Government should introduce the best mode of manufacture by the importation of Chinese or Assam experts, or by accrediting some qualified European to the tea districts of Northern India, in order that he may make himself master of the most approved methods of manufacture there, and instruct us here.

III.—That the Commissariat should be directed to call for tenders and purchase Indian teas instead of China as hitherto.

IV.—That a quantity of China, hybrid and indigenous Assam tea seeds should be imported by Government and planted out in separate patches at a distance from each other, so as to prevent hybridization and enable growers to get seeds *true* to their kind, which is not always the case with the seeds purchased from private gardens.

The planters had the satisfaction on interview here last year with His Excellency the Governor and the Members of Council on the subject of the first suggestion. I have written all I have to say on the same subject in my letters* to the Board, which are, I believe, still before Government, and on which final orders have not yet been received. I will only add that if the principle of free tenure for a time is one that can be recognized at all any where, tea planters on the Neilgherries have special claim to the indulgence.

In Assam, Cachar, Chittagong, and in Darjeeling, and other hill districts of Bengal, climates congenial to the tea plant are found, and the growth and manufacture of tea are thoroughly established there. But in Southern India tea cultivation is of recent date; and, although the plant will live and grow almost anywhere, soil, climate, elevation, labour, manufacture, and communications have all more or less to say to the success or failure of a plantation as an investment. On the Neilgherries the effect of all these is not yet known. A planter who, as a pioneer, employs his capital in the formation of a tea estate in the south of India, incurs risks beyond those of ordinary agriculture, or even of coffee planting, and may therefore fairly ask Government to forego the rent of the land until he has had time to ascertain whether or not his tea will yield him a profit. As regards the second suggestion, one thing is pretty certain that hill teas excel in flavour; but the hill plant yields less leaf, and the leaf weight for weight, wants the strength of Assam and other teas grown at lower elevations. On this account manufacture is all-important on hill states. Given a suitable soil, climate, and elevation, the tea plant here will produce *flushes* of leaf in considerable quantity, and so far the Neilgherry planter, who has some knowledge of tea growing, can see his way. But then comes manufacture on which profit and loss mainly depend. It will be within the recollection of Government that four tea manipulators were engaged for two years, brought down from the North-West Provinces, and placed in February 1863 upon the Neilgherry plantations of Messrs. Mann and Rae. Mr. Collector Grant† was under the impression that "considerable benefit resulted from the instruction of the tea manipulators." I am, however, rather disposed to think, from what I can learn, that the benefit was not great. Mr. Ouchterlony, who was managing Mr. Mann's estate at the time, wrote‡ on the 15th November 1864 that their (the tea manipulators) conduct had been good; "but, beyond showing "the detail of manipulating and use of the various utensils, they "cannot give instruction on the general work * * *, and the result "of their own work in preparing tea was an article inferior to "what the overseer and his own men prepared." Mr. Rae wrote§ "They will introduce a new era in the manufacture of "tea into the Dehrah Doon and North-West. The tea they first "made for me has cost me more than they here cost the Govern-"ment." If Government admitted the necessity of doing something more towards helping on *manufacture* here, I should not advise a fresh importation of native manipulators.

There are scarcely two estates here on which the mode of manufacture is the same. But an intelligent man, by attentive inquiry on the spot in old tea districts, would surely be able to determine which is the best plan, and afterwards instruct others in the process. An expenditure by Government of 3,000 or 4,000 Rupees in the employment of such a man for a few months might, I think, set the point at rest once for all; and it would be in this direction, if any, that I should like to see the Government take action rather than import more native manipulators. Year by year tea cultivation in India is assuming proportions which would justify the expenditure of a few hundred pounds to aid, if it be found really necessary, in developing an industry which promises to be of great national importance. When tea planting in the North first attracted notice, experimental estates were opened by the Government of India at great expense, and seeds and seedlings were given *gratis* to the public. The result is that several districts in the north are now studded with tea estates, worked by private individuals. There is every probability that tea growing on the Neilgherries can be made to pay when worked under proper conditions of locality and management, if the difficulty of manufacture can be satisfactorily solved. The Agricultural and Horticultural Society of India have offered a medal and 500 Rupees for the best essay on tea cultivation. The essays are to be in Calcutta by the 1st proximo. One I know has gone up from this district. It would be well to await the result, and see if the prize essay affords such information on *manufacture* as to obviate the necessity of Government moving in the matter. The third suggestion that the Commissariat should be called upon to purchase Indian teas is one that I cannot support. Such an artless mode of protection might find many advocates in America, but infant industries with us must be content with less easily discovered props. The attention of the Commissariat Officers might be drawn to Indian teas; but, in the interests of economy, they must be left to purchase the best tea they can find at the lowest figure. Before commenting on the fourth suggestion, I should like to

* 26th October 1869, No. 149, Board's Proceedings No. 1861 of 18th March 1870; 7th May 1870, No. 69, in Board's Proceedings No. 5611 of 6th September 1870.

† Letter, 2nd March 1863, No. 19, in Proceedings of Government, Revenue Department, 10th March 1866, No. 102

‡ Proceedings of Government, 29th December 1864, No. 212.

§ Proceedings of Government, Revenue Department, 30th January 1865, No. 314.

await Mr. McIvor's return from Bengal, in order that I may with him go over the small Government tea estate here, to see its condition and note what varieties of tea plants we have. In conclusion, I venture to point out the importance of encouraging tea planting to the utmost, with a view to the development of the resources of this and other Hill plateaus. Native hill cultivation is unimportant. The great staples of the low country cannot be raised here on account of the climate. Distance from markets and cost of transport tell heavily on agricultural industries which raise bulky or perishable articles. Coffee pays best at lower elevations. As cinchona produce is a medicine and not an article of food, its cultivation will too soon find a limit. The increased expense of living in India and the greater facilities of communication with Europe make the advent of mere settlers more and more improbable. Tea, therefore, growing, as it does, in climate attractive to Europeans, seems to me to afford the best hope of inducing any number of them to people our Hill plateaus.

From the Commissioner of the Neilgherries to the Secretary to Government, Revenue Department, dated Ootacamund, 11th September 1871, No. 67.

Your official memorandum dated 1st September 1871, No. 167. I have the honour to forward Mr. Brace's essay on tea culture for the perusal of Government. Mr. Brace informs me that the Secretary of Agri-Horticultural Society of India has written to him to say that it has not yet been decided to whom the prize of 500 Rupees is to be awarded.

From the Commissioner of the Neilgherries to the Secretary to Government, Revenue Department, dated Ootacamund, 20th September 1871, No. 70.

Your official memorandum, No. 167, dated 1st September 1871. In my letter of the 25th February 1871, I said I would await Mr. McIvor's return from Bengal before reporting on the desirability of Government importing further China hybrid and indigenous Assam tea seed and forming separate plantations of each at a distance from one another to prevent hybridization. I have since then been over the Government tea garden behind Dodabett two or three times, and went again on the 12th instant with Mr. McIvor, from whom I learn that we have 4,750 seven-year old tea plants and 2,500 young plants. Of the old plants about half are Assam and quarter the hybrid variety. The plants in the garden looked strong and healthy, and would furnish an immense number of cuttings if there was a demand for them. Mr. McIvor was of opinion that propagation by cuttings would prove more satisfactory than by importation of seed. Under these circumstances might be put down a few thousand cuttings of each variety of tea plant for distribution to planters *gratis*, or at some nominal price. This, I think, would meet present needs. Hereafter, when there are signs of tea paying and land is being taken up actively for tea cultivation, Government might consider the question of adding in the importation of seeds of the various varieties. In June last I received an offer from Captain Jennings to lease the Government tea garden for 150 Rupees per annum. Subsequently, in August, he modified his offer to the purchase of the leaf, and I have accordingly desired Mr. McIvor to arrange with him the price per pound, and to keep an account of the quantity of leaf picked and sold that we may know how much an acre of a certain age plants will produce.

If the annually increasing importation of Indian tea into the London market is meant to continue, it must do so under conditions which will not only multiply its popularity, but sap the associations which supported a taste for the China herb even before the hybrid product of Assam had been discovered, and which have continued to keep alive a partiality for it in spite of its inferiority to the plant of our Bengal gardens. Celestials have done much of late years to engender a distrust in the public mind of England of their honesty. A goodly quantity of the stuff exported from China as tea, has been discovered, on analysis, to be an abominable adulteration of willow leaves and steel-filings, together with used-up tea leaves renovated, artificially faced, and mixed with earthy colouring matter, besides "a great deal of dirt and filth." A single shipment of this vile compound consisted of 500 chests from Shanghai. Other invoices smaller in bulk, but numerically very large, aggregating some thousands of pounds, are yearly disseminated through England by the agency of petty dealers skilled in the art of alloying. Anxious enquiry has been suggested by the practice, in respect to how far the law is potent to step in and check this wholesale deterioration of a herb, which long habit has rendered so grateful to the palate. But the law, it would seem from published accounts, is powerless to interfere and circumvent the fraud, though admitting the necessity for special legislation. But where the law is so lax and toleration so charitable, it may be doubted whether very important or beneficial results would follow were the State even to provide against the nefarious systems adopted for "bettering" a staple. On this head, Dr. Scoffern of London, says :—

"Not all chemists, however, have accepted a chemical standard in the matter of adulteration. One chemical professor, who gave evidence before Mr. Scholefield's Select Committee on adulterations, seems to hold opinions of purity, impurity, adulteration, &c., more vague and undefined than any held by the public. The gentleman in question admitted that, in respect of gin, after the publican had weakened it with water, and subsequently reproduced the semblance of strength by the incorporation of other materials, no injury was committed on the public by the sale of such result. He maintained that the article ultimately sold was sold at a fair price, and therefore was not an adulterated article. Such was the testimony given by a Professor of Chemistry to the Pharmaceutical Society, and colleague to the late member for St. Albans. Surely this is loose morality to say the least of it."

Loose, however, as it doubtlessly will and must appear to persons of rigid principles, as we have before seen, the law cannot interpose to establish a healthier tone of morals, for so long as principles and interests conflict, a large margin of credibility must be entered on the debit side of charitableness. With the enlisted responsibility of professional experience, rogues have felt their hands strengthened and their dishonesty authorized under scientific analysis ; they have waxed fat, and pursued with renewed ardour the simple method of multiplying their unholy gains at the expense of a little ingenuity. The public has suffered in health as a matter of necessity, but the public is tolerably well contented to suffer when it is told, *ex-cathedrâ*, that its forbearance is indispensable to the promotion of rascality. We find precisely the same moderation used in tea adulteration. Most people are aware of the unenviable repute into which the sloe has fallen. They may remember the couplet :—

> "Port and China now farewell, for we've the sloe divine,
> Its leaves make all the tea we sell, its fruit makes half our wine."

If we substitute for the sloe some other ingredients we have enumerated, and base our conviction of the theory of tea adulteration as it now prevails, on the published experience of analytical chemists, we shall find the substance sold in England as China tea, not a greatly villified compound. As science has advanced, adulteration has become easier, and manipulation more dexterous. It is a well-known fact that establishments, having for their object the manufacture of spurious teas from the leaves of other than the tea plant, once existed in London, though it is probable they have been for some time past defunct, but the art they practised is yet alive, and the production of fictitious tea from exhausted leaves impregnated with colouring and flavouring substances, is abundantly evident. The notorious chicaneries of the modern Babylon, we purpose making the subject of a future article, confining ourselves for the present to a consideration of imports from China.

By far the largest amount of tea adulteration is carried on by those skillful operators, the Celestials, in their own country. These expert rogues, says a modern writer—"in whom the imitative faculty is so strongly developed that their artists will even depict each small-pox indentation on the face of a sitter"— experience no difficulty in palming off upon the "outer barbarians" adulterated tea. To fashion tea dust into the appearance of dry leaves, to make black tea blacker, and green tea greener by artificial means, are some of their pleasantest diversions. The disguising substances employed being seldom unobjectionable in a sanitary sense. By means of plumbago, a rich, deep, black colour is obtained, an increase of greenness and a lustrous sparkle are imparted to green tea by a mixture of talc powder, turmeric, and Prussian blue, a substance, which, if not positively poisonous, is, notwithstanding its toxicological inertness, highly indigestible. Mr. Warrington, of Apothecaries' Hall, is the chemist to whom must be allowed the praise of having fixed upon a determination of the methods by which tea is adulterated in China. He states :—

"I examined the article of tea some years back. In 1844, rather accidentally than otherwise, I was drawn into the examination more as a point of chemical interest. Two samples of green and black tea were brought to me by an excise officer, who had made a preliminary seizure in the neighbourhood of Kennington. He wished to know if those were genuine teas. I requested him to get further information as to the identification of the samples with the bulk of the teas, and he was to see me again. The samples lay before a window, and one day seeing the sun upon the surface of the green tea, I was very much surprised with the varying tints. I then examined it microscopically, and I found the whole of this tea was faced with a colouring material. On calling at one of the large tea warehouses, and mentioning what I had observed, they said immediately 'Have you examined the unglazed tea?' I was very much struck with the term unglazed. I asked them what they meant by 'unglazed tea.' They said 'we have two kinds of tea in the trade ; what is called glazed tea and unglazed tea."

Mr. Warrington was shown a specimen of unglazed tea, which he describes as of "a dull slate colour." On examination he found no turmeric, and very little Prussian blue, but a quantity of sulphate of lime upon the surface. Now, except the refuse dust of tea leaves can warrant the consanguinity, the

abominable mixture that passes—less now than in former years—in the London market, and is vended by wholesale and retail dealers for China tea, is nothing more than we have previously described. In China the process of sophistication is simple, consisting of a preparation of gum, brown earthy matters, and a little tea dust fashioned into the external appearance of tea and dried. This compound is produced for the special delectation of barbarians, under the appropriate designation "lie" tea. There is a germ of honesty in this appellation peculiarly gratifying, when we take into account the characteristics of our "Celestial" friends. Having enacted a falsehood by producing the mixture they seem to compound with conscience in their selection of a suggestive title for the filthy product.

It has frequently struck us as singular that so large and influential a body as the tea planters of Bengal, have never, for their own protection, exerted themselves for the formation of an associated Agency in London. We have frequently urged upon their consideration the immense advantage such a body would confer; the accession of power in moving the Indian authorities by extraneous pressure and parliamentary discussion, by the publicity of advertisements and ventilation in the first-class Metropolitan journals, and by means also of minor instrumentalities such as are unavailable in India. As the law reads, a custom-house official in London is not empowered to seize and confiscate the deleterious compou . ls now imported for home consumption, though he may know the same to be detrimental to health if used as beverages. It is matter for very serious deliberation, whether a system of inspection should not immediately be introduced in the interests of sanitation and public safety, and this is one of the essential measures a "Planters' Association," duly represented in London, would soon succeed in establishing. A good deal may also be urged on the advisability of popularising Indian teas at home by means of published reports of chemical examinations, correspondence with various societies, statistical information on Indian tea gardens, &c., by which invoices, with the exception of small reserves, might be bespoke long previously to arrival, at urrente market rates, or even more favourably, if the supplies were guaranteed to come regularly to hand. In this way also attested samples could always be made available to refute the suspicion of impure teas being made to do duty as genuine India manufacture. The advantages and facilities to planters would be, we believe, considerably greater than those we have enumerated, if they would but combine for the furtherance of the common object. In our next notice of the subject, we hope to offer a few more useful hints to such of our planting friends as may feel interested in the perusal.—*Bengal Times.*

Pruning of Tea:—By George King, M. B., F. L. S. Late Deputy Conservator of Forests, Kumaon.

(From the Journal of the Agricultural and Horticultural Society of India, Vol. III., Part 1.)

Although it is about a quarter of a century since its cultivation was begun in the North-West Provinces of India, only a few years have elapsed since tea first began to be seriously looked upon as a garden crop, and to have the commonest principles of horticulture practically applied to it. The idea that guided tea planters in these provinces for many years, appears to have been that tea is a kind of forest crop, on which high cultivation would be thrown away, and in fact that hoeing and manuring were likely chiefly to stimulate the growth of the rank grass and weeds that still disputed possession of the soil (usually only too successfully) with the Chinese exotic, to the success of which they were looking for the realization of their fortunes! In consequence of their attachment to such ideas, they did not consider a practical acquaintance with farming or gardening as of prime importance in the manager of a plantation. Great energy indeed was often displayed in planting out tea bushes, but none whatever in caring for them afterwards. *Laissez faire* was really the motto, and the practice was thankfully to collect what seed and leaves the bushes might yield, and by the aid of a Chinaman, (who might or might not have had anything to do with tea-making in his native country), to convert the latter into as good tea as possible. Among the ordinary operations of gardening in respect of which tea had been until very lately quite neglected is that of *pruning*, and on the *rationale* and practice of this I now venture to submit a few remarks:—

The tea gardens of the North-West Provinces are located either in Dehra Dhoon, a district lying at the base of the Himalayas on a plain about 2,000, or 2,200 feet above the level of the sea, or on the lower and outer ranges of the Himalayas in the provinces of Gurhwal and Kumaon, at elevations varying from probably 4,000 to 7,000 feet.* With a few exceptions not worthy of mention, the kind of bush laid out in these gardens is the Chinese planted in clumps at distances varying from 6 × 6 feet to 4 × 4 feet. The appearance presented by many of the clumps unpruned tea of various ages that may still be found in plantations in Kumaon, is that of small stunted masses from 1½ to 2½ feet in height, and about 3 feet or a little more in circumference. If examined, each clump will be found to consist of some gnarled and usually lichen-covered stems which give rise to a few crooked warty branches, that carry towards their tops a tangled crowded mass of short hard twigs, bearing some small leathery rather yellow-coloured leaves. A young healthy shoot coming straight from the roots is hardly to be found. At the appropriate seasons, this general appearance is modified by the presence of faint flushes of young and green leaves, by masses of flowers, and by loads of seed. Looked at from above, one of these clumps presents a rounded dense surface of small short twigs, and looks solid enough to afford a comfortable seat to a man of moderate weight! It need not be added that the yield of useful leaf on an acre of tea of this sort is but small. The condition above described is in some respects an extreme one, and is that assumed by unpruned tea in the higher plantations on the hills, where apparently the tea-plant is fighting against heavy odds in the matter of climate, and is in a state where the *laissez faire* system of treatment is particularly inappropriate, and where a little attention to other operations besides pruning (such as hoeing and manuring) would produce the most marked effects.

In the moister, warmer, and in everyway more genial climate of Dehra Dhoon, unpruned tea-clumps* are of greater size, and the stems and branches are less gnarled and lichen-grown. The leaves are also larger, and the flushes in the rains more vigorous.

The yield of seed used in Dehra as in Kumaon to be large; and this fact is quite in accordance with general experience, for it is a matter of common observation that many species of plants, when grown under circumstances not natural and unfavourable to them, have an excessive tendency to run to seed, as if, feeling themselves to be in a dying way, they were determined to do their best as an expiring effort, to continue a progeny to another generation. The appearance of untended tea in the higher plantations of Kumaon is particularly suggestive of the existence of such a struggle for life against adverse circumstances.

As long as tea-seed remained a marketable commodity, there was some show of reason for continuing a system of cultivation, or rather no cultivation, which undoubtedly favoured its production in quantity, though the quality must have been poor: and doubtless pruning would have been resorted to sooner, had the demand for seed (concomitant with the mania for extending cultivation) ceased earlier. Both have now ceased, and such tea-planters as still continue to carry on their gardens, now look to leaf, and to leaf alone, for their returns. Pruning has now begun to be generally practised; and in Dehra Dhoon indeed, every plantation has been submitted to the knife. The measure has not however always been either wisely or well carried out. A few remarks therefore upon the facts and principles on which the operation is founded might be of use as guiding to a correct practice, and before going further, it will be necessary to consider briefly the structure of the stems and leaves of plants, and their mode of nourishment and growth.†

The organs of flowering plants may be divided into *vegetative* and *reproductive*. The vegetative organs are those by which the life of the individual is sustained, and by means of which it grows; they consist of root, stem, and leaves. The reproductive organs (consisting of flower, fruit, and seed) are concerned with the continuation of the species by the production of other individuals, and they are supported by the plant for this purpose. It is with the former set that we are now chiefly concerned. The structure of each and all of these parts (however much they may differ from each other in texture and external apearance) is fundamentally the same. Each consists of an agglomeration of vegetable cells. The vegetable cell which is thus the ultimate element of vegetable anatomy, consists typically of a very minute spherical closed sack, with certain fluid and occasionally soiled contents. It is in fact a tiny bladder filled with fluids and solids, the membrane being thin enough to allow of the passage of fluid through it. But although typically spherical in form, cells are rarely so in fact. Some are developed into ducts and cylinders of various sorts, for the transmission of fluids in the stem and leaves; others are lengthened out into spindle-shaped bodies, and made up into small faggots for the formation of wood; many are flattened into bricklike forms for the construction of bark, and into tiles for smoothing off the surfaces of the leaves; while an immense number are used as packing material or padding, and are stuffed in wherever there is a blank to be filled up in the internal structure of leaves. Pith of young plants is also made up chiefly of cells squeezed into a variety of shapes by pressure. But

* These heights do not profess to be exactly correct.

* At present, happily, only a few such exist.

† It has not been thought advisable to introduce more scientific matter than was absolutely necessary: the account that follows of the structure and function of certain parts of plants, must therefore be accepted as only one, which does not pretend to be complete.

modified as they may be in form and function, they all remain essentially cells, and while young, the walls of all have the property of giving passage to fluids and gases. The cells in old wood, however, are exceptions, as their walls having become thickened, and their cavities obliterated, they are nearly, if not entirely, impermeable by fluids.

If the stem or branch of a tea-plant be cut across and examined with the naked eye, the following parts will present themselves. In the middle of the stem, if it be an old one, there will be seen a cylinder of hard wood*; outside this a circle of green young sap-wood; and encircling all, the layer of bark. When examined microscopically, the central cylinder of wood is found to be formed chiefly of spindle-shaped cells laid close together vertically, and with their tapering ends over-lapping. In old wood, as has just been said, these have become incapable of transmitting fluid, and therefore of performing any vital function; and the wood formed of them is useful to the plant merely as a mechanical support. This explains how trees that have become hollow from the decay of the wood in the centres of their stems can continue, nevertheless, to throw out leaves, and to yield flowers and fruit. The structure of the encircling layer of young or sap-wood differs in no way from that of the hard-wood, except that the walls of the spindle-shaped cells of which it is mainly composed, are thin and pervious to fluids, and the cavities of the cells are themselves filled with fluid. In stems of plants that have not attained a sufficient age, no central cylinder of hard-wood will be recognizable. The whole of the woody tissue will in such stems be found to consist of sap-wood, which will however be of greater density towards the centre. When the sap-wood is cut across, a greater or less amount of fluid will at certain seasons exude, and this is the layer which, in the language of gardeners, "bleeds" if cut while the sap is rising. Outside the ring of sap-wood is the bark which is composed of several layers, the inner of them being vascular and affording passage to fluids, the outer mainly protective.

The woody parts of the root of a tea-plant, being in reality merely stems situated underground, will be found to resemble the stem-proper in structure. The real roots consist not of the woody parts which give mere mechanical support, but of tender fibrils which proceed from these. These fibrils are composed of cellular tissue permeable to fluids, and, as will be seen presently, they are the chief means by which the plant collects its food.

The leaf, which is anatomically but a flattened expansion of the branch, and which retains an organic connection with the branch consists of a mass of loosely packed cells confined between two cellular membranes (which form the skin on its upper and lower surfaces) and penetrated by spreading bundles of fibres and vessels—the so-called "veins"—derived from the branch. These loosely packed cells, as well as the vessels of the leaf, are freely permeable by fluids. The root, stem, and leaves of which the above is a rough account, form the organs of a plant's digestion and assimilation, and therefore of its growth. The materials of its food must now be considered, and also the mode in which these materials are taken up and digested.

Plants cannot take in solid food. Whatever they absorb must be offered to them, either as a fluid or as a gas. The gaseous food of plants, in as far as it is absorbed in the state of gas, may be omitted from particular consideration at present. It is in the form of fluid that the great bulk of their food is taken up. This fluid consists of the natural moisture of the soil, and of the various salts of the earth and of manures which that moisture may hold in solution, and is absorbed by the delicate root-fibrils which radiate in all directions in search of it. Collected from the soil by the fibrils, this undigested fluid is conducted to the stem where, avoiding the hard heart wood, it passes into the part described above as the young or sap-wood layer, and, transmitted from cell to cell, passes upwards through the main stem along this layer, enters the corresponding layer in the branches, and finally reaches the flattened expansions of these which we call leaves. This ascending undigested fluid is known as the *crude sap*. Having reached the leaves, and there becoming exposed to the influences of light and heat, this sap parts with a large amount of water by evaporation, and undergoes certain chemical changes. Thus altered in character (and as it were *digested*) by the processes to which it has been submitted in the leaves, &c., the sap is now no longer crude, but has passed into the condition in which it can be directly assimilated as nourishment by the cells of the plant Up to this point the sap had been transmitted upwards in obedience to certain physical laws, and during the upward passage, probably no nutritive function had been fulfilled by it. Before parting with the fluid which they have thus elaborated, the leaves retain as much of it as they require for their own nourishment and growth, and the remainder they return to the branches and stem, mainly† through the vascular tissues of the inner bark, *i. e.*, the ring immediately outside the cambium. Passing downwards through these vessels as its main channel, the elaborated sap is distributed to all the growing parts of the branches, stem, and roots, and in fact affords to these, as to the leaves, the materials of their nourishment and growth. It is thus clear that the leaves are organs of very great importance in the economy of a plant's life, and indeed the mutual interaction of these and of the roots, its life may be said to consist. The truth of this is well illustrated in the structure of the seed, which, in the class of plants to which tea belongs, contains the rudiments of two leaves and of a root, with sometimes a little store of nourishment in addition. The parent plant supplies these to its offspring to enable it to start in life, and the very first thing that offspring does, when, in the act of germination, it begins life on its own account, is to send the two embryonic leaves upwards, and the embryonic root downwards, and so begin the mutual process above-mentioned, and thus become a living thing.

The evaporation which takes place in the leaves, consequent on the exposure to the air of the crude sap in them, is a potent cause* of the ascent of that sap in the stem, and of its collection by the roots. As long as the leaves remain green and healthy and continue exposed to air and light, so long will the roots go on collecting from the soil, fluid which the young wood of the stem will transmit upwards in a steady stream. The vigour of the one process is accurately proportioned to that of the other. The roots will not long collect, neither will the young wood of the stem transmit fluid for which there is no demand in leaves above. If from any cause the demand made by the leaves should be suddenly reduced, (as it would be by the removal of branches in pruning), the supply of sap which had been collected to meet the previous demand would thus become excessive and the excess would be got rid of either by the discharge known to gardeners as "bleeding," or by the plant making an effort to utilize it by rapidly putting forth new shoots and branches. Suppose, for instance, that a tree in full health and vigour be cut down close to the ground, either of two things may happen; the sap in course of collection by the roots will either simply run to waste on the surface of the cut stem, or a growth of young shoots will spring up round the margin of the stump, or from the underground stem. Shoots originating in this way are known in Forestry as coppice, and the vigour and rapidity of growth shown by many of them, though often surprising, is easily explained when we consider that they are nourished by a root-system calculated for the leaf-system of a tree. If shoots arising in this way be persistently cut down as fast as they appear, and the root-system be thus deprived of all demand for its collections and as it were of all object in life, it will soon decay and die. It is needless to say that, on the other hand, the growth and vigour of the leaves are modified by circumstances affecting the roots, and that any injury to the latter soon tells upon the former.— *To be continued.*

* In some trees the hard-wood and sap-wood are of different colours In Shishum *(Dalbergia Sissoo)* and Khair *(Accacia Catechu)* for example, the former is dark-brown, the latter yellow or whitish.

† The growth of the young wood takes place at its circumference, and the growing layer is known to Botanists as the *Cambium* This layer is also charged with descending sap

* An excellent idea of the influence that is exerted on the ascent of the sap in the stem by its evaporation in the leaves is obtained from the results of Dr. Hale's experiments. He found, for instance, that the evaporation from a cabbage of medium size amounted, during twelve hours of a summer day in Britain, to nineteen ounces.

COFFEE.

THERE is a character in one of the anti-slavery novels who reduced it to a matter of pounds, shillings, and pence, that it was cheaper to exact the utmost amount of work his slaves could do and to replace those who died off by fresh gangs, than to give lighter tasks and thus prolong the existence of his people to the full measure of their days. The case of the Government with reference to the coffee planters of Coorg would seem to be somewhat analogous, and they are anxiously watching for indications at the present time, as to whether Government intend to adopt the former or the latter policy towards them on the question of the Land Tax,—in fact, whether the executive means to enforce the assessment of two rupees per acre which may ruin the European coffee growers, or to lighten the tax and reserve this source of industry and wealth to the province. The tenure upon which planters hold their lands, is given briefly, as follows in the Manual of Coorg by the Revd. G. Richter:—"From the first to the fourth year the land is rent free from the date of acceptance by the District Officer of the tender for the grant. From the fifth to the ninth year one rupee per acre on the whole area, except a certain proportion of waste grass land. From the tenth and subsequent years two rupees per acre." In addition to this it is enacted by the amended rules that valuable timber in forests already in possession and about to be felled, is to be purchased by the tenant on his paying a royalty upon each tree. The effect of this last grievous impost is to burden the planter with a further payment to Government of ten to twenty rupees per acre, according to the value of the timber, which has to be taken at the rate fixed by the forest conservancy. It may be remarked here that the plan in force till within the last year or two, was much more equitable, the timber lying on newly felled land being put up to auction by

Government and sold to the highest bidder, and it is earnestly desired by the holders of land, that this mode may be re-adopted. It will happen that in the year 1872, a very large majority of the European planters will become liable for the major tax of two rupees per acre on the cultivated estates, and on the standing jungle also, but the unanimous feeling is that coffee growers cannot afford to pay it, and that if the collection be pressed many a good vessel tempest-tossed by the stress of hard times and bad seasons may go down. The Planters' Association has, we learn, discussed the subject fully; various propositions have been mooted and petitions have been sent up by them to Government embodying the views and feelings of the community concerned. As yet, we know not whether their burden is to be lightened. Possibly Government may consider that those planters who may be driven out by the increased tax can be replaced by others willing to pay it. We venture to say that it will not be so easy to replace the present body by new men, as the American slave-owner found he could do by buying new slaves to fill up the places of his gangs who died off from over work and want of food. It is a notorious fact that there have been scarcely any new settlers in Coorg during the past three years; that on the contrary several men who came out to make coffee-planting their profession, have left the district disappointed and disgusted. Perhaps Government imagine it will be possible to induce the Coorgs and native growers of coffee to take over all estates and properties abandoned by Europeans when the heavier assessment comes into operation. We submit, however, that this is not very likely to come to pass, because the Coorgs and Jamma landholders obtain pieces of land favourable for coffee cultivation free and for nothing, taken in with their paddy-fields held on Jamma tenure. But even if the Coorgs could be persuaded to buy up such abandoned coffee properties, it would not pay Government in the long run, for the native coffee growers do not use one tithe of the labour employed by the Europeans, nor would it be difficult to show that the land revenue, exclusive of coffee lands, has been greatest at the time that British capital was most freely invested. Quoting again from Richter's Manual of Coorg, we find that in 1858-59 the land revenue, exclusive of cardamoms and coffee, was Rs. 1,45,949. In 1864-65 it had risen to Rs. 1,67,803, and how can this increase be accounted for? Simply for the reason that the Coorgs had invested in paddy lands the money they obtained for their jungles between those dates, from intending coffee planters, that the grain cultivators sold their produce at enhanced rates, owing to the influx of coolies from the Mysore and Bangalore districts to the coffee estates, and that to almost every native in Coorg accrued some benefit from the great amount of capital invested by Europeans. In 1869-70 we find the above land revenue had fallen to rupees 1,50,111. And what had happened to the coffee planters in the meantime? We need hardly remind residents in the Madras Presidency of the shock the coffee industry in Coorg has sustained of late years, how the great Bombay crisis made money less plentiful to many unfortunate and enterprising planters, and how several bad and dry seasons, with borer, bug, and other evils, caused a succession of short crops. But it is still believed among planters that a coffee estate, carefully opened, may be made a source of profit, though the splendid visions of 15 cwts per acre all round that obtained in 1864 have passed away. It has been adduced by some that the planters brought the two rupees per acre land-tax upon themselves, that as they petitioned Government for the present tenure and got it they ought to abide by it. And why did they do this? At the very time that crops from coffee estates were anticipated to be from 15 to 16 cwts per acre, or at least five times the existing average, at a time when men holding Government appointments worth over Rs. 12,000 per annum were throwing them up to go into coffee. And is all based on a delusion to last for ever? Let us investigate the matter more closely and see what the profits from estates may be estimated at and what percentage of net profits at two rupees per acre land-tax will absorb. We assume then that an investor purchases 500 acres of forest costing him ten rupees to fifteen rupees per acre, which he gets free for two or three years at a nominal tax fixed on the old cardamum puttah tenure. He has therefore not been so fortunate as to obtain his land free of tax for four years, but has to pay one rupee per acre as soon as his puttah expires, say the second or third year after he purchased. The timber had gradually to be bought also according to the acreage he felled; so that taking all things together, he has been paying more than the equivalent of one rupee per acre land-tax per annum from the time he started. His cardamum puttah having run out, he now pays rupees 500 per annum for five years and afterwards at the rate of two rupees per acre or rupees 1,000 per annum. The planter thus finds he has been able to open 250 acres during the first five years, that he has 100 acres of fair land left, but that the remaining 150 acres are worthless for coffee cultivation being chiefly tops of hills exposed to the South-West monsoon. We will not discuss the percentage of profits he has been paying in the shape of tax during the time his estate was but partially in bearing,—and it often happens there are no profits at all, but the tax has to be paid nevertheless. We will pass on to the time when the 250 acres are in bearing and produce an annual crop of thirty to thirty-five tons, valued at 50 per ton or Rs. 15,000 to Rs. 17,500. The yearly working expenses to keep this acreage in good order may be put down at Rs. 10,000 to Rs. 11,000 without cost of superintendence. Reckon interest on capital sunk at 5 per cent. on Rs. 35,000:—

Thus 30 tons at Rs. 500 = ...	Rs.	15,000
Working expenses on 30 tons	10,000	
Interest on Rs. 35,000 at 5 per cent....	1,500	
		11,500
Net profit without land-tax...		3,500
Land tax at 2 Rupees per annum		1,000
Net profit		2,500
Or 35 tons at Rs. 500 = ...		17,500
Working expenses on 35 tons	11,000	
Interest on 35,000. Rs.	1,500	
		12,500
Net profit without tax		5,000
Land tax at 2 Rupees per annum		1,000
Net profit		4,000

In the first case the land-tax is equal to 28½ per cent. of net profits, in the second case to 20 per cent. It will thus be seen that, supposing the above data to be correct, a two rupee per acre land-tax is equal to from 20 to 28½ per cent. of the net profits from the estate. In fact it appears that Government is virtually a partner in a huge business in Coorg with at least 20 per cent. of net profits guaranteed as long as the industry lasts. Or to look at it from another light. A two rupee per annum land-tax is equal to an income-tax of from four shillings to six shillings in the pound. In addition to this the planter is liable for his share of indirect taxation, Municipal license, or any other tax that the Government of the day may choose to levy. It may be urged that a piece of bamboo land pays better than a block of forest; but if the profits be greater they are more precarious, suffering as they do from borer. The estate may not last so long and the expenses of cultivation are heavier than in forest. If the south-west aspect be not dreaded, swamps and bamboo scrub represent as large a proportion of land unsuited for coffee as in the instance just given, and if bamboo land costs less to begin with, the timber costs more than it does in forest. Indeed, it would not be difficult to show two estates, taking forest and bamboo together, that are making smaller profits for every one put forward as giving larger net returns than in the case we have cited above. There can be no doubt that the true test is to take the average of what the whole of the plantations in Coorg are doing, and we feel convinced we have shown net profits that are over rather than under such average. It is possible that planters of some districts are much better off. Though we could point out numbers of estates that do not pay at all we have purposely given as an example one that is profitable, as the figures show that taken at the best, a 2 rupee per cent. land-tax all round exceeds the rate that any Government, anxious for the welfare and prosperity of European settlers, would care to levy, and we contend that it is obviously to the interests of the executive to keep the land-tax at present at such a level that it may not exceed one rupee per acre on the entire holdings. In the case we have given, if the uncultivated portion of the land, most of which has been classed as worthless, had been allowed to run free of assessment, the result would have been a great boon to the planter; it would have diminished his tax by one-half. Practically it is found that with the one rupee tax in force, although the condition of planters is anything but thriving, existence is possible and daily bread procurable: nor can it be doubted that the investing of English capital is an advantage to Government, particularly as the bulk of the gross returns from coffee estates are given back to the country in the shape of pay for the labour employed, and it would be interesting to know the exact amount of increased wealth that has been collected in small sums of late years by the natives of this country in general, and by the Mysore coolies in particular. Reckoning that there are 190 estates owned by Europeans with an average expenditure in labour of rupees 8,000, the result would be that over fifteen lakhs of rupees are yearly paid away for the hire of coolies and maistries. If ever the coffee industry required encouragement, it is now, and if it ever behoved Government to have a regard for the planters' interests, it is at the present time, and we certainly trust the Government of India will be wise enough to adopt a statesmanlike and liberal policy with regard to the question of land-tax on coffee estates and jungles, and will strenuously avoid imitating the example of the old lady in the fairy tale who, in her hasty greed for the immediate increase of her revenue, killed her goose that laid the golden eggs.—*Athenæum and Daily News.*

CONCESSIONS TO WYNAAD AND NEILGHERRY PLANTERS.

The following is an extract from the Proceedings of the Madras Board of Revenue:—

"In their Proceedings of the 18th May 1809, No. 3,380, the Board, in reporting on a memorial from Wynaad planters, recommended that all land should be held free for the first two years, that one rupee an acre should be charged in the third year on planted land, and that the full tax of Rs. 2 an acre should be charged in the fourth and subsequent years on all land then planted

out, that unfelled forest land should be charged one rupee an acre, and that grass-land included in forest blocks not planted should be held tax-free. The Government recognized the depressed state of planting interests, and expressed themselves as disposed at any rate to let the Wynaad planters hold their land-tax free for three years; but before sanctioning any change in the rules called for, reports from the Commissioners of the Nilgiris and the Collector of Salem, on the ground that any change in the Wynaad rules would necessarily be applicable also to the Nilgiri and Shevaroy Hills. The Board submit, however, that the circumstances of these three localities are so different as to necessitate different treatment.

"The Collector of Salem reports that no change whatever is required on the Shevaroys. He states that the price paid for the land is always very small, that all preliminary expenses, except the purchase money, are paid by a crop in the fourth year, and that money sunk in well-worked coffee estates yields a profit of 25 per cent. per annum. He points out that the price of land is higher in the Wynaad, the cost of labour greater, and the land-tax twice as heavy. The Board concur with the Collector in considering that no change need be made in the rules for the sale of waste lands on the Shevaroys.

"The Commissioner of the Nilgiris sent in his report on the 26th October 1869, No. 149, and submitted the replies of twenty-two planters whom he had consulted; sixteen of twenty-two objected to the system of selling by auction land applied for by planters, but the Commissioner did not think that facts justified the complaint. He recommended that no quit-rent should be charged till the fourth year of possession, that a corresponding indulgence should be given to all who had already purchased land under the rules of 1863, that the concession should be saddled with the condition, that a third of the estate should be planted by the end of the fourth year, and that permanent grazing puttahs should be issued to planters purchasing estates from Government at the rate of 4 annas an acre for an extent of grass-land equal to half the area of their estates. The Board considered it clear that the depression of planting interests on the hills was much greater than in the Wynaad, and was so serious as to require that the existing system of selling land and levying revenue thereon should be carefully considered. Planters appeared to be almost unanimous against auction sales, because they enabled others to take advantage of the care and ability of any planter who, after much preliminary labour, had succeeded in finding a fit site for an estate. There was reason, moreover, to think that sale by public auction did not secure the interests of Government. On the whole, the Board were disposed to think that the system had not worked well, and that a modification of the durkhast rules might be introduced, a fixed price being charged per acre. With regard to the revenue to be levied on the land, they considered it best that the land should be held tax-free for three years, that half assessment should be charged in the fourth year, three-fourths in the fifth, and the whole in the sixth, without reference to the extent under cultivation. To avoid placing future estate holders on a most favourable footing than the owners of estates in existence, the Board thought it might be desirable to raise the permanent assessment slightly in cases where land is granted on these favourable terms.

"Before submitting these views to Government, the Board called on the Commissioner to give his opinion with regard to them, and his letter of the 7th May contains his reply. Mr. Brooks is strongly in favour of sale by auction. He considers that no other method could dispose fairly of the varied interests which may exist in any piece of land which an applicant under the Waste Land Rules desires to obtain, and he cites figures showing that in the majority of cases there is no competition at all, and that it is keen only in very few cases, involving but a small extent of land. The same figures show that the interests of Government are not protected by auction sales. The three largest lots comprise about 50 acres, for the greater part of which the price realized was only an anna an acre. There can be no doubt that Government would be a gainer if a fixed rate was charged per acre.

"On the whole, though the necessity of sale by auction has not been proved, though it is unpopular with those most interested in the subject, and though it must often fail to protect either the interests of the would-be purchasers or of Government, the majority of the Board see the force of the practical difficulties stated by the Commissioner, and, regarding the system as finally determined by the orders of the Secretary of State, resolves not to pursue the discussion further.

"With regard to the land-tax, Mr. Brooks argues against the increase of assessment with which the Board proposed to compensate for a more favourable cowle, and urges that whatever terms are granted to future applicants, it is absolutely necessary to put existing planters in the same position, giving them credit for their assessment hereafter, until they have enjoyed the same period of tenure as would be purchased under the changed rules by the amount of their past payments. The Board concur with the Commissioner as to the inexpediency of raising the assessment, and as to the way in which existing proprietors should be placed on equal terms with future purchasers of land, but they prefer the cowle proposed by them to that advocated by Mr. Brooks, which, in their opinion, does not give a sufficient measure of relief. The Board accordingly resolve to recommend the land purchased under the Waste Land Rules on the Nilgiris be held tax-free for three years, and that half-assessment be charged in the fourth year, three quarters in the fifth, and the whole in and from the sixth.

"In the more favoured tracts of the Wynaad, the Board think it will be sufficient if Government allow the land to be held tax-free until the close of the fourth year, as proposed in Government Order, dated 7th September 1869, No. 2526. Both on the Nilgiris and in the Wynaad, owners of existing estates should be placed in the same position as future applicants, credit being given them to the requisite amount for assessment as it falls due.

"In their Order of the 30th June 1870, No. 982, Government in disposing of Proceedings, relating to a memorial from the planters of Wynaad, direct the Board to recur to the subject when submitting this reply to Government Order, dated 7th September 1869, No. 2526, and to ascertain in the meantime the views of the Collector of Salem and the Commissioner of the Nilgiris.

"No answer has yet been received from Salem, and the recent death of the Collector makes it probable that some time must yet elapse before it can be submitted. The late Mr. Pochin's account of the condition of planters on the Shevaroys, however, makes it unlikely that any change in the Waste Land Rules is necessary there. The complaints of the Wynaad planters with regard to surveys, &c., are met to a certain extent by Government Order, dated 10th August 1870, No. 1225.

"With regard to the rule relating to the frontage of blocks of land, the Board think it will be enough if the proviso which Mr. Brooks states to be in force in Burmah and the Lower Provinces of Bengal is introduced, namely, that for special reasons the restriction may be relaxed by the Board of Revenue. The First Member of the Board dissents in part from these proceedings, and has recorded a minute on the subject."

The following is the Order of Government thereon, of the 22nd September:—

"The foregoing papers relate to the present depressed condition of the planting interests in the Wynaad and on the Nilgiris, and to the expediency of affording them some relief by a modification of the terms on which land for planting purposes is now procurable. It appears that no change in the rules for the aquisition of land on the Shevaroy Hills is needed. The late Collector reported that all the preliminary expenses connected with coffee estates, except the purchase money, are paid by the sale of the crop in the fourth year, and that capital invested in a well-worked estate will give a return of 25 per cent. per annum. The interests involved on the Shevaroys are, however, comparatively insignificant, and the condition of the plantations on the Nilgiris and in the Wynaad is certainly very different; but the Government are by no means of opinion that the present depression can, in any way be ascribed to the operation of the Waste Land Rules. As observed by the late Collector of Malabar and the Commissioner of the Nilgiris, it is probably owing to other causes, among which may be mentioned the increase in the price of labour, a succession of bad seasons, the recent commercial crisis in Bombay and England, the ravages of the borer, the insufficiency of the capital possessed by the planters for their operations, the high rate of interest paid for borrowed money, &c.

"At the same time the Government fully recognize the political and other incidental advantages to be derived from an influx of Europeans and European capital into India, and they would gladly give every reasonable encouragement to this movement. It is true that the grant of land by Government, entirely free of tax, would not make the cultivation of coffee, tea, or cinchona, a profitable speculation under certain circumstances; but any modification of the existing rules which would render them more favourable to the planter could not fail, in some degree, to assist him, and it is impossible to deny that at present the large majority of the existing estates are in a languishing condition, and that their proprietors have been brought to the verge of ruin.

"The Right Honorable the Governor-in-Council having given his most careful consideration to the several proposals made in the papers above recorded, and having also personally discussed the questions under consideration with deputations representing the planting interests, both of the Nilgiris and a portion of the Wynaad, has deemed it advisable to sanction the following relaxations, by which it is hoped some relief may be afforded to the planting interest:—

"In the Nilgiris no quit-rent will be exacted on forest land taken up for the purpose of planting until the sixth year, that is, the planter will hold his land free of assessment for five complete years, the climate being so severe that a remunerative crop is rarely obtained until after the lapse of that period. In the Wynaad, where the coffee plant comes more rapidly to maturity, forest land will be held free of assessment for three complete years. The assessment will be taken for the fourth year. The assessment prescribed for forest land at present will not be altered. It will remain for the Nilgiris and the Wynaad alike, fixed at Rs. 2 per acre; but the Conservator of Forests will be consulted previous to the sale of any such forest land. With the view of encouraging the multiplication of cattle, and the abundant application of manure, which has proved to be so essential to the sustained productiveness of plantations, the rent of grazing land is reduced from 1 rupee to 8 annas. The rent of grazing land will be exacted from the date of appropriation."

"In making the foregoing concessions to the planting interests, it has been felt that, if they are to have any useful effect, they cannot be rendered simply prospective. There are estates but recently taken up and imperfectly opened, there are others on which arrears of assessment are due, and which will undoubtedly be abandoned unless remission be made, there are others fully cultivated and on which there are no arrears, but which are worked without profits or by a yearly sacrifice of capital; all these it is proposed to admit to the same advantages. In the rare cases of estates which are in full production, which have no arrears, and which are cultivated with undoubted profit to the proprietor, it is still deemed advisable that the modified regulations should be applied. If such estates were placed in an exceptional position, there can be little doubt that disputes and dissatisfaction would arise, and that the refusal of the concession would be regarded in the obnoxious light of a special tax imposed upon superior skill, industry, and management. The benefit conceded by Government is applicable to all alike. Land taken up previous to the introduction of the Waste Land Rules will, of course, remain unaffected by the new regulations.

"The alteration of the frontage rule, to the extent of permitting a relaxation of the restrictions in special cases, by the Board of Revenue, as proposed, is sanctioned. These proceedings will be reported for information of the Secretary of State as was done in the case of the original rules."

THE OOTACAMUND VALLEY.

NEILGHERRY HILLS.

(From an occasional Correspondent.)

In compliance with a cordial invitation of some friends to join them in an excursion to the above-named and far-famed locality, and being desirous of revisiting the splendid coffee estates there, which I had not seen for ten or twelve years, and which during that period have been so vastly extended and improved, I gladly availed myself of the opportunity thus offered, so, after the necessary arrangements and equipments had been prepared, we started early on a fine morning last week, (strange to say it *was* really fine), with the sun shining brightly behind us, and a breeze blowing fresh and bracing over the broad expanse of woodland and wold that we had to traverse on our journey to our destination. We made use of both the old and new roads as they intersected each other at various points, but held more to the latter on account of its good bridges over the many streams; but now and again for a short cut, cantering across the "verdant turf" which at this time is indeed a beautiful green carpet, decked with a profusion of lovely wild flowers, conspicuous amongst which are a variety of balsams, pedicularis, salep, gentian, taraxacum, and an innumerable host of others, of all hues and forms, extending for miles, which conjured up visions of the prairies of the far far west; the effect of the landscape was complete to perfection whenever the clear and sparkling waters of the Pykara river, or other lesser streams, formed a part of it. The roads were rather heavy in consequence of the late rains, and we could not help observing the absence of milestones or posts along it for the convenience and information of travellers, —a want which has long been felt and complained of and should be attended to without further delay, as it is the only high road on the hills without them. After a pleasant ride of about three hours we arrived at the bungalow of the Nedivuttum cinchona plantations, where we were heartily welcomed and entertained by the Superintendent, Mr. Rowson. These estates are now so well known, and the magnificent scenery by which they are surrounded, that a further description of them (even were I able to express them grandour) is needless here. The trees of the upper and oldest plantations are just at this season looking their best; *C. succirubra* holds its own for size and luxuriance of foliage, while the *C. condaminea* still adheres to its stunted and shrubby habit, given more to seed-bearing than growth of wood. The average height of the former is now twenty feet, and the girth at one foot from the ground, twenty-seven inches. Experiments are still being carried on with the mossing process, and with the barks of different ages produced thereby; but it is not yet resolved as to the time of the year, the method, and the quantity of bark to be taken off each tree. If I am rightly informed, the cause of the great discrepancy between the alleged number of trees planted and the acreage as per Government survey, is easily accounted for, as the estates appear to have been surveyed by triangulation, from point to point, across valleys; the area thus obtained in the plans, would obviously be far short of the actual surface planted, the acreage of which could only be ascertained by traversing the boundaries with all their details up and down hill with chain and theodolite or prismatic compass, in the usual manner of land surveying, and thus the number of trees and acres be calculated with accuracy and ease. It seems, however, that an order has been passed for taking a census of or counting and marking every tree and vacancy on each plantation I do not envy the enumerator his task, who with paint-pot and brush in hand will have to travel some hundreds of miles ere his labours are finished. It has been suggested that a piece of red tape tied round each tree would be an improvement upon the paint-pot, as being easier of application and more appropriate and symbolical of the powers that be: the results of the undertaking, when known will be curious and instructive.

Having rested awhile and refreshed both man and beast, we resumed our ride, and were soon passing the large and well-built house situated at the head of the ghaut commanding a splendid view, and occupied by Mr. Wapshare, the Managing Director of all the estates in the valley. The descent commences here (elevation about 6,700 feet) and continues at an easy gradient, intended for carts, by a well-traced road (as yet far from being finished) to the "Guynd" estate, the largest and most valuable of the properties, the mean elevation of which is estimated at about 3,500 feet above sea-level. The scenery from different points of this ghaut is truly grand, and the mind soon becomes wrapt in admiration of it; as we descended clouds and mist rolled slowly up beneath us, and though partially obscuring the view, heightened its effect,—the far off peaks seemed more distant, the immediate crags higher and more towering, while all below an unfathomable space,—reality lost in a sea of gloom and vast profundity. We were aroused from our musings, by the noise of falling water, which a sharp turn of the road opened to our view on the left. This is one of the prettiest cascades to be seen on the hills, as it comes leaping and falling in snowy foam over the rugged boulders that form its rocky bed in densely wooded gorge through which it runs, soon lost to sight down a deep chasm on our right, to re-appear in the open coffee land, where it is utilized by the different estates to turn their huge water-wheels connected with the pulpers and other machinery, after which it empties itself into the Moyar, and so on to the Bowany. As we descend we become sensible of a warmer temperature. Vegetation is assuming a luxuriant and tropical form. Beautiful and curious parasitic and herbaceous plants are now seen on every side, orchids, mosses, and dewy ferns arching their graceful and feathery fronds in thousands from every rock and tree, elegant creepers hanging in festoons, and covering with their wild fantastic drapery the trunks of enormous forest trees, venerable giants of many hundreds years: these are some of the principal features nature puts on here. The first cultivation to be seen on the way down, are the tea and cinchona estates, with their picturesque buildings, belonging to Mr. Rhodes; to all appearance they seem to be flourishing. We next pass through a portion of the Balmadies coffee estate, also belonging to Mr. R., after which we enter the "Guynd," and by a gradual and winding road we reach the Superintendent's bungalow, where we remained during our short stay, and in which we were most kindly and hospitably entertained by Mr. C. Dawson and his good wife. My impressions whilst riding or strolling through the different fields of coffee on this splendid property were those of admiration at the vigour and luxurious growth of the tree, the dark glossy green of its leaves, and the uniform healthy appearance of the whole, but was much struck and surprised at seeing so little fruit. I believe the crop on the trees will not exceed 5 cwt. an acre all round, even if it reaches that low figure; and this estimate was endorsed and confirmed by my companion, a planter of 15 years' experience. This small yield seems entirely attributable to the system of pruning now in vogue in the district, by which the very best parts of the tree are cut away; this is followed by what is elsewhere properly termed "handling" but here the knife is again used, and melancholy indeed is the effect of it upon the condition of the tree. It is a matter for very grave consideration how much this system of pruning has to do with the light crops. It is undeniable that *judicious* pruning has a wonderful and surprising effect on the bearing capabilities of the coffee tree, but climate, soil, and the seasons, exercise a greater influence in producing crop, and I venture to affirm, that, if less wood were taken from the trees and more done in the way of cultivation, *i. e.*, trenching, terracing, renovating pits, &c., that the soil of the "Guynd," with such stamina that it possesses, together with the natural advantages of its climate, would yield an average of ten cwt. an acre for the next quarter of a century, without exhaustion, and with double profits to its owners. The buildings on these properties are worth a long ride, to those professionally interested, to see; good substantial edifices they are, of good material too—bench, bricks, and chunam, roofed with iron, shingles, and tiles, with the usual appurtenances for economising labour, such as water-wheels and improved machinery. Coffee shoots of round galvanized iron for sending down the berry picked from distant fields have also been put up on the "Guynd." The barbacues here consist of wooden frames covered with coir matting resting on brick pillars; all are in a busy state of preparation for crop, which is expected to be in full swing by middle of next month. The comfort and size of the Superin-

tendent's bungalows are also worthy of notice; the one in which we sojourned with its papered walls and other little luxuries, its neat and well-kept flower and fruit garden, might well serve as a model for cleanliness and refinement. The discipline and order characterising the whole system of the working in all details, and the efficient staff of assistants, &c., who so ably carry it out, is most exemplary, and must be a source of much satisfaction and happiness to the gentleman who rules and directs; nothing seems wanting, except a person, a library, and club, to complete the little colony, where so much kindly intercourse and harmony prevail.

Our visit terminated on the third morning, when we took leave of our kind friends and commenced our toilsome ascent homewards, amidst rain and fog; and after a cold, wet, and weary ride of nearly five hours, we arrived at the Pykara bungalow, where we found a good breakfast prepared for us (I never shall forget that breakfast), which with its after-choroot, amply compensated for the fatigues we had undergone, and produced that calm and tranquil state when "every sense is joy" alas! too soon to be dispelled by the sight of Ooty, with its dark and sombre-looking Australian trees, hideous architecture, long faces, its bickerings, prejudices, rivalries. * * *

Nilgiris, Sept. 1871. G.

OFFICIAL COFFEE DEALERS IN KANDY.

DEAR SIR,—May I ask, through the medium of your Journal, why it is that the Government allow some of their clerks to trade in coffee, seeing that the Civil Servants in Government employ are forbidden to engage in trade. I allude to one of the clerks in a Kandy office now engaged in the trade, and therefore interfering with us poor traders, who are trying to make a living. I hope the authorities will put a stop to this injustice being done to us.—I am, Sir, yours obediently,

Kandy, 1st Nov. 1871. A NATIVE COFFEE DEALER.

COFFEE LEAF DISEASE, NORTH OF KANDY.

DEAR SIR,—I have read your editorial and the letters from various writers on the leaf disease with a good deal of interest, but did not for one moment fancy the fates were going to give me a taste of it, but we never know what is in store for us. Drought has been assigned as the cause of it; but I think that is a mistake. After the continued and heavy rains in the latter part of July, and the showers had here in and all through August, and with fine mornings, but generally speaking, cloudy afternoons in September, I hardly think anyone will say we are suffering from drought. On or about 21st September I noticed the trees were looking a little yellow in the leaf, and attributed it to the crop in those parts, but in less than no time it spread, and parts of the estate bearing a little were just as bad, and within ten days I had 70 acres of coffee attacked with the leaf disease. There is no need my describing it, for it is well enough known, but it was worse than ever on the 4th instant: the next ten days were fine and *very hot*. This brings us to the 14th, and I noticed all the attacked leaves drop off during this period, and now there is not a sign of it on this estate. Since the 4th it has rained daily, and the estate is making fresh leaves fast. And now, if you will allow me, I would ask Mr. Thwaites, through your agency, is it not probable, or more than probable, that it is caused by the extensive *use of* artificial *manure, and especially by bone dust*. The fields manured with this caught it first, and suffered most, and from this coffee it spread; part of the estate did not catch it at all. I may just add the nearest coffee estate is a half mile off as the crow flies, and that is free from the disease. In Pusilava I heard of fields knocked to sticks, and that on an estate that is highly manured, I believe. Managers there might inform you, if asked, whether the parts manured with artificial manure did not suffer first and most. I remain, yours truly,

"NE FESTINA LOQUI."

Central Provinces, 25th October 1871.

THE COFFEE LEAF DISEASE.

DEAR SIR,—The thanks of those whose estates are suffering from the ravages of the coffee leaf disease are due to you for calling attention to the subject, and inviting discussion as to its origin and to what means may be discovered of repelling its inroads. It appears from your remarks that the theory has been advanced that it shows itself, after a protracted drought when the bushes are consequently in too weak a state to resist its attacks. This is too important a point to be finally settled to permit me to keep back from you my own experience, which teaches me this is not necessarily the case. Few districts, from what I can learn, have, this season, suffered more from the evil than that of Nilambe, and yet it has not for the last twelve years been visited with so wet a South-West monsoon. It first began seriously to feel the effects of the fungus in July, a particularly rainy month, and has generally been its victim ever since. The trees which were first affected have been for some time recovering, and were not checked in their improvement by the few weeks of dry weather, just ended by the late heavy rains, and, although not quite free from it, promise to regain the former luxuriant growth. Indeed, when the enemy invaded us, we all here, attributed our misfortune to the almost unceasing rain we had for some time been having. Again, as regards the injury incurred by the tree; from the tendency it has to throw out new wood, even when its aspect is most sickly, and from the rapid growth of the leaves and the young shoots as soon as it is only partially relieved from the plague, there is good reason to conclude that it has not been vitally affected, that its distress is but temporary, and that, although in its year of suffering it will give a reduced crop, or none at all, even, it will yet, by yielding many a profitable harvest, respond to liberal and judicious cultivation.—Yours truly,

Nilambe, 20th October. NIL DESPERANDUM.

THE PLANTER'S ASSOCIATION:—THE COFFEE-LEAF DISEASE.

DEAR SIR,—From the frequent applications made to me for information respecting the coffee-leaf disease now prevailing on so many of the estates, I cannot but believe that the following observations may prove of some interest to many of the members of the Planters' Association. The progress of this disease I have been watching with no little anxiety, and the accounts I receive of it are very conflicting. Some planters are of opinion that the higher and the lower estates are sufferers to an equal degree, whils others think that the higher estates are not so much injured by this disease as the lower ones. On some estates it is believed that the disease, after having shown itself in a very pronounced manner, has now disappeared to such an extent as to cause little alarm. On other estates which have suffered much from this pest, present appearances do not favour such a hopeful view of the matter. I have heard of trees being killed by the disease in very hot localities. Estates which have never had any manure applied to them have suffered severely. Manuring *per se* could never give origin to the disease, though manure might be the vehicle of its introduction to an estate. The disease is not a mere degeneration of the tissues of the coffee tree, but it is a well-marked fungus, propagating itself by its spores, just as the higher plants do by their seeds. This fungus possesses a distinct individuality, and an independent growth of its own, deriving, however, its sustenance from the nutrient juices of the coffee tree, and making its presence visible to us only when its minute orange-coloured spores are emergent on the underside of the coffee leaves. By means of its innumerable spores, this fungus is widely propagated in a very short period, for these spores are light enough to be conveyed long distances by the wind; and there is little doubt that even a single spore, when brought into contact with one of the tender rootlets of a coffee tree, is capable of infecting that tree with the disease. Under these circumstances it must be seen how difficult it is to suggest any course of procedure likely to avail for stopping the progress of this pest, and having had no previous experience of such a visitation as the present one, we have nothing on which to found a probable conjecture as to how long the disease is likely to prevail. Certain atmospheric conditions may possibly prove to be favourable to the development of this fungus, whilst the same conditions may favour the growth of the coffee tree, and thus enable the latter to gain the position of not being seriously affected by the presence of the fungus, or even to throw it off altogether. Another hope of mitigation of the evil may rest upon the fungus finding an enemy sufficiently numerous to check its propagation by destroying its spores as fast as they are produced; and this is not an impossible contingency, as these spores are found to be fed upon by the maggots or larvæ of a small species of fly. From what source the coffee became first infected with this troublesome disease is at present unknown. It may, however, be reasonably surmised that this particular fungus affects one or more of our indigenous plants, and that it has thence found its way to the cultivated coffee, to increase and multiply in so wide an area of suitable pabulum as the estates afford it. In conclusion I would venture to remark that, when planting operations are being carried on, the highly infectious nature of this disease should be constantly borne in mind, and that particular care should be taken in the selection of healthy nursery plants for putting out, and of seed for sowing in nurseries.

Yours truly, G. H. K. THWAITES.

THE OUVAH COFFEE DISTRICT.

DEAR SIR,—In your issue of the 25th September appeared —"*Notes by a Planter on a trip through Ouvah.*" The writer, signing himself, "*Eye Glass,*" (and short-sighted I presume), whose impertinence is only equalled by his untruthfulness, whose utter want of modesty seems excelled only by his ignorance, has made such a number of false statements calculated to impress readers at a distance (and who may be interested in Ouvah) unfavourably, that I deem it necessary to contradict them. "*Lies travel apace*" said the Persian sage *Khide.* There was no printing in his days, but now they go much faster, so I beg you will have the goodness to publish this contradiction as early as possible to Eye Glass's letter. He commences by stating that he can hardly

say whether he was pleased or disappointed with Ouvah, a matter perfectly immaterial, I should suppose, to the general public. After approving the Ouvah coffee climate and elevation, here its praises end, he says, and he goes on to state that Badulla is "fusty," the cultivation peculiar, the pruning remarkable; it would be advisable for those interested in it to send up a few pruning knives by way of trial; pruning and hat-pegging are synonymous terms; Badulla planters are great believers in mammoty weeding, and stick to it most religiously. The men of Ouvah have doubtless come to the same conclusion as Mr. Hawkes, that rain adds to the soil. There is also another dodge; a few of the Badulla planters do not believe in the application of pulp, and much prefer spouting it to the nearest ravine, there to await a heavy shower to carry it out of sight, and so on.

Finding the road impassible in his progress to Madoolseema, *Eye Glass* tries a passage through the coffee and discovers a drain, and finds it satisfactory to know that the planters of Madoolseema differed from their brothers in Badulla, and believed that wash did not add to the soil. What with beer barrels and drains, he found it impossible to penetrate further into Madoolseema. However, I will leave the planters there to deal with their would-be visitor and his account of their district, which *he had not seen*, and the obstructed state of their road, &c., having little doubt but that they perfectly understand how to treat him.

To return to his statement, regarding Badulla planters, I have simply to say that they are all more or less false, some perfectly so.

Firstly, pruning has been done for the last 23 years in Badulla, and hat-pegging was never done except by planters brought in from the Kandy side.

Mammoty weeding is not believed in, though it has of course to be done on fields in grass or hillocks, otherwise hand or scraper weeding is the rule.

Pulp manuring has been done for over 20 years, also cattle manuring and artificial manures have been used ever since they have been available.

Draining has been practised for fully 20 years, and several estates are most elaborately drained, and that on the best possible system of gradual delivery, the drain increasing in steepness as it approaches its delivery point. As to the roading, no *Eye Glass* is requisite to shew that the majority of the estates are very well roaded. My object, though is not to extol Ouvah, but simply to shew that the writer of the letter has made false statements. He says in addition, "There are many other peculiarities in the Ouvah "system of cultivation which are quite beyond me, and which "I venture to say will in course of time undergo a change." Their being quite beyond him is likely enough, but as to these peculiarities, as he terms them, undergoing a change, he is utterly mistaken, they depend entirely on the growth, blossoming, and cropping of the Ouvah coffee, which is quite different from that of any other district in the island, except perhaps Doombera, and which involes a description of cultivation, totally unlike that practised on the other side of the country, which planters therefrom discover after a short residence here.

Eye Glass goes on to state that "the great drawback is want of "communication with Kandy; let Sir Hercules Robinson, in the "interest of civilization connect Badulla with Kandy, and the "former would be a different place to what it is."

These are gross impertinences. What fettered and restricted Ouvah from the very first was its connection with the west side of the island, could that side have been split off at Nuwera Eliya by an earthquake, and towed over to the African coast, Ouvah would have gone ahead. As it was, all our produce had to take its chance round the island by sea, or to trail the whole way over the central ridge, to be sucked into the maelstrom at Colombo. Could we have shipped direct from the eastern sea-borde, nothing would have equalled Ouvah, as we produced our coffee on the estates for as low as 12*s.* per cwt, we had rice always at 5*s.* to 6*s.* a bushel, transport of coffee to Hambantotte or Batticaloa, ranged from 1*s.* to 1*s.* 6*d.* per bushel, and we had ample labour at a rate of pay now unheard-of. An occasional visit from a respectable merchant (not a sucking planter in training for a visiting Agent or a Colombo quill-driver on the loose) enlightened us as to all we cared to hear about. Connection with the western side has been an accursed hindrance to us; to it we owe the being taxed for years in export duty for a railway, which is of so little use to us, that we are paying the same cart-hire as before it was made. We were plundered again by the Immigration Commission Scheme, a simple case of downright robbery committed at the instigation of the Planters' Association of the day, in fine, we have never received a fraction, but have invariably been made to pay for the benefit of the western side, for the advantage of some of its effete used-up, manure subsisting, poonac and bone-dust devouring districts. Learning from Kandy planters! Heaven preserve us, the only man I ever saw attempt to plumb a post by getting up and squinting down it was a Kandy planter! Another tried to trace a water-course uphill, and another I saw spend the best part of a day, trying to take a trace of 1 in 10 *over a dead flat*; both these planters subsequently joined commercial firms, connected with coffee, one as principal, the other as junior partner. The only people I ever saw commence to plaster a barbecue on the lowest side first, and plaster the retaining walls of a built-up barbecue, leaving the top open and unplastered to the monsoon rains, were Kandy planters. The only planters I ever saw collect the wash by a drain on the inner side of the roads, and then shoot it off into the coffee by cross drains, were Kandy men, who are the only people too I ever saw build stores with reaper and matting lofts for the presumed purpose of drying their coffee or keeping it dry, and then underneath laid lofts having ranges of cisterns exhaling damp, and sour stinks throughout the whole crop, besides keeping the foundations of the building, more or less wet, with leakage, the wheel and watercourses, &c., setting aside the effluvia from the adjoining pulp pit.

Batta to coolies, coast advances, loss on rice, head Canganies, or any pay over 7*d.* or 8*d.* a day were never known in Ouvah, until brought in by Kandy planters, and it was discovered some time ago that some of them were actually giving the carters the usual wastage allowed them in Colombo *before starting*. I mention these trivial incidents merely for *Eye Glass's* information, and with the hope that he will look at home before going so very far abroad:—They are not much to be wonderd at though, after calmly considering the following, which is an indisputable fact. On the importation of the first lot of "*Jostic*" into Kandy, it was not an uncommon sight in the streets to see some of the planters chewing it, *whole stick*—the taste for it though gradually abated, when the discovery was made that it was not "*sweeties*," as they originally believed, the lucky accident of a Calcutta man seeing them at it and detailing its composition, led to the discontinuance of the practice. Again I repeat, we have gained nothing from our connection with the west side, and could the convulsion of nature I mentioned, only occur now, we should, at any rate, escape being bored with the Currency question, those eternal Gas Works, and other essays the papers abounded with lately.—Yours faithfully,

OLD OUVAH.

POSITION AND PROSPECTS OF THE COFFEE MARKET.

THE remarks offered by you in recently received copies of th *Observer*, as to the favourable prospects of coffee, are amply justified by what is now happening in Mincing Lane. Day by day large lots of coffee are sold steadily and at full rates. And, if the information which has reached us here in London, as to the enormous deficiency in Brazil can be relied on;—(I fear to mention the figure, but the whole export of that great country has been stated to me as likely not to exceed 1,500,000 bags, *one-third* of the figure which has been reached in its export annals) your vaticinations are not only likely to be realized but indefinitely exceeded. The United State's consumption is now, in round numbers 200,000 tons and as the people of that country *must* have their coffee, it is clear that Java, Ceylon, India, and the other coffee countries of the world will be largely indented on to make up the deficiency in the supply of Brazil. But then Europe consumes, even after the exhaustion of the recent war, or will consume if it can be procured, a quantity at least equal to 200,000 tons more. Thus America and Europe will be competing for the produce of Ceylon and the other eastern sources of supply. Let us hope then that "next" may be a year of unprecedented crop in Ceylon: for it will, according to all evidence, be a year of unprecedented average prices. A good authority, largely interested in coffee property in Ceylon, is certain that if only half we hear about short supplies as against increasing consumption be correct, the *average* for Ceylon "plantation" will, for the next year or two years, be at least 70*s.*, while if the whole of what is reported should be realized, it is simply impossible to fix a limit to the rise which may take place in prices. As far as Britain is concerned, plentiful and cheap supplies of tea will, I should think, act as a check, but over large portions of Europe no such check applies; the people have a passion for coffee and have not acquired a taste for tea. If therefore the best information obtainable and the opinions founded thereon of the best authorities, do not both turn out to be seriously erroneous, the prospects of those interested in the production and sale of coffee are for the next two years, and perhaps for many succeeding years, not only good but brilliant. Brazil, as you are aware, is in the first throes of the emancipation crisis, and how long that crisis may last, and how wide-spread and long-extended its effects may be in unsettling the relations between Brazil coffee growers and their labourers, it is impossible to say. All good men, who love human freedom, must wish speedy and peaceful success to the grand experiment on which the Emperor of Brazil and the best portion of his subjects have set their hearts. There is the example of the United States to afford encouragement, for there the Negroes, as free labourers, are equally exceeding the expectations of their friends, who hoped well of them and bringing confusion on their enemies who held that the Negro would do good work only under the coercion of slavery in the relation of "involuntary servitude." But a very large proportion of the Negro slaves of the United States were, if not educated in secular knowledge, at least imbued with the spirit of an evangelical, if a very simple and sometimes eccentric, Christianity. I suspect that the three millions of slaves in Brazil are in a very different condition, and that if in our own West Indian Colonies there was a disastrous reaction, and a long lapse of years before even a proportion

of those to whom slavery had rendered labour hateful and ignominious, came to realize the duty of honest and good work, the case may be expected to be worse in Brazil. It does not seem to be the order of PROVIDENCE that a great and crying injustice should be remedied without the wrong doers (in their individual or national capacity) passing through a baptism of retribution. It came on the Archipelago of the West in agricultural retrogression and commercial ruin, lasting for a generation. On the Northern portion of the Western Continent, the process was shorter, but beyond all comparison more awful, involving not only the temporary annihilation of many branches of agricultural and commercial enterprize, but such a fratricidal shedding of blood as the world had not previously witnessed. The same process is now going on in Cuba, the last stronghold of slavery in the Western World. Let us hope that Brazil, in her efforts to right a great wrong, may be spared the horrors of intestine strife, ere she has had time to recover from the exhaustions of a sanguinary foreign war. But all the operations of "God in history" seem to forbid the supposition that *some* retributive consequences will not visit the empire. The Emancipation Bill has passed the Chamber of Deputies, but not by a large majority, and its fate in the Senate is doubtful. Those who have had their profit by "this craft," notably those who have lent their capital on the security of human chattels, on mortgages not merely of land and crops, but of the bodies and "souls of men," naturally will hold their "securities" with a tenacious grip, and will only give way to the offer of "compensation" so enormous as seriously to embarrass the already depressed finances of the Empire. To take the most sober view, therefore, the probabilities seem to be that during the transition period of agitation and change which is before her, which may last many years, and which, if emancipation is withheld or much deferred, *may* be rendered memorable by a servile insurrection, a rising of those who *must* know, think over, and discuss what is proposed in their interest, Brazil will not be able to increase her production of coffee even if (which is doubtful) she is able to keep up the average of the past half dozen years. Readers of the *Observer* who have the advantage of independent sources of information can judge and act for themselves. But not forgetting how enormously the mere occurrence of a good or bad season in several of the producing countries influences the out-turn of coffee, and remembering the considerable breadth of young coffee, which a year may bring into full bearing in Ceylon especially, and to some extent in India and Java, it does seem that scarcely at any former period were the prospects of those whose prosperity is dependent on ready sales of coffee at high prices so good as they now are. Most fervently should I rejoice if a peaceful and perfectly successful revolution in Brazil from a system of slavery to gradual emancipation should enable that great empire—great in fact and grand beyond conception in prospect—to share in the benefits of the approaching prosperity. But we cannot ignore probabilities founded on the stern facts of the past; and therefore we can fairly assume a period of political and social strife, and of agricultural reaction in Brazil, as amongst the elements to be taken into account as justifying the adoption of a belief that a wonderfully good period prosperous "next years" are at hand for the coffee planters of the eastern world, especially those of Ceylon. "So mote it be."

MARKET REPORT.

COFFEE.—The coffee market shows less animation than last week, and the highest prices then paid have not been maintained, either for plantation Ceylon or East India, and a portion of the supply brought forward by auction was withdrawn. Native Ceylon afloat has been disposed of at about former terms. The parcels brought forward were all disposed of at steady rates 500 casks, 100 barrels, and 50 bags plantation Ceylon—triage, 57s 6d. to 60s.; small to bold grey, 65s. 6d. to 74s.; middling to good middling bold, 72s. 6d. to 80s.; peaberry, 82s. 6d. to 83s.; also privately, 800 bags native, at 63s. 6d to 64s.

TEA.—The deliveries in London, estimated for the week, were 1,755,744lbs., which is a decrease of 14,881bs. compared with the previous statement

INDIGO.—There is no change to report in the prospects of the Indigo crop which continue to be as favourable as could be wished from all parts of the country. Planters, in parts of *Lower Bengal*, would be glad of a few showers to enable them to finish their spring cultivation, but to judge from the appearance of the weather here they will probably have had them by this time. The plant is reported to be growing splendidly in *Tirhoot, Chumparun and Chuprah*; caterpillars have appeared in one or two concerns, but the damage done by them has been very trifling. Altogether we have seldom known a season open with such uniformly good prospects, and with a continuance of good fortune during manufacture, we may look for a bumper season.

Exports of Indigo from 1st November 1870, to 1st April 1871:—

	Chests.	Mds.	S.	Ch.
To Great Britain	16,460	62,175	18	0
„ France	513	1,867	13	8
„ Trieste	2,790	10,533	4	1
„ Foreign Europe	250	953	9	6
„ America	2,336	8,773	25	12
„ Gulphs & Levante	1,731	6,758	10	4
Total	24,080	91,061	0	15

RAW SILK.—We have no improvement to report in this market; prices cannot be quoted ower, but buyers are unwilling to operate; the present complication of affairs in France keeps business at a stand still, and a speedy settlement thereof is necessary to induce buyers to come forward at current rates. Good offers have been made for March bund filature Silk to arrive, which owners have refused; the only sale of filature is 75 bales of the (J D) Cooldah which is reported at the high figure of Rs. 29-8. The new Silk of the March bund will be here in a few days, and if producers will sell at reasonable rates, a fair business will no doubt follow.

TEA.—A small sale of 466 chests was held on the 31st ultimo: of this quantity the greater part was "Green Tea," which, in the absence of high enough offers, had to be withdrawn. Prices for other kinds remain unaltered.

Public Sale Prices.

ASSAM.—*Chanatollich Garden*—Broken Pekoe Sa. 1, Pekoe Souchong annas 12½, Souchong annas 11 ... ... 79 Chests, Average As. 12½ per lb.
MAIJAM GARDEN—*Fannings, &c.* .. .. 111 „ „ 6½ „

William Moran & Co's. Circular.

CEYLON EXPORTS FOR FIVE SEASONS.

WE append our usual comparative return on the close of the season ending 30th September. It embraces the exports for five years back, and affords the best possible criterion of the actual out-turn of crop during each season. Usually, a portion of the new crop of the succeeding season is despatched as early as August, while perhaps some of the old crop does not come on for shipment till October; but this being the case more or less every year, the balance is well maintained, and the practice which obtains in Brazil, and Java, from the absence of proper communinction with the coast and cheap transport of sending to the shipping port the crop of a couple of years at the same time, is unknown in Ceylon. The following table shews that our coffee exports for the past season are not only 100,000 cwts below those for 1869-70, but 83,000 and 46,000 cwts. below those for 1868-69 and 1867-68 respectively. The great falling-off this season has been in plantation kinds, while native actually shews a slight improvement on the previous export, although far below the export which ruled some years ago. As respects the distribution, the most striking circumstances is the small export during the past season direct to France, but this was made up by a full cargo of plantation and native—the first of its kind—sent to Hamburg. We must allow the figures to speak for themselves:—

COMPARATIVE TABLE OF COFFEE EXPORTED FROM CEYLON TO VARIOUS COUNTRIES IN THE YEARS ENDING 30TH SEPTEMBER 1867, 1868, 1869, 1870, AND 1871.

Countries.	Plantation.					Native.					Total.				
	1867.	1868.	1869.	1870.	1871.	1867.	1868.	1869.	1870.	1871.	1867.	1868.	1869.	1870.	1871.
Great Britain	614,834	694,301	747,080	824,663	736,597	174,081	200,746	151,495	70,625	102,080	788,915	895,187	898,583	895,207	838,587
France	8,662	4,276	11,246	14,907	966	8,855	6,554	22,156	11,731	632	17,571	10,829	33,402	26,638	1,598
Trieste, Venice, Austria	....	....	.....	7,004	3,001	.....	.....	....	2,221	59	....	.....	...	8,215	3,960
Port Said, & Suez	....	.....	....	15,013	7,345	.....	.....	...	609	512	....	....	....	15,622	7,777
Australia	8,466	11,831	14,001	18,035	11,852	1,188	5,679	2,169	1,708	3,417	9,603	17,510	16,170	19,743	14,754
America	.....	270	5,070	3,896	6,[illegible]	11,676	22,815	24,701	39,226	24,284	11,676	23,094	29,861	33,121	30,374
Mauritius	....	525	....	996	....	.....	12,672	15,428	1,695	1,618	....	13,407	15,428	2,691	1,618
India and the Red Sea	.....	.....	64	150	3,287	1,965	3,894	7,014	938	545	1,966	3,894	7,078	1,088	3,772
Gibraltar	5,000	....	....	5,[illegible]	....	2,579	....	....	....	....	7,639	....	....	5,207	....
Hamburg	....	....	....	....	13,535	....	....	....	....	3,301	....	....	....	....	15,836
Total	637,102	711,311	777,560	890,419	786,893	200,280	252,560	223,053	128,933	136,386	837,382	964,071	1,000,622	1,019,842	923,276

ORIENTAL BANK CORPORATION.

INCORPORATED BY ROYAL CHARTER, 30TH AUGUST 1851.

Paid up Capital, £1,500,000. Reserve Fund, £444,000.

Calcutta Agency.

DEPOSITS.

Deposits of Rs. 500 and upwards are received for fixed periods, the terms for which may be ascertained on application at the office in Calcutta.

No Interest is allowed on Current Deposit Accounts.

EXCHANGE.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius, Australia, and New Zealand at the exchange of the day.

Drafts are drawn for sums of £1 and upwards.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued.

N. B.—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if a married lady, her own Christian name, not that of her husband, is required.

JOHN S. SORYMGEOUR,
Agent.

Calcutta, 1st February 1871.

ORIENTAL BANK CORPORATION.

Bombay Agency.

EXCHANGE.

THE CORPORATION grants Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope.

No Draft at six months' sight is granted for a Sum under £50. Sums under 20*l.* are only drawn for on Demand.

COMMISSION.

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent., and on the collection of Bills one per cent. and Postage.

The Corporation takes charge of Government Paper, Shares in the Bank of Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms:—

If to be remitted through the Corporation	Without charge.	
If to be paid in India, a Commission will be charged of ...	¼	per cent.
On delivering Securities out of safe custody	¼	do.
Hours of business	10 to	3
Saturdays	10 to	1

Bombay, 1st October 1869.

CHARTERED MERCANTILE BANK OF INDIA,

LONDON, AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies.

Circular Notes and *Letters of Credit* are also granted for the use of Travellers in the *East*, on the *Continent*, and to *Europe* overland

The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Ceylon, Hongkong, Foochowfoo, Shanghai, Hankow, Singapore, Penang, and Yokohama.

INTEREST.

On Current Deposit Amounts Interest is allowed at 2 per cent. per annum, on the minimum Monthly Balances up to Rupees one Lac, but no Interest will be allowed on balances of less than Rs. 1,000.

INTEREST ALLOWED ON FIXED DEPOSITS.

When fixed for	12 months	5	per cent. per annum.
	6 do.	4	" "
	3 do.	3	" "

All letters should be addressed, and Hoondies made payable, to the Chartered Mercantile Bank.

NATIONAL BANK OF INDIA, *(Limited.)*

Bombay Branch.

CURRENT DEPOSIT ACCOUNTS.

Interest is allowed on Current Deposit Accounts at 2 per cent. per annum on the minimum monthly balances up to Rs. 1,00,000, but no Interest will be allowed on balances under Rs. 1,000.

FIXED DEPOSITS.

Deposits of Rupees Five Hundred and upwards are received for Fixed Periods, the terms for which may be ascertained on application at the Office in Bombay.

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta, Madras, Ceylon, Hongkong. It also grants drafts on London and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors,

JAMES WINDRAM, Manager.

Bombay, 1st July 1871.

NEW BANK OF BOMBAY, *(Limited).*

RATES.

DISCOUNT.

Government Bills	6 per cent.
On Goverate Bills and Notes	8 do.
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.
On do. do. do. Goods or Shipping documents for Goods	8 do.
On Cash Credits, on Security of Government Paper, Bullion or Railway Shares, subject to a Commission of ¼ per cent. on the amount of Credit	7 do.

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts.

Bombay, 15th July 1869.

LLOYD'S BANK,

DARJEELING.

Fixed Deposits.—Interest is allowed on deposits of Rs. 100, and upwards on the following terms:—

On sums lodged for 3 months certain..... 3 per cent. per annum.
Do. 12 do. 7 do.
Do. 2 years certain ..... 8 do.

Interest is allowed at 2 per cent. per annum on floating deposits or Current Accounts, when the Balances exceed 500 Rupees.

There are many who have a dread of speculation, and yet who desire a *fairer* rate of interest than is obtainable from investment in Government paper and Railway scrip, or from fixed deposits in Joint Stock Commercial Banks. Remittances can be made by cheques on any part of the world.

Interest paid half yearly in India or London.

A. B. L. WEBB,
Manager.

Darjeeling, Northern Bengal, 1st August 1870.

COMPTOIR D' ESCOMPTE DE PARIS

HEAD OFFICE: PARIS.

Subscribed and paid-up Capital £3,200,000
Reserve Fund ..... £ 800,000

London Bankers:

THE UNION BANK OF LONDON.

Exchange.

On London—6 months' sight	1s. 10¾d. per Rupee.
" On demand	1s. 10¾d. "
On Paris—6 months' sight	242 francs.
Letters of Credit.....	1s. 10¾d. "
Ditto for *Italy* and *France*, payable in Gold without Commission..	1s. 10¾d. "

Current Accounts.

Interest is allowed at *two per cent.* on minimum monthly balances.

Deposit Accounts.

Interest at *three per cent.* allowed on money placed in Deposit at seven days' notice.

Interest at *four per cent.* subject to six months' notice of withdrawal.

All remittances to be endorsed "PAY COMPTOIR D'ESCOMPTE DE PARIS OR ORDER."

E. J. HARDCASTLE, Manager.

14, Rampart Row, Bombay, 26th May 1871.

ENGLISH HOTEL, BOMBAY.

BRITISH HOTEL LANE,

APOLLO STREET.

THIS Hotel is fitted up and furnished in the most complete manner; no expense has been spared to render it the most commodious and comfortable Establishment, both for Gentlemen and Families, to be found in Bombay

The Sleeping Apartments and Sitting Rooms are replete with every convenience, and the strictest regard is paid to cleanliness throughout the premises.

The Table will be found to be abundantly supplied with viands of unrivalled excellence, and the culinary department is under the immediate supervision of the Proprietor.

The Wines, Liquors, and Beer are of the very best description, supplied from the most celebrated houses in the London and Continental Markets. The Proprietor confidently recommends this Establishment to the patronage of Travellers and Residents, all of whom may be accommodated with the comforts of home at moderate charges.

The Hotel is pleasantly situated, and within five minutes of the Railway Station, and Apollo Bunder.

Bombay, August 1870.

HOPE HALL FAMILY HOTEL,

MAZAGON, BOMBAY.

THE HOPE HALL FAMILY HOTEL has been greatly improved and enlarged, and a few extra detached Bungalows erected in the compound. As these add greatly to the comfort and privacy of families, the Proprietors respectfully beg that orders be sent in time by persons wishing to occupy them.

The Proprietors presume that it is hardly necessary to say that this Hotel offers greater advantages to the public than any other in this city, not only on account of its being nearest to the P. and O Company's Pier at Mazagon, and near enough to other landing places and the several Railway Stations, but because it has also an extensive and beautiful compound, nicely cultivated, and intersected by broad and well-kept walks.

For the amusement and recreation of gentlemen it has Billiard rooms, entirely detached from the other buildings in the compound, where also excellent refreshments may be obtained.

The Table and Wines are unrivalled. Horses and Carriages are always to be had on the premises.

SORABJEE FRAMJEE & Co., Proprietors.

THE ROYAL FAMILY HOTEL, POONA.

Opposite the Railway Station.

IS NOW RE-OPENED.

A most comfortable Residence, commodious and upper-storied, for Visitors as well as Residents in the capital of the Deccan, and conducted on English principles.

THE Proprietor of this Hotel begs to inform the public of Poona and Out-stations, that his Hotel, which has been under construction for an Upper Storey, to meet the demands of visitors to Poona, as well as for the comfort of the occupants, is now completed.

THE ROYAL FAMILY HOTEL, which has been established since 1862, is situated in the very centre of the station, and opposite the Railway Station. The Proprietor having made extensive repairs and improvements, by adding an Upper Storey, the comfort of visitors is greatly enhanced. The rooms, which are well furnished, and airy, command an extensive prospect. The Hotel is under the immediate superintendence of the Proprietor, and no efforts will be spared to give satisfaction, both in regard to the supplies for the table, attendance, and general cleanliness of the Establishment. Beers and Wines of the best quality, none other being admitted, will be supplied at moderate rates, and every exertion will be made to render visitors comfortable. Carriages, with good Horses, on hire, can be obtained on the premises.

DORABJEE SORABJEE,
Proprietor, Royal Family Hotel.

EDINBURGH FAMILY HOTEL,

RIVER VIEW, SIMLA.

PLEASANTLY situated in the most central part of the Station, near the Church and Mall, and within easy distance of the Library, Club, and Assembly Rooms, and entirely removed from the Bazaar.

The Proprietor solicits patronage, and begs to assure those who may engage accommodation at this establishment, that they will find no effort spared which can conduce to their comfort.

Rooms available for Private Families by the season, month, or day. Early application necessary. Address

THE PROPRIETOR,
Edinburgh Family Hotel, Simla.

Simla, 21st January 1870.

The Ravages of White Ants

ARE completely prevented by the Preservative Composition patented by Major Forbes, R. A., Executive Engineer, D. P. W.

This is the only effectual process yet invented for protection against White Ants, it also arrests decay in woodwork, whether sheltered or exposed.

The dry Ingredients, packed in tins, containing 25 lbs. each, can be obtained from the undersigned; this quantity, mixed with a due proportion of oil, will form a paint sufficient to prime 1,000 superficial feet. Price per tin, Rs. 5.

Sole Agents,
BURN & Co.

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The Proprietors have received the cordial support of the leading India, China, Australia, and American Houses; and the private information derived from the sources cannot but add immensely to the intrinsic value of the publication.

In addition to the business done in the various Produce Markets in London, "The London Daily Recorder" embraces the Provincial and Foreign Intelligence received from hour to hour in London by Telegraph; and the value of its Market Reports consists in their authenticity and absolute correctness, as they are supplied by houses of the highest standing in each department of business.

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* The P. C. Judgment, in the January *Jurist* 1870, was only one month old.

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It is well written, well arranged, well edited and well printed.—*Lucknow Times, Feb. 8.*
The articles are ably written, the tone moderate, and it is altogether an acquisition to the Indian Press.—*Mofussilite, Feb. 9.*
In print and style it is superior to any other Indian paper, and its articles are of the highest class.—*Indian Church Gazette, Feb. 11.*
The favourable critiques that have appeared in different papers, fully bear out our own opinion respecting this neatly-printed and ably-edited hebdomadal.—*Bengal Times, Feb. 15.*
The project of a master-mind, and the offspring of a master-hand.—*The Progress, Feb. 10*
It promises to be one of the best conducted Indian weeklies.—*Hindoo Patriot, Feb. 6.*
Indeed, the paper bids fair to be a first class journal, and as such we wish it all success.—*The Bengallee, Feb. 11.*
We wish the *Observer* every success, and trust he may have many readers.—*Rangoon Mail, Feb. 18.*
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To the Editor of the "Times of India."

DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India, I must ask you to correct an error which appears in your notice, if it has not already been corrected. I did not serve in Affghanistan. The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother, now Brigadier-General Edward Kaye, C. B., who thus commenced a long career of good military service. The best service which I ever rendered *in* India, or indeed *to* India, was the establishment, single-handed, of the *Calcutta Review*, which has done far more for Indian literature than anything I have written under my own name. In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours; and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave.
I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and general subjects, have given us valuable articles on the army. Some from the pen of Sir Henry Lawrence, who wrote with the spirit of prophecy of the coming storm of which he was one of the noblest victims.—*Address of His Excellency the Commander-in-Chief, at a meeting held on the 18th May 1871, at the United Service Institution of India, Simla.*

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India,

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, MONDAY, 22ND JANUARY 1872. No. 6.]

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NOTICES TO CORRESPONDENTS.

We trust that our friends will recognise their questions in the garb we have decked them in; if in this shape they do not altogether convey the meaning intended, we shall be glad to correct them in our next issue. We often experience much difficulty in discovering what it is our friends really want to know. We must ask them to be good enough to put their questions as definitely and as plainly as possible.—ED. *A. G. of I.*

How should land be prepared for a cotton crop; how should it be manured; how much seed will be required per acre; and how should the seed be sown?

The soil should be well worked by ploughing and cross ploughing, and thorough grubbing. You may sow on the flat, or on the ridge; in a wet district we should prefer the latter arrangement. We do not approve of applying nitrogenised organic manure directly to the cotton plant; with such manure the tendency of the plant is to produce wood and leaf. We consider it a far better arrangement to apply a fair dressing of foldyard manure to the previous crop, and apply our mineral manures to the cotton crop. Sow from 10 to 20 lbs. of seed per acre; if it is a large growing species, sow 10 lbs; if one of the ordinary country kinds, sow from 15 to 20 lbs; always sow in drills whether you sow on the level, or on the ridge. Place your drills from 4 to 6 feet apart according to the species. To economise space sow a row of maize or millet between the rows of cotton. Some remarks on this subject will be found in our notice of Mr. Login's Report on cotton cultivation in the Punjab.

I have a litter of fifteen young pigs, which is the most profitable way of disposing of them?

The number is too large for any sow to bring up well, especially in this country. Unless the sow is a very large one, you had better drown 2 or 3 *at once*, or the whole lot will be injured. Of the dozen that will remain you may, when about 6 weeks old, sell 3 or 4, as roasters, for which purpose, they will in most districts command Rs. 3 each. The remainder may, unless the breed is worth preserving, be fattened and sold as Porkers, at 6 or 9 months old, when they will, if of average size and in good condition, sell for 20 to 25 Rs. each.

You recommend Saltpetre as a manure; to what crops would you apply it, in what quantity, and in what manner?

Saltpetre, Nitrate of Potash, is certainly the most valuable manure we possess, not even excepting Peruvian guano; true, it contains none of the phosphatic material so valued in guano; still, by adding bone-dust, this fault is easily remedied. So mixed you may apply it to any crop, tobacco, maize, and most of the ordinary grain crops. Mixed with bone-dust, in equal weights, it is a useful application for the cotton crop, apply say 100 lbs. per acre of the mixture as a top dressing, either during showery weather, or after heavy rains, if applied during dry weather, hoe it in with the bullock hoe or hand hoes.

It is said that the inferior size of Indian Stock is due to the small proportion of phosphatic materials in their food, and that if a small daily supply of bone-dust (which contains phosphates) is given in the food of young animals, they will grow up stronger-limbed: is this the case?

We have not the least doubt but that one cause of the inferiority of Indian Stock, and we may add Indian people, is the great deficiency of bone material in the agricultural produce of this country; but we certainly do not believe that in the case of herbivorous animals any good would result from a daily doze of bone-dust. The only way of strengthening the bone of growing animals through the agency of bone-dust or any similar phosphatic material, is to apply it as a manure to crops; these crops will take up and elaborate the phosphatic material in a form in which it can readily be assimilated by herbivorous animals. But the chief cause of the small size of Indian Stock is, we believe, the stinted food and hard living they have been subjected to for so many generations. The now famous English horse did not exist in the 17th century, when nothing England could produce was thought comparable with the small horse from Arabia and Barbary.

At what age should a young heifer be put to the Bull?

Much will depend upon the breed of the animal, certainly not before she is 20 months old, probably if 24 months old the results would be better. We have, in England, seen well bred and short-horn heifer, not over 18 months old, that appeared as thoroughly developed and matured as many animals are in this country when nearly 3 years old. You must not be altogether guided by the age, use your observation. If your management has been such, that your heifer never lost its calf flesh, but was always kept in good condition, it may safely be put to the Bull 4 or 6 months before that of your neighbour's which may have been kept on the starvation system common amongst our humane (!) Hindu cultivators.

LETTERS TO THE EDITOR.

THE FORESTS OF THE HIMALAYAS.
N. W. PROVINCES.

To the Editor of the
Agricultural Gazette of India.

SIR,—I send you a few lines on the subject of my late experiences in extricating timber from the pine forests of the Himalayas.

The importance of their future good management must be my excuse for troubling you on the advisability of forming plantations of trees on either side of the lines of railway, to be placed in charge of Rangers each, in addition, having a small area of arable land attached, whereon improvements in the growth of seeds of the neighbourhood could be made.

It is from the fact of India becoming year by year more and more denuded of trees that the land cannot yield sufficient nourishment for the ever-increasing population, and that famines are becoming of such frequent occurrences.

The Rangers should not be placed at greater intervals than one mile apart on either side of the railway or river on which they may be fixed: they should all be married, and should be the pick of the Regiments.

A scheme of this description, well advertized in England, would prove a great attraction for a respectable class of men to join the army with the hope of enjoying the benefits that would accrue if they behaved themselves properly while in the regular service.

It should be obligatory to serve a certain number of years, say seven, also to pass examinations in reading, writing, and arithmetic, as well as in agriculture, and a thorough knowledge of drill should likewise be insisted upon. My experience of the quasi independent hill territories leads me to the belief that it is the greatest piece of folly, on the part of the paramount power, to allow them to exist side by side with our (slightly) better ruled State. On the one hand their subjects become dissatisfied at observing the difference between themselves and the inhabitants in British Territory, (the rascality of the native subordinates in British employ are bad enough, but the extortions of the native Rajahs are perfectly wonderful), and on the other the large landholders of Oudh, Punjab, and N. W. Provinces are irritated that they also have not the same power over their unfortunate ryots to squeeze and plunder them at their own will, and without any interference from the neighbouring Magistrate. Thus a large portion of the population in and adjacent to the territories of the feudatories are even in a chronic state of restlessness, from the highest to the lowest, each of its kind anxious for a change that may, in the one case, bring back the old days of rapine and bloodshed, and in the other removal to the protection of a better inclined system of Government.

Even the improvements that are so permanently brought before newspapor-readers, as occurring in native States, would hardly bear the investigation of men of ordinary common sense, but must be seen through the rose-coloured spectacles of a political official.

For any real and permanent good even to accrue to the natives of India a large farming population of Englishmen is required in every district. The native requires to come into contact with Europeans totally unconnected with the Government service. these latter they fear, and adopt changes simply by order when suggested to them, but in the former instance having no dread of the man, they would be more open and communicative, and also more apt to copy improvements in husbandry after they had seen (for some years) that they would benefit thereby.

The Forest Department appears to me to require an entire re-modelling and to become Conservators, instead of mere timber traders as they are at present.

December 20th 1871.

HIMALAYAN ENTERPRISE.

TEA CULTIVATION.—No. V.

To the Editor of the
Agricultural Gazette of India.

SIR,—The building of the factory described in my last (the materials being all ready on the spot having been previously collected) would occupy the planter for the greater part of the third year added to the getting ready, terracing, and planting of 30 acres more of land.

Not a yard of soil should, in my opinion, be planted (in the hills) without terracing. Terracing is the plan which has for countless ages been adopted both by the natives of India and China, wherever hill-cultivation is in question, and it is not to be supposed that they did so without good reason. Some people suppose that terracing, though requisite in the mountains for grain crops, the seed of which would otherwise be washed away by the heavy downpour of the monsoon, is *not* requisite for shrubs and bushes, such as tea, coffee, &c., and that these do better on properly drained slopes.

To this I submit that the wash plainly (as they themselves admit) *does take place* on slopes, and that it is therefore a mere question of time for the roots of plants set upon the said slopes to be laid bare, that draining, unless carried out on such a scale as to be in the long run *more costly than terracing*, does not protect the plants from the wash, especially under high cultivation, whereas once your ground is properly terraced, you are safe for ever.

Some again, who have never tried terracing, are frightened at the supposed expense, this however is a mistaken notion. I have found by experience that *good terracing* can be executed at the rate of Rs. 60 per acre, and I very much doubt if digging the ground up (when not terraced) to a depth of 10 inches or two feet, (as those who plant on slopes do), will not *cost more*, the reason being that the hill men are *accustomed* to terracing, all their cultivation being carried on in this manner, whereas they are not accustomed to deep hoeing. In the third year the planter will do well to commence early, and get thirty acres thoroughly well laid out for planting in the manner above described, or forty if his manure is likely to hold out.

I forgot to mention that he should, in the second year, have put down 50 to 100 maunds more of tea seed, making another nursery of one or two acres, so as to have plants coming on yearly, and the same the third year. These nurseries will eventually form part of the acreage under tea, as plants are left at intervals when the rows are planted out.

By the end of the third year, the factory and plant should be completed, and in the spring of the fourth, the ten acres planted in the second will be yielding probably 150 to 200 lbs. per acre, if well manured, in the preceding autumn. Thirty more acres terraced and planted during the rains of the fourth year, will bring the area under tea to 70 acres, while the fifth year will, at the same rate of progress, show the full complement of one hundred.

In the fifth year, the ten acres first planted will be yielding 300 to 400 lbs. per acre, while the thirty acres planted during the third year will have come into bearing.

In the sixth year, 70 acres will be giving a good return of leaf, and the seventh season will show the whole hundred (100) acres in yield, though the maximum yield will not, in all probability, be realised before the tenth year.

At that epoch (always of course supposing that the proper amount of food in the shape of manure, the one thing absolutely necessary has been supplied to the plants) the planter will witness a perpetual flush lasting from the middle of April to the middle of October, giving him as much as he can do with the assistance of all the women, children, and tag rag, and bobtail of the neighbouring villages to gather.

If the bushes yield 1,200 lbs. *leaf* per acre, he will realise 30,000 lbs. of made tea; but it is more than probable that, under the circumstances, 2,000 lbs. of leaf, or 500 lbs. made tea per acre, will be the actual outturn, as from 700 lbs. to 900 lbs. (nine hundred) made tea *has been obtained* from highly-manured plots in the N. W. Himalaya. It will cost the planter, at a rough estimate, eight (8) annas per pound all round, to cultivate, manufacture, pack in lead and box the tea, and say two (2) annas more to take to market: his schedule will therefore stand somewhat as follows:—

100 acres will yield at 300 lbs. made tea per acre, 30,000 lbs.—

Value 1 Rupee per pound	Rs. 30,000
Subtract cost of manufacture, &c.	„ 15,000
Carriage to market (2 As. per lb.)	„ 1,875
(Profit)	Rs. 13,125

100 acres yielding 500 lbs. per acre made tea, 50,000 lbs.—

At 1 Rupee per pound	Rs. 50,000
Subtract cost of manufacture, packing, &c.	„ 25,000
Ditto. carriage to market	„ 3,125
(Profit)	Rs. 21,875

Well-manufactured tea often sells for Rs. 1-2, 1-4, and even 1-8, at the auction. At Rs. 1-2, the planter would clear his Rs. 15,000 profit; in the others of course more.

Now one more piece of arithmetic in order to estimate the expense since the commencement of the 3rd year.

* Building factory	Rs.	3,000
Terracing and planting 30 acres	„	2,100
Manuring do.	„	150
Grain for cattle	„	900
Pay of ghorawallas or herdsmen	„	360
Carriage of grain	„	150
Cutting and stacking grass	„	200
Cost of living of planter	„	1,200
Odd expenses	„	200
Nursery of two acres	„	100

Expense of 4th year the same, deducting 3,000 Rs. for factory now finished.—

Brought forward	Rs.	8,360
Expense of 4th year	„	5,380
Do. of 5th year, 100 Rs. for nursery	„	5,260
Total expenditure from 3rd year	Rs.	18,980
Brought forward expenditure up to 3rd year	„	18,760
	„	18,980
	Rs.	37,740
Add for 3rd year weeding (10 acres)	Rs.	50
For 4th do. do. (40 do.)	„	200
For 5th do. do. (70 do.)	„	350
Brought forward	„	37,740
Add (for weeding)	„	600
Grand Total...		38,340

(Up to end of 5th year.)

The yield of tea for the 6th, 7th, and 8th years would be something considerable. 70 acres would be in bearing in the 6th year, yielding all round 200 lbs. per acre or thereabouts, thus:—

70 acres at 200 lbs. per acre. 14,000 lbs. in the 7th year, the whole area of 100 acres would be giving a return at about the same rate (all round). In the 8th year the yield per acre may safely be fixed at 250 lbs., reaching its maximum of 3 to 500 lbs. per acre by the 9th or 10th year. The return realised in the 6th, 7th, and 8th years, deducting cost of manufacture, packing, and carriage, would not be less (even taking the lavish average of 1 Rupee per pound) than Rs. 24,000.

This sum, after deducting Rs. 4,000 for the planter's private expenditure leaves a profit of Rs. 20,000, which will go far to cover the expenses incurred and the capital laid out on the plantation, while the profits of the 9th and 10th years, at the maximum yield of 300 to 500 lbs. made tea per acre, should do so entirely, leaving a surplus to boot.

It is thus clear that capital of 40,000 or 50,000 Rs. † *judiciously laid out* will, at the end of ten years, bring in an annual profit of Rs. 15,000 or thereabouts, and this after *paying its own expenses*.

The price to be paid for their investment would, it is true, see isolation for the greater part of the ten years in the wilds, and also of tolerably unremitting attention to work for the same period. *Per contra* the work is healthy work in a fine climate, and the solitude can be varied by occasional visits to a station or to neighbouring planters, while the very fact of isolation, I think, disposes many men to work hard if only to make the time pass.

In conclusion, I may remark, that though, as I said before, I have allowed a margin for inexperience, yet my estimates include a certain amount of *savoir facie*, and knowledge of the country and of native character, without which I doubt if any one could construct an estate at the rates I have set down, no matter how hard-working he might be

MINERAL AND SALINE MANURES.

To the Editor of the
Agricultural Gazette of India.

SIR,—It is the custom in India, when Agricultural subjects are discussed, to advance the opinion that improvements are impossible, because the only manure of the country, cow, and ox dung is made into cakes, which, after being sundried, are used as fuel.

The gentlemen who know all about it, call on the Government to form "Fuel Plantations" wherever needed, and then say they "cattle-dung will be turned to its legitimate use as manure, and the finest crops of wheat, maize, and Indian corn (the large millet of America and *jowar* of India) will be produced throughout the length and breadth of the Empire, to the great advantage of all concerned."

* Cost of collecting materials, timber, &c., given in former account.

† Rs 50,000 would allow for greater expenditure (private) per mensem for building a bungalow, laying out a garden, making a large orchard, &c., &c., &c.

It will perhaps astonish these gentlemen to be told that, with the exception of Spain, there is no other country in the world which possesses such a varied, valuable supply and inexhaustible of mineral manure as India.

My object is to bring these manures to prominent notice, and I will do so in an order of succession, which will indicate their value, as well as give them a distinctive number, by which they shall be known hereafter.

NATURAL MINERAL MANURES.

1st, Fossil Phosphate of Lime; 2nd, the fragments of Limestone or Matrix in which they are imbedded; 3rd, *Kunkur* dust or powder made by pounding or grinding Lime producing *Kunkur*; 4th, calcined Lime, made from *Kunkur*, all kinds of Limestone, shells, and coral; 5th, Magnesian Limestone, including the Magnesite, or native carbonate of magnesia, of Madras; 6th, superior marl; 7th, Red or Ferruginous marl; 8th, Steatite or Soapstone; 9th, Sulphate of Lime or Gypsum; 10th, Red and Yellow Ochres; 11th, Sulphate of Iron; 12th, Iron and Manganese clays, or disintegrations of rocks containing these metals. In the Himayalas—"*Kala muk kole*" is the native name for this substance, and it is much used for flat roofs in place of ordinary clay.

NON-FOSSIL MINERAL MANURES.

1st, Animal bones and bone dust; 2nd, Calcined bones or bone ash; 3rd, Fish bones, and Fish scales, Crab, Lobster, Praun and Shrimp shells; 4th, Squeezed Sugarcane (Megass) Ashes; 5th, Wood, brushwood and charcoal ashes; 6th, Ashes of all kinds of weeds and straw; 7th, all kinds of Brick-dust, Brick-kiln ashes and refuse, roasted earth, 8th, old crumbled down and refuse mortar.

SALINE MANURES.

1st, Muriate of Soda or culinary Salt; 2nd, Nitrate of Potash or Saltpetre; 3rd, Nitrate of Soda, (or *shore sujjee*); 4th, Sulphate of Soda (or *Kharee Neemuch*; 5th, Crude, native Carbonate of Soda, (or *Sujjee Mittee*); 6th, Salammoniac, (or Nousadur); of these numbers one to five are under the excise.

ARTIFICIAL MANURES.

1st, Super-phosphate of Lime; 2nd, Bi-sulphite of Lime; 3rd, Wood and vegetable charcoal.

India therefore possesses a total of 29 manures, of which 12 are mineral, 8 non-fossil mineral, 6 saline, and 3 artificial.

Two of the artificial manures require sulphuric acid and sulphur for their manufacture, and are of great value. But the use and importance of charcoal requires explanation to be understood.

CHARCOAL.—The dust and riddlings of charcoal which are now wasted possess remarkable chemical properties. 1st, charcoal evolves ozone, and absorbs oxygen, ozone acts as a purifier of the air and destroys malaria; 2nd, it acts both as a deodoriser, and disinfectant; 3rd, one cubic inch of charcoal will absorb 35 cubic inches of carbonic acid gas, 90 of ammoniacal gas, 55 of the deadly sulphuretted hydrogen, 5 of the deleterious carburetted hydrogen or ditch gas, and 7·50 of nitrogen, 4th, it attracts and retains moisture, and I believe produces water by catalytic chemical action, between atmospheric oxygen and the hydrogen of certain gases.

The roots of growing plants absorb or extract the condensed gases (suited to their wants) from the charcoal, and in this manner, though not a manure itself, it provides substances which act as manures, and as charcoal is unperishable, its chemical value, when present in the soil, is exceedingly great.

With this information before us, it is rather absurd to talk of India being deficient in manures. Cow-dung is well enough in its way as a leaf producer, but it is of very low value as a supplier of mineral matters, of which it does not contain one-and-a-quarter grains in the hundred, whilst wheat contains five per cent. in the grain alone. We learn from a careful analysis, that 100 grains of stall-fed cow's dung contains only 0·46 of a grain of the phosphate of lime, and as 365 pounds of first class wholemeal wheat flour contains 3 lbs. 6 ounces 4 drams and 44 grains of this most important substance, a simple calculation will show how utterly impossible it is to expect the half-starved Indian ox, and cow, fed on inferior grain, grass, and straw, to produce even one grain thereof in half-an ounce of manure.

Amateur agriculturists should bear in mind, that when proper mineral matters are deficient in the soil, the plant will take up silica to make good the deficiency, and as silica is of no value to man, the wheat in which it is present in excess, may indeed weigh 60 lbs. to the bushel. But what is the good of it? Flinty wheat is held in very low esteem as it can be easily recognised, therefore it will be found very unprofitable to raise wheat, in which the principal mineral matter is flint or silex, instead of the phosphates.

The quality of the wheat of India, as compared with that of Europe, is most decidedly inferior, and it is my duty to show that, unless saline and mineral manures are used, no improvement is possible. The reader may convince himself of the inferiority of Indian wheat and its flour by tasting or eating a bazaar biscuit, made of Indian flour, and then trying one made by "Huntly and Palmer," London. The remarkable difference in flavour is due, not to any secret in baking and manufacture, but to the superior quality of the wheat and its flour. To improve the wheat of India, saline manures, Nos. 1 and 2, and mineral manures Nos. 1, 3, or 4 will have to be applied to the soil, the latter directly, the former by being dissolved in water, and applied or sprinkled over any vegetable manure before use. By vegetable manure is meant leaves, weeds, refuse, straw, stubble, grass, and roots chopped up and stored in a pit to ferment and pass into manure, rich in humic acid.

The fermentation may at all times be accelerated by dissolving a *seer* of molasses in a *ghurrah*, (or four gallons of water), and sprinkling as many *ghurrahs* of it as may be needed to moisten the heap. An allowance of one *seer* of molasses to four *maunds* of 82 lbs. *av.* each, of vegetable refuse, will be ample. Of course the manure-making is to be taken in hand, when the rain crops are weeded. But if such manure is not forthcoming, the lime, or kunkur dust must be watered with the nitrous solution, and the same weight of soil will, after being pulverised, have to be mixed with dry salt in powder. The fossil phosphate of lime reduced to powder should now be added, the compost well mixed together, and when ready, applied to the surface of the ploughed land, which should then be harrowed and prepared for sowing.

The wheat should be sown after the above manure has been harrowed (not ploughed) into the soil, and if Captain Hallet's system, pursued by him in producing his "Pedigree wheat" and by all accounts successfully imitated by Mr. Logan be adopted, a vast saving of seed wheat will be effected, and the young crop will be produced under great advantages. When fairly above ground, *i.e.*, betwen 4 and 6 inches high, farmyard manure, if available, whether fresh or stale (Mechi says the fresher the better for use, and he is a great authority for ploughing in fresh manure) should be applied by hand as a top-dressing. This mode is prevalent in these Hills, and prevents deer, wild goats, and hares from eating up the young corn. Its value is obvious. The ammonia as evolved, is absorbed by the leaves or blades of the growing corn, to the great advantage and benefit of the plant, and the first fall of rain sends all soluble matters into the soil, where the rootlets enjoy the first and best portion of the banquet, and allow the roots to wait for what is left. The standing crop will be weeded as often as necessary; the weeds should be gathered, taken to the pit, and be converted into vegetable manure for future use.

If the land is under canal irrigation, and suitable water is supplied, the zemindar has every right to expect a full harvest of first-class wheat, weighing like that of England, 60 pounds to the bushel, and containing the smallest quantity possible of silica, and all other valuable mineral matters in the greatest abundance.

I think I can hear the reader say:—"Well, all this is simple and easily enough, and who prevents or is to prevent its being carried out?" The reply need not be given here, though with the facts before him, the reader will have no difficulty in obtaining satisfactory answer to his question.

H.

THE POULTRY YARD.

THE *Albany Country Gentleman* contains an article headed "How to make poultry profitable." The remarks are the result of much *interested* experience, and as such, are of not a little value. But much of the article applies only to a cold climate.

None of the many attempts at farming that have been made in India have, to our knowledge, proved successful. Many circumstances have contributed to this unfortunate result. But it would be a matter of great regret if the project were given up as a practical impossibility. It is our firm conviction that cattle and sheep farming would prove most successful in this country, and form a source of large profits to the individual or company that could only contrive to overcome the obstacles that have hitherto stood in the way of remunerative farming, and to establish the undertaking on a firm footing.

A large stock of poultry—geese, turkeys, ducks, fowls of sorts, pigeons—could not fail to be a most lucrative addition to such an enterprize. These birds multiply like mice out here, with little or no care, and even with the most trifling supply of the cheapest food. The heaps of eggs—small bad eggs, it is true—and the baskets-fuls of chickens and fowls exposed for sale in every market, are procured at a mere cipher of cost. Every family has a few fowls running in and out of their door, and feeding for the most part on the refuse of the town or village. We believe we are within the truth when we state that two or three handfuls of the cheapest corn, once a day, is all that any native gives to his stock of poultry. Still, stunted and ill-flavoured as the birds are, we are all only too glad to have them on our table; and far short as their fecundity must be compared with what would result from careful rearing and plentiful feeding, it is yet sufficient to make the keeping of poultry a most profitable business to the whole labouring classes of India, so that the following excellent remarks do not apply in their full force to this country:—

> Many persons suppose they have only to buy a few hens, no matter as to age and condition, turn them loose, allow them to pick their livings as they can, occasionally giving them food, seldom water, allowing them to roost on trees exposed to the cold and storm, or on the farm waggons and other implements and then, if they do not lay an abundance of eggs, cry cholera, humbug, nuisance, no profit, &c.

In order to make the greatest profit out of a stock of poultry it is necessary to keep everything about them scrupulously clean, and to allow them plenty of fresh air, especially by

night, and wide scope to roam at large for exercise and recreation. They should also have easy access at all times to *cold* and pure drinking water, which should be supplied moreover in unlimited quantity, and very clean, to the ducks and geese to swim in, and to the pigeons to bathe in. Turkeys and fowls like to lie and roll in sand or dust, a habit that tends greatly to keep them free from lice and other even more injurious parasites. For this purpose, a piece of ground in a sheltered and secluded spot, should be covered with a layer of sand, which should be often swept and cleared of stones, sticks, straws, &c. Poultry thrive best when they can indulge at pleasure in their taste for worms, snails, and insects, together with pickings from grass and weeds. With this in view, the common mistake of keeping fowls in a place "fine and clear" as a cricket ground, with only a shed for shelter, will be avoided. Green trees, green shrubs, and green grass, are indispensible to a flourishing poultry-yard. Of course the vegetation should not be allowed to grow rank, and all dead leaves and branches should be removed.

With regard to food. It is the worst policy to try economy by giving poultry any but the richest nourishment. Moreover, the food should be varied a good deal; *jowaree* from January to December is a great mistake. We quote once more, putting a passage or two in italics.

I go to my hen house early in the morning, before the fowls come down from the roost, and having previously *scattered over the feeding floor fine gravel, some burned bones and oyster shells*, I then throw on the floor the feed for the day—a mixture of 3 parts corn, 1 oats, 1 barley, and 1 wheat screenings, in the proportion of 1 quart to eight or nine fowls, depending somewhat on the size of them, also four pans with pure clean water—lock the door and leave them for the day. About twice a week I give chopped cabbages, turnips, onions, and the like; and twice a week meat scraps, soaked in water the night previous. In warm weather, I give in lieu of vegetables, grass, clover, weeds, &c., in the outer yards—*sometimes a little sweet corn in the ear. I seldom feed meal, boiled potatoes and slop feed, believing they are more conducive to fat than to eggs*; and during very cold weather, I think it injurious to the fowls to fill their crops with wet food. When I do feed this for a change, I add a little salt and pepper to warm them up

It is not generally known that curds (or *dhai*) is a most wholesome and nourishing article of diet for poultry, and materially increases the number of eggs laid. It should be mixed with bran. Native servants will be found, almost without exception, to offer every objection to this use of one of their most coveted perquisites, but no credit should be given to their "authenticated instances" of the injurious effects of feeding fowls on dhai. Onions, though disagreeably tasting the flesh, are excellent food for fowls. They will not eat more of it than is good for them. The eggs of white-ants are of great importance for chickens, and are indispensible to the successful rearing of young guinea-fowl.

The plan of locking poultry up in an enclosure, while it leads them a life the reverse of natural, and makes them wholly dependent on man for that change of food which their instinct teaches them to find for themselves, is a safeguard against the ravages of animals of prey. In our opinion, by far, the most destructve of these, nocturnal and diurnal, is the common pariah kite. It is scarcely feasible to let young chickens into the open air, without having one after another carried off by the sudden swoop of this active and watchful pest. In many parts of the country, especially in the vicinity of hills, hawks and eagles are very common; and these commit dreadful havoc among pigeons. Skin parasites, though terribly destructive when not guarded against, need be no cause of alarm. Regularly employing cow-dung on the floor of the fowl-house, and the whole inside of the pigeon boxes, effectually keeps down every species, except the gad-flies which infest pigeons, and which have to be caught and destroyed with the hand, whenever they can be found. The floors and walls should also be from time to time sprinkled with water in which unslaked lime has been dissolved, and with an infusion of tobacco juice. The former has an astonishing effect in giving a bright and clean appearance to a poultry-yard. White-washing should not be neglected.

In this country little regard need be paid to the weather. We never saw fowls much the worse for even a thorough drenching. But every poultry-yard ought to have a shed affording shelter from rain. It is important however to keep the sleeping places very dry. The birds should be encouraged to roost, not the ducks and geese of course.

Cleanness and wholesome food will effectually prevent most diseases, for fowls of all kinds are incredibly hardy, young ducks alone excepted. Curious to state, however, numbers of ducks and fowls drop down suddenly, and without any apparent cause, about the month of February. Attention to the subject would without doubt lead to the discovery of a remedy against this serious fatality.

The article in question contains many particulars relative to the breeding and rearing of poultry, and some statistics, from the writer's own experience, showing the profits that may be derived from a good stock of poultry.

When the attempt is made again in this country, as we hope and feel sure it will be, it would be well to postpone the expensive though excellent plan of securing a stock of English, Cochin, Surat, and other large and fine sorts of fowls. The common bazaar fowl can soon be brought to triple and quadruple its annual number of eggs: and from the increased size of the eggs which speedily results from good feeding, we do not doubt that two years would suffice to produce a generation of well-sized birds.

MR. LOGIN'S EXPERIMENTS.

Mr. Login's report on cotton cultivation in the Punjab, on the Egyptian system, should convince the most sceptical of the desirability of at once making every effort to induce the adoption of that system in preference to the native one in all parts of India where cotton cultivation is carried on. Mr. Login's statements are very clear. He has brought facts and figures together in such a way as utterly to dispel any misgivings that might be entertained as to the advantages of the system, and also to reduce to a minimum the weight of any arguments urged on the contrary side.

Mr. Login gives the details of the cultivation and produce of four experimental cotton fields, averaging in extent from ¼ to ¾ of an acre approximately, and lying at intervals along the road between Umballa and Delhi, a distance of 120 miles. The experiments seem to have been very fair, having been conducted under a full share of the misfortunes of floods, shade, stray cattle, and squirrels, while last, with parrots, appear to have destroyed a large number of the plants on one of the fields.

The prominent features in the new system of cultvation, as compared with the native system, are 1st, thin sowing, so that the plants can draw the necessary nourishment from the soil; and 2nd, careful cultivation, in the form of plentiful ploughing, manuring, watering, (when needed), and weeding. With reference to the manuring it must be noted that the 1st and largest field was not manured, *but irrigated*: and that the 4th field was neither manured nor irrigated. This one had been under grass for ten years. It might naturally be supposed that this steady attention to the fields would entail serious cost, but Mr. Login shows that the expense was trifling, and not worthy of account at all when compared with the enormous profit.

The following table shows the estimated produce of this year's crop on the four experimental fields:—

No. 1 ..	3-4th	acre	533 lbs. per acre, of clean cotton.
No. 2 ..	2-7th	,,	300 ,, ,,
No 3 ..	5-16th	,,	256 ,, ,,
No 4 ..	9 20th	,,	260 ,, ,,

In describing the cultivation of the first field, Mr. Login has gone into the minutest details, and estimates (not too sanguinely) that there will be a clear profit of 350 per cent. on the cost of labour and the seed.

These results cease to appear astonishing when we compare the two systems of cotton cultivation, and reflect that the natives find it *profitable* to give up, to a considerable extent, the cultivation of grain for that of cotton *on their own system*. All those who have seen Indian cotton fields know that natives make little or no difference between the sowing of cotton and the sowing of jowaree. A cotton field ripe for picking might easily be mistaken for a gram field—plants from 1 to 2 feet high, a few inches apart, and bearing from 12 to 20 pods each. But Mr. Login describes fine branching shrubs, *pruned down* to a height of five feet, growing from 2 to 3

feet apart, and with an average of 150 blossoms each; one plant, if plants they can be called, having no fewer than 370 blossoms, and another 275. It will now appear no more than what should be expected that the fibre of Mr. Login's cotton exceeded by one-third that obtained on the native plan. It remains to be added that Mr. Login gives his observations on some additional experiments, conspicuously a venture by a zemindar; and the results are much less satisfactory than might have been reasonably laid account with, considering the great disadvantages attending these small operations. We give two quotations from the report:—

"Surprising as these figures may appear, yet they are not more "so than seeing the field itself, and prove to my mind, if I ever had "any doubts, that India can and will compete with the world in "the produce of this great staple of industry."

"Should the ultimate result be that the Indian cultivators, by "the introduction of this Egyption system, can only produce half "this average, what a boon it will be both to India and England."

It seems to us that Mr Login is disposed to value unduly the apparent effects of his experiments upon the native mind. The stubbornness with which the natives run in the groove they and their fathers have been accustomed to, in the face of all reason and in spite of any pressure that can be brought to bear upon them, is almost incredible. Even granting that the gratification which Mr. Login remarked was not put on to please the "Sahib," we greatly doubt if, were their sincerity practically put to the test, the people would not, as they have done whenever they have been urged to adopt the English plough, obstinately take to their own way without approving or disapproving of the new system. And how little impression or recollection of what they have seen will they retain when a year has passed away and the cotton season comes on again.

The 13th, 14th, and 15th paragraphs are left out of this report as printed in the *Punjab Gazette*. These paragraphs contain suggestions upon the manner in which the system may be introduced. What these suggestions are, we do not know; but it occurs to us that we should be careful lest too much pecuniary inducement and encouragement be held out to the people as they will certainly take ill with having that assistance withdrawn. To get the natives to consent to even these experiments treated of in the report, Mr. Login had not only to guarantee them against loss, but also to hold out strong hopes of *extraordinary* gains.

Mr. Login says that the people are inclined to suspect, that under all these efforts at superior cultivation, lies a design to enhance the land rent. This is nothing unusual. Distrust and suspicion are ingrained in the native mind, and form a bar to any attempt to ameliorate their condition.

EDITORIAL NOTES.

An article appeared some months since in the *Albany Cultivator* stating it to be a fact established by "numerous carefully conducted experiments by reliable persons," that one quart of the milk of the Jersey cow produces as much cream or butter as four quarts of the poor ordinary kind.

Even manure does not escape adulteration. Guano is the name given to a substance found in considerable quantities on certain parts of the shores of Africa and South America, much frequented by sea fowl. It is composed principally of the excrements of these birds, and forms a valuable manure. Numerous analyses have lately shewn that in Peru this manure is being adulterated with clay, plaster of Paris, ochre, and inferior phosphatic guanos, to the extent of as much as from 30 to 60 per cent.

Under the heading "Heavy growth a protection against drought," F. J., in the *Albany Country Gentleman*, writes to prove that when fields are so thickly sown that the leaves and branches form an impenetrable shade, the evaporation of moisture from the ground will be hindered, and also the escape of fertilizing gases. The correspondent bases his theory mostly on the thriving and moist condition of a piece of thickly-sown clover, during several weeks of dry weather, which withered the grass and early-sown grains in an adjoining field. The idea sounds plausible, but manifestly can hold good only when the drought is not of long continuance. And the advantage of saving the moisture in the ground during an occasional and temporary drought would poorly compensate for the many enormous evils inseparable from thick sowing.

A writer in *Hearth and Home* recommends mixing Cayenne and other pepper with the food of fowls, and asserts that wild fowls season their diet with pungent and spicy leaves and buds. Audubon is mentioned as stating this to be a habit of the wild turkey. We require to go no further than to our gardens to see what a taste domestic poultry have for aromatic herbs. The same writer also recommends salt, which however is only one of several mineral substances which fowls greedily seek after whenever they are allowed to run loose.

Further on the article in question says "As all birds that live principally upon the ground swallow much earth with their food, it probably aids digestion; and some recommend that the chicken dough should be thrown upon the ground. If upon a fresh spot of earth, we have no objection." This is an original way of putting the well-known fact that all birds which feed on grains and seeds —sparrows as much as fowls—pick up and swallow fine gravel, because without that in their gizzards they cannot easily digest their food. The ostrich, as everybody knows, does not take unkindly to a pestle and mortar for this purpose.

A Master Mariner has written as follows in the *Farmer's Journal*:—

"I have conveyed my butter to the East Indies and back, perfectly sweet, and have crossed the lines four times with the same butter on board, and the last year it was as sweet and nice as the first after packing. First see that your buttermilk is well-worked out, Then pack in 12 lbs. oak kegs perfectly. Then pack your kegs in an oak barrel, and keep the kegs covered with brine made from Turk's Island salt. Keep them under the brine with a weight. In one year after, if good butter is put in, good and sweet butter will come out. To a ¼ lb. of lime, slaked with one gallon of water, add a handful of salt. Place the eggs in a jar with the small end downward, and when the mixture is cold, pour it over them. Eggs preserved in this way are not so good for cake-making, as the whites become thin and are difficult to froth; but they answer every other purpose, and may be kept indefinitely."

The Americans seem never to be happy, unless they are inventing. Farmers have hitherto had no recourse but the laborious and costly use of the measuring rod and tape, from the most uncertain estimates of the quantity of seed and manure, or the length of fence, required for their fields.

Mr. William Hull, of Hilltop, in the United States, has solved the difficulty. A huge pair of compasses, wielded by the right hand, besides serving many of the purposes of a walking-stick, will enable every farmer to measure the ground he traverses in the course of his morning walk. A scarcely less ingenious inventor improves upon this. He proposes driving a wheel of one rod circumference before you by means of two handles fastened to the two ends of the axis.

To ensure walking in a straight line, it is suggested to select two objects in the line of progress, and to keep the nearer one steadily between the further one and the eye. The other eye, we fancy, is to be employed counting the revolutions of the wheel.

From the following paragraph in the *Journal of the Society of Arts*, it would appear that a varnish exceeding in value any at present obtainable in the market still remains to be adopted by the civilized world:—

Among the raw-stuffs sent by Dr. Von Scherzer from Pekin, was one called schio-lias, a kind of varnish which is employed for varnishing all kinds of wooden things, and has the property of making these articles water-tight. Dr. Von Scherzer has

seen wooden chests in Pekin which have been over Siberia to St. Petersburg and back, and still remain sound and water-tight. Even baskets of straw used for the transport of oil are, by means of this varnish, made perfectly fit for the purpose. Pasteboard, by its use, becomes, both in appearance and firmness, like wood. Most exposed wood-work is coated with schio-lias, which gives it an ugly red appearance, but it gains in durability

This varnish was examined by the Australian Agricultural Department, and Dr. Von Scherzer's communication was fully corroborated. The "Wiener Gewerberrein" also made trials with it. By mixing together three parts of fresh, beaten, defibrinated blood, four parts of slaked lime, and some alum, a thin, sticky mass is obtained, which is immediately ready for use. Articles which are required to be particularly water-tight are varnished twice or at most three times by the Chinese. In Europe, this varnish is not yet made, although it is one of the surest and best ways of making wooden articles perfectly water-tight.

Mr. Mechi, whom we have quoted in several of our late numbers, has made some valuable observations upon the green food of cattle, and upon thick sowing. On the former subject he says:—

"The longer I farm the more I am convinced that the turning "out and roaming-at-large system will come to an end, especially "as land gets scarcer and dearer. It is cheaper and better to bring "the food to the animal than the animal to the food; because in "the latter case he is permitted to trample upon it, excrete upon "it, and lie upon it. One of the largest and most successful farm-"ers that I know has always folded his sheep, and cut the grass "for them—one man, a lad, and a horse chaff-cutter being on the "field, there feeding the sheep with green grass chaff, mixed with "cakes, &c."

Thick sowing, Mr. Mechi believes, to be a great cause of mildew, which kills and rots the plants. He says "The densely packed "mass of plants, weak below, tumbles down flat, or twisted in "various directions by winds and thunderstorms, and thatches the "earth; so that, while rain can pass through the thatch, the wet "earth is shaded from the action of the sun and air, and becomes in "the like condition to a dark and damp cellar, where, we all know, "mildew and fungi flourish." Mr. Mechi is fully alive to the importance of having among crops "a free circulation of air *and light*, and a free evaporation of moisture from the earth." This suggests a distinction that is too often overlooked in connecting malaria with vegetation.

The following interesting and suggestive account of a visit to a Hungarian Dairy appears in the *Chicago Post* under the signature of C. W. Marsh:—

We went out east to Perth to look over the farm of a gentleman who, it is said, has the finest lot of cows in Hungary. We found about sixty head of really splendid cattle of mixed Holland and Swiss breeds, very large and smooth-skinned, admirably kept in stables so clean and airy that we had fully anticipated and were prepared to relish the excellent cold milk which was presented to us for refreshment. These cows are not pastured, that is, they do not depend on pasturage, although they are allowed sufficient run for exercise and health. Their food consisted of cut straw, Hungarian grass, and "bran mash." The stables were furnished with straw cutting and steaming apparatus on quite an extensive scale, everything indicating a high degree of order and economy. The native Hungarian cattle are of a light dun colour, in shape and appearance much like our Texan cattle, with like immense horns. As we came down the Danube we passed very many large droves of them, drinking or bathing at the shores. They were very interesting in appearance, particularly as they are all of a colour, in this more resembling wild than domestic animals. Upon the farm referred to are raised chiefly rye and Indian corn, with Hungarian grass and vegetables for the stock.

The following paragraph is from an American paper. Doubtless there are not a few who could give valuable facts and statistics relative to the breeding of sheep and cattle in this country, where droughts are so frequent and so extensive. Measures calculated to counteract the evils of a sudden want of pasture are important enough to require deliberation. In a place with so many natural advantages as India, surely famines ought not to stand in the way of stock-beeding:—

The very frequent droughts which occur in California seem to exert an unfavourable influence on cattle-raising in the sections thus affected. There are now in the State 637,000 head of cattle, although there were 650,000 in 1863, and 500,000 in 1849. The loss of cows from the drought has been considerable. In 1856, 70,000 cows died in Los Angeleo country, and in 1863 and 1864 the loss in the State is estimated at from 200,000 to 300,000. In some branches on the southern coast, seventy-five per cent. of the stock perished. Sheep, however, fare better in drought, getting more food from poor land, and, as a general thing, being provided with more extensive pastures. Since 1845, attention has been turned to the breeding of fine-woolled sheep in California, and this year there are about four millions of these animals in the State. It is estimated that the wool crop of 1871 will be worth over five millions of dollars in gold. Farmers report that they can raise wool for 10 cents a lb., and as it now sells for from 25 to 30, it can be readily seen that the profits from sheep culture are likely to prove much greater than from stock-breeding, wherever the prolonged droughts are likely to occur.

NOTES FROM CONTEMPORARIES.

The *Travancore Gazette* contains the following report upon the quality of the tea grown at the Peermade Hills. The report is dated 15th Nov. 1871, and is addressed to Mr. Crawford, the Commercial Office, Alleppey:—

"We to-day received a report on the samples of tea sent to Russia, which is highly favourable. The tea is well liked, and an order was sent for 150 half boxes of same at 2s. per lb. Should you determine to send over next season's crop, you should ship in boxes of 50 to 60 lbs., and put it up in the same sort of packages in which Assam tea is usually packed.

"The tea is reported on from Russia as very nicely got up, and right in every respect as to colour, firing, &c.; therefore we would advise that no alteration be made in the manipulation.

"Green Indian teas are coming more into use, and fetching higher prices than formerly."

There is strong encouragement here to the Neilgherry planters. A report upon Indian tea, so favourable in all respects, we do not remember to have before seen.—*Indian Statesman.*

The effects of last years' deficient rainfall are making themselves severely felt, we are sorry to see, in Guzerat. The scarcity of fodder is pressing heavily on the people, the rain that fell a fortnight since having been insufficient to produce much effect. But the want of drinking water, as is frequent in such cases, is the most alarming symptom of the distress. The rivers, however flooded in the rainy season, are a precarious source of supply when the dry weather sets in, and the Nerbudda has already subsided to such an extent that its water is becoming disagreeably salt from the tides. It is mortifying to reflect that, filled before the river failed (and this was not till after all reasonable expectation of rain was gone) the capacious reservior at Broach would have afforded a plentiful supply of pure water. The consequences of the neglect of this provision forces upon us the necessity of not depending altogether upon the rainfall when it is possible to store a supply of water. The rainfall in Guzerat, last season, was not more than two-thirds the usual amount.—*Id.*

Many of our readers have doubtless observed with interest and surprise Mr. Login's Report of certain experiments conducted by him in the Punjab, with the view of testing the expediency of introducing into this country the Egyptian system of cotton cultivation. Mr. Login describes his operations and their results with great care, and at considerable length. Considering the pains-taking manner in which he has conducted his experiments, and the anxiety he seems to have felt lest he might draw too hasty inferences, we should think ourselves justified in accepting as decisive Mr. Login's simple statement that the introduction of the Egyptian system would be an improvement the value of

which it would be hard to exaggerate. But Mr. Login has *demonstrated* the reasonableness of his belief by a collection of facts which seem to us to prove conclusively that, profitable as the present methods of cotton cultivation may be, a system that gives us great bushes five feet in height, literally covered with pods, sometimes as many as 300, will be more remunerative still. Remarking that the land for these experiments was granted free of rent, Mr. Login calculates—he gives the figures—that there will be a net profit to the cultivator of 350 per cent., and then adds, "surprising as these figures may appear, they are not more so than seeing the field itself; and they prove to my mind, if I ever had any doubts, that India can and will compete with the world in the produce of this great staple of industry."

The people appear to have been enthusiastic in their admiration of these wonderful results, and profess themselves of full purpose to try the new system on an effective scale next year. The chief points in Mr. Login's plan are, 1st, thin sowing; one plant, it would seem, for ten or fifteen on the native system. 2nd, careful cultivation: *i. e.*, deep and repeated ploughing, followed by abundant manuring and watering, and frequent weeding. It is gratifying to learn that the zemindars noticed, and seemed to appreciate, this attention to the fields.—*Id.*

The *Agricultural Gazette of India* for November contained an inquiry from the Hon'ble Mr. Capron, the Commissioner of Agriculture at Washington, as to whether the sugar-cane ever matured its seeds in the East Indies. A late number of the *Sugar-cane* (Manchester) contains a most interesting article on the subject by a Dr. Vinson. The sugar-cane, he tells us, is purely the creation of man; it has no botanical existence. As the Arab or English thorough-bred from the ignoble wild horse, the pointer from the wolf-dog, and the canary from a green Chinese bird, so by the unremitting labour of successive generations, the thick-stemmed and juicy sugar-cane has been developed out of some grass, doubtless quite common and well known to botanists. "But animals do not, like vegetables, lose the faculty of reproduction. This is distinctive of animals; but they may become less prolific, or even sterile, when their form is improved by cross-breeding. It is in this manner, no doubt, that our finest roses, so rich in colour, so full of petals, of such great size, and of such various appearances, and so odoriferous, have descended from the simple briar.*** Has not wheat been a creation of the same kind, only that the art has been applied in an opposite direction? In the cane the seed disappeared to the advantage of the stalk, but in wheat the stalk has vanished for the development of the seed."

The Editor adds a note to the effect that sugar-cane seeds have been sent to England from Barbadoes, and sown in hot-houses, some at Kew, but with what success is not known.—*Id.*

Some idea of the enormous number of horned cattle in the Ganges Valley, may be formed by a perusal of the export returns of hides from Calcutta for the present year.

During the first eleven months of 1871 nearly *six millions* of hides were sent to Great Britain, Foreign Europe, and America; being a greater number than were ever before exported in an equal period. When it is remembered that this quantity represents only the surplus stock that is left over from the Bengal Presidency after the wants of the entire native community have been supplied, we may safely assume that the total number of cattle equals, if it does not exceed, that of human beings in this part of India.

There are probably *one hundred millions* of horned beasts to be found between the Sutlej and Calcutta, a number which probably does not exist anywhere else on the globe, except perhaps in the Pampas of South America.

We observe that although the prairies of North America are said to abound with herds of wild buffalo, she nevertheless imports buffalo hides from India to a greater extent than any other country in the world; in short it may be said that in regard to buffalo hides, and sheep and goat skins, America is not only India's best customer, but her only one; the exports to other countries being less than 2 per cent. of the total quantity sent out.

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A more striking proof of the fertility of the Ganges Valley could not be given than the fact that, with a population per square mile greater than that of most European countries, it nevertheless supports a larger number of cattle than is perhaps to be found in the whole of Europe, and exports besides a million tons of raw produce annually for the use of the rest of the world.

Can it be doubted that when India's agricultural resources are fully developed they will prove as astounding as the mineral resources of England are at the present moment.—*Delhi Gazette.*

AGRICULTURAL STOCK.

SHEEP-BREEDING EXPERIMENTS.

NORTH-WESTERN PROVINCES.

From Major W. C. Macdougal, Deputy Superintendent of Studs, North-Western Provinces: to W. Oldham, Esq., L.L.D., Magistrate and Collector of Ghazeepore, dated Haupper, the 25th August 1871.

In reply to your docket No. 308, dated 14th ultimo, I have to remark with regard to the Hissar-bred rams. *Hissar rams* appeared to be a cross between the imported Leicester and Hissar district ewe. The objections to the rams, in my opinion, were that they seemed too large and coarse narrow in the chest, flat sided, too long in the legs, did not possess fattening qualities, shewing more of the Hissar than the Leicester. I have a great objection to the Hissar country sheep, they seldom live out of their own districts, they will not thrive at Haupper, and they die at Saharunpore, in fact they will not stand crossing the Jumna. I consider the rams ill-adapted for the ewes of Ghazeepore; the sheep of the district are as a class well bred, small, compact, and may be considered a useful breed. The rain, to suit the Ghazeepore breed of sheep, should be stout, compact, stout-legged, well bred and small; large animals are a great mistake, owing to the difficulty in finding food for them. The wool of the Hissar rams was very fair in the one cross, the hair of the native breed had disappeared, and wool was produced; how long this improvement would last, if not properly fed, I do not know. I believe that, with the village system of keeping sheep, the wool would disappear, and hair be reproduced. The Hissar rams did not fill the ewes in the same proportion that native rams might have been expected, still the return from the Hissar rams was not disappointing.

Stock by Hissar Rams.

The lambs by the Hissar rams were very much larger than the produce usually obtained from the district ewes. My ewes were good, but of the common Ghazeepore breed. The lambs appeared coarse, with large joints and promised to grow into big sheep—this latter change, as regards size, is not, in my opinion, an advantage; the lambs inherited the defects of the Hissar rams and showed a good deal of the native Hissar breed, the lambs were nearly all white: there was a remarkable improvement in the wool, which appeared to be very different to the native stock of the same age, in thickness and texture. The lambs and ewes with me were well fed, getting mote, bhoos, and chopped oat in straw, with what grass and leaves they could pick up in a large compound; besides this the lambs had a small quantity of parched barley. They were first-rate on the table, and their quality of size was of course for killing of great advantage; but for rearing on bad fare, size would always be against them. I offered a number of the lambs away to the shepherds for the neighbourhood, but they were invariably refused on account of the lambs being "balnitee janwars," and would require as much food as a pony: the village fare would, they stated, soon ruin such animals. On leaving the district in February last, I offered my flock to several officers for what they cost, but finding no European willing to take them, I disposed of them to natives, as I thought this the best plan to ensure the breed getting into the district. I directed two lambs from my ewes to be sent to you with the Hissar rams, but in the hurry of leaving Koruntadeeh, I am not quite certain whether the lambs were ever dispatched. To enable the stock from the Hissar-bred rams to come to any sort of perfection, they require to be well fed; and likewise the ewes, if not supplied with sufficient nourishment, the stock would be weedy, narrow, and even worse than the native sheep, because less likely to undergo hardships. I had not the opportunity of judging what the lambs would be at an advanced age, but as a trial I consider the Hissar-bred rams a success; (much more might be expected from rams better suited to the district ewes); however increased size and improvement in wool was established, with good feeding of parent stock and the lambs: these qualities were apparent, but with poor food the result would have been different.

Remarks upon Sheep.

It is useless to try great extremes in breeding. To introduce changes into any breed, the alteration must be gradual, consequently slow, climate must be considered. I conceive it to be a great mistake to put a ram with blood of the native Hissar sheep in him to the Ghazeepore ewes or to any ewes of a small breed. Hissar sheep are as unlike the sheep of Ghazeepore as can well be conceived. If the English well-bred and small ram could be put to the Ghazeepore ewes, a good breed would be obtained, likely to suit the district. With the Hissar-bred rams, I sent you a young ram given me by Mr. MacNamarra of Arrah, being a cross from an English ram out of a common Arrah-bred ewe; this lamb was handsome, showed blood, was compact and small, and would, I thought, have proved useful and adapted for the Ghazeepore breed of sheep. Unfortunately when I got this lamb, he had been starved and was only just recovering when I sent him to you with the Hissar rams, which I returned in February last. I have a high opinion of the Indian breeds of sheep; I consider them wonderful animals. Neglected, starved, exposed to all seasons, it is a matter of astonishment to me how they can exist. Still if these sheep, emaciated and wretched in condition, are allowed to pick up what they can get about a compound, with a small quantity of bhoosah and small amount of salt for about two months, and then put upon gram and chaff for six months, they prove how easily they fatten, all the mutton is good, nourishing and fat, though small. With the advantages of nourishing and suitable shelter, I am very sanguine that great improvement in the Indian breeds of sheep could be established but nothing can be of much good so long as the sheep suffer from the existing difficulties.

The native breed is better capable of undergoing the starvation and exposure than any description of sheep which could be introduced. Sheep with an English cross would be worse than the pure native breeds, if left to undergo the hardships of Indian village treatment.

I believe with proper food, care and shelter, sheep might be improved in India to rival the best breeds, but whether the expense would remunerate the breeder is another question. In proof of my opinion that Indian sheep are a valuable breed, I would mention that when returning to India in 1863, I became acquainted with a number of Australian gentlemen, who lent me books on the colonies. I remarked that in several of these works it was mentioned that ewes had been imported into Australia from India, and upon enquiry I found that my friends from the colonies were well aware that Indian sheep had been bred from and had done well in Australia.

It is strange how peculiar sites in a locality suit sheep; sheep will do well upon one spot, when a few yards distance would cause certain loss to the breeder, both places looking exactly the same. I once forced my shepherd to keep my flock upon a site which I considered very suitable for sheep, being high with good shelter; the old shepherd warned me that the place would not be healthy, but I insisted that the flock should remain in the place I had selected: very shortly afterwards the sheep began to sicken, and after losing about a dozen or more, I was glad to remove the flock to a place recognized as a favourable site and recommended by the old shepherd, although I would not build a house and kept the sheep in the open, still the sheep soon recovered and did well. The despised native cultivator with all his ascribed ignorance, makes good use of the village flocks; ploughing well the land intended for sugar-cane and other valuable crops, he induces the shepherd to allow the sheep to remain during the night upon his field; long before the sun is up, he ploughs the droppings, hair, and grease into his land and gains a rich manure.

Difficulties of improvement.

It is useless to breed sheep with care and expense to turn valuable animals adrift on the same terms as our village flocks. It would be difficult to introduce any breed to exist upon bad fare and contend against all the drawbacks of climate, hard usage, and starvation better than the common breeds seen in every district. When it is considered how the sheep fare, the distance they have to travel daily to collect what will just support life, that the flocks are allowed to eat the filth about the villages, and that the shelter is in keeping with their food, that the shepherd is the poorest of the village community, and that to rear up his own children he has to milk the ewes as regularly as the cows of the village, the only wonder to me is how the breed of Indian sheep is ever at all maintained. *In conclusion* if it is the wish of the Commissioner to introduce rams into the district by breeding them within the Benares districts, or to go into the matter of improving the breed of sheep any further, I will be glad to supply information, if such be required, as I think a fair trial could be made without much expense or trouble.

THE INDIAN POULTRY YARD.

Geese sit admirably on their eggs, and are very careful of their young. Like the turkey chicks, and for the same reason, the little goslings should be kept separate from the mother, under a partly-shaded fowl-cage, on a nice spot covered with fine "Hurcealee" grass, and clean good water, in which a little very fine sifted rice tour has been mixed, given to them in a shallow saucer, several times a day. As the goslings will almost immediately commence to crop the fine grass, which is their natural food, they require nothing else beside this thin mixture of good water and fine tour; and it is surprising to see how well they thrive on this simple but natural treatment. They should, however, be let loose with the mother for an hour, morning and evening, for the purpose of grazing, accompanied by a boy with a long switch, to keep away the kites and ravens. After a time, when they begin to grow perceptibly, the tour and water should be gradually thickened, and eventually a little boiled "cumboo" mixed with it by degrees. They should be fed on this till they are six months old, when they will be found to be strong and healthy, and quite able to take care of themselves. During the nights they should always be shut up with the mother, under a large basket with fresh dry earth sprinkled underneath it. Coarse paddy thrown into a earthen basin of water, is the best food for geese but they will eat "cumboo" "cholum," and "ragee" given in the same way; and in order to thrive well they should have water to swim and frolic in, and a plot of nice grass to feed on daily.

Domestic ducks are very bad mothers, and appear to care nothing for their eggs, which they lay at night anywhere in the fowlhouse. It is necessary therefore that their eggs should be set under a hen which, as they are very little larger than her own eggs, manages to hatch them very well, and takes great care of her adopted children. Ducklings are hardy, and grow up very rapidly if properly treated. For the first week they should be allowed to remain with their foster-mother under a fowl cage partly shaded, and placed on clean, sandy, dry ground, and fed with a mixture of fine tour and water. When they begin to run about pretty well, they should be put into an inclosure, in which there is a small cistern with sloping sides, to enable the ducklings to get into the water and out again readily. The hens should then be kept under separate cages round this cistern, and the cages should be made with openings, sufficiently large, to admit of the ducklings running in and out, without enabling the hens to do so too. This inclosure should be covered over with open bamboo work to keep off the kites and ravens. In this place they should be kept all day, partially shaded from the sun and rain, and fed once a day with earth worms, besides getting their fine tour and water. The fine weeds, which grow in tanks and canals, afford them also great nourishment, and should be dropped into the cistern daily with the fresh water that is put into it. At night, cover up the ducklings, with the hen, under a large basket, with dry earth sprinkled under it, and renew this every night. After they are three months old, begin to mix a little boiled "cumboo" with their tour and water. Continue this treatment till they are six months old, from which time they can be fed in the same way as the full-grown ducks are. This should be a mixture of fine tour, and boiled "cumboo," or rice with water, for the morning meal; and either coarse paddy, "cumboo," or "ragee" thrown into a pan of water, for the evening one. They should always have lots of water to dabble in, and they thrive remarkably well in weedy tanks.

In breeding fowls, for useful purposes, one should not choose among the "assul," or through game birds, because such a hen not only lays a small number of eggs, but she is a careless, clumsy, and a fiery mother, frequently killing her own young, if another hen should approach her and her brood. She is very inapt also during the process of incubation, and very frequently breaks her own eggs in consequence. The little chickens also of this breed begin to fight among themselves, even before they are fledged, and not unfrequently kill each other. On this account we should recommend the breeder to select fowls of caste between the "assul" cock and large pariah hens. Fowls of this breed are called by the natives "doaq-la," and they grow to a much larger size than the real game fowl does: some young cocks, when only a year old, have been known to attain to a weight of twelve pounds, while their mother weighed only eight. On account of the great weight of such hens, their eggs had better be placed under large, feathery, pariah hens, as these are more careful mothers, and rear their young very tenderly and well; the abundance of feathers nature has provided them with, enabling them to do this readily. The eggs which are collected daily, should be placed on fine, clean sand, in a shallow box *without a lid*, and turned over every day till the hens have finished laying. They should then—that is, the eggs of the same fowl—be put under a hen to hatch. Small wooden tubs, of about fifteen inches in diameter and six inches deep, make the best nests, and last as long as one could wish. A quantity of dry ashes should be put into the tubs at first—this helps to keep

away vermin—and then they should be nearly filled with clean paddy straw, well crumpled to make it soft. These nests should be placed as far apart from each other as possible, in order to prevent the incubating hens from disturbing one another; and they should be fixed about three or four feet above the floor of the fowl house, which should be sprinkled daily with clean dry sand, or earth, and well swept in the mornings. The chickens should, on no account, be taken down as soon as they are hatched, but allowed to remain in the nest for a day or two, until the hen shows signs of wishing to get down. They should then be removed gently in a basket, and put with the mother, under a partly shaded fowl-cage, on a clean dry spot in the sun. For the first week they should not be put out before sunrise. At first they should be fed on "rolong," that is broken rice, sprinkled under the cage, and a little good clean water given to them in a small, shallow, earthon saucer. If a hard-boiled egg, in addition, were given to each brood every day, the chickens would thrive very much on it. It should be given chopped fine with a single clove of garlic. They should also be well fed on white-ants after they are a week old. A sufficient quantity of paddy should be thrown under the cage, twice a day for the hen; and the chickens should be fed three times a day, at the least, with the "rolong," while the white-ants should be given in the morning, and the chopped egg and garlic in the evening. If this treatment were continued for three months, the chickens would be found to be healthy, strong, and large. It would be of much advantage to let them loose with the mother after they are a fortnight old, into an inclosure covered over with bamboo work, or with a coarse net, to keep the kites and ravens off. At night they should be covered with the hen, under a basket, on a clean dry spot, on which a little dry earth has been sprinkled. As soon as they become too large for the kite to carry away, let them loose, and allow them to roam about the grounds. They can now be fed with fine tour, in which a little boiled "cumboo" or rice is mixed, as well as with paddy. Fowls should be fed with an admixture of the following grains, paddy, "cholum," "cumboo," and "ragee;" and their houses should be very clean, airy, and dry. Those who follow this plan will soon find their fowls to weigh eight and twelve pounds.

The breeding of pigeons, for domestic purposes, is not a difficult affair; and as they multiply very rapidly, and can fly to a distance to feed, it becomes a profitable one. The principal points to be attended to are, to have a properly constructed dove-cote; to feed them with an admixture of various kinds of grain; and to keep always some rock salt in the dove-cote. If this is done, pigeons will never leave their houses, and fly away to other places. The dove-cote, whether of masonry or of wood—the former is preferable—should be so constructed as to have the nests arranged in pairs, in such a manner, as to have each pair separated from another, because pigeons breed so fast, that they require a second nest, close by, to lay again before their young are fit to fly. If they have not this second nest, they lay their eggs in that in which their young are, where the mother is prevented from sitting on them by their presence. If they have a second nest at hand they lay in it, and both the male and female birds take it in turns to incubate, and also to feed their unfledged young till they are able to fly away. At this time the old nest should be well cleaned out. The best nests for pigeons are chatty pots, built into the wall, on their sides, with their mouths even with the face of the wall, and a ridge should run along just below these openings, to admit of the pigeons alighting on it before they enter the nests. Dove-cotes should have but one entrance for the birds, and that at the top, to prevent ravens, &c., from getting into them, and molesting the pigeons. A door should be furnished below, to allow a man to enter and clean them out daily. Pigeons delight to feed on various kinds of grain, and they thrive better, and breed faster if this is attended to. They are fond of the following grains: paddy, green gram, horsegram, "cholum," "cumboo," and "ragee," which should be given them mixed, and sprinkled on a hard spot of ground near their house. Good fresh water should always be easily accessible to them, because they drink every time they take a crop full of food for their little ones.—*Madras Times.*

The following remarks are by "G." in the *Farmer*. How common it is to see a fine horse seriously injured by native farriers who pare and rasp away at the foot till the poor animal has hardly anything to stand upon! And how often is the injured horse altogether destroyed by the reckless adoption of native remedies, suggested in many cases, by the sapient ghorawalla:—

There is much to be advanced in reference to the hereditary nature of sidebones. As an item in the lengthy list of points to be avoided in the selection of animals for breeding, they form one of the most important, and by such observance in a great measure their occurrence would be much less frequent. We now purpose to consider the common and exciting causes of sidebones, avoiding the arguments and speculation in reference to hereditary question for a more convenient opportunity. In our last, we briefly cited the facts and conditions which confer upon the limbs of the horse the wonderful powers of adapting themselves under trying circumstances and rapid movements. They are perfect in health, but by man's interference and carelessness, as well as brutality sometimes, those powers are subverted or perverted. We remarked, in addition, that the hoof estimated and preserved as nature had originally designed it—a protection and support—the communication of jar, or concussion, is impossible; but cut and rasp it away and it then ceases to support and protect. The sensitive parts are brought nearer to the ground, and pressure from stones, the shoe, nails, &c., operate very forcibly. The circulation is altogether interfered with, and a proneness to inflammation ensured. Parts hitherto united, and preserving relationship in the performance of functions, are now disturbed by the institution of motion between them, and pain results. Thus, when the heels are lowered too much, and the frog pared or neatly dressed up, the wings of the coffin-bone, which are prolonged backwards by means of cartilage, to mitigate or absorb concussion, receive an unnatural amount of pressure, and are caused to undergo needless motion. They then become, first, simply irritated, and tenderness merely is present, but this increases as the case is prolonged in its application, and becomes pain and inflammation. The sound, strong, healthy foot, would either prevent these states, or, in the case of hereditary predisposition, delay their appearance for a much longer time; but being reduced to a condition inadequate for its purposes—even the weight of the animal standing induces disease—it recedes and assumes an alteration of form, to the detriment of the parts within. As cartilage, like all other parts of the body, cannot have inflammatory action going on within its substance, without undergoing change of structure, that which prolongs the coffin-bone into the angles of the heels being no exception when so affected, eventually becomes bone. It will be now readily understood, that such a change being secured, the former elasticity will be gone; the rough surface of bones which now come together, do not favour ease of motion. Stiffness is the consequence, and not uncommonly the point is permanently destroyed. The prevention of sidebones is mainly secured by adopting proper rules of shoeing and preserving the feet. We defer their enumeration just now, and briefly detail the usual plan of remedial treatment.

Firing is a cruel measure, and we have discarded it long ago as higly improper; also blisters frequently aggravate the inflammation, and cause an extension of the ossification. Rest is the most appropriate thing to be observed first, and next promote the growth of the hoof, by means of foot ointments regularly applied. A little cooling medicine is very useful, and the diet should be laxative; while a large box, well littered with sawdust or chaff, with straw above, is allowed where the animal may remain in quietude. The use of an anodyne liniment may be directed round the coronets, two or three times a week, and, alternating with them, fomentations by means of flannel bandages, wrung out of hot water and bound around, will be found serviceable. These should remain on until dry, after the process has been conducted, say half-an-hour. When the shoes are applied, which may be done in about a month, care must be observed to take the pressure from the heels by means of a bar shoe, and place it upon the frog. The animal should be put to very slow work at first, and, by degrees, as the foot acquires greater strength and protection, the diseased parts having lost their previous pain and tenderness, the heels may again receive the weight, and the horse be enabled to perform heavy, but slow work, with ease for years. With this treatment, a horse in our possesion has been restored, and now draws a carriage over the stones without signs of pain or lameness.

THE COCOANUT TREE AND ITS CULTIVATION.

(*Concluded from our last.*)

If the *soil* at the foot become *too rich*, the larva of a beetle a large grub with a reddish brown head, soon finds its way to the roots and into the stem, hence though the foot of the tree may enlarge, the stem does not develop itself, the new leaf spike at the crown becomes yellow, fades, and is not replaced, nor does it open out into the usual frond, and in two or three months, sometimes a little longer, the whole tree top is affected and drops down piecemeal to the ground. It would appear that fear of this evil is the reason that ashes *alone* are recommended by so many cultivators.

As soon as the *new fronds have divided* into the long side leaflets or lost their connected form, which is at the end of the first year, the soil should be dug up and ashes applied about once a month. When the tree is *two years* old, and henceforward at the commencement of every monsoon in May and June, the whole of the soil, a yard or two round the stem, should be

opened out and ashes with dry manure applied and left open to the air; and in October when the rains have ceased this freshened earth should be replaced and levelled. As the tree gets older and the depression at the foot is gradually filled up, it may not in after years be necessary to dig so deep as for the earlier growths. If the opening out of the roots and manuring be thus *annually* attended to, the tendency to form a sort of bulb on the surface, and throw roots above the soil will be checked, the old worn-out rootlets are cut away, strong roots from other trees and all weeds are removed, and the process acts both as "a wintering and pruning" as recommended by scientific gardeners in Europe to productions of their own gardens.

Cattle are most destructive the first two years in eating off the ends of the fronds and stripping the leaflets, if the plants suffer often in this way, the growth is entirely stopped, sometimes the new spike leaf is pulled out when the tree dies. Should the heart of the stem and top not be injured, still the tree will remain an unsightly object, and often entirely profitless and barren.

From the time that the leaflets become fully developed and distinct from each other, till the time that the spatha (or covers to the flower) make their appearance, the fronds should be shaken and weighed or pressed downwards each month, so as to keep them from each other and make them spread, and careful examination should be made lest rats, beetles, or worms have made nests upon the head or bored into the cabboge heart of the cocoa, and this often. Some planters sprinkle ash and salt about the spike shoots to keep insects away. The dried fronds, old spatha, fruit and blossom stalks, and ragged fibres should be removed at stated periods of perhaps a month, or so often as the nuts may hereafter be gathered. The application of salt and ashes to the tree tops is usual at *least* in March and October to keep off the swarms of insects, particularly red-ants which live upon the juices of the tree and render them fruitless.

The cocoanut tree is at all periods of its life endangered by the attacks of enemies, while one beetle bores into the tender shooting leaf, and lays its eggs there, to be hatched into grubs which will eat their way in all directions. Another will bore round holes into the stem itself and live there, rats climb up and have their nests in the hollows of the branching fronds, and eat the cabboge itself or feast upon the young kernels. The common *flying fox* or Rousette (Pteropus) gnaws round holes through husk and shell of the mature cocoanut, and will attack the young cocoanut, biting away large pieces from the tender part under the capsule, and burying its head in the nut, will revel in the sweets within. The *flying squirrel* (Pteromys) will also make his abode in some cocoanut topes near woods or forest trees, and at nightfall attack the nuts, and two or three dozen may be picked up every morning with the marks of his teeth upon them, or partly destroyed. The common striped palm squirrel is also sometimes found destroying the nuts and blossom—while red-ants and parrots attack the blossoms only. The only method of obviating these evils is to shoot the flying foxes and squirrels by moonlight, to use arsenic with grated cocoanut pulp, or pounded glass, oil, and black sugar mixed in cocoanut shells, left in the tree tops. In one plantation of about 15,000 trees, six to seven hundered rats were taken month after month in trap falls. The red-ant's nests should be sought out and destroyed. A large wasp will attack the very small nut, taking it for the material of their nests. Beside using ashes sprinkled often with salt between the fronds, *some natives* place onions, garlic, or even assafœtida and fenugreek there, thinking the scent would keep off beetles and grubs. When the spatha is cut for drawing toddy, the frequent visits of the men will tend to keep other intruders away, but the smell of the toddy is said to invite rats and toddy cats. If any of the extracted juice falls from the receiving vessel on to the young spike or leaf, it is said to cause it to decay by attracting insects to bore into the fronds. Grass should be kept down by feeding off with goats and cattle. In marshy lands cattle are apt to make deep tracks and break down the margins of the terraces, hence goats or calves only are allowed, and the undergrowth is told to be annually cut for the repairs of paddy fields, and this is another source of profit.

Planting jack, mango, tamarind, punna, coffee, and other trees, as is often done close to the cocoanut tree, is thought to be detrimental, as also allowing the pepper and betel vine to climb the tree, or even the sowing of gram, maize, or any of the dry pulses under the shade.

But areca-nut trees may be planted as all other palms, and the ground may be dug, and all kinds of yams and tuberous roots cultivated with advantage.

If the instructions given are followed, distinct leaflets will begin to show themselves at the end of the first year, and be completed at the end of the second; on each frond which will be 3 inches thick in the stem or leaf stalk next the *parent* trunk. In the 3rd year the bottom of the frond will assume somewhat the form of a horse shoe where it clasps the main tree, and in the fourth year the trunk of the tree will appear slightly above ground, and is then called "a cocoanut tree with the elephant's foot" and will have not less than 12 fronds. About the fifth year the trunk is fully manifested, and there should be about 20 to 24 fronds, and when a luxuriant well-grown tree begins to bear fruit, there will be no less than 30 of these branches or fronds. If a tree receives much attention and is close to a hut or stall for cattle, these processes may be hastened, but on a rocky hill-side they will be much delayed, two or more years being required in addition to each stage.

Spatha (chotta) or shoots from which eventually the flowers are to appear, will begin to make their appearance in the sixth year, but some kinds of cocoa as the Nicobar, even before this, but on some soils seven to fifteen years may pass without the slightest appearance of the spatha. The height of the stems at this important period, in some *kinds* of tree usually, and *in all* when influenced by the soil, will be only a foot or two above the ground; while, in other places, the stem may be sixteen feet high. For the first few months these flower shoots are deceptive and only dry up, but within the year begin to retain their blossoms and bear a few fruit, yielding abundantly in three or four years after their first appearance.

In six months from blossoming, the nuts will have the kernel begin to solidify, and in a year the fruit is fully ripe, even sooner, if the season is very hot and dry.

The produce of the tree in full health and properly tended is yet very much dependant on soil and climate. The average may be put down at 120 nuts in the twelve months, while in a low and sandy soil it will amount to 200; and when planted in gravel and laterate foundations not 60—but the most productive months are from January to June, that is, for ripe nuts, the heat bringing them quickly to maturity.

It is calculated that where the roots of the trees can reach water and the soil is alluvial, the trees will bear from 8 to 10 ounches or crops of fruit, in other and higher lands not more than six.

One hundred cocoanuts perfectly grown and carefully dried will, it is generally calculated, yield when pressed 10 to 13 edangalies, (each containing 92 cubic inches) of oil, (40 nuts to an imperial gallon). Inferior cocoanuts will vary from 3 to 9 edangalies; fruit taken from trees on salt marshes have the least oil.

When the trees begin to show the fruit, shoot, or spatha, it is often thought advisable to extract the juices for toddy and not allow the blossoms to be grown, but this only in the monsoon and for that season only. This is supposed to render the future fruit bunches more numerous and give the sap a tendency to flow. In some places trees are never allowed to bear fruit, but toddy is always extracted. Drawing toddy for a few months is thought to check the habit in some trees of dropping immature fruit, and again of preventing injurious animals and insects from infesting plantations, the frequent visits of the men to the trees being a check to their forming nests and otherwise remaining hid in the tree tops.

Overdrawing of toddy will cause the luxuriant trees to dwindle away and acquire very sickly habits and may make them barren, hence if a tree is allowed to be drawn for toddy for six months, this should not be repeated till another five years at least have elapsed, otherwise they become exhausted and shortlived. Ants, bees, and other creatures are attracted by the sweet toddy, not only should the vessel be protected from them, but the liquid as before noticed should not be spilled over the young leaves.

While certain of the fruit shoots are cut for toddy the others will still produce cocoanuts, as well as those previously developed, but if three or four be used for this purpose, the others will dry away or be of very little use. Even when a spatha is partly used for toddy and left, provided the part containing the buds remain undestroyed, a few fruit may be produced on that stalk.

Five parras of 10 edangalies each of good arrack may be made from a single tree devoted to this purpose during a single year, but some very good trees will give 8 to 10 parras even—this is rare.

Gathering some of the tender cocoanuts from the earlier bunches will develop the *succeeding* bunches greatly, and strengthen the whole tree very naturally. It is not however recommended by some to cut the fruit stems or stalks out, before they are matured and dry, as it causes the tree to bleed and lose its most valuable juices, hence in order to prevent the possibility of injury to the tree, owners will permit none but mature fruit to be taken.

The number of fronds which dry and fall off from a tree is eight or ten in the course of the year, principally in the hot season. It is usual to cut these off but if done too early, those next the one cut is affected and fades; hence only those turning brown should be cut, and that leaving a cole and a half on the tree of the foot stalk. It should be remembered that the drooping leaves are intended to protect the tree stem from the burning sun.

Thirty species of the cocoanut are described and named as in the subjoined list, but cultivation and incidental natural causes

have much to do with the diversity, and in a few cases these are but imaginary :—

	Names.	*Description.*
1.	The green cocoanut.	The fruit and fronds are of a bright green.
2.	Black or dark.	These are of a dark green.
3.	The Native.	The fruit has a yellow tinge.
4.	(a) Goulipatra.	This name is given to what is supposed the best kinds, are yellow and the other a light brown or
5.	(b) Ditto.	light colour, and of beautiful form.
6.	The reddish cocoanut.	The nut has a strong red tinge.
7.	The red do.	Is brighter than the last.
8.	The crimson.	Even the pulp and fresh fibres of the husk round the nut are pink, and the fronds are reddish.
9.	The Sunbright.	The nut, &c., has a beautiful fading blush, and fruit are small in size, but numerous.
10.	The white.	The nut and fronds have a grey bloom.
11.	The milky.	Which in No. 11 is creamy and thick.
12.	Oblong oval.	The fruit is long, and the ridges well developed.
13.	The Tanjore.	The nut is long and pointed, with a large base.
14.	The Oora.	The nut is pointed at each end and oblong.
15.	Globular.	The branches contain many large round fruit.
16.	Small round.	Fruit more numerous, but also very round.
17.	Minute cocoanut.	It is diminutive fruit making up by number.
18.	The weighty do.	Fruit are few, but large and heavy with thick kernel.
19.	The heavy do.	The eyes of the fruit are small, but the copra or dried kernel is very full of oil.
20.	Male cocoanut.	There is a peculiarity in the fronds and the leaflets do not separate from each other.
21.	Foreign coccoa.	Evidently from the Maldives, both the nut and
22.	The Island.	fruit stems reddish.
23.	The Portuguese.	The same as above.
24.	Shanar or Ceylon.	Nut large and red, fronds slightly bluish.
25.	The Dutch.	Fruit, &c, a red pale colour.
26.	The Goa.	Two fruits only on each bunch, and these dark green.
27.	Jaffna cocoa.	Here again the fruit are large, but few in numbers.
28.	Palamcotta.	The fronds of this tree are pale yellow.
29.	The ship cocoanut.	Stem or trunk of the tree, boughs, or leaves are small and all tinted with black spots as if blighted.
30.	The Maldive.	The covering of the fruit is of a whitish or washed-out blue.

The red and the black kinds are generally supposed to be the most fruitful, although with care and cultivation of the above described, none need be disappointed in the returns, and this will be in proportion to the labour bestowed.

The trees which live in the most fertile soils will live for a century, other less favoured from 60 to 80 years only ; the former will yield their fruit commencing at the 10th year, and with rare intervals continue until their 60th year, and then gradually decrease in fruitfulness till they decay.

RICE CULTIVATION.

MAJOR MAYNE ON RICE CULTIVATION BY IRRIGATION.

(*From the Pioneer.*)

DEAR SIR,—I have only lately seen the account of the experiments at the Shameerpett tank, conducted by Major Mayne, R. E., and concerning the conclusions of which I have previously addressed you. I find that the experiments at this tank, though conducted with great care, are not decisive. With reference to the experiments on evaporation, there is nothing to cavil at ; but the following points, which have been neglected in the consideration of the amount of water required for the irrigation of rice, appear to me to seriously affect the value of the conclusions drawn.

Firstly.—In para. 10 of his report, Major Mayne, while allowing that any heavy rainfall would have considerably affected the experiments, proceeds to say that a rainfall of 187 inches during the period of cultivation "may be left out (of the calculations) without affecting the results in any material degree." Surely, if it were not to be considered in any other way, at least 187 inches of water, falling on the experimental rice crops, should be added to the actual depth of water expended on the crop ; and if we consider besides that the total annual rainfall is 26 inches, and that on the gathering ground of the tank this gives a possible collection of 134 millions of cubic yards (para 4), it seems rash to neglect 187 inches, or one-fourteenth of the annual rainfall. It is true that this 187 inches may not have fallen over the whole gathering ground ; but the distribution of the fall should have been ascertained, and the amount of water supplied by it incorporated with the calculations.

Secondly.—"A very petty stream," we are told in para 10, was at the commencement of the experiments found running into the tank ; but Major Mayne has "neglected also to notice that." We are told that the bed of the tank was rocky ; we may assume the bed of the water-course was the same. Under such circumstances it is frequently a matter of great difficulty to gauge a small stream of water, and moreover the amount visible is not necessarily all that passes down the channel. There may have been much more running than was visible to the eye. We are not told whether any investigation of this point was made and what were the measures adopted for gauging the stream, nor are we informed how long this petty stream ran.

Thirdly.—Why does Major Mayne deduct as much for soakage as for leakage from the gross amount of water expended ? The tank is said to have a rocky bed. Moreover the greater part of such soakage may fairly be charged as water expended in irrigation. If the tank leaks, or if the walls of the tank are of soil admitting the percolating of water, such leakage and percolation must benefit the irrigated lands situated in rear of, and below, the tank bund. Major Mayne deducts nearly 600,000 cubic yards for "soakage." A large part of this, as having percolated into the irrigated lands, should be considered as water expended in irrigation.

To conclude this already too lengthy letter, I think it is a matter for regret that under such "exceptionally favourable circumstances" the experiments, careful so far as they went, were not more thorough. I am convinced had the points I have noticed been considered, the results would have been more in accordance with the hitherto accepted estimates of water required for rice cultivation in other rice-growing countries. In my previous letter, which you were so good as to print, I pointed out that in Spain, Portugal, Italy, and other parts of India, Major Mayne's estimates would be considered too little by at least one-half. The only circumstances in favour of the probability of Major Mayne's experiments giving a better "duty" per cubic foot of water than those usually assumed, are that this experimental rice crop was grown in a comparatively cool climate and at a cool time of the year. The consequence would naturally be that the evaporation, not only in the tank but in the fields, moistened by the waterings from it, would be sensibly diminished and there would not therefore be so frequent a demand for water.

Major Mayne's report is valuable only, therefore, for the actual facts it contains, and these are the rate of evaporation of water in a tank during certain periods, and the quantity of land irrigated from a tank by an amount of water not sufficiently defined.

W. G. R.

GROWTH OF SUGAR.

NEW SOUTH WALES.

THE sugar industry is assuming great and permanent proportions It has passed through a critical stage, and is emerging with honours. In the first instance it seemed necessary to exaggerate the expectations formed of the sugar-cane, in order to get any one to try it and since it was planted until the present year the conditions for testing its worth have been absent ; for when the season was good the necessary machinery was absent ; and when the machinery arrived, the season was adverse. Although a strong opinion based on physical considerations was expressed from the first concerning the suitability of the crop to this colony, gross ignorance prevailed respecting the treatment of the cane, and the manipulation of the juice. Experience had to be purchased at considerable cost, for many of those who first venture to make sugar, utterly failed in the attempt, and have been obliged to retire from the field. These failures, and the miserable weather that prevailed during the sugar-making season last year and the year previous, induced many men not only to abstain from planting more cane, but to determine to plough up what they had. A favourable winter, and a genial spring, have happily operated to stop this process. The cane is taken into favour again. Planting is going on anew. The abandoned mills are again at work, and confidence is restored. The planters and manufacturers are beginning to understand what they are doing, and what they have to expect, and they find the reward promised fully equal to the toil and expenditure required. The experience of the last year or two has thrown a great deal of light upon the worth of the several sorts of cane ; some being of little value, and some of special adaptation to particular circumstances. The planters are acquiring knowledge of the soils best suited to the several varieties of cane, and the treatment needed to bring out their virtues. They are also finding out when it is best to plant and when to cut. At first mistakes were made in these matters that will henceforth be avoided. It is hoped too that the want of harmony between the sugar makers and the growers, which was the result of misunderstanding and misinformation on the part of the latter, may be no longer observable. They now see the bulk that can be grown, and what it costs to grow it, and are able to compare the results of growing cane with the results of growing maize. It is generally admitted that an ordinary crop of cane pays far better than an extraordinary crop of maize. On this point we quote from the letter of our special reporter to the Clarence. He inserts the evidence given by the lessee of one of the sugar mills :—"In reply to queries about cane and corn, I would say that I am this season paying from £15 to £16-10s. for good full crops of cane per acre, such acres yielding from 35 to 45 tons. I am paying 15s. per ton for cane delivered at the mill. Cane delivered on the river bank at a distance from the mill is worth about 12s. per ton. The cost of cultivating an acre of cane, including thrashing, &c., is £6 to £8 the first year, and £5 for ratoon crops. The cost of cultivating an acre of maize is about half the above. The average yield of cane per acre is about 35 tons. The average yield of dry sugar per acre about 2 tons. The price of sugar at the mill about £32 per ton."

It was considered that New South Wales had no chance as a sugar producer against Queensland. But it does not seem to be so. The yields this season are reported to excel those of the Queensland growers. The cane crop of last season on the Clarence did not cover more than 446 acres—the amount of sugar sold and consumed is set down at 1,072 tons—so that the produce per acre must

have been about 2½ tons. In Queensland however they have overtaken their own consumption; we on the other hand, must multiply our present product by thirteen before we can reach a like point.

SILK CULTIVATION.

CEYLON.

A CORRESPONDENT gives us the following particulars:—"There is no country better suited for the cultivation of silk than this colony, but unless we are given some encouragement by the Government there is but little hope of our success. Until we are blessed with a Governor like that good and great man, Sir H. Ward, to hope for encouragement in any new industry would simply prove one's fitness for a nomination to an asylum for idiots. All over the Central Province the mulberry thrives. Good cuttings in a year and a half become trees from twelve to fifteen feet in height. I have, as an experiment, put in cuttings only three inches in length, and with moderate care got 90 per cent. of plants. M.—— has not been so successful in the neighbourhood of Galle, for although the plantation at first throve well, it did not survive the dry weather. Mons.——was new to the country, and because he ordered the plants to be watered and paid for its being done, he took it for granted that it was done. Another experimental plantation has been started in Badulla, which I hear is doing very well. But as yet no attempt on a commercial scale has been made at rearing the worm. Our spirited Director of the Botanical Gardens has got some seed, and is willing to give small portions gratis to such persons as are capable of and willing to try the experiments. Up to date nothing goes down with the public but coffee. The monied men, the agents, are most active in discouraging everything else." [This is great exaggeration, or indeed is an incorrect statement.—*Ed. C. O.*] Very naturally too, as our present staple gives them enormous incomes. On tea, cinchona, or silk they could scarcely levy a black mail.—*Silk Journal.*

The Foresters' Gazette.

BOMBAY, 22ND JANUARY 1872.

ON THE RESERVE SUPPLY OF MATURE TIMBER IN EUROPE.

IN the number of the *Revue des Deux Mondes*, which appeared on the 15th of September last, there is an article by M. Broilliard worth some notice; it treats well and fully the subject of the scarcity of mature timber likely to occur in Europe generally, but in France more particularly. Many of the facts mentioned and discussed in this essay are of general interest, especially at a time when the subject of forest management is meeting with so much public attention. The following is a short epitome of the most important passages:—

The reviewer commences by drawing attention to the fact that one of the most serious deprivations to which an industrial state of society can be subjected, would be a scarcity in the supply of timber of workable dimensions; that, although it requires one, or even two centuries to produce a full-grown tree, at the present time more timber of large scantling is consumed in Europe than is being produced. He quotes the maxim of Colbert (laid down so long ago as 1669), but still adhered to in the Code Forestiere of France), that in the State forests, in those belonging to the Communes, or to any public body, no oak tree should be felled before it has arrived at maturity, *i.e.*, when no further improvement in the tree can, during the next thirty years, be looked for. To a strict unvarying adhesion to this rule, during the next century, must France look to ensure to herself the supply of timber which she will assuredly need. Since the end of last century, the rate of consumption of timber in France has greatly increased; up to that time the production exceeded the consumption. Now the case is reversed; the rise in prices has led to the sale of all available timber belonging to private parties to such an extent that full-grown trees in private forests have almost entirely disappeared. Even to many forests belonging to Communes the same injury is being done, though more slowly; while State forests are continually being reduced in area by repeated alienations of land suited for the growth of large timber. At the commencement of this century, trees, 12 feet in girth, were common; now they are rarely met with in the forest. While this diminution in production increases, so do, day by day, the requirements of the timber trade. How are these requirements eventually to be met? During the last fifty years the rate of consumption has at least doubled, and France now imports more timber than she produces. In England scarcely any large trees remain excepting those which are carefully preserved in her public and private parks. She imports twice the amount of timber that France does, of which her colonies furnish scarcely a moiety. Holland and Belgium, possessing hardly any woods of their own, are obliged to import largely from all parts of the world. North Germany, though rich in forest lands, allow the forests to be worked at too early an age. The Austrian forests, rendered accessible by the completion of railways, can now send their produce to the market; the vast forests of Croatia and Sclavonia have fallen into the hands of speculators who will soon make a clean sweep of their timber. Within the last five years, too, the noble forests on the upper Save river, and on the Julian Alps, have been sold to companies who have purchased them on speculation at 220 francs per hectare (2½ acres), with the view of realizing the utmost profit they can on the sale of the timber. Spain, Italy, and Greece are almost entirely denuded of anything worthy the name of forests. The woods of Mount Etna (of old historical reputation, from which the mountain derived her name of Nemorosa), covering two and a quarter millions of acres, abounding in oak, chestnut, beech, birch, and pine, have been, since the sixteenth century, undergoing a system of steady, gradual destruction, not yet quite completed. Italy, whose surface bristles with mountains, possesses hardly 1,250,000 acres of miserable forests to supply the wants of 25 millions of inhabitants. In Russia, the forests have been long worked, and impoverished by every kind of abuse; and now the railways threaten rapidly to use up the few remaining trees. In the steamers plying on the Volga, wood only is used for fuel. Norway, Sweden, and Finland seem at present to furnish all the countries along the shores of the Atlantic with pine timber; not only is it exported by millions of cubic feet to England and France, but Rio Janeiro itself is built of Norway pine; and even Australia and India claim their share of the supply. In northerly climates the growth of timber is at least five times slower than in France, or any more southerly latitude; while the consumption per head for the number of the inhabitants is at least five times greater; this joined to the present rate of export, must exhaust the forests at no very distant date.

In Europe, the difficulty of obtaining wood by importation from the other continents must soon be increasingly felt. England already imports annually many millions of cubic feet of timber from her American possessions. Chicago, a city of 300,000 inhabitants, which has already become, on Lake Michigan, a port equal in importance to Marseilles on the Mediterranean, draws yearly from Canada more timber than France imports from all foreign countries put together, that is, more than half of all the timber annually used in France. This timber again is exported to the Prairie States, which possess no wood, *viz*, to Illinois and Indiana. The late destruction by fire of Chicago, may be considered a warning against the almost exclusive use of wood in house-building. Nevertheless the re-construction of the ruined city will of course greatly increase the demand for large timber. By the St. Lawrence, yet more is carried to New York and the eastern coasts of the United States. The great forests of South America, extending from the Amazon to Paraguay, hardly export any wood; their extreme unhealthiness rendering the working of them almost impossible. Moreover, in these vast tropical forests, the useful sorts of timber are much more rarely met with than in the woods of colder climates. San Francisco is so denuded of timber that the iron works of that region are actually lying idle for want of proper fuel. Further in the interior, the temporary clearings made by the coffee-planters have half ruined the forests. Some of the finest forest tracts on the earth's surface seem to be disappearing without their produce ever having been seen in the markets of the world. Of all descriptions of timber, the most useful is the oak; equally serviceable in carpentry, upholstery, cask-making, and carriage-building: it is necessary too for house and ship-building, and for railways—in certain branches of trade, as for instance in the making of wine casks, no other wood can supply its place,—for all these purposes the French oak is unequalled. African and American oak can in no way be compared to it; the former being far more difficult to work, besides being more liable to warp and split, while the latter is far less durable. But the supply of French oak seems threatened with exhaustion; when France was conquered by the Romans, her forests from the Rhine to the Pyrenees covered a surface of 100 millions of acres: now she hardly possesses 20 million acres of forest-lands. Besides the enormous amount of timber required for ship-building, there is the still greater demand of the wine trade. France manufactures yearly from 50 to 70 million hectolitres (one hectolitre represents 22 gallons) of wine and brandy for home consumption and foreign export. It is a fact worth noticing that the wine trade in France makes five or six times greater demand on the timber-market than does the navy. For all this wine oak-casks are absolutely essential. During the twelve years previous to 1857, about 20 million pieces of cask staves were annually imported into France. In 1866, the importation of these pieces for cask staves had reached to 63 millions, and it seems probable that as steam facilitates a wide development of trade, so will this branch of demand yearly increase. During the last 30 years the price of oak-timber has just doubled itself; and while the call for it increases, and the sources of supply decrease, it is evident that the price must rise almost without limit.

Now, as to the best methods of meeting a crisis that seems inevitable, the reviewer proposes,—*first*, that with the view of economizing her own supply of oak, France should import all the foreign timber she can procure, using her own as little as possible; *secondly*, that the system of mixed coppices (a system well-known to all who have had the treatment of forests to attend to) should be encouraged in all private, and absolutely practised in all State forests. By this system eight or ten standard trees would be allowed to remain per acre, and an amount of mature timber would be ensured to meet the future demands of the country.

It would be well if attention were more generally drawn to these undoubted facts, touching the prospects of our timber supply; the general diminution of serviceable wood being a question which must affect all countries; and none will suffer more than England and her dependencies should not the matter be taken up in time. The truth of the impending difficulty is perhaps not sufficiently believed in; the greatly increased demand made by the inventions of modern civilization on the timber-market are forgotten. These demands are indeed met for the present, but there is a future to be provided for. Writing as we do for Indian readers, we would wish to impress on all to whom the management of the already mutilated forests of this country is entrusted, that the main object of their work is *not* to see how many trees can be brought to market and sold for the enhancement of forest revenue, but to so sparingly work and husband the resources of the forests that, while providing as far as is safe for present wants, the demands of the future are never forgotten; on the contrary, that they must be kept constantly in view, and that all forest work should be carried on with primary reference to them. It is only by such a system of management that our Forest Department can accomplish its real objects, otherwise it will do more harm than good to the country.—*Indian Public Opinion.*

Official Gazette.

BOMBAY, 22ND JANUARY 1872.

MODEL FARMS—MADRAS.

EXTRACT FROM THE PROCEEDINGS OF THE GOVERNMENT OF FORT ST. GEORGE, IN THE REVENUE DEPARTMENT,—DATED THE 22ND SEPTEMBER 1871.

From the Acting Sub-Secretary to the Board of Revenue, to the Acting Secretary to Government, Revenue Department,—No. 5013, dated Madras, the 23rd July 1870.

I AM directed by the Board of Revenue, to submit the report called for, together with a file of replies from Collectors on the same subject, the last of which was only received on the 27th of May last.

With the despatch to which the above Government order had reference, the Secretary of State transmitted the observations of Major-General Cotton on the experiments made with English agricultural implements that had been reported on, and observed, "considering the slow growth of public opinion in this country in regard to the use of machinery for agricultural purposes, I regard with satisfaction the experiment which has been made in Madras, where the difficulties from the prejudices, habits, and poverty of the people are so much greater than in England." General Cotton observes *in limine* "the first thing that strikes me in this respect is the hopelessness of attempting to do anything vigorously for the improvement of Indian agriculture, unless it is made the special duty of some one to look into the results of such trials as these; to see that the implements are skilfully used; to suggest modifications of them to suit the peculiar crops of the country, so unlike in many cases the crops they are prepared for in England; and to give immediate advice and help to those who venture to take them into use." He points out, in the most forcible language, how impossible it is for Collectors in this Presidency to devote much time and attention to the question, even if they have the necessary knowledge of the subject; and remarks with reference to the report of the Agent for Remounts at Oossoor, that when improved agricultural implements are in the hands of those who are "actually engaged in farming, and who can look into their use, watch their working, and apply them judiciously to the work required, their success is complete." General Cotton considers that the obstacle which the smallness of holdings and the poverty of the great bulk of the cultivators of Madras oppose to the more general use of machinery, may be overcome by travelling machinery, which would execute the various farming operations for hire. But he urges that "the introduction of the very simplest tools of better form than those now in use" is nevertheless likely to be productive of great economy of labour and improvement in culture. General Cotton observes: "I have great confidence in the skill that can be acquired by natives of India. * * They will use the tools given them with much more delicacy of hand * * than could be hoped for from the English ploughman, and we may take advantage of that in using lighter and cheaper tools, always provided that their first introduction is made under careful warning and instructions." In his remarks on special implements, General Cotton describes the superiority of the cultivator over any modification of the native plough for the purpose of Indian agriculture, and considers that the difficulty of finding "cattle strong enough to plough the soil to a sufficient depth in India is to be met at present by going over the ground more than once, by ploughing a moderate depth with one plough and following it by another. This, he observes, is one of the improvements specially needed in India, as it is of infinite importance that where the sun is so scorching as it is in the tropics, the roots of all plants should have as deep a bed as possible."

A winnowing machine, he thinks, might be set up in a village at small cost and could hardly fail to answer, and chaff-cutters should be established at cattle-halting places, while travelling thrashing machines might gradually be introduced through the agency of wealthy proprietors. He considers the introduction of the rice-hulling machine "of great importance and worth any effort that can be made." On the general subject of improvement of Indian agriculture, General Cotton makes the following impressive remarks: "In the present state of affairs, the *Government* must act if anything is to be done, there being no Agricultural Society to press improvements and too large a field for any but Government influence to reach at all;" and again, remarking on the slow and partial appreciation of any new efforts to economise agricultural labour, and turn the soil to the best account in other countries, he observes, "if so in England * * what hope is there of India, unless the Government goes into the subject in all parts of the country, and makes the importance of it fully understood;" (lastly,) "the only question seems to be whether so much advantage can be derived from better treatment of the land and the economy of labour now wasted, as to justify the attempt on a larger scale; and no one who has looked into the result of what is called high farming in this country (England), can question this. We are every year more and more astonished with the yield of the land which really seems to have no limit." On receipt of the order of Government, the Board called upon all Collectors to report, after due consideration, what measures they could suggest to attain the end in view; and in their replies above recorded they have submitted their own views and those of the various intelligent persons, European and Native, with whom they have been in communication. The Principal Assistant Collector in charge of Vizagapatam thinks that neither the simple introduction nor exhibition of improved appliances is likely to lead to success. The Rajah of Vizianagram, he says, once experimented with the plough sent by Government, but nothing has been heard of the implement for three years. Mr. Sewell strongly advocates the plan recommended by a predecessor in 1863, in the following terms:—

> "There is no doubt the art of agriculture in India is entirely empirical in this as in other things, the natives of the country follow the traditions of their fathers in full faith and simplicity; but they are never slow to adopt changes which recommend themselves to their interest in social and economical matters. Witness the improvement in the cultivation of cotton, of indigo, coffee, and many other products. I can conceive nothing more suited to foster and develop an improved system of agriculture than the institution of model farms in selected localities. But I apprehend that such undertakings should be superintended by practical farmers from England, men thoroughly acquainted with the whole system of crops, manures, and soil, and initiated moreover into chemistry and the cognate sciences. If left in the hands of amateurs, whether Collectors or Centurions, I look for nothing but failure and self-deception.
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> "To these farms should be attached, as apprentices, some of the best lads of the European and East Indian Orphanages. There are several agricultural schools in England, where the training is both practical and scientific, and they are resorted to with the best result as well by those who intend to start in farming with their own capital, as by those who design to get their living as bailiffs, land-agents, surveyors, and the like. I am confident that the demand for such qualified youths would far exceed the supply, both with planters and native landholders; and so by degrees the country-farming would be raised into a science."

The Collector of Godavery observes: "It is not to be expected that any natives will purchase the machines and use them at their own expense, without a careful inspection and seeing them at work. Without knowledge how to work them, they will not introduce them;" and he suggests that if implements are sent for exhibition in the district, they "should have persons competent to work them and explain their advantages."

The Collector of Kistna reports that the impression amongst the agricultural population is that European agricultural implements are beyond their means and unsuited to their system of agriculture, either in irrigated or unirrigated land, and to their draught cattle. He adds, that there is no doubt whatever that an unfavourable impression has been created by sending implements up-country to be exhibited by unskilled workmen. The exhibitions have been failures, the implements have been broken, and their repairs on the spot have proved to be impossible. "This mode of exhibiting improvements in agricultural appliances is," he observes, "perfectly

useless." The rice-hulling machine set up at Nedumole has been a failure, the lease has not been renewed. The Sub-Collector of the same district observes that even ryots who "are well-to-do have not the spirit of enterprize to purchase expensive machines, the uses and advantages of which are unknown to them, and the profits from which, are problematical in their eyes. The Collector of Nellore states that all whom he had consulted, including the Dewan of the Rajah of Venkatagherry, agree that the first step in the matter of improved agricultural appliances must be taken by Government, "but express themselves willing to follow the example set by Government." An experienced agriculturist in the public service in that district proposes that to familiarize natives with these implements, "Model Farms under European superintendence should be established in each district." The Sub-Collector of Cuddapah deems the establishment of a farm under a practical agriculturist the only mode of introducing improved agricultural appliances to the notice of the people; but the Collector doubts whether even then "the present generation would take example therefrom." The Sub-Collector observes that the want of roads must long prove an obstacle to the introduction of travelling machines. The Collector of Madras shows that "the result of holding agricultural exhibitions in creating a demand for improved agricultural implements has not hitherto been encouraging." He doubts, as several others do, whether while labour is cheap and plentiful, the use of costly and large agricultural machines is likely to be general; but thinks that persistent endeavours should still be made to introduce better tools than those now in use, especially at the Government Farm at Sydapet.

The Collector of North Arcot reports that the universal desire is to see the implements, &c., that the ryots may judge for themselves. Ploughs were distributed in 1866; but "owing to the price or some inadaptability to the requirements of the district, they have not found acceptance." The Head Assistant remarks that when labour is so cheap and the number of poor employed in agriculture so large, "the introduction of machinery, *qua* releasing superfluous hands, will not be felt but rather denied." That "the richest puttah-holders never look at their fields, while the cleverest cultivators are the poorest labourers, and therefore are the most opposed to any innovation which might reduce their profits and save the money of their employers." The Collector of Tanjore observes that most of the implements named by General Cotton, can, with great advantage, be introduced, in parts at least of Tanjore. "But," he adds, "the main difficulty lies in securing the requisite mechanical skill in handling and using these implements, by which alone fair results can be attained and the agricultural classes convinced of their actual utility and value in ensuring a saving of labour." The Head Assistant observes that it is "indispensable that we should in the first introduction of ploughs, &c., take care that they are only entrusted to the handling of skilled labourers." Positive harm is caused "by bungling and failure at the outset." A large body of mirassidars in the district have expressed themselves ready to subscribe to get implements down, if the skilled labourers and trained cattle can be found to accompany them. The Officiating Collector of Madura indents for three sets of implements "with persons qualified to use and keep them in order." He states that the ryots are unwilling to purchase any at present, but considers "that if an opportunity were afforded them of seeing some of the simpler implements properly worked, they are sufficiently intelligent and enterprizing to appreciate them, provided the work done in their presence shows conclusively that the implements exhibited are well calculated to economize labour and develop the resources of the land." Messrs. Yorke and Scott, two practical agriculturists, offer some excellent remarks on the kinds of ploughs and other implements required for this country.

From Tinnevelly the reports are very full. The Collector says that the universal desire is to see by experiment that the agricultural implements offered, are more effective than those in use. The zemindars, he says, will adopt no change "unless it be forcibly demonstrated that the purchase would pay." He therefore strongly advocates "the establishment of a Model Farm, fully convinced that nothing will really ever be done by making desultory experiments here and there over the country, such experiments being conducted often by men who really understand very little about what they profess to teach." He recommends that a farm be opened in connection with the Jail under the superintendence of Dr. Thompson, the Superintendent. The Acting Sub-Collector likewise deprecates "random trials here and there" of improved implements, and urges the establishment of a Model Farm in each district, remarking that the Government would probably be glad to instruct the ryots about many matters "connected with farming, such as rotation of crops, growing special crops for the sole use of cattle, the use and value of wells and manure in high farming small areas of dry land; all points which the natives require to learn a good deal from us about. But to do so, or to secure the adoption of improved implements of husbandry or methods of agriculture, successful results "must be systematically and persistently worked out before the people." In a very useful letter, Dr. Thompson, the Superintendent of the Jail, deprecates the promiscuous transmission of new agricultural implements into the district, but urges measures being adopted to introduce improved method of cultivation and to instruct natives in all branches of improved agriculture. He instances many serious and wasteful defects in the existing native methods of husbandry in respect to the cultivation, both of rice and dry land, which would be remedied by instruction and by observation of the principles and practice of improved husbandry. He urges "the systematic formation of farms at each district head-quarter station," in which the rearing of live-stock should be combined with tillage, and he considers that, with time and care, such farms should turn out self-supporting and remunerative. He would attach one to each Jail, and considers that Municipalities also should establish Model Farms. The Commissioner of the Hills, reporting after the close of his Agricultural Exhibition, states: "I see little prospect of the introduction of modern machinery and improved methods of agriculture until a farm has been established by Government, wherein natives could watch the working of better implements, and could see the result of improved modes of culture in the standing crops." He observes that "there is scarcely a province in Prussia which has not its State Model Farm," that "agricultural institutions are in other countries maintained or aided by the State," and that "with a view to satisfactory progress in the general improvement of agriculture in the Presidency, the State must be prepared to step in, and take the initiative by the establishment of Practical Farms." Mr. Brooks describes the miserable deficiencies in agriculture on the Hills, notwithstanding great capabilities, and he places on record a memorandum by Lord Tweeddale, and one by Mr. Veterinary Surgeon Thacker, on the subject of breeding cattle, and adds, "no attempt to introduce modern agricultural appliances or to improve the breed of cattle will meet with real success, until the Government take the matter in hand and secure the services of a practical agriculturist to show the way as suggested by His Lordship." Lord Tweeddale is of opinion that, "it is of the greatest consequence that everything should be well considered and carried out profitably, before Natives or Europeans are invited to follow the example set by Government." The Collector of South Canara states that the cultivators of that district are thoroughly alive to their own interests and ready to take advantage of useful implements, but that it is necessary that they should be exhibited before them in full work to enable them to judge of the advantage of using them. He thinks that the casual exhibitions hitherto tried are soon forgotten and fail to convince, and suggests that acquaintance with mechanics and the principles of agriculture might be made part of the curriculum of study necessary to obtain employment in the Revenue Department of the public service. Mr. Pfliederer, to whom the Board are much indebted for his interesting communication, after noticing various defects in agricultural processes, now sufficiently obvious and their remedies, remarks—"but such improvements, if they shall be effective, ought to be demonstrated *ad oculos*, and not merely by pamphlets and publications. A Government farm in each district, under intelligent supervisors and carried on on enlightened principles, might indeed be a great blessing, and would be certain to lead to a gradual, but sure development, of the country and its resources in every respect. Simple importation of foreign agricultural implements is not enough. They must be adopted to the requirements of the soil, climate, cattle, and people; it must be demonstrated by real use how to be used with advantage, how to be treated, and to be kept up."

The Collector of Malabar remarks: "The more wealthy agriculturists would go to the expense of providing themselves with improved implements were they satisfied of the advantages to be derived." And Mr. Login considers that they are quite as ready to do so as the people of England. He notices the waste of manure, the indifferent ploughing, &c., and considers that the value of improved agriculture must be demonstrated to the people by actual experiment. In his opinion, what is required is some institution where the people may be taught by actual experiment the many methods and the use of the many machines and implements employed in agriculture. "It is foolish," he adds, "to suppose that the methods and implements in use elsewhere will be equally well-adapted to this country; but the people, if properly used, could contribute very largely to the practical working out of the questions that would arise simply by criticizing where methods and implements in use elsewhere are practically experimented with in India. What is required is a school to which at least at first all classes should have free access." Thus from every quarter, and with the authority of all best qualified to judge, there is an almost unanimous opinion and desire that attention should now be seriously given to raising the status of agriculture in this country, to promoting its efficiency, and to giving a vigorous impetus to the improvement and study of practical farming. The Board believe that this cannot be done without the interposition of Government. The advantages to be derived from a scientific knowledge of agriculture in a country where three-fourths of the people live directly thereby and the public revenues are mainly dependent thereon, cannot be denied or exaggerated, however, existing shortcomings may be excused and excellencies in the traditional methods of culture admitted. In this matter, as in any other great system of popular education, it is necessary at least at first that the Government

should intervene, and by their example enlist the sympathy of the zemindars and the well-to-do landholders, through whom improved systems may gradually be transmitted to the lower classes of the proprietary and tenantry. There are no doubt many who only need encouragement to take up agriculture as a science, and to learn, *by seeing*, what they ought to do. The vast and steadily increasing revenue which is derived from the cultivation of the country, and the stimulus imparted by largely enhanced prices to the demand for land, and the investment of capital in the spread of agriculture, seem to indicate that the time has fully come when the Government should take decided action for the promotion of agriculture, and adopt a system for the gradual advancement of agricultural education, intelligence, and knowledge, for the improvement of indigenous stock, and for the development of the resources of our fertile, but neglected, over-worked soils. The obligation has been fully acknowledged by the Secretary of State and other Administrations in India, and is countenanced by the example of all civilized States. The Board resolve therefore to take this opportunity of earnestly urging the necessity of establishing efficient Model Farms with classes for practical instruction. The first might be at once established in connection with the now flourishing farm at Sydapet; and, as soon as Superintendents have been trained to take charge of them, similar Model Farms on a smaller scale might be established in each district for the study and encouragement of local agriculture, adapted to its peculiarities in respect to soil, climate, and natural condition. Classes for elementary instruction in agricultural science might also be formed in connection with zillah schools. The advantages to be gained by such persistent and systematic efforts need not be discussed in the face of the examples set by England, Ireland, Prussia, and the Colonies. Possibly local Agricultural Societies in great measure, independent of State-aid, might spring up in such districts as Vizagapatam (under the patronage of the Vizianagram zemindar), Tanjore, Malabar, &c. As above noticed, there is in the Government Farm at Sydapet the means of making a beginning. The Superintendent who has recently joined it is a thoroughly trained and scientific agriculturist, and his experience has satisfied him and the Farm Committee that Model Farms can be established with a reasonable hope of their being made self-supporting. What is now required is that the Superintendent's ability—he holds a diploma of the Royal Agricultural College—may be still further utilized by the establishment of an agricultural school in connection with the farm, where overseers and labourers may be trained, and whence they may be sent up-country as the means of extending operations to other districts become available. Should the Government see fit to express their general approval of this proposal, the Board are prepared to make an estimate of the probable cost, and to lay down detailed rules for the management of such farms and classes. They entirely concur in the almost unanimous expression of opinion against the continuance of such desultory experiments as have hitherto been made with a view to improve the agriculture of the country, and are satisfied that more harm than good is done by them. As regards implements and machines, the Board believe, that what are wanted at the present time are such modifications of the simplest implements, (*e. g.*, ploughs, drills, cultivators, &c.,) as render tillage more efficient by increasing the productive powers of the soil *at a moderate cost*, rather than such as economize labour. Labour and animal power are still abundant and cheap, and must, for a long time, successfully compete with steam as applied to tillage in this country. Mr. Robertson's experience will no doubt soon enable him to prepare a list of all such implements as are likely to be practically useful on an Indian Farm, and to suggest modifications to adapt them to the peculiarities of this country. For example, on the Government Farm at Sydapet it is found that even with high lifts water can be raised (and that too with far greater economy, certainty, and regularity) by bullock power and picottah than by the steam lift, comparatively large as the stream raised by it is. Indeed, the great cost of fuel, and the expense of tedious repairs, &c., preclude the use of the latter altogether. In native hands up-country the use of any such machine is simply out of the question. Erected on a Government Model Farm the chances are that a steam water-lift would swamp all profits from wet agriculture, and probably repel rather than attract the attention of native agriculturists to improved appliances. There are no doubt special localities where such a machine might be useful and economical, but the conditions of any such locality must be a subject of special consideration, and a careful estimate should be made before attempting any such expensive appliance. For some time to come, however, it would be better to discard steam-pumps altogether. The steam-plough again, is, so far as the Board can judge, unsuited to the present conditions of the country. Though applied to agriculture it is not really an implement used by the agricultural population in the less wealthy countries of Europe. Capitalists or large proprietors in England, invest capital in what is more or less a commercial speculation, and contract to do the ploughing at so much an acre. In this Presidency, the Government alone is for the present in such a position as a large landed proprietor as would admit of its owning and working a steam-plough, and the Board are not disposed to advocate any experiment in this direction at present. Even in England it is not an easy thing to start and maintain a steam-plough in remunerative working, except in wealthy districts with large farms; and the cost of cultivation even then (with cheap coal and skilled labour in abundance) exceeds what it is possible for the dry land in this country to pay. The Board observe, from a recent Journal of the *Royal Agricultural Society*, that the Duke of Northumberland's tenantry pay 10 shillings an acre for the ploughing of their land. In some places as much as 14 to 16 shillings is paid. This operation is done on the Government Farm at Sydapet, with powerful cattle and Ransome's improved ploughs at 1*s.* 0*d.* to 2*s.* an acre; and the ordinary charge in this country is from 0*d.* to 2*s.* (6 annas to one Rupee). It would probably not cost Government less than 15*s.* to 20*s.* an acre to plough in this country with an improved steam-plough; and there is no part of the country where the ryots could be induced to pay for it. It must be further borne in mind that there are few districts in which such a machine could be moved in the absence of roads; and it is probably wholly unsuited to wet agriculture which alone could afford to pay such largely enhanced rates. Hulling-machines too should be discarded from the category of agricultural implements. Hulling rice is a manufacturing process. It takes the place that milling does in England, or garbling coffee and preparing it for export does in this country. The producers do not hull their paddy for the market. It is purchased as paddy by the dealers, and can best be carried in this form, and it is hulled for the market or at the port of shipment by a special class of labourers with great skill and at reasonable rates. At Madras, 13 mercals of paddy are issued to the hullers, who return 6 mercals of well cleaned and unbroken rice, and sometimes one-half of the husk also. Up-country the rate is cheaper. There is no doubt that a suitable rice-hulling machine is a great desideratum in Madras; but it is for capitalists and manufacturers to turn their attention to this matter rather than farmers and agriculturists. Probably the firms who (according to General Cotton) are using machinery in Burmah, are large exporting firms. These are the proper persons to interest themselves about hulling-machines. It has been found impossible to use the rice-huller at the farm. It requires steam-power; and a large capital would have to be invested in the purchase of rice to keep it employed. The same may be said of bone-crushing. It is scarcely a farm operation. It is much to be desired that there were bone-crushing factories all over a country like India where lime is so deficient in the soil, but this unwholesome manufacture must not be thrown on the agricultural institutions of the country. It is a significant fact that although the export of bones from Madras to Ceylon is very large, no crushing-machine has yet been set up in Madras to reduce their bulk and so facilitate stowage.

The Board decidedly approve of agriculture as an occupation for convicts, but do not consider that Jail Farms could ever take the place or properly answer the purpose of the Model Farms, the establishment of which they are now advocating as a means for raising the status of agriculture and enlisting the interest of the well-to-do classes. Jail Farms cannot be public institutions, open to the inspection and participation of the people, and the association might tend to degrade rather than elevate the subject in the eyes of the people. At the same time they are of opinion that arrangements might well be made with the co-operation of the Farm Committee for instructing Jail Overseers and Deputy Jailors, under Mr. Robertson's superintendence, or trained workmen might be sent by the Committee to instruct prisoners in the use of improved implements at the various Jails; but any efforts that are to be made to affect the agriculture of the country permanently must be systematic and persistent under such complete and established organization as shall command success. There is much to be learnt of the agricultural conditions of this country before European science can be applied to their improvement, and this knowledge cannot be gained without some opportunity of study and experiment at Model Farms and careful observations. The Board learn that already zemindars and others are sending their ploughmen and farm labourers to be instructed at the Government Farm in the use of improved implements of various descriptions. The Maharajah of Vizianagram, the Zemindar of Calastri, the Jaghirdar of Arni, and some of the Mirassidars of Tanjore have set the example, and it can hardly be doubted that with greater facilities of education *within their own districts* very many substantial ryots would gladly avail themselves of the opportunity of studying the various improvements in agriculture introduced by other nations.

Order thereon by the Government of Fort St. George,—No. 1657, dated 22nd September 1871.

THE Government have recently reviewed the report of the Sydapet Farm Committee for 1869-70 and 1870-71, and have recorded their satisfaction with the very valuable results which have been attained under the skilful management of Mr. Robertson, the Superintendent. They consider that the time has now come when the Government may, with confidence and advantage, extend their operations over a wider field, and afford to the agricultural interests of this Presidency those benefits and aids which are being extended to them in other parts of India.

Two courses are open to Government for this purpose. They might inaugurate operations on a large scale, and endeavour to exhibit the results of high farming over wide areas, with expensive machinery and establishments in a manner to attract the ryots; but they are confident that no real good would be derived from such a course, and that it would rather tend to discourage enterprise. They prefer the less ambitious method of establishing Model Farms of moderate size in several localities, with the view of demonstrating to the ryot the practicability of effecting sensible improvements by means quite within his reach. The distinct objects at which the Government would aim may be epitomized as follows:—

(1.) To ascertain by experiment the proper use of rotation in crops in this country.
(2.) To introduce the system of root or green crops in lieu of fallow, without artificial irrigation.
(3.) To introduce new crops.
(4.) To provide new kinds of seed, and fresh seed for the crops now cultivated.
(5.) To make experiments in the use of water for the cultivation of crops now termed "dry" crops, and for raising grasses and other crops to be used as fodder
(6.) To make experiments in the use of lime and other manures—mineral and animal.
(7.) To introduce new and improved implements of rural labour.
(8.) To improve the working cattle, sheep, horses, and other varieties of live-stock in the country.

It is evident from the foregoing that the scheme will be mainly one for the improvement of dry cultivation; and although wet cultivation is incidentally affected with reference to seed and implements of labour, still the main objects of inquiry and experiment are dry grains and unirrigated products, cotton, silk, tobacco, indigo, wool, &c. There can be little doubt that the cultivation of rice and of the sugar-cane is well practised, and a due economy of water is the only point which need attention at present in regard to it. Regard being had to the number of objects in view as above indicated, the Government consider that the proposed farms should be:—

(1) of considerable area; (2), in different climates and at different elevations; (3), and placed conveniently with reference to water supply, minerals, markets, and communications.

The area the Government consider should be not less than 200 acres for each farm, for although it may not at first be expedient to reclaim and cultivate more than 100 acres in each, still the additional cost of securing the larger area will be immaterial, and the command of means for future expansion is eminently desirable. The extent not immediately required for Government purposes might probably be leased out at yearly rents, or might be used for pasture, growth of firewood, &c. The localities which for the present approve themselves to Government for the Experimental or Model Farms are the districts of Bellary, Coimbatore, and Tinnevelly. Should it hereafter be deemed desirable to add a fourth farm, it might be placed in Salem Baramahal, or perhaps by preference in Ganjam, where it would be accessible to the people of Vizagapatam. These districts are comparatively backward and inhabited in part by Ooriyas, the least developed of the people of the plains, and in part by hill-tribes, almost destitute of any culture. But the districts have great capabilities, the climate is far more temperate than what prevails in the rest of the Presidency, and is probably specially suitable for the culture of indigo. The primary object of the Bellary farm should be the cultivation of cotton, and the experimental use of varieties of seed, methods of culture, and mechanical processes; but a portion only of the area should be of the "black cotton soil," and the remainder should include other varieties of soil adapted for miscellaneous tillage. It will be an essential condition of selection that some portion of the area shall have means of irrigation, either from a well-supplied tank, or from reliable wells, or at least that water shall be attainable at such reasonable depth as to allow of wells being sunk and worked without extravagant expense. In Coimbatore the special objects should be silk-culture, the growth of tobacco and cotton, the breed of sheep, and perhaps the breed of horses, and, with these in view, attention will be directed in the selection of a site to the suitability of the soil for the cultivation of the mulberry and of tobacco, and to a command of water for raising green-crops for the sustenance of live-stock. The farm should, by preference, be at a high elevation. In Tinnevelly the position will be selected partly, but not chiefly or exclusively, with reference to experimental cotton cultivation. The farm will be for general experimental cultivation, in which cotton will have a part, and in which regard will also be had to tobacco, senna, &c.

In selecting the sites for these farms the Government do not desire that the requirement of first-rate quality of soil, of whatever category should be insisted on. It will be sufficient that the land be of fair average quality, that its situation shall enjoy at least an average rain-fall as compared with the rest of the district, and that there shall be some partial water-supply obtainable from a channel, a tank, or from wells. A site will, of course, be selected conveniently placed as regards roads and existing or projected railways, and, if possible, within easy distance of a fair market for the farm-produce, including meat. The neighbourhood of limestone of a quality fit to be burned for agricultural purposes would be desirable but not indispensable. The experiments made at the Madras Farm in the use of lime are encouraging, except as to cost of preparation. These District Experimental Farms will be placed in connection with the Sydapet farm, and under the superior management of Mr. Robertson, in whom the Government possess an officer admirably fitted for the post, and who adds to his other acquirements, as a scientific and practical agriculturist, the great advantage of several years' experience of India, popularity with natives, and a thorough appreciation of the fact that the experiment to be successful, must be economically conducted. Mr. Robertson's present engagement expires on 10th October 1871, and from that date his salary will be raised to Rs. 700 monthly, with horse allowance of Rs. 30 monthly, and his travelling expenses when absent from the Presidency on duty. He will retain his residence on the Sydapet Farm, free of rent. Mr. Robertson will come under the Uncovenanted Service Rules, regarding leave of absence and pension, and his service will date from the commencement of his original engagement. His duties will be to have the superior management of all the Government Farms which may be established now or hereafter, the superintendents in immediate charge being his subordinates; to prescribe the course of operations, and to train the apprentices who may be placed under him for the superior charges. The Government have entire confidence in Mr. Robertson's competency for this important duty.

The general supervision of the agricultural experiment will be placed under the Board of Revenue, through whom Mr. Robertson will, in ordinary course, submit his reports and address Government. But his reports on the individual district farms he will forward to the Board, through the Collectors of the districts to which they refer, so as to keep those officers informed of the progress of the local experiment, and to allow them the opportunity of recording any remarks they may wish to make. Mr. Robertson will understand that the Government expect him to consult fully with the Collectors as to all action in their respective districts.

The direct management of each farm will be conducted under Mr. Robertson's orders by a Native Superintendent on a salary of Rs. 150 monthly, rising to a maximum of Rs. 250 by annual increments of Rs. 25. To provide the necessary agency the Government resolve to establish four native Apprenticeships at once, and to attach to them salaries of Rs. 40 monthly, with lodging on the Sydapet Farm, and to instruct the Collectors of Bellary, Coimbatore, and Tinnevelly, to select for them from the ryot-class of their respective districts, or from some class connected with the land, each one young man, of age between 18 and 20 years, of good constitution and possessing a colloquial knowledge of English, who may be willing to enter into the engagement. The posts of Farm Superintendent will be given to the best qualified Apprentices at the end of three years' training. The Collectors will also proceed to select in their respective districts one or more blocks of land, either waste or cultivated, extending approximately to 200 acres, and fulfilling the conditions above specified to serve as an Experimental Farm. The land being indicated, Mr. Robertson will be deputed to visit the site and report upon it. He will submit to Government through the Board of Revenue—

(1.) A rough estimate of the cost of establishing an Experimental Farm of the dimensions prescribed, contemplating, in the first instance, the cultivation of 100 acres.
(2.) A general estimate of an approximate character of the probable permanent charge which will be incurred for establishments, including his own salary at the Government Farm at Sydapet, and at the three Provincial Farms, making provision for four students at the Sydapet Farm.
(3.) Proposals for the reclamation and management of the three projected Farms until they can be placed in charge of their permanent Native Superintendents. It may be presumed that the requisite buildings could not be raised, and the necessary improvements perfected in less than two years from the present time.

As to the source whence the funds for this agricultural experiment shall be derived, the Government are of opinion that the Surplus Cattle Trespass or Pound Fund furnishes a suitable and sufficient provision. Act I. of 1871 provides that this "surplus shall be applied, under the orders of the Local Government, to the construction and repair of roads and bridges, and to other purposes of public utility," and the Government consider that the object in question is a most appropriate purpose on which to employ part of the funds. The budget for the current year estimates that an unapplied balance of Pound Funds of Rs. 77,000 will remain at its close, after allowing for a liberal allotment for roads and bridges, and the demands on the balance for the Experimental Farms cannot possibly be large for the remainder of this year. The contribution from this source for roads, &c., in aid of Local Funds will not hereafter need to be on so liberal a scale as hitherto, and the Government do not doubt that ample means will be available for developing the present scheme. They commit it to Mr. Robertson, and to the Board of Revenue, and District Officers, with the confident anticipation that no efforts will be spared to ensure success, and in

full hope of valuable results being attained for the improvement of the country.

MR. LOGIN'S EXPERIMENTS.

From Col. Alex. Taylor, C.B., R. E., Offg. Secy. to Govt., Punjab, Public Works Department; to the Offg. Secretary to Government, Punjab, No. 5636, dated Lahore, 27th November 1871.

By desire of His Honor the Lieutenant-Governor, the undersigned has the honour to forward, for disposal in Civil Department, Superintending Engineer's (2nd Circle) No. 740A., of the 8th current, forwarding Mr. Login's report on cotton cultivation.

From T. Login, Esq., C.E., F.R.S.E., M. Inst. C.E., P. W. Department, India; to the Superintending Engineer, (2nd Circle,) Umballa, dated 20th October 1871.

DURING my late inspection tour at the end of September, I visited my several experimental cotton fields along the Grand Trunk Road between this and Delhi, and, in continuation of my reports on the experiments of last year, I beg to submit a report of the success which has attended my experiments this season up to the present.

No. 1 experimental cotton field, 20 miles from Delhi; agreement with Zemindars.—The first is in the compound of the rest house at Rai, on the 20th mile of the road from Delhi. The agreement with the zemindar who cultivated it was that he got the land rent free and the produce, he supplying all the labour; so that in fact this experiment cost nothing but supervision, which the Sub-Overseer could do without any loss to Government.

Area of this field.—The area of this field is 32,896 square feet, or 226 square feet over three-fourths of an acre; but as there are two trees which overshadow the field, and have thus stunted the neighbouring plants, the correct area is about exactly three-fourths of an acre.

Details of cultivation of ditto.—The soil, which is rather good and has been under grass for several years, was *not* manured, but irrigated. The ploughing began on the 28th May, and was ploughed six times, and the ridges, 3 feet apart, were thrown up as before described, when the first watering was given; and on the 10th of June the sowing of the seed was put in at two feet apart in the usual manner, and three seers fourteen chittacks were expended, or 10¾ lbs per acre. This operation was completed on the 12th by one cooly; so the extra outlay on this only amounts to about 6 annas per acre, while the seed would not cost 1 annas more; thus the saving on seed alone would pay for sowing. The field has been watered since the sowing five times, or in all six waterings, and the weeding has been done four times in all.

Present state of ditto.—There are at present 5,436 plants, which average four to five feet high, and no plant was permitted to exceed five feet, so as to make them to give out a number of branches. The effect has been that, after counting a number of plants, it was found that each plant gave off about seven branches, and each branch about 15 twigs, while on each of these there are some three or four pods; so it can be easily imagined that the whole field is now thickly covered.

Probable yield.—The natives say that the yield will be about 15 maunds of "kapas," which is now selling at nine seers per rupee; so this at once represents a sum equal to Rs. 66-10-8, or nearly £9 sterling per acre, while the expenditure can in no way exceed £2, leaving a profit of 350 per cent.

Ultimate results.—Surprising as these figures may appear, yet they are not more so than seeing the field itself, and prove to my mind, if I ever had any doubts, that India can and will compete with the world in the produce of this great staple of industry.

Opinions of the natives regarding this system of cultivation.—Fortunately on this occasion I left the zemindar to supply the seed himself, so the next field to mine, which this man also has under cotton, can at once be compared with mine; and it is all the more so that, for reasons I cannot attempt to explain, my cotton plants, some six weeks ago, threw out a number of *red* blossoms while in next field they were yellow or white; so the people all said I have brought the seed from foreign countries, till the zemindar convinced them that he himself supplied the seed. Now, however, the blossoms are yellow and white, and very few red ones remain; so all doubt on the question of seed has vanished.

They fear enhanced land rent.—Concerning my objects in making the experiments, I regret to say that the old story still prevails, though I think not so universally as it did last season, namely, that I am making these experiments with the view of enhancing the land revenue, which is, in the Delhi and Kurnal districts, now being settled, as the people see that I am in no way connected with this department; so I trust next year a number of zemindars will be induced to try the Egyptian system themselves,—and in one instance this has been done.

Experiment conducted by a zemindar.—Near Lursowli, at the 32nd mile from Delhi, Lalla Narain Dass, my Assistant, got a zemindar to try a small patch, about one-fourth of a beegah, on the Egyptian system.—this man having seen the wheat experiment at Lursowli last cold season. He however did not do the sowing properly, and it was rather late in the season also. The Sub-Overseer, however, by judicious thinning, was able to make something of it, though the zemindar thought all was ruined by so doing, and the yield will probably exceed 200 lbs per acre; but, being private property, I cannot have the power of testing the yield of this field. It was however most gratifying to me to see the pleased countenance of this zemindar when I visited this field, and to hear him say that, though by my plan there were not one-fourth the number of plants, yet it was *doogna fidah* (twice as profitable) than the old system. He said he would try a lot of cotton next year, and that he would have one of his fields sown with wheat this rubbee, now at hand.

Favourable impressions on the native cultivators.—From the above, therefore, it will be seen that a good impression is being made on the minds of the native cultivators, which, if encouraged, cannot but lead to satisfactory results,—and this in a much shorter space of time than many are prepared for,—as few people are more alive to their own interests than the natives of India, once it is clearly shown them that this or that is profitable.

Favourable impressions on the native cultivators.—In fact, my Sub-Overseer, Zoolficar, says that a great number of zemindars have visited the fields near Ambala, and hundreds of them say they will try this system next season; so all that appears wanting is encouragement in some shape or other,—such as remissions of land rent for the first season where they give the system a trial.

No. 2 experimental field, 18 miles from Ambala; giving details.—To return to the cotton fields near Ambala at the 102nd mile, or 18 miles out of the station. A zemindar, called Suhoo, was persuaded to give his field for trial, he getting all the produce, and I guaranteeing him against any loss. The field measures 130 by 95 = 12,350 square feet, or two-sevenths of an acre nearly. The field was watered on the 22nd May 1871, ploughed four times, and, after making the furrows, the seed was put in the same as in other cases two feet apart on the ridges, on the 27th May. Nine days after, the plants had all sprung up, when manure was spread over the field, and on the 9th June this field got a watering; so as the rains began the following day, there was no more watering till September, when it got water twice; but during the interval it had been weeded four times, and twice more in September, or in all six times; and on the 24th June a little more manure was spread over this field.

No. 2 experimental field, 18 miles from Ambala; giving details.—Up to the end of July this was the most promising field of all,—the plants looked like goosberry bushes, but on the 2nd August the flood caused by the overflow of the Markunda river found its way to this field, six miles away from the river, and stood at a height of three feet above the ground for three days. This injured all the plants very much, killing nearly one-fourth of them; but there still remains 1,500 from two and a half to seven feet high; so in spite of the injury done by the flood, the yield is expected to be at the rate of 300 lbs. of clean cotton per acre, as each plant has on an average about 150 blossoms,—one as many as 275 of them. Picking began on 15th September, and the first month 34 seers of "kapas" had been collected, or about the rate of 80 lbs. of clean cotton per acre.

No. 3 experimental field, with photograph attached.—At mile 108th, or 12 miles from Ambala, is another field, measuring 138 by 97 = 13,386 square feet, or about five-sixteenths of an acre. This field was once manured, three times watered, and four times weeded. Up to the 16th October the yield of "kapas" was half a maund; and the probable yield will, it is said, be over three maunds, or 80 lbs. of clean cotton, which gives a rate of 256 lbs. per acre of clean cotton.

No. 3 experimental field, with photograph attached: native opinion and increased length of fibre.—This field also got flooded, which injured the plants considerably; yet for all that, to compare this field with those sown on the native system near it, is most satisfactory, or, as the owner of the field said to me, it was a capital "turkeeb." What perhaps pleased me here, most of all, was to find that the length of staple of my cotton, grown from the Bahalgurh seed of last year, exceeded the length of that grown on the native plan at least one-third.

No. 4 experimental field, with photograph attached.—The next field is situated at the 111th mile, or nine miles from Ambala, on the land attached to a European rest-house. The ground is good, and has been under grass for the last ten years; and this experimental field measures 195 by 100 = 19,500 square feet, or nearly nine-twentieths of an acre. The peculiarity about this field is that it was neither manured or irrigated,—only weeded six times. There are 3,000 plants, none exceeding eight feet, or less than two feet in height; and one of them has had no less then 370 blossoms—the least being eight, the average being about 150; and the height of the plants averaging about four feet.

No. 4 experimental field, with photograph attached; native opinion.—Up to the 19th instant the yield has been from this field one maund 10 seers of "kapas," and from four to five maunds are expected, or for a whole acre say ten maunds, which would give an

average of clean cotton of 200 lbs. per acre. The zemindars have perhaps been more surprised at the result of this experiment than with any other, as it proves that *care* is the great thing required; and many say that they will next year sow one-fourth the area with cotton, and bestow four times the care on it, and still get the same yield; thus they will have the remaining three-fourths for other crops.

Total area of experimental fields, and probable results.—Not to lose sight of the foregoing, I will now recapitulate—

		Md.	s.	c.	
No. 1 field, equal three-fourths of an acre, expected to yield	..	5	0	0	clean cotton.
„ 2 A. belongs to a zemindar, and cannot be tested.					
„ 2, equal two sevenths of an acre, expected to yield	..	1	6	0	„ „
„ 3, „ five-sixteenths „ „	..	1	0	0	„ „
„ 4, „ nine-twentieths „ „	..	1	20	0	„ „
Total	..	8	26	0	

Equals total, one and four-fifths acres— ...666 lbs.

or an average, on the whole of 370 lbs. per acre from this season's experiments.

Want of rain in September and October.—Had there been a shower of rain at the end of September or the beginning of this month, the average would have been still greater; but, should the ultimate result be that the Indian cultivators, by the introduction of this Egyptian system, can only produce half this average, what a boon it will be both to India and England!

Further experimental patches near bungalows.—In addition to these experiments, I tried several smaller patches, two of which were completely destroyed by floods, one, the most promising, by stray cattle, and the others, by squirrels and parrots, were much injured owing to the number of trees which afforded them shelter, as well as deprived the cotton plants of the direct rays of the sun; so that the plants, instead of spreading out like goosberry bushes, were tall and lanky—all the more ready to be broken by squirrels and parrots, which last year at Bahalgurh were the cause of annoyance.

Further experimental patches near bungalows.—None of these patches—four in all—will probably yield half as much as those fields that were not in the neighbourhood of bungalows as these were, which in itself is satisfactory, as people might say that experiments tried in bungalow compounds were only garden experiments, while those out in the fields were proper ones,—and this applies not only to the ignorant native, but the educated European.

Willing aid given by the establishment.—In experiments of this nature it would be impossible to succeed without a hearty support of one's establishment; and this I have been fortunate in securing, all taking as much interest in their success as myself; so my share has been more of encouragement than anything else. By persuading several zemindars to carry on the work (I guaranteeing them against loss) enabled me to conduct the experiments at an insignificant outlay, as I only have, up to the present, advanced from private funds the small amount of *ten rupees*, while a little over an acre of Government land, which would otherwise have been in grass, and for which the rent would hardly have been Rs. 1, is all that can be directly due to Government on account of the experiments which promise to give such favourable results,—a future report of which will be submitted at the close of the cotton season.

P. S.—Owing to sickness in the office establishment in the first instance, and the promise of a friend to take photographs of the cotton fields, the submission of this report has been delayed.

The photographs are herewith attached, which will show the present state of the field at Shahabad, referred to at paras 18 and 19 of this report, and also of the field spoken of at the 20th para, where there had been no irrigation or manure.

Regarding the field 20 miles out of Delhi, in the last report received, the Sub-Overseer, Chokee Lall, informs me that up to the 24th October the yield of clean cotton was at the rate of 185 lbs. per acre, and during the last six days (from the 18th to the 24th) the yield had been 57 lbs., or a rate per acre of nearly 10 lbs. daily; so, if the frost or some other unforeseen cause does not injure this field, there is every prospect of having 500 lbs. per acre. I may add that the Sub-Overseer's *urzie* states that the plants are now so thickly interlaced that the coolies employed in picking have some difficulty in moving up und down the furrows.

From C. M. Rivaz, Esq., Offg. Under-Secretary to Government Punjab; to the Offg. Secretary to Government, Punjab, Public Works Department, No. 898, dated 11th December 1871.

THE undersigned is directed to acknowledge the receipt of Mr. Login's report on cotton cultivation, forwarded with Public Works Department No. 5636, of the 27th ultimo, and to state that His Honor has perused the report with interest, and has directed its publication in the *Gazette*, and copies to be forwarded to the Government of India in the Department of Agriculture, Revenue, and Commerce.

From C. M. Rivaz, Esq., Offg. Under-Secretary to Government, Punjab; to the Secretary to Government of India, Department of Agriculture, Revenue, and Commerce, No. 899, dated 11th December 1871.

IN continuation of my No. 643, dated the 23rd September last, I am desired by His Honor the Lieutenant-Governor to forward six copies of a further report by Mr. Login on the experimental cultivation of cotton.

SEASON REPORTS.

MR. H. RIVETT-CARNAC, under date the 30th December 1871 sends to the Secretary of the Bombay Chamber of Commerce the following report on the state of the weather and prospects of the cotton crop in the Central Provinces and the Berars.

Mr. Nago Rao, in his report, dated Oomraotee, 25th instant, writes as follows:—

"I have the honour to report that during the past week ending 23rd instant the weather continued to be cloudy, and a little rain also fell at Oomraotee and in its neighbourhood on the 22nd idem at night; but the fall amounted to only 10 cents at Oomraotee, and consequently it was not sufficient to do any good to the rubbee crops of the country. Since then the days are somewhat cloudy, but the nights are pretty cool.

"While passing from Oomraotee to this place through Mortizapore, I found that in most of the cotton-fields on the road, the picking of *kapas* was entirely over, and that *jowaree* also was reaped and gathered. I met with no rubbee crop, save a few fields between Mortizapore and Karinjah, but between Oomraotee and Mortizapore I perceived that in most of the fields wheat was suffering much from want of moisture, and the plants in many places looked somewhat withered. Gram and other rubbee crops looked to be in better condition, but they were not as fresh and healthy as they should have been by this time of the season.

"The reports which I have received from the different parts of the East Berar country indicate that the cultivators are engaged in picking and ginning *kapas*, and that the rubbee crops of the country are suffering from want of rain."

Mr. Beck, the Superintendent of the Farm at Oomraotee, writing on the 23rd instant, says:—

"The weather during the past week has been cooler, and a few clouds have been passing most days. A heavy shower appeared to have fallen in the east last evening. The crops during the week have made little improvement. The bolls of cotton now opening are small and few. The Hinguughaut plants will be finished first: they are now nearly leafless; they have not stood the season so well as the Bunnee. The Borda Jurree plants are healthy and strong, but will give a small out-turn: one-fifth of the bolls are opened with little *kapas*, some not yielding any; they are one month later than Bunnee and Hinguughaut, and I think they would do better where there is a greater quantity of rain. The gram on the farm, as compared with other crops, is about equal; wheat, lac, and *alsee* are below the average crops about here. The cultivators' fields of wheat are looking well: they have not gone back this last three weeks as they had done before. The good fields are looking well, and the worst have not improved: they appear to fall off most during the growing season. The linseed has not come up well: the temperature being hot and the soil of a very close nature have been against it. I am making another sowing on loose soil, where I think I shall be more successful."

And Mr. Lloyd, at Lakpooree on the same date, reports as follows:—

"Very little change has taken place since my last visit. Cotton picking is still going on in a few fields, but in most of the fields it has been all gathered. In our fields a small quantity remains to be picked, including the Dharwar. Egyptian, Sea Island, Peruvian, and Nankin will give nothing this season, but in a favourable season I have no doubt they would do well. All the *jowaree* has been cut in our fields, but a little still remains standing in the districts. The rubbee crops are about the same as when I last saw them. The wheat is dying off in places; about one-third of the crops has gone off, and the remainder is very small. The caterpillars which had attacked the grain are not so numerous as they were, but as it is they have done a great deal of damage to the plants. Linseed is looking better and is in flower; lac is pretty good and is coming into bloom.

"The temperature during the past few days has been rather lower. A little rain fell at Oomraotee last night, but not enough to do any good to the crops."

Mr. Dunlop, writing on the 25th instant from Booldana, reports as follows:—

"Since the date of my last report, I have had an opportunity of seeing something of the crops above the ghauts in the Booldana district, and from what I have been able to learn, they are certainly somewhat better than those in the plains, but still far from what they should be.

"We were threatened with rain three days ago, but happily for the sake of the cotton, the clouds passed away. Putting cotton out of the question, it is seriously to be regretted that rain has not fallen at this time; for the water-supply of the country is at a very low ebb, and during the hot weather the distress on this account will be very great.

"Cotton comes very slowly into Khangaum, but I expect to see larger arrivals from the beginning of January, as the cultivators will then realize as much as they can in order to pay the first instalment of the land-revenue, which falls due on the 1st proximo. The receipts at Khangaum up to the 22nd instant, when I was there, amounted to only 1,600 *bejahs*, much of which was supposed to be old cotton.

"Mr. Pillan's report is annexed. The crop on the farm is being gradually secured, and I was pleased to learn some days ago that our best field has

yielded up to date 101 lbs. of clean cotton per acre, which, in so poor a season, is a large out-turn. It was irrigated in the beginning of the season, but it received so little water that I attribute the large out-turn to the ploughing more than to the irrigation."

"*P.S.*—I have just received the following statement of the exports of cotton from Khangaum by railway up to the 16th instant. The figures are:—

Full-pressed Bales.	*Half-pressed Bales.*	*Dokras.*
2,093	128	51"

And Mr. Pillans, the Superintendent of the Farm at Sheagaum, in his report of the 23rd instant, says:—

"The work has not differed from that of last week—the chief being picking the growing cotton, cutting and thrashing and winnowing *jowaree*, weighing and stacking *kurbee*, and irrigating. There are 4,123 lbs. of *kapas* picked up to date, which is chiefly Bunnee and Hingunghaut; Jurree is just commencing. Some of the fields show pretty well.

"The cereal crops are not promising well at all: the wheat and gram does not look well; lac is fair, and about the best of any cereals I have; linseed and safflower are fair. The young forest-trees and bamboos are all doing well. The weather of the past week has been fine, with cloudy days. Our total rainfall up to date is 12·70 inches."

Mr. Noble, in his letter, dated Nagpore, 20th instant, thus reports:—

"Since my last report the weather has been fine, the afternoons being generally cloudy; but I do not think there is much chance of any rain falling shortly, as the nights and mornings have been getting considerably colder. My marches since my last report have been:—

16th, Saongee to Nachangaon.
17th, Nachangaon to Bairool.
18th, Bairool to Dhanori.
19th, Dhanori to Dalwalwara.
20th, Dalwalwara to Arvi.

"The state of the crops remains unchanged; there is still a considerable quantity of cotton unpicked, and the *jowaree* is now being cut on all sides. In the district through which I have just passed, the *khurreef* crops (crops of the autumn harvest) have on the whole been good—in some parts very good—as may be judged from the fact that at several villages, including the villages of Nachangaon and Bairool (the acreages of the land attached to these being of considerable extent), the Malgoozars when questioned have at first answered that the cotton and *jowaree* crops have been very good, being full 'sixteen-anna' ones. In villages where perhaps the land is not quite so good, the crop is generally considered to be a 'twelve-anna' crop, which in reality means a very fair average one. I wish I could say the same of the *rubbee* crop (spring harvest); this I am afraid will be as bad as the *khurreef* in this part has been good. Many cultivators say that it will be as much as they will get if they get the amount of seed sown; while others say that certain fields will give a 'twelve-anna' crop, and others an 'eight-anna' one. From my own personal observation, I should say that unless rain falls very shortly, the poorer fields, the soil of which is unable to retain moisture for any length of time, will certainly not yield very much more than was sown, but the number of such fields in this part is in the minority, and I think that the average yield will be nearly an 'eight-anna' one. Several of the more forward fields are now in ear, and consequently rain would be of no benefit even to the more backward fields, unless it comes within a few days."

Prospects then are about the same. In fact, as far as the quality of the cotton-crop is concerned, no change either for the better or the worse is to be expected. Heavy rain now might stain and thereby affect the colour and quality of the crop, but would in no way affect the out-turn.

THE WEATHER AND THE CROPS.

WESTERN INDIA.

Report of the general character and prospects of the season 1871-72.

Poona Collectorate.—The fall of rain during the season under report was much below the average. The out-turn of the khurreef crops in the western districts has been fair except in the talooka of Joonere, where it is reported to be no better than eight or nine annas in the rupee. The rubbee crops throughout the collectorate were at first very unpromising, but a slight fall of rain in the month of November benefited them. The yield will, it is feared, be but indifferent. The out-turn of rubbee in talooka Indapoor will, it is reported, be about eight annas in the rupee, and in Bheemthurry even less. For want of sufficient rain, failure of water in some places of the Haveilly talooka is anticipated. Fever and ague have been prevalent in a few villages in the talookas of Bhimthurry, Serroor, and Indapoor. A few cases of sporadic cholera have occured here and there. Cattle-disease in a few villages in Mawul. The total fall of rain registered up to the end of the 31st December last was:—In Joonere 21 in. 75 cents; in Hurkulla 61 in. 14 cents; in Patus 12 in. 20 cents; in Baramuttee 11in. 97 cents; in Pour 60 in. 87 cents; in Seroor 11 in. 25 cents; in Kheir 19 in. 1 cent; in Ghoreh 18 in. 20 cents; in Indapoor 10 inches only; in Shapoor 15 in. 18 cents; in Poona 21 in. 8 cents.

Sattara Collectorate.—The fall of rain was scanty. The khurreef crops however yielded on the whole a tolerably good harvest, the rubbee crops promise pretty well, but if they be not favoured with an early fall of rain, they also will greatly suffer. In these talookas owing to a general want of rain, the sowing of khurreef crops in most parts did not take place at all, and where they were sown, they yielded but a very scanty harvest. The rubbee crops where sown are withering for want of the late rain which failed almost throughout the whole of the district. Fever and cholera prevailed to a certain extent, but very very few persons died of the latter. It has now disappeared. Disease among cattle existed in some of the talookas. The fall of rain was:—In Mahableshwur 188 in. 90 cents; in Sattara 30 in. 21 cents; Jaolee 54 in. 61 cents: in War 18 in. 81 cents; in Koregoan 20 in. 93 cents; in Pahtun 45 in. 35 cents; in Kurrar 17 in. 42 cents; in Malwa 22 in. 41 cents; in Shirala 22 in. 71 cents; in Khundala 8 in. 21 cents; in Tasgoom 17 in. 44 cents; in Khanapoor 12 in. 63 cents; in Mann 13 in. 64 cents; in Khutow 17 in. 68 cents; and in Malseerus 9 in. 9 cents.

Ahmednuggur Collectorate.—For want of sufficient and seasonable rain the khurreef was sown to a very small extent, and with the exception of that in the Parnair and Ankola talookas, where the crop may be considered an average one, the khurreef crop has entirely failed. Rain fell in September, and a large area of land was sown. The fall was not, however, universal as in portions of the district, especially along the course of the Godavery, the rain was not sufficient to enable the cultivators to sow, and considerable tracts of land remain absolutely barren. Rain fell in November, which greatly benefited the crops, but it was partial, and in many parts insufficient to secure a crop. The yield of the rubbee may be estimated at half the average. Many crops have been saved by well irrigation owing to the heavy fall of last year, and to the fall in January of the present year, the wells give a better supply of water than would be expected from the monsoon fall. Many fields have been saved by irrigation from the Lakh canal and the Bhatoodee tank. The grass is insufficient for the live-stock, and in the worst parts of the district, what small supply there was, has long since been exhausted. The state of public health has been generally good. Cholera prevailed to a slight extent in some talookas, and a few deaths occurred. Cattle have died from want of fodder, and are still suffering. A number of cattle have been removed to other places. In some villages of Sumpgaom, Kopergaom, Sewassa, and Sheagaom, many people have left their houses. It is apprehended there will be scarcity of water.

MISCELLANEA.

HOW DAIRYING IS CARRIED ON IN AMERICA.

The butter and cheese factories of New York State number 944, and are supplied daily with milk from 240,000 cows. In the seven States of Ohio, Illinois, Wiscousin, Vermont, Massachusetts, Michigan, and Pennsylvania, there are 258 factories supplied daily with milk from 2,400 cows. It is estimated however that there are in the United States 1,300 butter and cheese factories, supplied with the milk of 300,000 cows, and producing about 100,000,000 lbs. of cheese, and the same number of gallons of milk. Every 300 cows therefore yield every year 100,000 lbs. of cheese, valued, it is stated, at 140,000 dols.; so that each cow yields 333 lbs. of cheese, valued at 47 dols. The export of American cheese to Great Britain in 1853 amounted to 1,000,000 lbs., and this quantity in 1870 had increased to 57,000,000 lbs., valued at 8,000,000 dols.

DIARRHŒA IN CATTLE.

This affection is caused by the change of food, the introduction of acrid herbs and other irritating substances into the bowels, long drives in hot weather, or by rapid change of temperature, lying out on the cold, wet ground, &c. Sometimes it makes its appearance without any obvious cause, while the animal is apparently doing well and fattening. The conditions under which the disease makes its appearance must always be observed. If the animals are weakly, as the generality of them are when attacked by diarrhœa, a tonic in the shape of an ounce of gentian, and a drachm of ginger, twice daily, mixed with a pint of water, or, what is better, a pint of beer, with a change of food, and an occasional walk about the yards for exercise, if the animal is not too weak, will effect a cure. If you have reason to believe that the disease is caused by some irritant in the alimentary canal, give a ½ lb. of epsom salts, or a ½ pint of linseed oil. If it comes on suddenly, with much fever, opium 1 drachm, calomel every three hours, until the symptoms subside. If it has been of long standing, use sulphate of iron, 2 drachms catechu, 1 drachm two or three times a-day, adding now and then a ½ ounce of gentian and a ½ ounce of ginger. If while using calomel the mouth should become sore, desist immediately, as the system is now under its influence, and can be of no further use; continue to use the opium, however, until the symptoms abate; feed liberally, give plenty of water, good bed, &c. Always give cattle medicine out of a bottle in a fluid state; pour it slowly down the throat.

SEASON REPORTS, DECEMBER 1871.

GENERAL REMARKS.—The rice crops have been harvested generally throughout India, with the exception of Coorg.

All through Central India, Oudh, and the Punjab, anxiety is felt regarding the rubbee crops, which have suffered in parts for want of the usual winter showers. The weather in all these provinces is reported to be cloudy and unsettled.

In British Burmah, Madras, and Bengal, the crops are reported to be fair and promising, though, in a portion of the Cuttack country between the Chilka lake and the sea, there has been extensive failure, and some apprehension of distress exists.

The cotton prospects continue to be discouraging in Khandeish, Nassick, and the Deccan, and to some extent in the Southern Mahratta Country. The accounts from other parts of Bombay are, on the whole, favourable.

Cattle disease has appeared in the neighbourhood of Mundla and Jubbulpoor, and in a limited area in the Punjab.

Presidency or Province.	District	Date of District Report.	Rain-fall for fortnight preceding.	Date of Report from Local Government or Administration	State of Agricultural prospects.	Remarks of Local Government or Administration.
Madras	Ganjam	December 17	*Nil.*	December 21	Water supply failing in places ; migration from tract suffering from drought ; market well supplied ; health good ; prices high but slightly falling.	Government considers the promise of the season to be good except in parts of the Northern Circars. The markets are well supplied by local produce or imports. Prices are rising generally owing to the demand for distant markets, and in the North from partial failure of crops.
	Vizagapatam	„ 20	*Nil.*	.....	Markets well supplied : health good ; prices slightly rising.	
	Kistna	„	*Nil.*	... .	Dry crop good ; wet crops not satisfactory in parts ; markets fairly supplied ; prices steady ; large exports to Hydrabad Country.	
	Kurnool	„ ...	*Nil.*	.. ..	Dry crops fairly good ; wet crops suffering in parts : prices have slightly fallen.	
	Negapatam	„	3·53	.....	Prospects favorable ; prices rising.	
	Trichinopoly	„ . ..	2·26	.. ..	Crops in good order ; harvest below the average ; prices rising.	
	Calicut	„ 19 . ..	0·66	. ..	Prospects good ; prices low but rising.	
Bombay and Sind	Hydrabad (Sind)	„	*Nil.*	December 21 . ..	Districts healthy ; no cattle disease. Agricultural reports favorable, but cotton has suffered from frost. Indus at low level.	
	Kurrachee	„ 20 .. .	...	... ..	Cotton indifferent.	
	Shikarpore	„	...	... .	Cotton fair.	
	Jacobabad	„	...	....	Cotton good.	
	Goozerat	„	*0·03	. . ..	Cotton good ; late crops favourable, slightly damaged in Broach by cloudy weather.	* In Ahmedabad.
	Khandeish	„	*Nil.*	.....	Weather cooler : grain crops middling ; cotton bad.	
	Nassick...	„	...	.....	Early crops middling ; late not flourishing : cotton prospects bad.	
	Deccan	„	...	.....	Cotton prospects discouraging ; late crops failed in places and withering.	
	Southern Maratha Country ...	„	...	.....	Cotton generally middling : late crops withering in Kulladghee ; elsewhere partially good.	
Bengal...	Dacca Division	December 6	*Nil.*	December 20 . .	... Rice nearly all cut; winter crops promise well.	
	Patna „	„	„	„ ...	... All going on well.	
	Burdwan „	„	„	„ . .	... Amun reaped. Winter crops good.	
	Cuttack „	„	„	„ ..	... Prospects of crops generally good. Almost total failure has, however, been reported from Parikood, Malood and Budgerkote between the Chilka Lake and the sea. People very badly off, with neither food nor money to buy.	Loan to Parikood Rajah for Rs. 10,000 applied for by the Commissioner to be expended on works and improvements. Advance of Rs. 1,000 on this account has been sanctioned.
N. W. Provinces	.....	.....	*Nil.*	December 21 .	... Crops as before.	
Punjab	Delhi	December 20 ...	*Nil.*	„	Weather cloudy: rain much wanted.	The weather has been cloudy for the last few days ; a good general fall of rain now would be of inestimable value.
	Umballa...	„	*Nil.*	.	Rain much wanted: agricultural prospects gloomy.	
	Jullundhur	„	*Nil.*	.. ..	A good fall now would be in time for crops on favorable soils.	
	Lahore	„	*Nil.*	.....	Season for sowings on unirrigated lands almost past; great scarcity of fodder.	
	Mooltan	„	*Nil.*	.....	Agricultural prospects same as before; cattle disease prevails in Tehsil Serai Sidhu.	
	Rawul Pindee	„	*Nil.*	.....	Crops suffering.	
	Peshawur	„	*Nil.*	.....	Rubbee sowings progressing.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of Report from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
Oudh	Lucknow and Fyzabad... ...	,, ...	*Nil.*	December 21	... ...	The Chief Commissioner observes that the rubbee prospects throughout the province are favourable. The usual Christmas rain is wanted in parts. In the meantime the young wheat is being irrigated. Weather somewhat cloudy.
Central Provinces	Raipore	December 18	*Nil.*	December 21	Rubbee prospects depend on the usual winter rains; should these fail a very short crop will be obtained.	
	Belaspore	.....	*Nil.*	.. ...	Occasionally cloudy; rice nearly harvested; kodo, oilseeds and others reaping; rubbee crops require rain.	
	Sumbulpore	.. ...	*Nil.*	.. ...	Rice harvest much below the average.	
	Nagpore	December 20 . ..	*Nil.*	.. ...	Cloudy weather for some days has affected the khureef and rubbee crops; jowaree and tur harvest poor; rice partially failed; rubbee wheat in some places drying for want of moisture; gram and lak slightly injured; prices of grain falling.	In the Nagpore and Chutteesgurh Divisions the rubbee crops will fall short of the average even if rain comes; it has held off too long. In the Jubbulpore and Nerbudda Divisions prospects are more favourable, but rain is wanted everywhere.
	Wurdha	.. ..	...	.....	Khureef crops fair; cotton good; some anxiety for rubbee crops from absence of rain.	
	Jubbulpore	December 20 . ..	*Nil.*	.....	Prospects of rubbee in good soils promising, but rain is needed; weather cloudy. Cattle-disease prevalent in Mundla and Jubbulpore.	
	Hoshungabad	..	*Nil.*	.. ..	Prospects continue favourable; a little rain would do good.	
	Baitool	.	...	.. ...	Same as above.	
	Nimar	.	...	.. ...	Khureef good, rubbee bad.	
	Nursingpore	.	..	.. ...	The want of rain and the cloudy weather are affecting the rubbee crops.	
Hydrabad Assigned Districts.	East Berar	December 21	*Nil.*	December 21 . .	... In the southern portion of Oomrawuttee District the Commissioner says he sees the rubbee crops withering. The short fall of rain, absence of dew, and the recent great heat are destroying them. However, the percentage of rubbee to the total cultivation is small. In the Woon District also, in the north of the district, prospects fail. Christmas rains are hoped for.	
	West Berar . ..	,, 18 . ..	,,	.. 20 ...	.. No rain, and consequently no improvement in agricultural propects. Khureef almost reaped. Rubbee crops suffering from want of rain.	
Central India..	Indore	December 20 ...	*Nil.*	,, 21 ...	... Prospects in Malwa are fair, but southwards and below the Vindyhas the want of rain is much felt, and the wells have little in them.	
	Gwalior	,, . ..	.	.....	Weather changeable; rain wanted.	
	Rutlam	..	...	.....	No return.	
	Baghelcund	.....	...	.....	No return.	
British Burmah	Akyab	December 20 . ..	0·7	December 21 ...	... Crops in good condition.	
	Rangoon	,, . ..	*Nil.*	.....	No change in crops.	
	Thayetmyoo	,, ...	*Nil.*	.....	Fair.	
	Tounghoo	,, ...	0·16	.....	No alteration.	
	Amherst	,, ...	*Nil.*	.... .	Most part of crops reaped; no damage since last report.	
Mysore and Coorg	Bangalore	,, 21	*0·25	December 21 ...	... Crops favourable; raggi harvested; paddy being reaped.	* Very little rain in the district and only twenty-five cents in the Bangalore Cantonment.
	Mysore	,, 19	*Nil.*	.....	Crops thriving throughout the district.	
	Coorg	,, 21	*Nil.*	.....	Paddy ripening fast and a good crop generally expected; reaping has commenced in some parts of South Coorg; horse and Bengal gram crops thriving; coffee berries being picked on European estates.	Agricultural prospects good.

The Planters' Gazette.

BOMBAY, 22ND JANUARY 1872.

THE ESTATES.

THE *Indian Statesman* makes the following observations upon the present system of pruning coffee in India :—

"THE growth of coffee in India has been so unfortunate an enterprise hitherto, that planters would do well, we think, to review closely every step of the system upon which they have hitherto gone. Are they quite sure, for instance, that their present system of *pruning* is correct? That it is a direct of interference with the natural development the tree is admitted. Are the planters then quite sure that this interference is not carried too far? A late visitor to the Neilgherry Plantations, writes :—

"My impressions, whilst riding or strolling through the different fields of coffee on this splendid property, were those of admiration at the vigour and luxurious growth of the tree, the dark glossy green of its leaves, and the uniform healthy appearance of the whole, *but I was much struck* and surprised at seeing so little fruit. I believe the crop on the trees will not exceed 5 cwts. an acre all round, even if it reaches that low figure; and this estimate was endorsed and confirmed by my companion, a planter of 15 years' experience. This small yield seems attributable to the system of pruning now in vogue in the district, by which the very best parts of the tree are cut away; this is followed by what is elsewhere properly termed "handling," but here the knife is again used, and melancholy indeed is the effect upon the condition of the tree. It is matter for very grave consideration how much this system of pruning has to do with light crops. It is undeniable that *judicious* pruning has a wonderful and surprising effect on the bearing capabilities of the coffee tree, but climate, soil, and the seasons, exercise a greater influence in producing crops, and I venture to affirm, that if less wood were taken from the trees and more done in the way of cultivation, *i. e.*, trenching, terracing, renovating pits, &c., that the soil of this estate, with the stamina which it possesses, together with the natural advantages of its climate, would yield an average of 10 cwts. an acre for the next quarter of a century, without exhaustion, and with double profit to its owners."

We commend these suggestions to the attention of the planter. It is quite within the range of likelihood, that in remorselessly pruning the tree down to a convenient height for 'picking,' its fruit-bearing powers may be seriously interfered with."

For further information upon this question of pruning coffee trees we refer our readers to the back number of this journal for September 1870, wherein the subject was discussed by several correspondents.

TEA ESTATES.

THE *Darjeeling News*, in taking a retrospective view of the general agriculture of the district during the past year, says :—

One of the most noticeable features, perhaps the first, that strikes us on looking around Darjeeling is, that while our monsoons are characterised by an unabated heavy rainfall and our winters continue to be severe,—severe enough to render good fires indispensible in our dwellings, many of the hill sides in the vicinity of the station are beginning to look miserably bald owing to the rapid clearance of their covering of ancient forest timber, the timber which a few years ago it was doubtless imagined would afford a practically inexhaustible supply of the needed firewood. This alarming denuding of our hill sides, directly consequent on the clearing of ground for the irrepressible tea plant, has already told seriously on the selling price of firewood which has risen 25 per cent. in the station within the year. Let us note this now, for as time runs on firewood must necessarily become a seriously expensive item in our domestic economics, unless our expected railway brings with it coal to our rescue! The Forest Department it is true, has large reserves of forest land in the district; and the Darjeeling Municipality is still in the ownership of a most picturesque forest close to the station—but to cut down that forest would be a mortal sin—and we dont know that the Forest Department have as yet founded any definite intentions respecting its preserves.

Passing on from forests to the at present all-prevailing industry of these hills, tea cultivation, we are glad to note the general verdict—that it flourishes. The progress in the year which is just about to expire, has, perhaps, been less apparent because less spasmodic, but probably more real than in many of the years which have preceded it. The prices of this season's crops have, on the whole, maintained a favourable stand, and the time seems to be at hand for capitalists to declare, with truthful confidence, that tea growing here must be regarded as one of the remunerative "developments" of British enterprise. The rapidly increasing empoloyment of machinery in tea houses may also be regarded as significant of the *permanent* character of the investments made in the tea spec, and with rare and insignificant exceptions the gambling spirit in which so many speculators made their first rush at tea has disappeared. We are bound to say, indeed, that none of the Darjeeling planters now-a-days look upon their business as other than that in which their future income for life must be obtained. Tea manufacturing is no longer the temporary task from the performance of which a sudden and rapid fortune can be made, by a "clever" sale of stock and block, at an exorbitant price.

In some few instances lately comparisons have been instituted between the Darjeeling and the Assam and Cachar teas, showing unfavourably for Darjeeling. But while we are inclined to suspect that this is partly due to the existence of unworthy jealousies, or party-spirit in trade rivalry, its wholesome effect on our Darjeeling planters ought undoubtedly to be the prompting to renewed enquiry into the cause of shortcoming and of excellence, and increased activity in the effort to excel.

The cinchona gardens, both those of Government and of the Cinchona Association, are reported to be doing well, and the former has lately passed into the charge of a new Superintendent, Dr. George King. We have not yet heard what success has attended his efforts in manufacturing quinine, but we apprehend that this branch of the business will tax the utmost skill of the best manipulative chemists in the service of Government.

TEA.

THE prospects of tea-planting in these provinces are brightening. We have heard of a large parcel of green tea from the Western Dhoon, comprising four qualities, being sold lately at rates which gave over three shillings per lb. for the higher sorts, two shillings nine pence for medium, and two shillings two pence for the worst. We need not say that these prices are splendidly remunerative.—*Pioneer.*

PRUNING OF TEA :—BY GEORGE KING, M.B., F.L.S., LATE DEPUTY CONSERVATOR OF FORESTS, KUMAON.

(From the Journal of the Agricultural and Horticultural Society of India, Vol. III., Part 1.)

LET us now consider for a little what the systematic "plucking" of the tea plant really amounts to, and what it is that the planter demands of the bushes in his garden. In the operation of "plucking" the plant is regularly deprived, during the season of active vegetative activity each year, of its young expanding leaves, and of the growing extremities of its branches. In other words, it is systematically deprived of the parts that are at once the organs of its digestion and the instruments of its growth, as fast as it provides itself with them. Were the deprivation complete, the plant would simply die. But, even in the most over-plucked plantations, it is only partial. Not only however does the planter thus continuously deprive the plant to a serious extent of the very organs of its life and growth, but he demands that it shall continue for a series of years to be submitted to this process, and still to continue healthy and vigorous, or as he phrases it, to give good "flushes." Observe too the kind of leaves that the planter chooses to pluck. They are not old mature leaves, whose vital functions are sluggishly performed, and whose best days have past. The tea plant being an evergreen, a large proportion of such might be removed without injury. It is not these however that are taken; but the young and growing, in which sap circulation is rapid and free, in which the vital processes are carried on with vigour, and to which the young branches bearing them, and indeed the whole plant look chiefly for the materials of life. Where, as in the North-West Provinces of India, the planter has asked the plant to yield up these for a succession of years, while he on his part has given but small help in the way of manure and tillage, and denied even the cheap aid of the pruning-knife, it is not to be wondered at that tea planting has proved unsuccessful.

Inasmuch as the plant is a perennial one, from which are annually gathered the majority of its growing leaves, the tea crop differs from every other with which we are familiar, except perhaps mulberry, which, as food for silk-worms, is also grown for its leaves. Most garden vegetable crops of which the leaves are the parts gathered, are the produce of plants which are expected only to yield a return to the grower once in their lives, (*e. g.*, Cabbage); or a return for a short season, (*e. g.*, Brussel's Sprouts), and then to die. They therefore present no parallel case to that of tea. The returns desiderated in other perennial cultivations than tea, are usually flowers or fruit, (or what is the same thing—seed), but never young leaves. Now the bearing of flowers and fruit is the natural consumation of a plant's life, and the removal of these, after they have been produced, does no harm to the producing plant *as an individual*, (on the contrary often benefits it), although the act affects its possible posterity. It is true that, in order to force it to bear unnatural quantities of flowers and fruit, or flowers and fruit possessing unnatural qualities, the horticulturalist often exposes a plant to treatment which is injurious to it as an *individual*, and which leads to premature old age; at the same time it is treatment which, as regards flowers or fruit, is the most advantageous. In contrast to this is the action of the tea grower who, by the very collection of this crop, necessarily exposes his plants to treatment which, as regards a continuation of that crop, is disadvantageous.

In the cultivation of almost all kinds of fruit trees, the operation of pruning holds a prominent place. The problems respectively presented to the European grower of fruit and flowers, and to the Indian cultivator of tea, being different, it is only reasonable to expect that different methods of practising that operation would be advisable. The general practice of pruning, as carried on by European gardeners, is however founded, for the most part, upon a knowledge of the principles of vegetable physiology, and it is therefore also reasonable to suppose that Indian tea growers might have learnt a good deal on the general subject of pruning from European writers on gardening, even although not venturing to put their plantations under the charge of practical European gardeners, with full powers to do as they might deem best. Until within a year or two ago, however, the only kind of pruning attempted in the tea gardens of the North-West Provinces was the removal of wood actually dead, and the application, on rare occasions, of a hedge-clipping scissors, which delicate implement used to be entrusted to a native gardener (malee), with orders to reduce, by its means, certain bushes to a particular height, a stick of the required length being given to him as a measure. Indiscriminating treatment like this is the kind of pruning to which a few gardens in these provinces used now and then to be submitted. Rational pruning involves consideration and selection; and each bush ought to be treated according to its own individual condition, and not in accordance with a rule of thumb laid down for an entire field or garden. It is only certain stems and branches to which, as a rule, the knife can be applied with advantage, and these for the most part are the ones that afford the most marked examples of the natural effects of "plucking." Now if we think of the matter for a little, the process of "plucking" will be seen to be really of the nature of *pruning*, and to recommend pruning as a cure for the evils of plucking, may therefore appear paradoxical. To explain the seeming paradox, let us consider briefly the appearances presented by a young shoot of tea before it has been deprived by the plucker of its tip with the three or four leaves or leaf-buds born thereon. Such a shoot bears on its entire length let us say, ten leaves, and at the point where each leaf springs from the stem (*i. e.*, at the *axil**) there lies a small bud. Each of these buds is capable of development into a lateral branchlet. In a branch bearing as we have supposed ten leaves, it is not probable that, were things left to their natural course, each of the ten axillary buds would become developed into a lateral branchlet. When however the growing point of the shoot is removed, these axillary buds are stimulated by the ascending sap, and most of them expand into lateral branchlets, and these being in turn topped by the plucker, their axillary buds are stimulated, though in a less degree, into expansion into branchlets, and so on. The vigour with which lateral branchlets follow on "plucking" or topping the leaders, diminishes regularly with each repetition of the process, until after a few years of such treatment, a period of nearly complete stagnation is reached, and the original ten-leafed shoot, with which we started, presents the appearance of a tough greyish-barked and often gnarled stem, bearing at its top a dense collection of small wiry twigs, which carry a quantity of small thin tough leaves totally unfitted for manufacture into good tea. These twigs moreover are of such low vitality that when topped they hardly respond by throwing out fresh lateral shoots or "flushes." This is the kind of stem of which the clumps of unpruned tea already described consist. The reason of the smallness and non-activity of the leaves upon these brush-like masses, is simply that they have increased in number out of proportion to their means of nourishment. The stem, through the sap-wood layer of which their nourishment is transmitted, has not increased proportionally with the number of the leaves which have been forced into existence by the operation of plucking; and it is a physical impossibility that, through the layer of sap-wood in the stem, there *can* be transmitted enough sap to support many young leaves, in addition to the old ones with which its top is crowded. Were such a stem left to itself, and all plucking suspended for a time, it is probable that in some cases an equilibrium would be established between the leaves and sap-wood, and that the latter would again become extensive enough for the transmission of sap sufficient to support a natural succession of young leaves, or in other words, to "yield flushes." But the process of recovery would involve time, which to the tea planter means money. A quicker way therefore of obtaining leaf must be tried, and this is found in pruning off the profitless wiry spray with which the stem is crowned, so that the sap transmitted upwards may cease to be dissipated away in the support of leaves which can never be made into tea, but which as long as they remain on the plant must have their needful supply of sap; and further, that the sap may be directed into the new shoots which the plant may be expected to throw out after the pruning. It is thus that pruning becomes the necessary sequence of plucking, if healthy young leaves, fit for tea-making, are sought to be continuously produced. The end in view should never be lost sight of when using the knife, for the mere meaningless mutilation of a plant by its application, is quite as likely to be hurtful as not.

It is extremely difficult to get native workmen to understand the kind of stems and branches they are to remove, and it will require much ingenuity and care and incessant watchfulness on the part of a manager to keep them from doing harm. As is the the case with many other matters, it is infinitely easier to prune badly than to prune well; but there are few operations where the difference in results between bad and good work is more striking. In order to prune really well, each clump ought (as has already been said) to be treated on its own merits; but as it is pretty nearly hopeless to think of getting native workmen who are capable of doing this, it would be necessary for the manager (after having clearly defined to himself what it is that he wants to effect, and the best way of doing it) to give his pruners a general idea of the kind of measures suitable for each patch of tea in the garden as they come to go over it, illustrating to them practically what kind of stems and branches should be cut quite away, what kind should be merely trimmed, and what left entirely untouched.

It might be safely impressed on tea pruners as a fundamental maxim, *that old wood is to be cut away within a few inches from the root*, for it will generally be found that such wood bears no leaves of which good tea can be made, but merely the small thin sluggish sort that are carried by the broom-like masses of spray already described. As a rule then, the best thing that can be done with hard old stems is to cut them off low down, in the hope that fresh new shoots may, as a result, spring from the root or from the collar, as gardeners phrase it. By the removal of these, not only are a quantity of useless leaves prevented from preying on the sap, but light and air are secured for the young shoots that will spring up. In old unpruned plantations, or on such as have been over-plucked, the proportion of such broom-bearing old stems is very great. Clumps formed of them are often very handsome and healthy-looking, and thus are very deceptive. If a large clump be entirely composed of such brooms, it is a question whether a certain number of them should not be spared until a succeeding year, to carry on, as it were, the life-work of the plants, and not to trust entirely to the new start in life which a clean sweep of all would necessarily involve. When we consider the influence that leaves have in promoting the collection and transmission upwards of the crude sap, it does appear more rational to leave a certain number of these old stems for one season, so that by their means, sap may be attracted and elaborated for the benefit of the young root-shoots which may be expected to appear as the successors of the stems that may be removed. Stems thus spared ought however to be cut away in the next year, by which time the young shoots will have acquired some size, and will carry a number of leaves. If the mode be adopted of at once cutting down to the root the entire clump, the pruner of course accepts the chance of the roots sending up no young shoots at all, and therefore dying, a result which for reasons above explained, is quite possible, and the possibility of which should always be borne in mind.

In tea growing in unsuitable localities or in poor soil, and in tea which has been prematurely plucked, it is often the case that each stem in a clump represents a plant, (in other words that a plant consists of but one stem), and to prune entirely away such a stem would therefore be to cut down or coppice an entire plant which, as we have just seen, is to run the risk of killing it. A wise precaution in dealing with such weakly clumps would be, *first* to deep-hoe and manure the soil round them, so as to get them into a little better heart, then to prune gently, and finally to cut down by the root during the succeeding cold weather. It is of course a question whether it would not be cheaper in dealing with such unhealthy tea to run all risks, and to cut it down to the ground at once.

The old hard stems of which we have been treating may easily be recognised by the appearance of their bark, which, often gnarled, lichen-grown, and warty, is always grey in colour. Younger stems, on the other hand, are of a brownish colour, and often marked with

* Derived from the Latin word *axilla*, the arm-pit.

dark lines. If a clump is very thick and close, and the young stems are twiggy above and yield small leaves, some of them may be cut away by the root, but the majority of young stems should, as a rule, merely be trimmed a little by being relieved of their most wiry twigs.

In many clumps, there will be found springing straight from the root, a few long lanky shoots, which bear their leaves far apart, and do not branch. These have probably been unnaturally "drawn up," owing to want of air and light. They are never likely to be of much use, and if in the way should be removed.

Young and vigorous stems ought not to be touched with the knife.

It is not necessary to go into details with regard to the treatment of younger clumps of tea which have not been over-plucked, and which therefore do not abound in broom-bearing stems.

The general principles already insisted upon should be carried out, and after the pruner has finished with it, each clump ought to consist of young healthy stems with fresh looking bark which do not branch too much, nor end in the wiry spray so often alluded to. The height and circumference of clumps will depend on their age, and on site and soil. Each clump should be open and sparse enough to admit air and light to its centre, and no particular form should be insisted on as a pattern to which all are to be made to conform. Each should, on the contrary, be of the form most suitable to its condition and requirements. Experience alone will teach the comparative severity or lightness of pruning which will be most advantageous to the different varieties of the plant, and in different soils and situations. Generally pruning should be done when the sap is down and the plant is at rest, which with the tea plant is the case in the cold weather. The rains having ceased, and the ground during the early part of the cold weather having been deeply hoed and manured, whatever pruning is contemplated ought to be begun at once, and finished with all convenient speed, so that the plants may have time to recover themselves before the sap begins to rise and the flushes to appear.

The frequency with which this operation is to be repeated must be determined by the condition of the plants, but probably a light pruning would be advantageous every year, if it could be managed.

Pruning, such as has been recommended, cannot be practised successfully on one set of bushes for ever. A time must arrive when they will cease to respond to the calls upon them, and to begin to yield but poor and small leaf, and little of it. Entire exhaustion will eventually follow, but we have yet to learn how long, under such a system, they will continue to yield *profitably*. With generous treatment they may probably do so until they are 15 or 20 years of age, or even older; but the wise planter will provide for the future by laying down year by year new patches of bushes to succeed the old.

It has not been the object of this paper to treat of other matters connected with tea cultivation. I would merely say, in conclusion, that to ensure success, pruning must go hand in hand with deep hoeing, careful weeding, and manuring. If these, the essentials of all gardening and farming be attended to, and intelligent efforts be made to get good seed-bearers, if a system of closer planting than now prevails be adopted, if rational plucking be practised, and increased care be taken in the manufacture for the market, there is every reason to believe that tea growing in the North-West Provinces of India may yet become a great and successful enterprise.

IPECACUANHA.

From the Assistant Conservator of Forests, to the Government Quinologist, Ootacamund, dated Nellumboor, 17th October 1871.

I HAVE the honour to report, for your information, the particulars noted regarding the growth of the Ipecacuanha plants under my charge. Best plant 10 inches in height, inclusive of double tops (each 4½ inches in length), one of which has also again doubled. Each leader 2½ inches in length, and in July a shoot from the root appeared, which is now 3½ inches in height. This plant is most thriving and healthy. The other plant has improved greatly during the rain, and is 5½ inches in height, fresh and healthy, although not so forward as the other.

Both plants flowered abundantly. The large plant only produced seed which failed to germinate. Major Beddome, Conservator of Forests, when here in January last, saw the seeds and said from what is known of the plant it could hardly be expected to germinate. However, the plants being more established and acclimatized, I am sanguine the next seeds will prove a success. Meantime it is very satisfactory to see the marked improvement in the growth of both plants.

COFFEE.

PROGRESS OF COFFEE PLANTING IN DIMBULA.

A planter who has taken the trouble to collate the information, informs us that during the present season there will not be less than from 3,000 to 7,000 acres of forest land felled and planted in Dimboola. We suppose between the three districts of Dimboola, Dickoya, and Maskeliya, the addition to the planted extent of coffee will not be far short of 10,000 acres, which three years hence may be expected to add 50,000 cwts. to our coffee exports, rising by-and-bye to 80,000.

SALE OF FOREST LAND IN DIMBULA.

Probably the last sale of Crown lands for coffee planting purposes which will take place during Sir Hercules Robinson's administration came off at the Kandy Kutcherry yesterday; and the result ought to satisfy the Governor that the most sanguine account he may choose to give to the Secretary of State, of the value of Crown forest land suitable for coffee and of the greatly-increased price which would be given for it were the Ouvah railway (through Dimbula or Dickoya) only announced, will be amply justified by the experience of future sales. We have a graphic account of the scene—no ordinary one—in Kandy and at the Kutcherry there yesterday. There were only three blocks of land—one of 184 acres, one of 322, and one of 458 acres—to be sold, and yet as planter after planter came riding or driving into town, it seemed as if all Dimbula had been deserted for the occasion, besides there being visitors from other districts. The meeting of the competitors is said to have been the most dismal affair possible—they all seemed like attendants on a funeral—and each fresh arrival produced not a smile, or a word of welcome, but a further lengthening of the countenance, and a more dismal look all round. In the verandah of the Kutcherry there could not be less than a dozen earnest bidders (among the many others not so flush of money) after three blocks of land. But then such fine land, even for Dimbula! We are assured by an impartial authority that the 320 acres comprise as fine a piece of land as could possibly be desired by any coffee-planter in the country, and the other two were nearly as good. The bidding was animated: in one case a block after running up gradually to £500 was at one stroke raised to £900 by an enterprising bidder who thought his antagonists would be driven out of the field, but in vain. The result of the sale was that the largest block of 458 acres was sold to Messrs. A. L. Cross and G. M. Ballardie for £1,655 being at the rate of £3 12*s.* 3*d.*, per acre, and that of 320 acres to Mr. L. St. Geo. Carey for £1,550 equivalent to £4 16*s.* 10*d.*, per acre; while the remaining one of 184 acres was purchased at £4 5*s.*, per acre for £750 by Mr. Wm. Northway. Thus for an aggregate of 962 acres of forest land, the Government has received no less than £3,955, being at the rate of £4-2*s.* per acre without counting survey fees or cost of title-deeds to the purchasers. With such prices and the present prospects for coffee-planting, not a day should be lost in dealing with the question of Railway Extension.

PRODUCTION AND CONSUMPTION OF COFFEE.

A persual of the article on this subject, taken from the London *Grocer*, ought to cheer the hearts of despondent planters and planting agents in the midst of the present short crops. The concurrence of testimony from all quarters, with reference to the great deficiency in the supply of coffee for the coming year, and the difficulty of producers to keep pace with the consumption for many years henceforward, is simply irresistible. Every acre of coffee-land, worthy of cultivation in Ceylon, ought to rise in value considerably, and the forbearance of capitalists towards their debtors with over-drawn accounts, should never be asked for more successfully. There are undoubtedly "good times coming" for the Ceylon coffee planters, and we trust the men still amongst them, who have borne 'the burden and heat of the day' for a long series of years back will, at length, meet with the due reward of their labours.

COFFEE: ITS PRODUCTION, CONSUMPTION, &c.

(*From the Grocer, Nov.* 11*th.*)

THE recent extraordinary rise in the price of coffee has (according to the *New York Shipping List*) produced much discussion in American commercial circles. The price of good Rio in cargo, for instance, has within a few weeks advanced from 11½c. to nearly 17c. per lb., and other descriptions of coffee have risen nearly as much. A glance at the history of the coffee trade and at the influences which have brought about the recent changes in price will be interesting at this time, when this sudden and great advance in price, indicating a scarcity of coffee, is followed by recent news from Brazil, the chief producing country, that the Legislature has passed the Bill for emancipating the slaves. The abolition of slavery in the British West Indies contributed, among other circumstances, to disturb the regular production of coffee. Soon after, in 1837, the West Indies, not including Hayti, produced 40,000 tons, while the Dutch East Indies produced 26,000 tons. The total production of the world was 142,000 tons.

In 1851 the proportion was as follows:—West Indies, 20,000; Dutch East Indies, 82,000; total product, 275,000 tons. In 1868 the change of relations appears still more remarkable:—West Indies, 8,000; Dutch East Indies, 96,000; total, 342,500 tons. The West India plantations were long neglected by their owners, who lived in Europe, leaving them to overseers. Coffee culture requires constant attention and cheap labour. It is not strange therefore that it sought more congenial regions. The Government supervision and the coolie labour of Java and Ceylon were well suited to it. In Java and Padang the East India Company knew how to produce the best coffee at the cheapest rates. Ceylon rose from a production of 31,000 cwts. in 1837 to ten times as much in 1851, and this is again trebled in the present short crop. Java, more subject to droughts and devastating storms, fluctuated a good deal more in supplying the markets. The lowest point reached was 15,000 tons in 1833, and the highest point was 77,000 tons in 1855. The average yearly product during the four successive decades of years, from 1831 to 1871, has been 37,000, 58,000, 61,000, and 55,000 tons respectively. The Brazils, with abundant black labour, in the meantime rose to prominence in the coffee market. Beginning with 1821, the average production per year during the four following periods of ten years was 19,000, 49,000, 97,000, and 144,000 tons. The average then fell off to 128,000 tons during the seven years after 1861.

Among the coffee-producing countries, near the United States, the production of sugar has been encroaching in a remarkable manner on that of coffee. The value of sugar, only 1½c. per lb. on the plantation in 1847, has been quadrupled since that time, while the value of coffee has only been doubled. Two influences have tended to the advance—the abolition of slavery in the West Indies already mentioned, and the depreciation of gold. In Cuba, if we except the Santiago district, coffee cultivation has ceased altogether; and in other islands, except in Porto Rico, it has continued with varying and uncertain results. This change of the field of production is unquestionably a very important fact. When the production was scattered over the world, we were less subject to the chances of a "short crop," because the local influences of one part of the world would not be felt in another. Now, however, the production is confined to the Brazils and two large islands in the Indian Ocean. A favourable or unfavourable season in any one of these coffee-raising countries, produces a marked effect in the amount and price of the staple. To this cause of fluctuation must be added the uncertainty as to the renewal of the Dutch East India Company's charter. If the charter be not renewed, labour complications in Java will follow, the auction sales may cease, and the vessels of all nations will come into competition with those of the Dutch merchants, which are now employed in regular order. This would produce irregularity in transportation. It is an interesting fact that in Europe the consumption of coffee has increased slowly, varying with the price and the duties imposed, and ranging from 1 lb. for each person in England to 11 lbs. in Holland. In America the consumption in 1821 was 1 lb. 4 oz. for each person: in 1830, 6 lbs.; in 1851, 8¼ lbs. The total consumption in 1842 was 67,000 tons; in 1862 it was only 40,000 tons; and last year it was 124,000 tons. In 1851, Europe consumed 186,000; and the United States, 76,000; total, 22,000 tons. In 1867 the proportion was as follows:—Europe, 282,000; United States, 92,000; total, 374,000 tons. In 1870, Europe, 347,000; United States, 124,000; total, 471,000 tons. If the American population numbers 100,000,000 in the year 1900, as many predict, they should consume at the present rate per person (nearly 8 lbs.) 357,000 tons of coffee. The consumption in America has rapidly increased of late, on account of the lower duty, and the great demand of the coloured population in the Southern States. This demand is principally for Rio. The increased demand among the whites is mostly for Java and Maracaibo. The consumption will be checked, of course, by the rise in value.

As emancipation is now imminent in the Brazils, we must be prepared for a low production in the future, especially if the slaves are suddenly liberated. If the coffee-production of a country is once interrupted, it requires time to fill the vacancy in the market, because the coffee tree does not begin to bear until its fifth year. High values produced by interruption are more permanent, therefore, in the coffee trade than in any other, except in the case of certain spices. The estimates of the short crops, however, which are now made and published must not be taken with too much credulity, as the range of area under cultivation is so large that it is impossible to judge of the crop with accuracy. The lowest estimates of the deficiency of the crop, now given by intelligent students of the subject, are as follows:—For the Brazils, 70,000; for Java, 20,000; for Ceylon, 10,000 tons—a total estimated deficit of 100,000 tons.

The weather is now hard and dry. Hot days and high winds, with cold mornings, have prevailed for the past ten days, and Christmas day for a wonder promises to be dry this year. *Low crops* are finished and high ones all but, both high and low, are a sad disappointment; and owners, agents, and managers, after repeated reductions of original and altered estimates, are now obliged to bear witness to the melancholy fact that they have been deceived by appearances. To such an extent has this gone that many well-known properties, well cultivated too, are giving one-fourth and one-fifth of their average yield. Hence we find even since crop began, estimates have been twice and in some cases three times reduced. As a consequence too conjecture is free and out-spoken as to the probable total out-turn of our export of this season, which it is now thought by many will not exceed 600,000 cwts. Acre for acre, I believe, this will be the shortest yield our island has ever given. Fortunately the price keeps up. But no price we can look for will compensate for such an awful deficiency in quantity. The cause of this deficiency is not far to seek. The land, as before shewn in these reports, is taking its periodical rest. And all the manure we can apply, and all the cultivation we can bestow, will not prevent its requiring and taking this rest. Is it not so in England and other European countries? and are not farmers discovering that, notwithstanding their boasted rotation of crops and of manures, the land requires a rest; nor in this a new thing, was it not so in earliest times? What do we read in Exodus chapter 23 and at verses 10 and 11? "And six years "shalt thou sow thy land, and shalt gather in the fruits thereof. "But the seventh year thou shalt let it rest and lie still; that the "poor of thy people may eat, and what they leave the beasts of "the field shall eat. In like manner shalt thou deal with thy "vineyard and with thy olive-yard."

If, owing to a difference in our tropical soil and seasons, the land continues to bear crops for ten or eleven years on end, we find it squares itself with us by taking two successive years of rest, as we see it has done regularly during three decades; seasons out of joint, and leaf disease, seem but auxiliaries to this necessary condition of all lands—*periodical rests.*

The leaf disease appears to be wearing itself out, and green is again becoming the prevailing colour. Estates are rehabilitating themselves quicker than usual after crop, and indeed well they may, having done so little to hurt themselves with the present crop. The spirit in the price of coffee has given a stimulus to the recultivation of many a patch along road-sides, and it is amusing to see with what vigour the owners of such bits are working up gardens that have been neglected for years. Where bare sticks only were visible a month or two ago, they are now brushed up and are getting tipped with green.

Blossoming has begun to shew on low lands. It will be a sprinkling of crop next July. During the last week arrivals of coffee both Native and Plantation in the central capital have got scantier daily, and the end cannot be distant.

Health in the whole is good.

Labour is plantiful, and soon it will be paid off in large quantities.

Rice is still dear, and it will likely be so till February when the next crop will begin to arrive.

In the report of our correspondent in the last issue of the *Overland Observer*, a mistake occurs: the estimate for 1872-73 should be 1,200,000 cwts. instead of 200,000 cwts.

CEYLON COFFEE SOILS.

Memo. of particulars of samples of Soils, &c., sent to England for Analysis.

"LOOLE CONDERA" AND "WALOYA."

Extract from letter from James Taylor, Esq., to Messrs. Keir Dundas & Co.

In filling the boxes of soil, I dug a hole, about the same width as the box, filling the box by stages of an inch or two with earth from corresponding depths in the hole. Thus if a side of the box is taken out, a section of the soil as it is in the field will be seen nearly correct to the depth of fully a foot. The surface soil is at the end of the boxes marked TOP. I may mention that the bulk of the small feeding roots of the coffee are within generally two or three inches of the surface of the ground.

W. M. L.

The box marked L. C. *a*, contains a sample of branches with the berries and leaves on, from

W. M. L.

trees *under* bearing, and the box marked L. C. *b*, contains a sample with berries and all the leaves on, from trees over-bearing, and unable to ripen the crop properly, although it is only a small crop.

The sample *a* is from good soil, same as in the

W. M. L.

box of soil marked L. C. 3, and taken from the same place. The sample *b* is from exhausted soil, a sample of which is contained in the box marked W. M. L.

L. C. 4. There are but few trees in the place that sample *a* is taken from, which have not a very much thicker crop than shown

by the sample, and these few trees *under* bearing, will have a very much larger crop next year. On some of the branches of sample *a*, will be found specimens of the coffee bug, that is the black bug, but not in quantity to have done harm. My idea in selecting these two samples is, that in the bad sample *b*, something may be found deficient, the want of which prevents the berries from ripening properly and accounts for the sickly and nearly leafless-state of the trees when maturing crop. The berries on the branches, sample *a*, being from trees *under* bearing, and from excellent soil, might be expected to contain an ample supply of all necessary materials. It might be useful to know what difference there is between the ingredients of these two samples. Perhaps the difference may be found more between the ash of the branches and leaves of the two samples than between that of the berries. The berries in the bad sample may have absorbed nearly as much mineral matter from the branches as they want. The cause of their not ripening being the unhealthiness of the branches, and scarcity of leaves thus produced. In sample *a*, I should suppose that berries, leaves, and branches, will contain everything they want in abundance; but I hardly think the samples are large enough to allow of the branches and berries being analysed separately, and I should think that there might be a general deficiency shown by sample *b*, taken altogether as compared with sample *a*. In some respects it would be interesting to know the proportion of ash from equal weights of the two samples. In case of there being no great difference between materials of the ashes, the proportion of the quantities of ashes might help to guide us to an explanation of how they come to differ. Comparing the analysis of the two samples of soils, from which the samples of branches are taken, with the analysis of the branches, might also help to throw light on the matter. The samples of soil I took to Kandy the other day, are as follows:—

W. M. L.

L. C. 1. Is fresh soil from the forest: it is a soil in which I know coffee would grow well, and bear good crops for many years without manure.

L. C. 2. Is from clearing which has been felled and burned off, for a year and a half, on which nothing has grown yet (since burning off) it being just recently planted with tea. I should like this sample compared with the first sample, to see what difference the burning of the forest makes to the soil by adding its ashes; say also, if practicable, to see what effect exposure to the sun may have on the soil, say by exhausting the organic matter in it perhaps. Coffee does not grow well here, especially in black soil, when there has been no burn, as on places where the felled forest has been carried off the land, or on places that have not got covered with it in felling, the young plants on such places are often very sickly for years after planting, but eventually grow all right. Young coffee plants usually grow better the sooner they are planted in the field after burning off the forest. Seeing that potash applied to young coffee plants in the shape of saltpetre seems to have no effect, I am inclined to think that a good burn of the forest causes the young coffee to grow better by the alkali of the ashes destroying acids in the soil. Black soil up in this cool climate, and of a peaty nature, might contain some such noxious properties, and other jungle soils in a less degree.

L. C. 3. Is a fine black soil, in which coffee has borne heavy crops for many years, and in which the coffee is still as good, perhaps as never was, and will be good, I have no doubt, for very many years to come without any manure. It is from a very stony rocky place which has never been manured. Both the former samples are also of black soils. This sample might be compared with the two former, to see if it is still as rich as they are in necessary materials. Any deficiency as yet has certainly not deteriorated the coffee much, though no doubt, were the soil to be re-planted with young coffee trees, they would not grow well.

C. L. 3½. Is a sample of a brown colored soil which coffee has borne good crops for many years, and is still as good bearing coffee as ever, showing no sign of exhaustion in any way.

L. C. 3. Soil without manure. This W. O. 3½ soil has never been manured either, unless any small experiment which I may have forgot about may have been made on the spot many years ago. But the same sort of soil is equally good for the coffee all round, over a far greater extent than could have been occupied by any experiment, and including the unmanured parts that must have been left round any such. It might be useful to know if there is any peculiarity common to these two different-looking soils, that accounts for both being up to now equally good for coffee.

L. C. 4. Is a sample of soil of fair appearance in which coffee bore good crops for a good number of years, but is now very much fallen off, bearing but small crops and being unable to mature even these properly. I have, I think, some recollection of a part of this piece of inferior soil, having been manured, if not the whole of it with guano of the supply got up in 1863, or with the Australian bone-dust of 1864, but it is not mentioned in the list of experiments I made, and probably never has been manured, but so far this does not matter, as its badness is not to be attributed to any manuring or other experiment tried with it, I am sure.

L. C. 5. Sample is soil from near a patena of maana-grass. It seems good-looking soil, although there is a peculiarity about its looks. It is black with a copper-colored tinge, and although pretty deep, has a very inferior quality of sub-soil. Coffee trees grow very badly, and bear little or no crop. In the case of L. C. 4 sample, I should like to know what may be found deficient in it, as compared with samples L. C. 3 and W. O. 3½. In the case of sample L. C. 5, I should like to know, besides any deficiency of necessary materials that may be found to characterise it, if there is not some poisonous quality in it, if it be practicable to find this out.

I should like to know the proportion of organic matter in each of these six samples of soils. In all I see of artificial manuring, leads me to doubt if mineral matter be as yet wanted for our coffee, unless it may be in exceptional cases, as near native villages, in land that has in former ages been cultivated with green crops, it strikes me too from all I see of our coffee, that its falling off is mostly from exhaustion of organic matter in the soil, still this does not seem to be capable of explaining the matter in many cases.

NARANGHENA.

As requested, I now send you four samples of Naranghena soils.

W. M. L.

No. 1. From old coffee, at an elevation of 3,300 feet, bearing an average crop of from 5 cwts. to 6 cwts. per acre. This coffee is exposed to wind.

No. 2. Old coffee, same elevation as above, but not exposed to wind, bearing average crops year by year of 12 cwts. per acre.

No. 3. Coffee planted in 1862 at an elevation of 2,000 feet, and has, since it came into bearing in 1865, borne average crops of 8 cwts. per acre.

No. 4. From the forest which has just been felled, but not yet burned off.

Nos. 1 & 2. Samples have never been manured to my knowledge, which extends to 1863.

No. 3. Sample now manured with saltpetre and bone-dust in September 1869, and will this season yield a crop of 12 cwts. per acre.

SYLVAKANDE.

Samples of Soil sent by E. J. Young, Esq.

No. 1. Virgin soil from the Kandanewera jungle, adjoining Sylvakande coffee.

No. 2. Soil from good coffee, with samples of leaves, berries, &c., enclosed, done up in a bag.

No. 3. Soil taken from exhausted coffee with leaves, berries, &c.

BULLATWELLE.

The box contains nine samples, namely, No. 1. of soil, wood, and coffee berries; Nos. 2 and 3 ditto.

Sample No. 1. Taken from the face of a hill, with a westerly aspect, and at an elevation of about 1,500 feet above sea level. The coffee is very bad and stunted in appearance and, in my opinion, never can have been good. It has never been manured and, as far as I can learn, has never given good crops. It must also have suffered a good deal from rain, wash, and wind.

No. 2. Sample was taken from the brow of a hill, having a northerly aspect, and at an elevation of 1,640 feet. It has always been good coffee, and has borne good crops for many years, has never been manured, and is still vigorous coffee.

No. 3. Is taken from the best part of a young field of coffee, about seven years old. The trees have borne large crops for about 4 years past and are still vigorous, and likely to bear good crops for some years to come.

MORATENNE.

Remarks on Samples sent for Analysis.

No. 1. Sample taken from a field facing the north. The ground is steep and very stony, but shows no sign of rain-wash, the roots of the trees being well covered. The whole field is dying out, and the trees on many parts are already dead. Has never been manured.

No. 2. Sample taken from field in which the trees are good, and show no signs of decay. The land is steep and stony, and has never been manured.

COLGRAIN.

Memo. of Samples of Colgrain Soil sent for Analysis.

A 1. Taken from a field planted about 17 years ago; is very fertile; trees are very strong and vigorous, and yield heavy crops year by year without manure.

A 2. The sub-soil to the above, texture good; not too stiff, yet pretty retentive. These two soils may be taken as models of a good coffee soil and sub-soil.

B. 1. Taken from a field which has been under cultivation for 15 years or more and still crops well. The soil of good average quality.

B. 2. Sub-soil to above.

C. Very deep and very productive; the soil looks like an accumulation of soil washed down by rain.

D. Exhausted for coffee growing, and abandoned 2 years ago. It has been cultivated for 8 years, and was probably originally of good quality.

E. Exhausted and abandoned like the D sample. These two samples of abandoned soilsd iffer a good deal in appearance, and are from opposite hills.

F 1. Has been planted with coffee 16 to 17 years; may probably have cropped well in its time, but is now wanting in vigour.

F 2. Sub-soil to above.

G 1. Soil a good deal exhausted; has been long under cultivation:

G 2. Sub-soil to above.

H 1. Has given very fine crops, but now shews signs of falling off. Has been planted from 9 to 10 years.

H 2. Sub-soil to above.

I 1. Similar in character to the former sample, but not quite as good.

I 2. Sub-soil to above.

The fields from which the samples F G H and I have been taken are so situated on the estate, as to make it highly desirable that they should be recruited through the application of artificial manures alone, and their physical character is such as to encourage the hope that this may be found practicable.

K 1. On this field the trees are thin of wood, and do not crop well.

K 2. Sub-soil to above.

L 1. A red clay, differing much in appearance from any of the preceding samples. The trees pretty vigorous for their age.

L 2. Sub-soil to above.

M 1. Poor quartz soil, not likely to be much benefited by the application of artificial manures.

M 2. The sub-soil; this looks better than the arable which seems washed out. This soil had bone-dust and poonac applied to it, about 18 months ago, but without any result.

3 packets of the ash of a strong healthy coffee tree, grown in the soils marked A 1 and A 2.

N.B.—The depth of arable soil is very various; in some parts it is four to five inches or more, in other parts barely an inch or none at all. The above samples marked as "*the soil*" are from a depth of 2 to 4 or 5 inches, just such a depth as what are known as the "feeding roots" were found to permeate.

Those marked "sub-soil" are from a depth of between 5 and 9 to 12 inches. All the samples have been dried in the sun before being put up, and their coarser fragments picked out.

PENDLETON.

Memo of samples of soils and berries and branches of the coffee tree sent from Pendleton Estate.

W. M. L.

No. 1. Samples are selected from a field of coffee which has always borne heavily; matures its crop well, and shows no signs of want of vigour.

No. 2. Samples are taken from a field, the trees on which over-bear every alternate year; they suffer greatly; cannot mature their crop, and many of them die out year by year from the effects of over-cropping.

No. 3. Samples are taken from a field which bore heavily for two or three years, but which has done nothing since, and in which the trees seem to be thoroughly exhausted, not even able to put out leaves. The samples are all selected from coffee fields in their eleventh year, at an elevation of from 2,000 to 3,000 feet above sea level, and from fields which have never been manured.

W. M. L.

Boxes I. II. & III. contain the 3 samples of soil. Box No. IV. contains the 3 samples of fruit, and box No. V. 3 samples of branches.

GONA ADIKA.

Memo. of samples of Gona Adika soils.

W. M. L.

No. 1. Contains sample of soil from the lower and best part of Cape Colony, where the coffee is very good, and the trees bear well, but are unable to mature all the crop they bear.

No. 2. Soil from the jungle immediately adjoining the above field, and at the same adjoining on the other side, a field where the coffee is old, but has been good, and is now gradually going out.

No. 3. Soil from oldest coffee on Mousa Compera, now almost extinct, and not kept under cultivation.

No. 4. Soil from the youngest coffee in "Corpabody" adjoining Parnawatte where the coffee is now in full bearing, and would do well were it not for the great amount of wash during the heavy rains. The soil in this field is apparently the best on the estate.

N.B.—The samples in the box are all divided, and have been put in exactly as they were originally in the field, that is, the soil at the top of the box being the surface soil, and so on, to the depth of a foot. By taking off one side of the box, the sections of soil will appear as they are in the field.

GALLOWAY KNOWE.

W. M. L.

No 1. Sample of soil from young coffee, (about 7 years old) and which has borne good crops and is still vigorous.

No. 2. Sample of soil from old coffee which has been abandoned for years.

No. 3. Sample of soil from old coffee.

FERTILIZING SUBSTANCES FOR CEYLON COFFEE LANDS.

Our best thanks are due for a copy of the report for 1870-71 of the Ceylon Planters' Association. Amongst information of a useful nature on subjects which have been already discussed to a more or less extent, we are surprised to find, for the first time published, a lengthy and most important contribution to our knowledge of the chemistry of that branch of agriculture which constitutes the main material interest of this colony. Proceedings of Committee Meetings of the Association were formerly held sacred from publication, a rule more honoured in the breach than the observance. The result of the restrictive rule, (no longer in force,) is that we only now are aware that at a Committee meeting held so long ago as 20th June 1870, "Mr. Harrinson mentioned that in accordance with the request of the Committee he had selected samples of soils, coffee, &c., from various estates and forwarded them to England for purposes of analysis. He then read a paper descriptive of the various samples sent." The analyses of soils made by Dr. Voelcker a year ago (he does not seem to have thought it necessary to report on the branches, leaves, and fruit sent to him) are published, with the opinions of that eminent agricultural chemist as to the best substances for application to such soils and the proportions of each. The soils were of all qualities, taken from estates of varying ages, and at different elevations, and Dr. Voelcker prescribes for each typical case. This contribution to the literature of coffee culture is, therefore, of general and great importance, fully justifying the space we devote to it. We intended to have drawn attention in detail to the main results established, but space to-day will not permit. For the present, therefore, we can only say that Dr. Voelcker's analyses confirm the results of previous lines as to the wonderful similarity of the coffee soils of Ceylon in all the main constituents: organic matter, oxides of iron, alumina and insoluble silicious matter.

The great problem is to ascertain the proportions of the soil of,—*first*, phosphoric acid; and *second*, potash. A few decimal parts of these essential elements efficient or in excess, make all the difference between sterility and fertility; and on the proportions ascertained, depend the quantities which should be applied to the soil of

First,—Good muriate of potash,

the imported potash of commerce, muriate, and chloride of potash meaning just the same thing,) containing 80 per cent. of pure muriate of potash. *Second*,—*Fine* bone-dust. *Third*,—*Good* superphosphate of lime, (bones treated with sulphuric acid the best form), containing 25 per cent. of soluble phosphate. *Fourth*,—*Good* sulphate of ammonia. In one case alone is nitrate of soda the form of saltpetre most allied to common (salt) recommended, and with Dr. Voelcker's verdict that it is evanescent and liable to be washed away, while, being in demand, unhappily, of the manufacture of gunpowder, it is far more expensive than muriate of potash, we may dismiss it. Four-fifths at least of what the eminent agricultural chemist considers the most efficacious manure for coffee must consist of potash, bone-dust, and ashes in the shape of superphosphate; while the phosphate of ammonia added should never exceed one-fifth. In four out of six recipes, indeed, given by Dr. Voelcker, the proportion is only 15 per cent. proportions applied, as Dr. Voelcker states, of fertilising salts he recommends, depend on the condition of the soil as revealed by analysis; but even where analysis cannot be obtained, any planter would be safe in applying a small dressing of the substances named to good soil (say 3 cwts. per acre) so as to keep it good; and a larger dressing (say 5 cwts. per acre, with about an equal quantity of poonac) to fertilize poor or restore exhausted soil. The application to secure the fullest results ought, we learn from a planter of experience, to be made annually; but once in two years would keep land fairly in heart. A most important point to be remembered is that every cwt. added to the normal produce of an estate is almost clear profit. It follows that if by adding 3 cwt. per acre annually of

manure, the yield is raised from 5 cwt. to 7, 8, 9, or 10 cwt., the immediate profit will be large, while the land will be kept permanently in good condition. The cost of 3 cwt. of Dr. Voelcker's mixture ought not, when applied, to reach £3, while 2 cwt. *additional* of coffee ought to realize £6 to £7 gross, of which according to our authority a very large proportion would be profit. Can any of our readers favour us with analysis of castoroil cake, so that we may be able to see *why* it is so much better than cocoanut poonac which we know yields to analysis the elements of coffee? Dr. Voelcker, the man of science, attaches far less importance to organic matter than does the merely practical planter, Mr. Taylor. Organic matter is of great importance, nevertheless; just as fallen leaves, though they contain the minimum of fertilizing salts, are yet most efficacious in securing the action on soil which results from warmth and moisture. In the soils examined by Dr. Voelcker the proportion of organic matter varied from a minimum of 5·07 to a maximum of 13·13; oxides of iron from 2·64 to 12·84; alumina from 6·01 to 16·47; while insoluble silicious matter proved to be never below 50·57, (alumina being in this case high in proportion,) rising to 82·23. Our soils consist of about 98 per cent. of the organic and mineral substances named, with not much more than traces in each case of such salts as sulphate and carbonate of lime, magnesia, phosphoric acid, potash and soda. In the very best soil we get ·30 of phosphoric acid, and ·27 of potash. Such soil would grow anything; but what could be expected from another soil shewing only ·02 of phosphoric acid, and ·04 of potash? This was a dark patena soil and although it *looked* well, did not, of course, grow coffee well. Even the richest manure would probably be thrown away in this case, unless the ground were first well stirred up and left for a couple of years to be aerated. The great desiderata seem to be simple tests for phosphoric acid and potash, which any Superintendent could apply. So long as a soil is found to contain appreciable quantities of each, it will grow coffee well and require but a moderate expenditure for manuring. If phosphoric acid is so low as ·10, and potash down to 15 per cent., then only heavy manuring with potash, bones, superphosphate, and ammonia, with or without poonac, pulp, &c., will enable the soil to yield good crops of coffee. So much for to-day, but we hope to extend more of the attention which it deserves to the very valuable addition to our knowledge of the successful culture of coffee contained in the opinions which Mr. Harrison, at the instance of the Planters' Association has been the means of eliciting from Dr. Voelcker. Complaints have been made, we understand, that while the association paid for the analyses, the soils analyzed were all from properties owned by one Firm. We think this was unfortunate, not so much as a matter of science, (for every possible condition seems to have been represented,) but with reference to good taste and good feeling.

VARIETIES OF MILK.

(Communicated.)

As far as we know, no nation uses the milk of any carnivorous animal. There is no reason for believing that the milk of this order of animals would either be disagreeable or unwholesome; but the ferocity and restlessness of the creatures will always present an obstacle to the experiment. The different milk of those animals with which we are acquainted agree in their chemical qualities, and is confirmed by the fact that other animals, besides man, can be nourished in infancy by the milk of every distinct species. Rats and leverets have been suckled by cats, fawns by ewes, foals by goats, and man, in all stages of his existence, has been nourished by the milk of various animals, except the carnivorous. The milk of the mare is inferior in oily matter to that of the cow, but it is said to contain more sugar, and other salts. The milk of the ewe is as rich as that of the cow in oil, but contains less sugar than that of other animals. Cheese made of ewe's milk is still made in England and Scotland, but it is gradually being disused. The milk of the ass approaches that of human milk in several of its qualities. To this resemblance it owes its use by invalids in pulmonary complaints, but it has no particular virtue to recommend its preference, and is only prescribed by nurses. Goat's milk perhaps stands next to that of the cow in its qualities; it is much used in Southern Europe. It affords excellent cheese and butter, its cream being rich and more copious than that from cows. Camel's milk is employed in China, Africa, and, in short, in all those countries where the animal flourishes. It is, however, poor in every respect, but still, being milk, is invaluable where butter is not to be procured. The milk of the sow resembles that of the cow, and is used at Canton and other parts of China. The milk of the buffaloe is also like that of the cow, though the two animals belong to different species. Every preparation of milk, and every separate ingredient of it is wholesome milk, cream, butter, cheese, fresh curds, whey, skimmed-milk, butter-milk, &c. Butter-milk and whey will undergo a spontaneous vinous fermentation, if kept long enough, and alcohol can be distilled from it. The Tartars, it is well-known, prepare quantities of spirituous drink from mare's milk.

MARKET REPORT.

HOME NEWS, *8th December* 1871.

SILK.—With the exception of a few days of rather improved business a fortnight ago, the silk market has been exceedingly quiet during the past month, there having been little or no demand for the continent, and home manufacturers contenting themselves with working up their stocks. China silk has steadily maintained its former rates however, and importers continue to hold very firmly, rejecting offers of 3d. to 6d. under quotations. Thus there has been little or no sensible change in prices during the month. In Canton silk there has been occasional business at 15s. to 16s. for common to fair market Tsatlee, and 21s. to 22s. for finest "curlo" sort, but the medium qualities have not been wanted. Loong Kongs are flat, at 21s. 6d. to 22s. for finest No. 1, and inferior qualities in proportion; but this is owing mainly to the heavy simultaneous arrivals of this silk, for which there is always so limited a demand. Japans and Bengals are both much neglected, and sales are only to be made by forcing; both these silks are comparatively very cheap, and the difficulty of getting them thrown, ap the one great obstacle to business. Deliveries last month were fairly good. S are large, owing to the rapid shipments from the east since the opening of the new season, and the simultaneous large arrivals here; but the market will soon feel relief, as the bulk of the silk to arrive this season has already come forward.

TEA.—The deliveries in London estimated for the week were 1,717,049 lbs., which is an increase of 45,234 lbs. compared with the previous statement.

SUGAR.—The market continues in the same dull state as previously reported, transactions continuing very limited, and at prices in buyers' favour. 200 casks British West India sold; Demerara and Berbice, 29s. to 31s. 6d; St. Kitts, 30s. 6d. The remainder of the parcel of Mauritius offered in public sales yesterday—1,700 at 27s to 32s.; and 600 baskets of Penang date, 24s. 6d. Refined dried goods are slow of sale at previous prices. Pieces now show a decline of 6d. per cwt. Molasses: 50 casks fine Australian sold at 15s. 6d.

COFFEE.—The small parcels offered to-day were disposed of at full rates. 130 casks, 50 bags and barrels Plantation Ceylon: triage, 62s. 6d. small, 67s. to 68s.; low middling, 71s. 6d. to 72s.; middling, 73s. 6d. to 78s.; peaberry, 83s. to 84s.; and 70 bags Natal, 72s. 6d.; 70 packages Mocha bought in at 92s. Privately, 50 tons native Ceylon sold for arrival: good ordinary, 67s.; bold. 69s.

Messrs Kilburn, Kershaw & Co.'s Circular.

CALCUTTA, *26th December* 1871.

INDIGO.—In consequence of the Christmas holidays, two Public Sales only have been held during the past week; at these, 1,930 chests were offered and 1,828 chests (including some rejections previously counted as sold) disposed of, making the total quantity out of the market about 75,000 maunds. The demand has been very active, and prices, except for the very fine lots, again rather stiffer. Clean plant Oudes, and good Benares consumers are in great request, and sell at very full prices.

Exports of Indigo from 1st November to 31st instant 1871:—

	Chests.	Mds.	S.	Ch.
To Great Britain	4,615	17,549	37	0
,, France	1,720	5,333	29	6
,, Trieste	2,410	9,272	21	5
,, Foreign Europe	476	1,842	16	7
,, America	377	1,510	22	0
,, Gulphs & Levante	179	682	5	13
Total....	9,777	37,191	11	15

RAW SILK.—Since our last report about 40 bales middling native rainy Jungypore have been sold at Rs. 12-8; some very low offers have been made for inferior native Commercolly, which have been refused; 20 Rupees have been offered and refused for the first 25 bales J & R. W Radnagur October bund just arrived, but in the present state of the market no higher offer is likely to be made; they will, in all probability, be shipped on owners' account: the first arrivals of native November bund are expected to be here at the beginning of next month.

The Str. *Ashburnham* left on the 21st instant with 23 bales for France; Str. *Petersburg* left on the same day with 9 bales for London.

TEA.—The Christmas holidays have caused business to be interrupted during the past week, and we have very little of interest to report.

A Public Sale, consisting of 863 chests, took place on the 21st instant; all were sold. There was a good amount of competition, and prices ruled firm throughout. A small invoice of *Green* Tea from the Chota Nagpore District realized an average of Re. 1-2 per lb.

There have been large arrivals from all quarters during the past few days, and liberal quantities will shortly be brought forward at auction.

Reuter, under date the 20th, quotes the London market firm for good qualities.

PUBLIC SALE PRICES, 21ST DECEMBER 1871,

Equiv. London price.

	Chests	Average		Ft. £4-10; Et. 2s. Usual Commissions. s.	d.
ASSAM.—Sookimbarry Tea Estate—various kinds	113 chests	15½	per lb.	2	4½
VARIOUS.—Sungoo River Tea Plantation, Chittagong—Pekoe, annas 15½; Broken ditto, Re. 1; Congou, annas 11½; Broken Mixed, annas 10½	42 ,,	14	,,	2	1½
Dantmara Tea Factory, Chittagong.—Pekoe, Re. 1; Souchong, annas 10½; Congou, annas, 9½; Broken kinds, annas 4½ to 11.	35 ,,	9½	,,	1	6½
Kurseong and Darjeeling Tea Co., Ld.,—Pekoe, annas 15 to Re. 1-3; Pekoe Souchong, annas 13 to 14; Souchong, annas 11½; Congou, annas 9½; Broken Tea, annas 7 to 9; Dust, annas 4½	544 ,,	12½		1	10½
Ramgurh Tea Co., Ld., Hazareebaugh.—Pekoe	36 ,,	14½			9½
Ditto,—Green Tea, various kinds	25 Re.	1-2			8½

William Moran & Co's Circular.

ORIENTAL BANK CORPORATION.

INCORPORATED BY ROYAL CHARTER, 30TH AUGUST 1851.

Paid up Capital, £1,500,000. Reserve Fund, £444,000.

Calcutta Agency.

DEPOSITS.

Deposits of Rs. 500 and upwards are received for fixed periods, the terms for which may be ascertained on application at the office in Calcutta.

No Interest is allowed on Current Deposit Accounts.

EXCHANGE.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius, Australia, and New Zealand at the exchange of the day.

Drafts are drawn for sums of £1 and upwards.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued

N. B.—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if a married lady, her own Christian name, not that of her husband, is required.

JOHN S. SCRYMGEOUR,
Agent.

Calcutta, 1st February 1871.

ORIENTAL BANK CORPORATION.

Bombay Agency.

EXCHANGE.

THE CORPORATION grants Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope.

No Draft at six months' sight is granted for a Sum under £50. Sums under 20*l.* are only drawn for on Demand.

COMMISSION.

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent., and on the collection of Bills one per cent. and Postage.

The Corporation takes charge of Government Paper, Shares in the Bank of Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms :—

	Without charge.
If to be remitted through the Corporation	
If to be paid in India, a Commission will be charged of	¼ per cent.
On delivering Securities out of safe custody	¼ do.
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869.

CHARTERED MERCANTILE BANK OF INDIA,

LONDON, AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England*, *Scotland*, *and Ireland*, and in the principal Towns of all the *Australian* Colonies.

Circular Notes and *Letters of Credit* are also granted for the use of Travellers in the *East*, on the *Continent*, and to *Europe* overland

The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Ceylon, Hongkong, Foochowfoo, Shanghai, Hankow, Singapore, Penang, and Yokohama.

INTEREST.

On Current Deposit Amounts Interest is allowed at 2 per cent. per annum, on the minimum Monthly Balances up to Rupees one Lac, but no interest will be allowed on balances of less than Rs. 1,000.

INTEREST ALLOWED ON FIXED DEPOSITS

When fixed for	12 months	5 per cent. per annum.
	6 do.	4 " "
	3 do.	3 " "

All letters should be addressed, and Hoondies made payable, to the Chartered Mercantile Bank.

NATIONAL BANK OF INDIA, *(Limited.)*

Bombay Branch.

CURRENT DEPOSIT ACCOUNTS.

Interest is allowed on Current Deposit Accounts at 2 per cent. per annum on the minimum monthly balances up to Rs. 1,00,000, but no Interest will be allowed on balances under Rs. 1,000.

FIXED DEPOSITS.

Deposits of Rupees Five Hundred and upwards are received for Fixed Periods, the terms for which may be ascertained on application at the Office in Bombay.

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta, Madras, and Hongkong. It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors,

Bombay, 1st July 1871. JAMES WINDRAM, Manager.

NEW BANK OF BOMBAY, *(Limited).*

RATES.

DISCOUNT.

On Government Bills	6 per cent
On Private Bills and Notes	8 do.
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.
On do. do. do. Goods or Shipping documents for Goods	8 do.
On Cash Credits, on Security of Government Paper, Bullion or Railway Shares, subject to a Commission of ¼ per cent. on the amount of Credit	do.

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts.

Bombay, 15th July 1869.

LLOYD'S BANK,

DARJEELING.

Fixed Deposits.—Interest is allowed on deposits of Rs. 100, and upwards on the following terms :—

On sums lodged for 3 months certain	3 per cent. per annum.
Do. 12 do.	7 do.
Do. 2 years certain	8 do.

Interest is allowed at 2 per cent. per annum on floating deposits or Current Accounts, when the Balances exceed 500 Rupees.

There are many who have a dread of speculation, and yet who desire a *fairer* rate of interest. than is obtainable from investment in Government paper and Railway scrip, or from fixed deposits in Joint Stock Commercial Banks. Remittances can be made by cheques on any part of the world.

Interest paid half yearly in India or London.

A. B. L. WEBB,
Manager.

Darjeeling, Northern Bengal, 1st August 1870.

COMPTOIR D' ESCOMPTE DE PARIS

HEAD OFFICE: PARIS.

Subscribed and paid-up Capital £2,200,000
Reserve Fund.. ..... £ 200,000

London Bankers :

THE UNION BANK OF LONDON.

Exchange.

On London—6 months' sight	1s. 10¾d. per Rupee.
" On demand	1s. 10¾d. "
On Paris—6 months' sight	243 francs.
Letters of Credit	1s. 10¾d. "
Ditto for *Italy* and *France*, payable in Gold without Commission	1s. 10¾d. "

Current Accounts.

Interest is allowed at *two per cent.* on minimum monthly balances.

Deposit Accounts.

Interest at *three per cent.* allowed on money placed in Deposit at seven days' notice.

Interest at *four per cent.* subject to six months' notice of withdrawal.

All remittances to be endorsed "PAY COMPTOIR D'ESCOMPTE DE PARIS OR ORDER."

E. J. HARDCASTLE, Manager.

14, Rampart Row, Bombay, 26th May 1871.

ENGLISH HOTEL, BOMBAY.

BRITISH HOTEL LANE,

APOLLO STREET.

THIS Hotel is fitted up and furnished in the most complete manner; no expense has been spared to render it the most commodious and comfortable Establishment, both for Gentlemen and Families, to be found in Bombay

The Sleeping Apartments and Sitting Rooms are replete with every convenience, and the strictest regard is paid to cleanliness throughout the premises.

The Table will be found to be abundantly supplied with viands of unrivalled excellence, and the culinary department is under the immediate supervision of the Proprietor.

The Wines, Liquors, and Beer are of the very best description, supplied from the most celebrated houses in the London and Continental Markets. The Proprietor confidently recommends this Establishment to the patronage of Travellers and Residents, all of whom may be accommodated with the comforts of home at moderate charges.

The Hotel is pleasantly situated, and within five minutes of the Railway Station, and Apollo Bunder.

Bombay, August 1870.

HOPE HALL FAMILY HOTEL,

MAZAGON, BOMBAY.

THE HOPE HALL FAMILY HOTEL has been greatly improved and enlarged, and a few extra detached Bungalows erected in the compound. As these add greatly to the comfort and privacy of families, the Proprietors respectfully beg that orders be sent in time by persons wishing to occupy them.

The Proprietors presume that it is hardly necessary to say that this Hotel offers greater advantages to the public than any other in this city, not only on account of its being nearest to the P. and O Company's Pier at Mazagon, and near enough to other landing places and the several Railway Stations, but because it has also an extensive and beautiful compound, nicely cultivated, and intersected by broad and well-kept walks.

For the amusement and recreation of gentlemen it has Billiard rooms, entirely detached from the other buildings in the compound, where also excellent refreshments may be obtained.

The Table and Wines are unrivalled. Horses and Carriages are always to be had on the premises.

SORABJEE FRAMJEE & Co., Proprietors.

THE ROYAL FAMILY HOTEL, POONA.

Opposite the Railway Station.

IS NOW RE-OPENED.

A most comfortable Residence, commodious and upper-storied, for Visitors as well as Residents in the capital of the Deccan, and conducted on English principles.

THE Proprietor of this Hotel begs to inform the public of Poona and Out-stations, that his Hotel, which has been under construction for an Upper Storey, to meet the demands of visitors to Poona, as well as for the comfort of the occupants, is now completed.

THE ROYAL FAMILY HOTEL, which has been established since 1862, is situated in the very centre of the station, and opposite the Railway Station. The Proprietor having made extensive repairs and improvements, by adding an Upper Storey, the comfort of visitors is greatly enhanced. The rooms, which are well furnished, and airy, command an extensive prospect. The Hotel is under the immediate superintendence of the Proprietor, and no efforts will be spared to give satisfaction, both in regard to the supplies for the table, attendance, and general cleanliness of the Establishment. Beers and Wines of the best quality, none other being admitted, will be supplied at moderate rates, and every exertion will be made to render visitors comfortable. Carriages, with good Horses, on hire, can be obtained on the premises.

DORABJEE SORABJEE,
Proprietor, Royal Family Hotel.

EDINBURGH FAMILY HOTEL,

RIVER VIEW, SIMLA.

PLEASANTLY situated in the most central part of the Station, near the Church and Mall, and within easy distance of the Library, Club, and Assembly Rooms, and entirely removed from the Bazar.

The Proprietor solicits patronage, and begs to assure those who may engage accommodation at this establishment, that they will find no effort spared which can conduce to their comfort.

Rooms available for Private Families by the season, month, or day. Early application necessary. Address

THE PROPRIETOR,
Edinburgh Family Hotel, Simla.

Simla, 21st January 1870.

The Ravages of White Ants

ARE completely prevented by the Preservative Composition patented by Major Forbes, R. A., Executive Engineer, D. P. W.

This is the only effectual process yet invented for protection against White Ants, it also arrests decay in woodwork, whether sheltered or exposed.

The dry Ingredients, packed in tins, containing 25 lbs. each, can be obtained from the undersigned; this quantity, mixed with a due proportion of oil, will form a paint sufficient to prime 1,000 superficial feet. Price per tin, Rs. 5.

Sole Agents,
BURN & Co.

7, Hastings Street.

TO MERCHANTS AND BANKERS.

LONDON DAILY RECORDER.

MINCING LANE AND BALTIC GAZETTE,

A FIRST CLASS COMMERCIAL PAPER,

PUBLISHED DAILY IN TIME FOR THE EVENING MAILS.

CONTAINS full and authentic Reports of the business done during the day in all the Home and Foreign Markets; also the Private Telegrams and other commercial information of the Leading Houses in London, Liverpool, and Manchester. No other publication in England has such a complete service of Telegraphic and other commercial information; and published immediately after the close of the markets, it is the earliest Report issued of the business done during the day.

The Proprietors have received the cordial support of the leading India, China, Australia, and American Houses; and the private information derived from the sources cannot but add immensely to the intrinsic value of the publication.

In addition to the business done in the various Produce Markets in London, "The London Daily Recorder" embraces the Provincial and Foreign Intelligence received from hour to hour in London by Telegraph; and the value of its Market Reports consists in their authenticity and absolute correctness, as they are supplied by houses of the highest standing in each department of business.

SUBSCRIPTION, Rs. 25 per annum.

(Including Postage) payable in advance.

Remittances to be made through the Oriental Bank Corporation to

JAMES BROWN,

"London Daily Recorder" Office,

65a, Leadenhall Street, London.

To whom all Communications are to be addressed.

AGENTS IN INDIA:

MESSRS THACKER SPINK & Co., Calcutta.

" THACKER VINING & Co., Bombay.

" HIGGINBOTHAM & Co., Madras.

ADDIS'S IRON PERMANENT WAY FOR RAILWAYS.

THE advantage of Addis's Permanent Way, in addition to its cheapness and durability, consists in its being a longitudinal Sleeper Road, it combines the office of sleeper and fish-plate, and thus enables chairs, spikes, and trenails to be dispensed with. The parts being fewer, in cases of shipment to foreign countries, is of great importance in saving of freight, as well as for facility of close packing of carriage over long land distances.

It has also great advantage in simplicity of laying, and cheapness in maintenance. The staff needed for this purpose may be limited, and no special or previous knowledge is required.

For plans, specifications, price lists, and all other information, apply to the undersigned. W. J. ADDIS, C. E., Tanna.

HOWRAH IRON WORKS.—WROUGHT IRON BRIDGES, Roofs, Irrigation, and Pumping appliances, Cotton, Jute, and Oil Presses, Pug Mills, (the latest Akra Pattern), Jute, Flax, and Cotton Mills, Gearing and Shafting; Machinery for Collieries, Indigo Concerns, and Silk Filatures, Iron Steamers, and Barges, Ships' Capstans and Windlasses, Portable, Stationary, and Marine Engines, Hydraulic Presses, High and Low-pressure, Boilers, Tanks, Gasholders, Railway, Mining, and Contractors' Plant; Turn Tables, Crossings, and improved jointed Levers for Switches, Road Rollers, Cranes, Winches, Traverses, &c., &c., manufactured.

Having a very extensive Foundry, the undersigned are in a position to execute orders for all kinds of Castings with great despatch.

Head Office, 7, Hastings Street, Calcutta. BURN & Co.

HOWRAH STEAM SAW MILLS.—The undersigned having erected extensive Steam Saw Mills with vertical and circular saws, are prepared to execute every description of Woodwork on a large scale. Rates can be obtained at our Howrah Iron Works, or at the offices, Hastings Street.

BURN & Co.,

Calcutta, January 1870. Iron Founders and Mechanical Engineers

MESSRS. KING, SUGDEN, & Co.,

BRASS AND IRON FOUNDERS,

ENGINEERS, BOILER MAKERS, AND GENERAL BROKERS,

PERSEVERANCE FOUNDRY,

No. 30, UPPER DUNCAN ROAD, BOMBAY.

BEG most respectfully to inform their Friends in Bombay and Out-stations, that they are prepared to execute orders to any extent for Iron, Brass Castings, and any other kind of Engineering works.

K. S. & Co. have on hand, for sale, a quantity of Stationary Engines and Boilers of sizes, together with Saw Benches with Saws. They have for sale or for hire 4 Portable Engines, with Centrifugal Pumps, and a large quantity of other Machinery.

ROWLAND & Co.,

SADDLERY AND HARNESS ESTABLISHMENT,

No. 8, Meadow Street, Fort.

ALL orders will be promptly attended to and carefully executed. Orders from Outstations must be accompanied by a remittance or reference for payment in Bombay.

R. & Co. solicit especial attention to their own *Composition for softening Leather.*

F. HARLEY & Co.,

OIL COLOR, SOAP, AND TALLOW MERCHANTS,

IMPORTERS OF COLORS, PAINTS, VARNISHES, CANVAS, &c., &c.,

16A, Loll Bazar, opposite the old Sailors' Home, Calcutta.

RAILROAD AND STEAM NAVIGATION STORES.

ALUMINIUM WATCHES.

£1 : 1 : — £1 : 10 : — £1 : 15 : 0

Same as supplied by us to H. R. H. The Prince of Wales, and Earl Mayo, Viceroy of India.

Illustrated Catalogues of these marvellous Time-keepers, specially adapted for use in India, forwarded post free, per next Mail.

MILLIKIN & LAWLEY.

168, *Strand, (adjoining Strand Theatre), London.*

INDIAN TRANSIT & GENERAL COMMISSION AGENCY.

OFFICES—6, CHURCH LANE, BOMBAY.

AGENTS IN LONDON AND LIVERPOOL.

THE OCEAN EXPRESS, AND ANGLO-AMERICAN EXPRESS,

OVERLAND AND SHIPPING AGENCY OFFICES.

4 & 5, Agar Street, Strand; 56 King William Street, City, and 40 Regent Circus Piccadilly, also "Atlas Express," Liverpool, Glasgow, and Manchester.

MESSRS. N. V. CURRANNNE & Co. have the honor to inform Merchants, Shippers, and the Public in general, that they are prepared to undertake transmission of parcels, patterns, samples, packages, valuable treasure and merchandize by mails and other steamers, viâ Southampton and Suez Canal, and by clipper ships, native crafts, and express railways, with economy, speed, regularity and safety to all parts of the globe.

Passages engaged, luggage collected, packed, addressed, cleared, shipped, landed, warehoused, and carefully forwarded, to any part of the United Kingdom through the Ocean Express forwarding office.

Invoices collected against delivery of goods, commissions executed and miscellaneous supplies of every description carefully selected for private families, regimental messes, bands, cricket clubs, institutions, colleges, and books punctually supplied and agency business in general done with satisfaction.

N. V. C. & Co., having had considerable experience in these special branches of business, can with confidence tender their services.

Agents and Correspondents throughout the Presidencies.

ENGLISH AND INDIAN AGENCY.

THE undersigned will from the 1st February 1870, reduce his Commission from 5 to 2½ per cent. for all orders to be executed viâ the Suez Canal.

Up-country orders must be accompanied with a remittance of 25 per cent. or a reference in Calcutta.

PERCIVAL J. WAITE, 10, Clive Row, Calcutta.

AGENTS.

London.....	*Messrs. Smith, Sander, & Co*.....		17, *Grace Church Street.*
Southampton.....	*Do.*	*Do.*	..... 4, *Oriental Place.*
Plymouth.....	*Do.*	*Do.*	..... *Millbay Road, opposite the Railway Station.*
Liverpool.....	*Mr. C. R. Payne.*		..28, *Brunswick Street.*

A minimum charge of 6s. will be made for Shipping Goods in England; but if more than 5 cases are shipped 1s. 3d. a case.

For loading, clearing, and forwarding Goods from Calcutta, if over 50 cases 8d. a case; if over 20 cases, 1s. a case.

BOMBAY METAL MART.

WE have the pleasure to announce that we have been appointed sole Agents for the following well known manufactures:—

Clayton and Shuttleworth's Portable Engines and Agricultural Machinery of all kinds.

Aveling and Porter's Steam Road Rollers, Traction Engines, &c.

J. and H. Gwynne's Centrifugal Pumps.

P. Morton & Co.'s (Limited) Wire Fencing Gates, &c.

Hart, Son and Peard.—Art Metal Workers. Ornamental work in Wrought and Cast Iron of all descriptions.

Bal-de-Traver's Asphalte, which is now being laid in most of the principal thoroughfares of the City of London. This Asphalte has been laid in several parts of Bombay by the Municipality and has stood the climate admirably: for Flat Roofs, Verandahs, &c, it is much superior to chunam.

We have now in stock Portable and fixed Engines, Centrifugal, Bullock power, and Hand Lift and Force Pumps of various kinds. Fire Engines by *Shand and Mason* of a size well adapted for small Municipalities and Cotton Stations, and Dicks' Chemical Fire Engines or L'Extincteurs in a cheap form suitable for Spinning Factories, Barracks, Mansions, &c.

We have always on hand Corrugated Iron of the best brands, Common Staffordshire and Lowmoor Iron of all sizes. Cast steel, Street and Perforated Zinc, and a general assortment of Contractors' and Engineers' Tools of all kinds.

We will be glad to quote prices and give all particulars on application.

We are also prepared to give Plans and Estimates for all kinds of Machinery and Ironwork, and to tender for the same delivered at any Railway Station. All orders for Ironwork are executed at our Saw Mill Workshops under European Superintendence.

Bombay, 19th January 1871. W. NICOL & Co.

D. S. KEMP & Co.,

PHARMACEUTICAL CHEMISTS, BOMBAY.

Established, January 1868.

ATTENTION is confined to business strictly connected with that of *Wholesale* and *Retail Chemists* and *Druggists*, and by means of our connection with eminent Foreign and English manufacturers and importers, we claim to be able to supply Drugs and Chemical Preparations of the first quality at the lowest remunerative prices.

We are the Sole Importers of the celebrated

GOA POWDER,

a medicine whose extraordinary curative powers in Parasitic Ringworm is renowned throughout the Torrid Zone.

Our well-known preparation

LIQUOR CHIRETTINÆ

has been written of by medical authorities as a Tonic and Febrifuge of remarkable power. It is the only preparation extant which produces the precise therapeutic effects of the herb chiretta; being a solution of its active principle Chirettina.

In Muscular debility it is unapproached by any other remedy.

We are Sole Agents in India, for the Patent Extract for preparing

LIEBIG'S MILK,

By the London Infants' Food Society.

A preparation which, since its introduction into this country, has, we are assured by parents, saved many infant lives.

MEDICINE CHESTS.

are the objects of our unremitting attention. Having very large experience of the wants of residents in India, we believe we can meet a greater variety of requirements in this respect than any other house. A new edition of Kemp's Medicine Chest Companion is now in preparation.

Preparations which have obtained celebrity, and are prepared only by us:

Liebig's Nutritive Extract Liquid.	Equatorial Hair Douch.
Ros Alpinus for Prickly Heat.	Cholera and Diarrhœa Mixture.
Tonic Refresher.	Fever Mixture and Fever drops.
Aromatic Distillate for Claret cup.	Corroborative Drops.

Soda and other Aërated Water in all their modifications, by powerful machinery

BOMBAY:—Printed and Published for the Proprietor at the *Economist Steam Press*, by G. L. F. SONNEBL, Manager.—22nd January 1872.

THE

SUPPLEMENT TO THE
"INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, WEDNESDAY, 21st FEBRUARY 1872. [No. 7.

Advertisements.

AGRICULTURAL SEEDS.

FOR SALE at the GOVERNMENT FARMS at Madras, the following recently harvested Seeds :—

	Rs. per 100 lbs.
Mackey Maize	
Queensland Maize	
Carolina Paddy	" "
Yellow Cholum (Holcus Sorghum)	3½ "
Chinese Sugar-cane (Sorghum Saccharatum)	3½ "
Cumboo (Penicillaria Spicata)	2 "
Tenney, Italian Millet, (Panicum Italicum)	
Shamay (Panicum Miliare)	
Cotton Seeds of Sorts.	

Government Farms' Office, Madras, 6th January 1872.

ECONOMIST PRINTING PRESS,

No. 2, MARINE LANE, FORT.

EXECUTES

PRINTING AND LITHOGRAPHING,

RULING, NUMBERING, & PERFORATING,

COPPER-PLATE AND WOOD PRINTING AND ENGRAVING,

SEAL ENGRAVING, VELLUM ENGROSSING, DIE SINKING, BOOK-BINDING, MARBLING, &c. &c.

Printing materials made, kept on hand, and procured to order.

Mr. G. L. F. CONNELL is hereby authorized to sign for our Firm per procuration. R. KNIGHT & Co.

MESSRS. NICHOLAS AND CURTIS,

PHOTOGRAPHERS AND ARTIST'S COLOURMEN.—Messrs. N. and Co.'s views of Madras, with the recent additions, now comprise the following. Taken on 12 by 10 Plates.

Price 3 Rs. each, or 30 Rs. per dozen unmounted.

The Cathedral.	The Surf.
The Pier.	Mount Road (2 Views)
Government House.	Royapooram Station.
Munro Statue.	Moorish Tombs.
Neil Statue.	The Light House.
Club.	Memorial Hall.
Napier Bridge.	St. Andrew's Church
Budgerows and Top Boats.	Moorish Mosque.
Vepery Church.	Purtasardy Pagoda
Patcheappah's Hall	Cocoanut Palms
Mess House, Fort.	Date. "
Government Office, Fort.	Palmyra "
The Flag Staff, Fort.	Areca "
Indian Well and Foliage.	Catamaran.

Panoramas of the Beach, the Fort, and Black Town, and a number of other subjects not specified. Also Views of Ootacamund and all the other stations of the Neilgherries, Bangalore, Seven Pagodas, Tirupatty, Conjeveram, Mysore, the Pulney Hills, Tanjore, Madura, &c.

Photographs illustrative of native character in Madras, also Burmese, Nicobarians, Andamanese, &c.

Detailed Catalogues of all the above may be had on application.

Customers residing in any part of India who have not an opportunity of selecting views for themselves may rely upon Messrs. N. and Co. sending the most interesting, when the selection is entrusted to them.

Madras, April 1870.

TO STOCK BREEDERS.

CATTLE FOOD PHOSPHATES.

As the remarkable degeneration in the Bone, Muscle, and Strength of the Indian horse (no matter how well bred), commences *in Utero* and is entirely due to the grass, hay, and corn given to the Dam, being most detrimentally deficient in the Phosphates of *Soda, Potash, Lime, Magnesia,* and *Iron,* PRIVATE BREEDERS are advised to add them to the food. A Mare in Foal will require one ounce daily for ten months, and the same quantity till her Foal is weaned.

The Yearling will require one quarter of an ounce per diem, and the two and three year old COLT and FILLY, half an ounce daily, throughout each year.

The Cattle Food Phosphates will cost twelve annas per pound for Horses, and eight annas for Cows—ready for use.

For further information, address LIEUTENANT J. F. POGSON, SIMLA.

Agents wanted for Bombay and Madras.

COMPTOIR D'ESCOMPTE DE PARIS.

NEW FRENCH LOAN.—The sixteen Monthly Instalments fall due on the First of each month, commencing from the 1st August 1871.

The amount due on each Instalment per 5 Francs Rente is Rs. 1-14-1 92-100.

The Coupons are payable on 16th August, 16th November, 16th February, 16th May.

During the payment of Instalment, namely, up to 31st October 1872, the Interest will be paid on the 1st August, November, February, and May, in order that the Coupons due may be received in part-payment of Instalments.

Interest is payable on presentation of Stock Receipts, pending the arrival of the Stock from Paris.

SOUNDY & CO.,

BOMBAY,

SOLE IMPORTERS OF ALEXANDRE & SONS', AND DEBAIN'S HARMONIUMS.

HARMONIUMS Manufactured for India, from Rs. 120 to Rs. 800.

"SYMPATHETIC" PIANOFORTES, in solid Mahogany or Rosewood, guaranteed for India, from Rs. 750.

THE "INDIAN" SQUARE PIANOFORTE, in solid Mahogany, guaranteed for India, from Rs. 550.

BROADWOOD AND SONS' PIANOS, from Rs. 900 to Rs. 1,200.

COLLARD AND COLLARD'S PIANOS, from Rs. 850 to Rs. 1,000.

PIANOFORTES FOR HIRE.

PIANOFORTES AND HARMONIUMS REPAIRED AND REPOLISHED EQUAL TO NEW, BY A STAFF OF EXPERIENCED EUROPEAN WORKMEN.

Arrangements made for Tuning Pianos by the Half-Year or Year. Terms on application.

SOUNDY & Co.,

PIANOFORTE SALOONS,

BOMBAY.

CARR BROTHERS,

CIVIL, NAVAL, AND MILITARY TAILORS, AND GENERAL OUTFITTERS.

17, CHURCH STREET, BOMBAY

6, Edgware Road, London. 8, Old Court House, Calcutta.

Waterproof Clothing.

Ex Godavery.

F. HARLEY & Co.

Waterproof Military Ground Sheets,

REGULATION SIZE.

F. HARLEY & Co.

Patent Improved Tarpaulins of Sizes

ALWAYS IN STOCK.

F. HARLEY & Co.

Improved Patent Tarpaulins.

PREPARED ON ENGLISH CANVAS ONLY; guaranteed Free from Adhesiveness either in Sun or Rain; finished expressly for use in hot climates; no Tarred matter is used in our composition, which is perfectly pliable, and free of all spontaneously combustible matter. Our tarpaulins with ordinary usage will last for years. The Arsenal Fort William, has tested and found them all that we describe, and, in addition, proof against Damp and White Ants. Assorted sizes always in stock.

All Tarpaulins made by us are branded

F. HARLEY & Co., Makers, Calcutta.

THE CALCUTTA MUSICAL ESTABLISHMENT.

12, GOVERNMENT PLACE.

BY APPOINTMENT.

LATE BUCKINYOUNG & Co., A.D. 1814.

Indian Pianofortes.

Broadwood & Sons' new Cottage 7 Octaves, with three Unisons throughout
New Cottage Grand, with three Unisons in Tenor and Treble
New Semi-Grand, ditto ditto ditto ditto ditto ditto
COLLARD & COLLARD'S Sympathetic quare Semi-Grand 7 Octaves
Semi-Grand 7 Octaves with three Unisons Treble.
Boudoir Grand 7 Octaves, three Unisons throughout

Sympathetic Pianofortes

A consignment of the above expected very shortly from Germany. These instruments are made expressly for India, and will be sold at 20 per cent. below the usual price charged for similar instruments in Calcutta.

Sheet Music.

Among the present extensive stock of the above firm will be found the best modern, as well as the most admired classical productions of the best masters. Constituents are respectfully informed that for *immediate* Cash payments the publisher's marked price will be charged for single pieces, and for every six pieces purchased, a seventh one of equal value will be added to the number without additional charge.

C. GOULD,
Proprietor.

Calcutta, April 1870.

DAVIDGE BROTHERS, Late S. H. CLARKE & Co., Established 27 years. Meean Meer, Simla, Murree and Peshawur Civil and Military Tailors, Outfitters, Drapers, Wine and Spirit Merchants, Importers of Preserved Provisions and Ollman's Stores.

DURBAR TENTS & CAMP EQUIPAGE
OF EVERY DESCRIPTION
MADE TO ORDER AT THE
FUTTEHGURH ORPHAN ASYLUM TENT MANUFACTURING COMPANY, LIMITED,
OF EXCELLENT CUT, BEST MATERIALS PROCURABLE, AND HANDSOME WORKMANSHIP.
ESTABLISHED IN 1838.
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EDITORIAL.

THERE are some vacancies on the Staff of Contributors to the *Madras Mail*. Gentlemen possessed of the requisite ability who are desirous of discussing current topics from a liberal and independent stand-point, are solicited to place themselves in confidential communication with the Editor, from whom all information can be obtained as to the requirements and honorarium of this Journal.
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Indeed, the paper bids fair to be a first class journal, and as such we wish it all success.—*The Bengalee, Feb 11.*
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To the Editor of the "Times of India."

DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India, I must ask you to correct an error which appears in your notice, if it has not already been corrected. I did not serve in Affghanistan. The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother, now Brigadier-General Edward Kaye, C. B., who thus commenced a long career of good military service. The best service which I ever rendered *in* India, or indeed *to* India, was the establishment, single-handed, of the *Calcutta Review*, which has done far more for Indian literature than anything I have written under my own name. In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours; and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave.
I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and

the Commander-in-Chief, at a meeting held on the 18th May 1871, at the United Service Institution of India, Simla.

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India,

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, WEDNESDAY, 21st FEBRUARY 1872. No. 7.]

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NOTICES TO CORRESPONDENTS.

Are there any Agricultural Training Institutions in this Country? I am a Hindu, a Landowner, anxious to improve my Estate, I fear that even if I could afford the expense, I am too old to be admitted as a student in the Royal Agricultural College in England. What is about the annual cost of a student at that institution?

There are not, we regret to say, any Agricultural Educational Institutions in this great Agricultural Country: a circumstance that reflects little credit, either on the people, or Government. You need have no fears as to not being admitted a student at the Royal Agricultural College on account of your age, as that is no disqualification. We remember several of our fellow-students over 50 years of age, and one or two Lieutenant-Colonels, who had served 30 years in India. You will, however, find it rather costly to go to England for your Agricultural education. The College fees are 100 guineas per annum, and 40 guineas per annum extra, if you have a private room in addition to the room allowed by the College rules, and it will cost you, at the least, £100 per annum for Text Books, Chemical apparatus, and your personal expenses at College, and during the long vacations, making your expenses in England, something near £250 per annum; an attendance at lectures for 4 Sessions at least is necessary before you can take the Diploma; but, as few English Students, even with two or three years previous training, take the Diploma in 4 Sessions, it is more likely that you will require 6 Sessions, or 3 years residence, before you can pass your Diploma examination. In short, you will have to expend, including expenses out and back, something like one thousand pounds, and work hard for 3 years before you can hope to get the College Diploma; but, even at this cost, if you have the means, we would strongly advise you to enter as a student at Cirencester though, as we before said, it shows a very discreditable state of things that, in an Agricultural Country like this, a Native Gentleman cannot obtain the necessary Agricultural education to qualify himself to manage his own Estates.

Is the yellow Cholum (Holcus Sorghum) grown at the Government Farms at Madras, known in the Bombay Presidency?

Can yellow Cholum seed be procured in this (Bombay) Presidency?

Advertise.

Has Chinese Sugar-cane (Sorghum Saccharatum) ever been tried on this (Bombay) side of India for forage?

Yes, but we are not acquainted with any published results. From our experience with Sorghum, in other parts of India, we can assure you most positively that the western side of India is much better suited for its cultivation than the eastern side.

Is the Coolty (Horse Gram) of Madras, the Coolty of Bombay?

We believe so.

Can you recommend any other fodder-producer?

Yes, Pencillaria Spicata, Phaseolus Mungo, Panicum Miliare, Panicum Italicum, Paddy, &c., &c.

In fact almost every one of our leguminous or cereal crops may be used for fodder, if cut before the seed begins to mature. Let us recommend to your notice, ordinary country paddy; under irrigation it may be cut even 3 or 4 times, and will yield excellent fodder, either green or dry. You must however see that it is always cut before the grain appears.

LETTERS TO THE EDITOR.

MR. LOGIN'S EXPERIMENTS.

To the Editor of the Indian Statesman.

SIR,—The statistical returns you have already referred to have appeared in the *Punjab Gazette* of the 1st instant. I trust it will lead to very important results towards the improvement of agriculture, and will disclose results few are prepared for. In my opinion this step will in a much shorter space of time than most people are ready to credit, effect beneficial changes of much greater moment than the most sanguine at present contemplate.

The first step in all matters, is to collect *facts*, and when trustworthy facts are obtained, practical results are sure to follow, for example the small experiment on cotton being now carried out in this neighbourhood, go to show that with reasonable care, India can, from her own indigenous seed, produce as much as the average of Egypt, or *seven times* as much as is now done by the cultivators here; but by an official return lately submitted to our Government at Home from Egypt, it is stated that with the best cultivation, as much as *twenty times* our average cotton produce in India can be obtained, and of a superior quality to that grown here.

If the above facts can be relied on, (I for one don't doubt them) what a field is there for improvement. So who can for a moment doubt that it is quite possible to double our land revenue, which would only be to bring it back to what it was 200 years ago, under Aurungzeb.

This action taken by the Punjab Government will put in motion the whole civil machinery of the province. No doubt many may wish to have their returns appear as great as possible, so at first we can scarcely expect to have them quite reliable; but it is hoped where they are found to be not so, that the parties who submit them will be "hauled over the coals" in a manner that will show to all that it is every man's interest, not only that their returns are accurate, but that his future promotion will be considerably affected by the improved out-turn.

Having thus made it the interest of our tahsildars, and all connected with land revenue to have improved agriculture, the next grand step is to convince the cultivators that it is their interest in a much greater degree than that of Government to increase their produce, which if heartily set about will be accomplished, I believe, in no great number of years. It is a firm belief in this that has induced me to urge my views, and you among others will no doubt be pleased to learn that, now that the in-gathering season is closed, my best field at Rai, 20 miles north of Delhi, which is exactly ¾ of an acre in area, produced 15 maunds, 2 seers of "kapas," and as 100 lbs. of this kapas has been found to give 31 seers of clean cotton and 60 of seed, we have 15 maunds, 2 seers = 1,204 lbs., and 1,204 by 4/3 by 0·31 = 407½ lbs. per acre of clean cotton, or just about the average of Egypt, being seven times that of India, which is said to be from 60 to 70 lbs. an acre. But I am inclined to think from my own inquiries that the average is rather more in this part of India—something less than 100 lbs. per acre.

Umballa, Feb. 3. T. LOGIN.

MINERAL AND SALINE MANURES.—II.

To the Editor of the
Agricultural Gazette of India.

I do not advocate Government Model Farms all over the country, for from them the agricultural classes will not learn anything, in fact will

look upon them with suspicion and distrust. But I would select from 2 to 4 intelligent zemindars in each Zilla or Talook, whose holdings are situated on the lines of road leading to the civil station, and within two or three miles of it. I would supply these men with a sufficient quantity of mineral and saline manures, free of cost. The object in view should be explained and instruction given in the art of applying them to the soil. The zemindars should be allowed to select both land and seed wheat, which as well as the rate for canal water, should be paid for, and in addition I would guarantee them from all loss. Thus the zemindars, conducting the experiment, would only have to pay for the cost of ploughing (which should, as a rule, always be deep, not because *virgin soil* is to be found at a depth of ten inches, but on account of the roots of wheat and other crops not being able to descend freely into the soil in search of food, which they will do to a depth of from 12 to 18 inches, without reaching *virgin soil*, which does not exist in the subsoil, but is the surface soil of land reclaimed from forests and prairie, and has never been cropped), weeding, and other manual labour, and in order to make success an object to the zemindars, the prize of a handsome pair of silver bangles and a turban of honour, of gold and crimson silk, should be conferred on each in open Durbar, to be held after the grain was harvested, the reaping being witnessed by umpires, (zemindars of the villages), and one square chain of each field being reaped in the presence of the European official, the ears of corn being removed from the stalks, put in sacks, sealed, and carted away for future disposal. This sample of wheat should in due course be publicly threshed, the grain being weighed, after measurment, by the bushel, and the produce per acre calculated. In England the average produce of wheat per acre is four quarters, or 23 *maunds* 5½ *seers* in Indian weight. The white wheat of South Australia which gained the first prize in the Great Exhibition, weighed 70 lbs. to the bushel, and the wheat of Tasmania is remarkable for its superior nutritious quality; that grown on the banks of the Clyde weighed 70 lbs. to the bushel, and fifty bushels per acre are frequently obtained. On new land (virgin soil), "it is said that seventy bushels of wheat and fifteen tons of potatoes per acre is not an uncommon crop." (*Vide* Whitaker's Almanac for 1870, pages 288-289.)

Now, 70 pounds to the bushel and 70 of them to the acre, is 4,900 lbs., or 81¼ bushels of 60 lbs. each. This converted into Indian measure, gives 59 maunds, 2 seers, 15 7 9 chittacks of wheat, and the potatoes equal 405 maunds.

If the Indian zemindar will put his shoulder to the wheel, there is nothing to prevent him from producing half this quantity of wheat and potatoes per acre.

To return to the prize-holders and their wheat, the entire crop should be purchased for use as seed wheat, and liberally paid for by the Government.

I submit, that by repeating this plan of operations for five years, selecting new zemindars for each year, and allowing the passed years prize-holders to compete for other rewards, (say a Hansi milch cow and calf, a yoke of superior oxen, a gold nine-pointed star with a *sunnud* of high approbation, bearing the seal of the Supreme Government of India), a system of intelligent, competitive wheat cultivation would be speedily established, and as the superior grain would very soon command a high value, as compared with the ordinary inferior wheat, the agriculturists would see the advantages of the transaction, and adopt the improved method of agriculture. Whilst this plan of operations was being carried on, the Government of India should form seed wheat Farms in the districts of *Umballa, Jullundur, Umritsur*, and *Scalkote*, as also in the Hill district of Simla, and within and without the *Pinjore* valley, *i. e.*, on the *Kalka* side of *Bussee*. His Highness of *Puttiala*, and the Sirdar of *Bussee* would no doubt rent land, parallel to the Umballa road, for this purpose. The great Native Princes and Chiefs, who have to wait on His Excellency the Viceroy of Simla, should be invited to visit these seed farms, and be presented with choice wheat seed for sowing in their own territories. The prizes offered by the Government being open to their zemindars.

In these seed farms, the wheat of South Australia, Tasmania, Spain, Poland, Russia and Yarkand, should be extensively cultivated. The system of culture being that already indicated. The seed so obtained should be given to the zemindars, who are prize-holders, to sow, grow, and harvest, separate prizes being given to each successful cultivator and competitor, not being a prize-holder, whose ambition may induce him to ask for such superior wheat seed.

In the first part of this essay I have stated that five of the saline manures are under the excise. This is owing to culinary salt being present as an adulterant in saltpetre and sulphate of soda, and it was assumed that it (salt) must also be present in the others, hence all have been placed under interdict.

The value of salt, as a manure, is quite unknown to the Salt Department, in which the general impression prevails that cattle can get on very well without it, though the natives give some salt once or twice a year to their cattle, either as a treat or as a superstitious observance.

A customs or excise duty of Rs. 3½ per maund of 82 pounds, is levied on culinary salt, no matter how produced, and as it is almost always associated in India with nitre, a similar duty is levied on the salt crystallized out of the saltpetre. Rock salt is similarly taxed.

It is stated that, for every *maund* of nitre manufactured, the same quantity of culinary salt has to be eliminated therefrom. Hence it follows that the nitre manufacturer is compelled to bear the expense of removing the adulterant (salt), and when he has done so, down comes the excise man for the salt duty of Rs. 3½, per *maund*, or £13 10 shillings per ton.

To tax the manufacturer of nitre, for the acts of Providence, seems a curious proceeding, and when it is asserted that the measure has destroyed an Export Saltpetre Trade of some £350,000 to £400,000 per annum, it cannot be called a very wise one.

It will be shown in the course of this paper that first-class wheat cannot be produced if *salt, soda*, and *potash* are not present in the soil.

The nitrate of potash contains 46·55 per cent. of potash, and the muriate of soda, or common salt, 40 per cent. of soda. Now if these substances are kept out of agricultural use by a crushing taxation unsuited to an enlightened age, the pecuniary loss, both directly and indirectly will be immense, whilst a vast agricultural population will be obliged to produce inferior food (wheat) for a non-agricultural population, which as well as themselves, require first-class food to arrest and prevent further degeneration of race.

Wheat, being the most valuable food crop cultivated by man, has only to be of superior quality to command high prices in all markets, and especially in that of London and China; therefore if India would grow more wheat, and less rubbish (officially called "*Inferior food grains*)," an export wheat trade of £20,000,000 sterling per annum could be easily secured.

We know that first-class European wheat contains, in addition to water, gluten, starch, sugar, gum, albumen, and bran, a fluctuating quantity of the food phosphates.

The nourishing, or *blood flesh* and *muscle* producing powers of wheat, depends on its richness in gluten and albumen. Common wheat contains 12.½ per cent., the *Triticum spelta* 22, and the *Triticum hybernum*, 24 per cent. of gluten—the two latter also contain 1½ per cent. of albumen. When we remember that rice contains only 7½ per cent. of gluten, a portion of which is always lost in boiling, a very simple calculation will show that the physical strength of the wheat-eater must far exceed that of the rice-consumer.

The value of wheat, as respiratory food, is due to its starch, sugar, and gum, and its *constructive, renovative*, and *restorative* powers to the mineral matters or food phosphates; these are derived entirely from the soil, and if they are deficient, the flesh, bone, muscle, and physical strength of the population will always show a degree of degeneration, corresponding to the deficiency.

Analysis proves that human blood, when reduced to ash, contains of,—

Phosphoric acid	31·787
Alkalies and alkaline earths	58·993
Carbonic acid	3·783

When dry human blood is burned, it leaves five per cent. of ash, and more than half of this ash (57 per cent.) is common salt, and the residue contains from 17 to 22 parts of iron in the state of oxide.—H.

CONDENSED MILK.

In 1866 an Anglo Swiss Company established themselves at Lake Zug, opposite the Rigi mountains in Switzerland, for preparing condensed milk. In September last year, a Branch Company was set up in England at Aylesbury for the same purpose, taking milk from about 1,000 cows which are pastured in this celebrated locality. The following process of preparing the milk has been taken from the *London Standard*.

Steam is got up in the factory at 6 in the morning, and the farmers who live within from 1 to 10 miles of it, begin to deliver their milk about 7; but it is nearly 9 o'clock before the last arrives. The milk is emptied at once from the large tin cans, generally used in the trade, into a trough, which conducts it through sieves into a large tank holding about 800 gallons, in the department where the first part of the process takes places. From this tank it is drawn into large open metal cylinders, which are slung up by a crane, and placed in a hot bath in large tanks, somewhat after the manner of the tins of meat in the preserving process; after remaining in this some time, they are again lifted by the cranes and emptied into large open funnel-shaped vats, whence the hot milk is drawn up through a pipe in the centre into the condensing pans on the upper floor, the sugar having been mixed with it solely for the purpose of preserving it. It remains in these, subject to somewhat low heat for two or three hours, while the evaporation of the water is taking place, and the milk gradually condensing. When this part of the process, which may be seen through the glass window of the condenser, is completed, the milk then about the consistency of liquid honey, returns by a pipe into the lower room, and is received again into the open cylinders which are swung into the central tanks; this time being filled with cold water for the purpose of cooling the regulation of the temperature during the whole process being a matter of the greatest nicety. Hence it is taken to the filling-room and run into the 1 lb. tins, which are soldered up and packed in cases of four dozen each, ready for sale. The greatest care is taken that no tin leaves the establishment unless perfectly air-tight; and to ensure this, each one is closely examined by a lad, who, in addition to his regular wages, gets 1*d.* each for every tin he finds imperfect, and the solderer has to take and pay for its contents. The condensed milk in

these tins gradually thickens, becoming slightly more consistent up to five or six months; after which it remains of the same consistency, and will continue good for years, perhaps as long as the tins themselves continue sound, and in all climates; and even when opened remains sweet for weeks.

It should be mentioned, that the greatest cleanliness is observed throughout the whole process. Even the milk-tins which the farmers deliver immediately on their being emptied, are in the receiving room placed in warm water and scrubbed inside with brushes. A strong jet of steam is turned into them, searching every chink and cranny; and finally, another very powerful jet of cold water completes the cleansing process, which is also applied continually to all cylinders and receptacles used in the factory. And in addition to this the floor of the lower room is constantly deluged with streams of water supplied by pipes from the Chiltern Hills Water Company's Works. The milk received from the farmers, at about 2*d.* per quart, is tested in a variety of ways several times in the week, and some is stood in pans to test the rise of cream, a record of which is carefully kept. The contracts with the farmers are very stringent, and if anything is found wrong with the milk, the Company reserve to themselves the right of returning it, and at once throwing up the contract. They are careful also to examine the police records of the district to see if any of the farmers, whose milk they take, have any cases of diseased cattle on their farms, which they are bound by Act of Parliament, under heavy penalties, to report at once to the police. The sugar used is of the best refined kind, some also from beetroot, and we need hardly observe that no adulteration takes place at any part of the process; it would be impossible, and if attempted, would at once defeat the great object, namely, the preservation of the milk; and as the article is sold only in the Company's tins, hermetically closed and labelled, it is impossible for retailers to tamper with it. The result is, that we have an article which is pure milk, not an article made from milk with the addition of sugar; all that is taken from the milk being the water, which in milk direct from the cow, constitutes as much as 80 parts out of 100. Astounding as this statement may seem, there is no doubt about it, and the stream of colourless water which runs continuously from the condensers give ocular evidence of it, and its being almost tasteless further shows that by the process the milk loses nothing but its water, and this it does to the extent of about 55 parts out of the 80, leaving in the condensed milk from 20 to 25 parts of water, the rest being the caseine, butter or fat, and other solid substances which remain intact. This is proved by the fact that when the proper quantity of water is again added to the condensed milk, it will at a certain temperature churn into butter. The analyses of the condensed milk produced by the Swiss and English Companies, made by Baron Liebig and other eminent chemists, leave no room for doubting the above facts.

In America also there are several manufactories of the condensed milk without sugar, which will keep good for a week or ten days, and it is this form which a large portion of the population of New York and large American cities have used for some years past The English Company will probably offer some of this kind to the public, and we see no reason why it should not be very extensively used. Each household knows, with tolerable exactness, its weekly consumption of milk, and by taking a weekly supply in this form will be sure of getting a genuine article. We should not forget to mention that the English Company make a preparation of condensed milk and cocoa, which is sold retail, at about 1*s.* for the 1 lb. tin; the roasting, grinding, sifting, and general preparation of the cocoa is all done at the Aylesbury Works, and a most excellent combination is produced, the cocoa assisting as well as the sugar in the preservation of the milk. Two teaspoonsfull, equalling in value one penny, with boiling water, make as good a cup of cocoa, already sweetened, as can be desired. They contemplate also bringing out a mixture of the milk with essence of coffee.

But to return to the condensed and sweetened milk. The present retail price of the 1 lb. tin of both Companies is about 8*d.*, and as this will bear at the very least as much water added to it as will make it equivalent to 2 quarts of pure milk, we have a genuine article at 4*d.* per quart, with the addition of nearly one pennyworth of sugar to each quart, no slight consideration when estimating the price. Thus it is considerably cheaper than any milk sold in towns, even if that could be obtained pure. The condensed milk can be used for any purpose for which ordinary milk and sugar are used for puddings, custards, and other cooking purposes; less than a teaspoonfull is sufficient for a cup of tea, sweetening it at the same time; two or three times the quantity will make a large basin of sweet bread and milk.

IMPROVED AGRICULTURE IN IRELAND.

We take the following article on the improvements effected during the last thirty years on the estates of the Earl of Arran, County Mayo, from the *Irish Sportsman* and *Farmer*:—

When the present Earl of Arran succeeded his uncle in 1837, he found those estates in the most wretched condition that they could possibly be, and the occupants steeped in the most abject state of helpless misery. The late Earl, from delicate health, was an absentee for many years, and those placed in charge of the property grossly abused the trust reposed in them, and by the most unheard of misrule, suffered the lands to be deteriorated and covered with a pauper population struggling for existence, the land being unable to feed them, much less able to pay any rent—the result of the management falling into the hands of corrupt unprincipled agents, or receivers, who let townland after townland to *squireens*, without capital or any knowledge of agriculture, who immediately on getting possession of those fine pasture-lands, sublet them to a class of tenantry, in common without capital, the middleman having no other means, living on the profit rents, and caring little about either the land or its miserable occupants, who were left to their own resources, and permitted to do just as they liked so long as they paid the rent, each or any of them being liable for the entire rent. Those tenants in common erected a cluster of wretched hovels, which they denominated villages, and divided the land in rundale, some more and some less, according to their means, so that each had a patch of good, middling, and bad land scattered here and there over the townland.

In process of time as the population increased, hovel was thrown up against hovel, and the land became still further divided, and filth, squalor, and wretchedness prevailed inside and outside the wretched dwellings. There being no fences, the cattle roamed at large after the crops were removed till the return of spring; the store cattle were sent to the mountains or bogs early in the summer, to exist as best they might; the milch-cow was kept at home, and herded on some waste patch by a child or some aged person past labour during the day. All were then in a hurry early and late in the spring, and till far-advanced in the summer to get in the crops; then came the temporary fencing between the arable and waste lands to keep off the cattle, and thus the season passed till the crops were harvested and secured, when the whole arable lands were again thrown open to cattle, sheep, pigs, goats, and poultry, in common, so that any attempt to grow clover, rye-grass, turnips, &c., was completely out of the question. In course of time, the leases, which were granted generally for thirty-one years and three lives, came to an end, and the unfortunate landlord instead of finding his property improved, or at least in the condition in which it was demised, to his horror found it exhausted, vastly reduced in value, and unable to feed the occupants, let alone paying rent for it.

When the present Earl came into possession, his horror and chagrin may be imagined, but description is impossible. Friends advised some one thing and some another. Sympathizers suggested that as those unfortunates were not his tenants, they had no claim on him, but His Lordship thought and acted differently. He admitted that the case was most unfortunate, but as he had got it and was now placed over them, he would see what could be done to humanize and lift them out of that state of misery and moral decrepitude in which he found them.

Among those, whose aid and advice would be most likely to be thoroughly practical and disinterested, was the late Mr. James Fraser, so many years celebrated as a rural architect and designer of land improvements, and whose practical experience and thorough

knowledge of the country could not but be of the utmost value in such a vastly important case, involving the improvement of many thousand acres, and the social condition and welfare of thousands of human beings. Mr. Fraser came, and after careful consultation respectable surveyors were employed, a census taken, rentals examined, and the result was the breaking up of those villages of beastly hovels, laying out good and convenient roads, a re-division of the lands, giving each tenant his portion in one lot in proportion to his rent, instead of a patch here and there; lots were cast, straight lines of fences were laid out, and each tenant compelled to build his house and offices on his own lot: the domestic animals were no longer permitted to occupy the same apartment with the man and his family, the pestiferous cesspool and the dung-heap no longer to occupy the front of the dwelling, but to be removed to a proper distance.

This new order of things caused at first great dissatisfaction amongst the people; somehow, in the redistribution of the land, everyone lost good land and noone got it, one man's house was better than another, and he did not like to part with it. Wicked words and threats ensued, but his Lordship was firm—he had taken measures for their good. A well-considered system of compensating rules was adopted, by which none could gain at the expense of his neighbour. After much vexation and opposition one townland was commenced and put in order, and soon followed by another, with the most happy results. The benefits were so apparent and approved of, that instead of opposition, the occupants of townland after townland came in and begged to have theirs "striped," as it was termed. New dwellings of a superior, but not costly, description appeared in every direction, the stable, cow-house, pig-sty, and barn followed: divisional fences were soon erected: turnips, mangold, clover, ryegrass, vetch seeds, were purchased at wholesale prices, and given at cost price to some, and to the smaller and more necessitous, gratuitously. It must not be supposed that this mighty social revolution was effected without some vexations, for the old leaven was still secretly at work; but Lord Arran had "nailed his colours to the mast, pursued his course undeviatingly, and rose superior to every device of the common enemy." He appointed two respectable agriculturists to reside on the estate—one on the southern, the other on the northern division—whose duty it was to instruct and advise the tenants in the best and most profitable systems of husbandry. The holdings are small, ranging from 3 acres upwards: the steadings are complete, except on the more recently taken up townlands, for it is only those which fall out of the grasp of the middleman that his Lordship can deal with; the houses are beautifully clean and comfortable, well lighted, and both houses and offices nicely white-washed inside and outside, the furniture clean and in good condition, the bedsteads well made, barded at top and three sides, and covered at the inside with fancy-room paper, and tastefully draped at the exposed side. All had ample stores of home-made linen, rivalling the snow in whiteness, fancy linsey, woolsey, and frieze, the produce of their own industry; so that they had almost everything they required for wear without buying, except shoes. Samples from this estate, amounting to nine different fabrics, in some cases from one family, were exhibited at the Royal Dublin Society's Exhibition in 1865, and still remain there in a glass case, as evidence of what can be done by the Irish peasantry when properly fostered and encouraged.

In consequence of the difficulty of procuring good seeds, and true to name, these people have been taught to grow their own swede, mangold, parsnip, vetch, and grass seeds, and the samples produced are for purity, maturity, and quality, fully equal to any imported. But the improvements effected in both the cottages and the land are as nothing compared with the social regeneration and independent spirit of the people. When Lord Arran first came amongst them, it was disgusting to his mind to see them follow him in crowds, fall prostrate before him, grovel in the mire, kiss his boots, his hands, and garments; he has now, by his treating them as human beings, infused so much of his own independent spirit amongst his people that he can walk through his estates without any man wasting his time to follow or do anything more than respectfully saluting him.

In former times, when misrule reigned, those extensive estates were governed by absentee and local agents, with a dozen of drivers or bailiffs at their heels, who fleeced the tenants unsparingly. The district pounds were seldom unoccupied at any time throughout the year by the defaulting tenants' live-stock. All these cormorants have long since been sent to the right-about, and a respectable high-principled resident agent appointed to second his principals' views. There are no bailiffs or drivers on the estate; there is no longer any use for pounds. Formerly the tenants were from two to five years' rent in arrear; now the rents are regularly paid up, and little or no arrears, and many with money in the bank; and we have no doubt similar results would follow the same humanizing treatment of the poor ignorant tenants on other estates. But it will be asked, what has all this improved state of things cost? In reply we say, with the exception of his own personal exertions, the cost of surveys, the stipends of the agriculturists, and some assistance in road-making and draining, these stupendous improvements, and the quietness and content they have conferred, have cost his Lordship nothing.

The designs and erections are his and his *employés*, but they have been worked out by the well-directed labour of the tenants themselves, whose willing minds and sinewy limbs succumbed to no toil, being assured that what they effected was exclusively for their own sole use and benefit. Such have been the benefits conferred by the Earl of Arran amongst his numerous tenantry, by his going in earnest and perseveringly to work; and after attentively watching its progress for so many years, we have no doubt but that, with similar means, the same results would follow in any other part of Ireland.

Note.—And we would add, in India: the conditions herein described are just what we meet with in every part of this country. We commend this article strongly to the consideration of our Government, its Agricultural Department, and our Landowners.—*Ed. A. G. of I.*

EDITORIAL NOTES.

As there seems to be some misunderstanding as to the conditions of the trial that is to be made at Saharunpore in April, of the competitive machinery sent in for the treatment of rheea fibre, we are requested to publish the following letter from the Government of India upon the subject for general information:—

Department of Agriculture, Revenue, and Commerce,—No. 170.

Calcutta, the 27th December 1871.

To Dr. R. H. Collyer,
199, Brompton Road, London, S. W.

Sir,—I am directed to acknowledge the receipt of your two letters of the 25th October, on the subject of your process for the treatment of the rheea fibre.

Apparently you have misunderstood the intentions of the Government of India with reference to the conditions of the public trials to be held at Saharunpore in April next. The Government of India never intended to debar intending competitors from applying any process they preferred to the treatment of the stem in any condition of the latter, green or dried. Green stems only were certainly referred to in the notification of the 26th January last, because it appeared from the experience that had been acquired that the fibre could be treated successfully only while fresh. Hence the announcement that green stems will be furnished to intending competitors. It will be open, however, to you and any other competitor who may prefer it, to dry the green stems which will be furnished, and to operate on them in the dried condition.—I have the honor, &c.,

J. GEOGHEGAN,
Offg. Secretary to the Government of India.

In an article on the Poultry yard in the last number of the *Agricultural Gazette* we mentioned the frequent and sudden deaths that occur among poultry in the cold season. The *South of India Observer*, last month, gave the following testimony on the subject:—

We would caution all owners of poultry to be careful, as disease is rife, and many persons have lost all their fowls, some people as many as fifty or sixty. We hear that segregation has saved some. The epidemic is very

violent; fowls perfectly well one day are dead the next. All kinds of remedies have been tried, such as garlic, calomel, but with little benefit. Whitewashing fowl-houses, separating the fowls, and keeping them at distances from each other are the best remedies. Ducks and even geese have fallen victims, to say nothing of the Christmas turkey

A CORRESPONDENT to the *Gardener's Chronicle* thus writes of the successful results of artificial incubation :—

I have just received by Cape mail a copy of *The Farm*, published in Grahamstown, containing an article on the successful results of an incubator I constructed for the purpose of hatching ostriches, and as the report may prove interesting to your readers, I beg to forward an extract. I believe this is the first instance on record of ostriches being hatched artificially. The Editor says:—"At the Jubilee Exhibition an improved incubator was shown by A. Douglas, Esq., Hilton, near Grahamstown, and we hear from Mr. Douglas that after a few alterations and the exercise of a little patience, he has got the machine into capital working order, and finds it answer admirably, having hatched a troop of ostriches with it, which—with we suppose the help of the artificial mothers—have grown up all good-sized chicks. We would merely add, for the information of anyone who may wish to know about this operation, that the eggs are kept up to a temperature of about 100 to 105 by the aid of an oil lamp, at the cost of a little over a penny for the 24 hours. We think this mode of rearing young ostriches, when it comes to be understood, will be pretty generally adopted."

DR. AUGUSTE VINSON, in the *Sugar-Cane*, is amused at the simplicity of those who are constantly enquiring after the seed of the sugar-cane. He refers such to the common grass of our day, the *sorghum*, which he believes to be the original of the cane. The faculty of reproduction is so entirely lost in the modern cane, that were it not for human skill it would disappear altogether. He declares the title of *saccharum officinarum* to be a mere conventional designation, and adds :—

"The sugar-cane has no botanical existence. It is not in nature. "It is men who have made this plant; and therefore, being of "artificial production, manured, denaturalized so far that it cannot "reproduce its own forms, it is to be regarded as one of the great- "est conquests of man over nature, one of the grandest marvels "which industrial and agricultural power have yet achieved.

"To search for sugar-cane, with a view of regenerating, is to "march in a direction diametrically opposite to that in which we "have been going, and it will prove a delusion. Seed can only be "procured by a prolonged degeneration, and no single observer "could live long enough to obtain the result. It is planting, con- "tinued through previous and successive generations, which has "produced the cane by deformation and cultivation; it is a human "and artificial production. To seek for cane seed therefore is to "follow after a myth—an impossibility."

We learn however from the *Sugar-Cane* that at one of the sittings of the Chamber of Agriculture of Mauritius, one M. Lemarle, of the island of Reunion, informed the Chamber that he had been so fortunate on his estate as to establish the possibility of the reproduction of the sugar-cane from seed.

WE read in the *Bombay Gazette* that "a number of proprietors and superintendents of coffee estates, both European and Native, resident in North-West Wynaad, recently addressed Government on the neglected state of the district, which is suffering from want of roads, and especially from want of cart-road communication with the Coast and with other parts of Wynaad."

The *Cochin Argus* tells us that "the prospects of those who trade in coffee were hardly at any former period so good as they are now." Placing these two readings one after the other, the *Bombay Catholic Examiner* remarks that there is a "strong cause for reproach against the British Government, for a neglect which so flagrantly checks the prosperity of the country it has undertaken to rule. Good cart-roads were, in the opinion of the writer, "the want that demanded the attention of Government in preference to every other want for the physical improvement of the country." "In fact," the writer goes on to say, "the experience of the managers of our great lines of Railway has been precisely to this effect, and the working of the immense line, for instance, from Bombay to Jubbulpore, has been and is still many times more expensive, on account of its being in parts so inaccessible from the cultivated parts of the country. A good, plain means of transit by land and by water was the first requisite in the work of turning the riches of India to account. Speed in transit, in the writer's idea, was a sort of luxury, which might be pleasant enough to the upper classes, but it could not be called a requisite, as far as millions of people and acres in the country were considered. Whereas, it is most certain, he ends by saying, "that had the millions of money swallowed up by our railways been first allotted to the work of making good roads, communicating with the ports along the coasts and with the rivers, the country at this moment would have both roads and railways, and be at the same time much richer than it is."

A FRESH series of analyses of the ashes of tobacco has been prepared by Mr. Broughton of Ootacamund, in continuation of those published sometime ago. It appears that Mr. Broughton has now examined nearly a hundred samples of tobacco grown in the Presidency of Madras. These analyses prove conclusively that tobacco is a great consumer of potash, and that the ashes of a tobacco are invariably poor in this mineral, when it has been grown in a soil deficient therein. But these are facts which have long been known to the agricultural chemist, and to the most intelligent cultivators of tobacco in Europe and America. The work performed by Mr. Broughton was therefore quite out of proportion to the value of the results obtained. Still these analyses possess a local value. They partially explain why the tobaccos of Southern India are so inferior, and why one district produces better tobacco than another. Still we are yet only on the verge of the inquiry. Mr. Broughton's investigation extended only to the percentage of potash and nicotine contained in the tobacco examined. We should like to be informed regarding the lime, phosphoric acid, magnesia, and soda which together, form thirty-five per cent. of the ash of the best varieties of American tobacco. Most of the American tobaccos give an ash containing at least twenty per cent. of lime. May it not be possible that the inferiority of the tobaccos of Southern India is due to a deficiency of lime as well as potash? Again, many of these American tobaccos contain as much as nine or ten per cent. of phosphoric acid, which we know is present in very small quantities, even in the best of our arable soils. Again, we should like to know whether lime, magnesia, and soda, and potash will replace each other, as they are known to do in many plants cultivated by the English farmer, as it will make a great difference in the profit of growing tobacco, if soda, costing £10 per ton, can replace potash at £20 per ton. It would, we think, have been much better had Mr. Broughton made a *complete* analyses of the ashes of some half-dozen well selected samples grown under known conditions, and of the soils upon which they were grown. However what we require still more are analyses of the juice of the tobacco plant in different stages of maturity, to assist us in determining the nature and proportions of the organic acids and salts. We need also special researches into the chemical changes effected by the fermentation of tobacco. The fact that remarkable changes do take place is well known, but they are not sufficiently understood to enable us to control them.—*Indian Statesman.*

MR. WILLOUGHBY WOOD advocates the claims of pedigree in the *Farmer* :—

"It is nearly twenty years since I began to advocate in your columns the claims of pedigree to the attention of practical farmers. At that time pure breeds of domestic animals were in the hands of comparatively few men. With some of these the cultivation of blood was a profitable monopoly, while with others it was a speculation, in which only the wealthy could indulge with impunity. The ordinary farmer, whose cattle were reared for feeding or for dairy purposes, regarded animals with pedigrees as "fancy stock," with which he had as little concern with as a prize tulip or carnation. In the exceptional case of one who gave a liberal price for a well-bred bull, the neighbours shook their heads, and hoped such extravagance might not be his ruin. But the rapid advance which about that time took place in the price of stock, caused attention to be turned to rearing animals of an improved character. The demand for the better qualities raised their price so greatly in proportion to that of inferior kinds, as to render the breeding of the former an object well-worthy of the study of agriculturists. I pointed out that the best means of

effecting the improvement of stock at a reasonable cost, was by the purchase of pure-bred short-horn bulls, to be used with the ordinary cows of the district. The effect of the offspring is so decisive that the steers or heifers of such a cross may be taken as worth some £5 a-head more than if they had been by a mongrel bull. Some of the finest animals ever exhibited have been the result of a cross between a short-horn bull with a cow either of another pure breed, or of an ordinary dairy cow. Thus any farmer owning a herd of cows, possesses the means of improving his stock almost indefinitely, by the purchase of short-horn bulls. Gradually men have become convinced that this small outlay yields a return of profit which is not exceeded by any other agricultural investment. Thus a demand for pure-bred bulls has been steadily growing on the part of men who breed for practical purposes, and who, not expecting to sell their stock for fancy prices, look for their profits to the butcher or the dairyman. Such purchasers have no preference for one strain of blood over another. All that they require of a bull is that he should be the sire of heavy thriving steers, and of large good-looking heifers. They are careless of show-yard honours, excepting those of Islington, Birmingham, or wherever else quantity and quality of beef are held to be the sole criterion of merit. There can be no doubt that such a demand as this is the only solid foundation on which a pure breed can rest. Is it a fact that the offspring of pure short-horn bulls attain heavier weights at an earlier age than the offspring of ordinary bulls? Then the demand for the former must continue and extend. If on the other hand, it should ever be found that the introduction of pure blood, so far from insuring size and early maturity, was the means of introducing light flesh, weak constitutions, and dwindling frames, then the days of short-horns would be numbered. They would pass away and be forgotten, as has been the case with breeds once as fashionable, but which ultimately failed to satisfy the practical requirements of the time."

Hearth and Home, an American paper, contains the following remarks on the pursuit of farming as a recreation. They are entitled "Can an educated man get a living by farming":—

"An educated man cannot make a living by mere manual labour either on a farm, in the blacksmith shop, or in the factory. He may do more work in an hour or in a day, and do it better than the uneducated man by his side. A man with brains, other things being equal, can pitch more hay, or dig more rods of ditch in a day, than the mere man of muscle. But what of it? The uneducated man can perhaps earn 1½ dollar per day, and the educated man, from his superior skill, can do one-third more work and earn 2 dollars per day. But will extra 50 cents a day pay him for his years of hard study and self-denial? Will 2 dollars a day go as far in providing the luxuries and necessaries of life for himself and his family, as the 1½ dollar will in the other case? Will it enable him to educate his family as well as he himself has been educated?

"An educated man, to get a living by farming, must do work that an ignorant man cannot perform. On an ordinary sized farm, and with ordinary farm men, he will find no lack of employment—or if he does, he must change his system of farming, and go into some of the higher branches of agriculture or horticulture. No matter how thoroughly educated he may be, work he must, and work hard too—self-denying work, "honest work," as Carlyle says, "which you intend getting done," and then go at something else.

"This is the secret of success in all undertakings. There are a good many educated men who, having made money in other pursuits, turn their attention to farming. We wish there were more such. We extend to them a right hearty welcome. But as a general rule, they will not make farming pay. It is not the business of their lives. It is not work: it is recreation, and they should expect to pay for it, as they would for any other amusement. We know a lawyer—one of the ablest in the State—who has retired on to a farm. He makes a capital good farmer; has the neatest and cleanest farm in the neighbourhood. He also takes real delight in spreading manure, feeding his stock, and digging and laying under-drains. He works harder than any other man on the farm. But it is not work to him anymore than rowing is work to the Howard Club. Some time since a wealthy New York merchant wished to consult him on a legal question of great importance. He went to the house and was told that the "Judge" was out on the farm, going to look for him, he found an old man digging out an under-drain that had got stopped up. He inquired for the Judge, and was told that he would be there in a few minutes. He concluded to wait. The man kept on throwing out the mud. "Dirty work," remarked the kid-gloved merchant, as he stood on the side of the ditch in his patent leather boots. "How much does the Judge pay you a-day?" "I have taken it by the job," was the reply, "and shall not make my board." It was the Judge himself, and he undoubtedly told the truth. Hard he works, and skilful a ditcher as he certainly is, he nevertheless cannot make his board in digging under-drains. This noble old veteran of the Bar and the Bench spent the next day in writing an opinion that was worth more money to the merchant than it would cost to drain the Judge's whole farm. This was work and would command its price; digging ditches was play to the old Judge, and was paid accordingly—paid in restored health and in command of vigour of mind and body. But it would not pay his board.

"The educated farmer must do precisely as other successful men do. He must not spend his time in doing things that he likes to do. He must exercise self-denial; with him farming is buisiness, not pleasure. Because he likes to chop, it will not do to leave the care of the stock to Patrick, while he goes to the woods and "puts up" his two cords and then spend the evening with his neighbours, boasting how much work he has done that day. In fact, he has not worked at all. Had he stayed at home and attended to his stock, and done other things which he did not like to do, but which were necessary to be done, and which Patrick could not do, then he would have worked, and would sooner or later have got his reward.

"Amateur farmers, notoriously, do not make a living. And yet many of them are thoroughly educated men, and not a few know far more of the theory and practice of agriculture than their successful neighbours. Their failure is usually attributed to their employing too many men, and in not "getting the work out of them." There is some truth in this: but we have known an eminent successful contractor on a railroad, who owed his success to his energy and to his ability to manage men, utterly fail in making farming pay. And in his case, at least, the cause was not in his ignorance of general agriculture, or in his employing too many men, or in his inability to get the work out of them, it was due principally to his neglecting the little details of farming. He was inclined to do things on a large scale, and he made the mistake of going into the raising of those crops which require minute attention, and this he neglected to bestow. He would have done better had he confined himself to some one or two leading crops, such as wheat, corn, or potatoes, but he thought the prouts not large enough."

NOTES FROM CONTEMPORARIES.

A Dr. Getty has discovered a remedy for the blight, the foe of the gardener and fruit grower. It is simply the application of a decoction of quassia with a brush to the parts of the tree or plant affected by the blight.—*Delhi Gazette.*

Sad accounts reach us respecting the state of the wheat crops throughout the province, although the reports of District Officers are as yet silent thereon. It would seem that the late and unseasonable rains have had the effect of bringing in their wake that destructive insect, the *gerwee*, and the corn stands a great chance of deterioration in consequence. We trust matters may not be actually as bad as Agriculturists represent however.—*Lucknow Times.*

We learn that one of the simplest means of keeping flies from annoying horses or cattle, is to take a bunch of smart weed (*Polygonum hydropiper*), bruise it so as to cause the juice to exude, and rub the animal thoroughly with it, especially upon his neck, legs, and ears. Neither flies nor other insects will trouble him for at least twenty-four hours. If preferred, an infusion may be made by steeping the weed and applying the liquid with a sponge.—*Delhi Gazette.*

THE cultivation of flax in New Zealand is attracting much attention at present. A pair of shoes made of woven fibre of New Zealand flax were lately shown in a shop window at Nelson, made thirty-five years ago, as well as other specimens of the fabric woven by natives, and as a contrast, two samples of colored cloth for shirtings lately manufactured in England. The latter cloth is said to be silky in appearance, and both soft and flexible, and an attempt is to be shortly made to manufacture sheeting from flax. —*Pioneer.*

IT is said that the petroleum wells of Burmah promise after all to become a success. Even at the depths at which the shafts are at present sunk, the yield covers the working expenses; but the native workmen accustomed to those operations declare that no true spring has yet been struck, and that the oil at present obtained is only that which has trickled in from cracks of the rocks through which the boring passed. When "ile" is really "struck," they say that it swells up with a simmering sound; and that it will be struck if the shaft is only carried on to thrice the present depth they do not doubt.—*Indian Statesman.*

THE novelty of the season in the horticultural world at Bangalore is the Amaranthus Salicifolius, an annual introduced from the Philippine Islands. It is of pyramidal form, from two to three feet high, branching close to the ground. The branches extend in a horizontal position, the leaves are beautifully undulated, and assume a bright orange red. Full grown specimens bear a very close resemblance in habit of growth to the well-known Croton Angustifolium. It is confidently believed that this unique Amaranthus will prove well-suited to the climate.—*Times of India.*

IN the cold season, plants and cutting in pots suffer from extremes of temperature, the pots being made of porous clay regularly watered, become when exposed to sun and wind so many water-coolers or refrigerators to the roots inside, especially those round the sides. This will explain why at this season so many plants do better in the ground, for there they get a certain amount of bottom heat, instead of losing it by evaporation. To insure delicate plants keeping healthy in pots through the cold weather, they should be plunged, as gardeners term it, that is buried to the brim in earth ashes or fermented dung according to the degree of heat required to the particular class of plant.—*Bangalore Spectator.*

THE Cotton Commissioner of the Presidency reports that the breadth of land under cotton this season is very materially contracted. Including the Native States under the administration of Bombay, the total reduction of the area is estimated by Major Moore at about 600,000 acres. The exact figures are:—

	Acres.
Decrease in the Northern Division	278,132
" the Southern "	263,017
" the Native States	225,652
Total	766,821

Neither the Sind returns have yet been received, nor some others, and Major Moore estimates that the net decrease will prove to be about 617,000 acres. As the average out-turn of clean staple in Western India is 60 to 70 lbs. per acre, the falling-off represents about 100,000 bales, a quantity too trifling to have any effect either upon the local or Liverpool market.—*Indian Statesman.*

AT the last meeting of the Agri-Horticultural Society, Calcutta, a member introduced some Ribstone-pippin apples in capital preservation, to the notice of the Society, with the following remarks:—"These apples were picked by me from a tree in my garden in Devonshire in the middle of September last. When picked they were tolerably ripe. I had them carefully rolled in tissue paper, and with some soft clothing put in the bag in which I now show them. They were sent Overland via Southampton, and arrived in India on the 22nd October. As you will see, they are still in excellent preservation, though they have already been two months in this country. Judging by my success with these apples, I have no doubt, with ordinary care, many fine kinds might be brought to India."—*Bombay Gazette.*

ANY suggestions, remarks the *Englishman*, for the reclamation of the "Oosur" (usar) soils, or soils containing an excess of salt, which prevail extensively in different parts of the North-West Provinces, are most valuable. One of a very simple character, which has successfully stood the test of practice, is furnished by the Commissioner of Sind, whose memorandum on the subject is printed in the supplement to the last *Gazette of India*. When the salt is in moderate quantity, a crop is sown in spite of it, and the stalks of whatever is produced are cut off and left on the ground, into which they are afterwards ploughed to decompose. Where the land is subject to inundation, the next rise produces a film of good soil, which is also ploughed in. Another crop is then sown, which gives a superior yield; and repetition of the process described leads to further continual improvement. The same plan has been tried where fresh water was used for irrigation, and given good results; and there appears to be no reason why it should not be generally adopted. The possibility of remunerative success depends of course on the proportion of saline matter present in the soil.—*Indian Statesman.*

THE question whether the sugar-cane ever matures its seed in India, was raised we observe at a late meeting of the Agri-Horticultural Society in Calcutta. The enquiry was first addressed to the editor of this journal some months ago, by the American Consul at Bombay, at the instance of the Agricultural Department at Washington. We ascertained that no attempt was made to propagate from seed in Southern India, and Mr. Blechynden now tells us that "so long ago as in 1844, the Royal Agricultural Society of Jamaica made a similar enquiry, and that some interesting correspondence was the result, shewing that so far as had been ascertained, the cane was not known to be anywhere propagated by seed." In 1853, the subject was again mooted on the occasion of a small quantity of seed being presented by Mr. W. Haworth, which he had obtained from some fields of cane in the neighbourhood of Kandy in Ceylon. This seed was carefully sown in the Society's garden, but failed to germinate. The rattoon crops of foreign varieties of cane, more especially the China, had frequently been found to grow in the Society's garden, but the seed had never proved fertile. The result of all enquiries would seem to show that sugar-cane cannot be raised by seed.

The *Sugar-cane* magazine states distinctly that the cane is simply a common grass, which has been improved by the continued care of man for thousands of years into the modern cane, and that it has absolutely lost all power of reproducing itself by seed. In a late number of the same journal however, we see it stated that at a recent sitting of the Chamber of Agriculture of Mauritius, a letter was read from M. Lemarle, of the island of Reunion, informing the Chamber that "he had been so fortunate on his estate at *Riviere-des-creoles*, as to establish the possibility of the reproduction of the sugar-cane from seed." This communication was the cause of a very long discussion, the result of which we are not told. —*Indian Statesman.*

(*Indian Statesman.*)

THE Secretary of State for India has just forwarded to the Madras Government the following Report by Doctor Forbes Watson on a sample of Yea Valley cotton which had been forwarded to England by that Government for professional valuation. The cotton was grown on the Madras Experimental Farm:—

"This cotton was submitted to, and valued at from 10d. to 10½d per pound by the Cotton Brokers' Association in Liverpool on the 28th ultimo. It was likewise valued by a firm of brokers in the same place, and at the same time, at from 10d. to 11d. per pound. It is considered to be similar to Peruvian cotton, and the prices named are nearly identical with those quoted for the best qualities ("good and fine") of Peruvian cotton at the same date, and it ranks higher than "good" Egyptian, as will be seen from the subjoined table which gives the means of comparing the value of the Yea Valley sample from Madras, with that of similar staples in the Liverpool market, during the week ending 28th September last."

Description of Cotton.	Classification and Value per Pound.		
	Low Fair.	Fair.	Good.
	d.	d.	d.
Cotton from the Yea Valley seed grown in Madras in 1871, value 10d. to 11d. per pound.			
Peruvian	8⅞	9¼	10⅛
Pernam	8⅞	9¼	11⅛
Egyptian	8¼	9⅛	

"It should be mentioned that during the same period American 'Middling Uplands' was selling at 9s. 0d., and American 'Middling Fair Uplands' at 10⅛d. per pound, whilst the price of the two best sorts ('good') of Indian cotton in the market at that time, namely, 'Hingunghaut' and 'Middling ginned Broach,' amounted to 8¾d. and 8⅛d. respectively.

17th October 1871. J. FORBES WATSON.

AGRICULTURE IN EUROPE.

THE IMPROVEMENT OF LAND.

The President of the Highland and Agricultural Society of Scotland recently brought under the attention of the Directors of the Society the importance of "the improvement of the cultivation of land so as to increase the produce of human as well as of animal food." This subject, the Marquis of Tweedale said, "he had for many years thought was of greater importance to the public than the improvement of the breeds of cattle, sheep, pigs, &c., which had, in his opinion, reached the climax of perfection." If the improvement of the cultivation of land, brought under public notice by the President of the Highland Society, is considered from a national point of view, it is impossible to adequately appreciate its importance should that improvement cause such an increase in the produce of the soil of the United Kingdom, as to render the inhabitants comparatively independent of foreign and colonial supplies of those products which go to the sustentation of men and the domestic animals. Some of the highest authorities on agricultural topics have said that there would be no difficulty in so increasing the produce of the soil as to meet the consumptive requirements of the country; but to ensure this increase, thorough draining, deeper and more perfect cultivation of the soil, with improved systems of cropping, are requisite. There exist ample opportunities for the application of capital and skill for improving the cultivation of land. The extent of arable land, the cultivation of which could be advantageously improved, and the extent of unreclaimed land capable of being profitably reclaimed, are both points which call for investigation on the part of the committee appointed by the Directors to consider the question raised by the President. The amount of capital which would be required to effect these changes in reclaimed and unreclaimed lands could be easily obtained, provided proper security were given. This want of security is the greatest hindrance to improvement in cultivation, especially on the part of the tenant-occupiers. Comparatively few landowners at the present day undertake the carrying out of those improvements of the soil essential to ensure its profitable cultivation, draining excepted. A different state of matters as regards landowners making improvements existed even as late as the middle of the last century. It is now about three hundred years since Lord Bacon wrote:—"The improvement of the ground is the most natural way of obtaining riches, for it is our great mother's blessing, the earth's, but it is slow. And yet when men of great wealth do stoop to husbandry it multiplieth riches exceedingly." What was true in Lord Bacon's time is not less true in our day in the present state of agriculture in England and Scotland.

Confining the consideration of the question however to the improvement of the cultivation of land in Scotland, as the subject has been brought under the attention of farmers by the Marquis of Tweedale, there are collateral questions which have an intimate connection with the subject, such as the hindrances to the progress of improvement in the cultivation of land. The most prominent of these is, insufficient security to the occupying tenants; and the first question with them is, will the improvements pay those who undertake them? This will depend, in a great measure upon the amount of capital requisite to effect the improvements, and the time which must necessarily elapse before the increased returns from the land repay the capital with the interest of that capital. The President of the Society stated—"I believe from experience that the land of second and third quality is capable of very great improvement, and at a much less expense than farmers imagine, were they possessed of the means applied by the most experienced in carrying out successfully the contemplated improvements." Presumably the experience of the Marquis of Tweedale has been gained in effecting the improvement of about 1,500 acres of land near the village of Gifford, East-Lothian, and which is still farmed by the Marquis. The improvement of part of this land was commenced about thirty years ago, and the whole operations connected with these improvements have since been skilfully conducted, and the land well farmed. The improvements are most favourable examples of what can be effected by the command of ample capital judiciously applied, with the time requisite to reap the pecuniary benefits from such improvements as thorough drainage, deep and perfect stirring of the land, the improvement of the texture of the soil by the application of lime composts, and of vegetable matter taken from the bottom of a drained lake, and the application of a limited amount of auxiliary manures furnishing nitrogen and phosphoric acid to the soil—the farm-yard manure produced on the farms being the chief manurial agent employed to raise and maintain fertility. The lands were originally poor clays or retentive loams. By means of the improvements effected, lands which were previously worth not more than about 10s. per acre to rent on a lease of nineteen years, are now worth from 30s. to 35s. per acre, and perhaps more than one of the farms would at present let at 40s. per acre.

The lands previous to their improvement were not inviting to tenant-farmers holding under leases of nineteen years, and at the rents at which they were formerly let, did not prove profitable to the occupying tenants.

The improvements, viewed from a landowner's point of view, were a great success, for there can be no doubt but that the capital expended, and the skill and labour applied, were judicious outlays on lands naturally inferior, but capable of being very materially improved. The improvements, considered from a tenant-farmer's point of view, however, holding under a nineteen years' lease, and without conditions in the lease as to payment at its termination for unexhausted improvements, assume a somewhat different aspect. The improvements might have been judicious on the part of a tenant, provided they were executed during the beginning of the lease, and the seasons were favourable for clay-lands situated at altitudes from 500 to 800 feet, or more above sea level. The expenditure of the necessary amount of capital to effect similar improvements to those so successfully carried out on the farms situated near the village of Gifford would not be under twenty pounds per acre, the interest of which sum and its redemption, say in fifteen years, could only be met by a large increase in the amount of produce. In the possession of the landowner, capital expended in raising the real value is amply met when the increase in the hiring value of the land covers the interest.

In the case of those holding land by ordinary lease, the facts referred to by Lord Bacon should not be lost sight of in making improvements—namely, that "great wealth" requires to be expended on the ground—the return from which, as he remarked, "is slow."

The practical example shown by the Marquis of Tweedale as an improver of land of second and third quality, and his example as a farmer producing full crops without an extravagant expenditure upon the purchase of auxiliary manures, have not been generally understood by many of the tenant-farmers in East-Lothian—although his example as an improver of such lands cannot be, as a rule, generally followed by farmers holding under leases for a period of nineteen years, with the ordinary conditions of the way-going tenant in the country of Haddington.

The improvement of the cultivation of land depends however on something more than rendering the soil thoroughly dry by means of drains, and friable to certain depths by the use of subsoil ploughs, with the alteration of its texture by the application of lime and vegetable composts. Manures are indispensible for the improvement of almost all lands. The farm-yard manure made and applied on the Yester farms is obtained from feeding a large number of cattle (250) during the winter and spring months on turnips, the cattle receiving in addition a certain quantity of oleaginous cakes. About 1,500 sheep are kept on the farms, a number of these being high-bred Leicesters. To keep and fatten cattle with a profit, comfortable housing for them is indispensible. The erection of suitable additions to the farm offices however cannot be regarded as an improvement to be undertaken by a farmer farming under a lease with the ordinary clauses as to way-going; and where suitable buildings are required as an adjunct to the improvement and cultivation of the land, the necessary buildings should be erected by the landowner.—*North British Agriculturist.*

AGRICULTURAL STOCK—INDIA.

THE CATTLE PLAGUE.

(Indian Statesman.)

Sir,—Your remarks on the cattle plague in this country has led us to forward you the enclosed article on chloralum. Professor Gamgee, who discovered this useful and unique disinfectant, was consulted by the Privy Council on the rinderpest visiting the United Kingdom some years ago, and we believe it was owing to his advice that measures were adopted which succeeded in ridding the country speedily of the dreadful scourge. Whilst fearlessly resorting to the poleaxe for the diseased cattle, the healthy were protected by disinfectants, amongst which chloralum now takes the first place.—We are, Sir, yours faithfully,

23rd January 1872. R. T. SOUTHERN & Co.

ON CHLORALUM.

The ever-increasing attention paid to sanitary matters, and an intimate acquaintance with the nature and spread of contagion, invest with a special interest the study of disinfectants. We may hope some day to reduce to a minimum the demand for agents which are to neutralise the effects of filthy accumulations, such as under wise sanitary rules should never be witnessed; but we are still far from the period when perfect drainage and the complete utilization of sewage may protect us from offensive effluvia that are constantly inducing sickness, and an unnecessarily high rate of mortality amongst human beings. In fact, instead of the employment of disinfectants being on the wane, it is largely on the increase, and the practice of disinfection would, by this time, have been more generally pursued, but for the noxious and offensive character of the few agents which are known to check decay, and destroy contagion with any degree of certainty.

Tar and its products have from time immemorial been credited with active antiseptic and purifying properties, but the odour which restricted the

use of the first to the smearing of stall posts and the noses of cattle in farmyards, the [illegible] to its popularity in households. [illegible] which have led to the manufacture of [illegible] such as carbolic acid, have enabled [illegible] to employ it very widely. We are met however by two [illegible] the first, that just in proportion as carbolic acid has become popular, have we had to lament its use in cases of accidental or suicidal poisoning by it; and its application on an efficient scale to the refuse of towns is quite incompatible with the essential utilization of such refuse for agricultural purposes.

There is but one agent that, so far as we know, can supersede carbolic acid. It is the chloride of aluminium, which was introduced last year by Mr. John Gamgee, and which, in the entirely new form of a hydrated chloride, is fast enabling us to fix and deodorise sewage, to fix and destroy organic poisons, which must otherwise pollute the air and engender disease. This hydrated chloride, now very widely known under the name of chloralum, is in no way injurious to animal or plant life. Mr. Francis Vigers, a surveyor of extensive experience, was the first to use it systematically, in deodorising, day by day, a large quantity of sewage, which was pumped over land. One gallon of solution, containg 30 per cent. of the chloride, effectually deodorised 150 gallons of sewage, and completely arrested the evolution of foetid gases and other noxious effluvia such as are known at times to produce dysentery.

And here it may be well to dwell for a moment, on the power of chloralum as a deodoriser. Its action is peculiar and to a certain extent unexplained. Dr. Stevenson and others have asserted that, on adding chloralum to a sulphide, the evolution of sulphuretted hydrogen with the well-known fœtor which characterises this compound proved that it was not an active deodoriser. But it is certain that sulphuretted hydrogen is not, as a rule, the cure of bad smells, which are by some attributed to ammonia, and especially foetid organic ammonias, which are neutralized most effectually by the hydrochloric acid of chloralum. Moreover the aluminic chloride from its action as an antiseptic, completely prevents decay and the formation of the foetid gases of decomposition.

I have tried many experiments with chloralum, and found it completely successful in preventing the bad odour of urinals, in purifying the air of stables, and rendering drains and sewers as wholesome and odourless as it is possible ever to obtain them.

There are certain mal-odorous things which, if masked, are unattacked by any deodoriser that I am acquainted with, with the exception of hydrochloric acid, or the chloride of aluminium. The discharges from the anal glands of carnivorous and feline animals, the well-known odour of tomcats, or a dog kennel, and, as Professor Haughton, of Dublin, has shown, the penetrating fœtor of the secretions of foxes, polecats, and allied creatures, are completely removed by the use of chloralum.

But it is not only as a deodoriser that chloralum is gaining ground. In a fever ward it is the most manageable of all agents for the complete destruction of fever germs. Small-pox patients experience the greatest relief from its use as a gargle or as a wash to the skin. In scarlatina and diphtheria it has a similar grateful effect; and by suspending cloths dipped in it in a sick room, the attraction of moisture in virtue of the deliquescent character of the chloride favours evaporation from the fevered patient's surface, and produces a cooling sensation that is quite grateful even to by-standers.

The chloride in these cases acts as a contagion destroyer, probably in virtue of its acid rather than its base, and Professor Wanklyn has told me that he considers the use of this solution as the most admirable method of washing with strong hydrochloric acid, which is rendered quite harmless in consequence of the aluminous base with which it it combined.

It is not only in destroying contagion that chloralum is found of service. Surgeons are using it extensively in the treatment of wounds and ulcers, and as a detergent and deodoriser, in cancer it has been found of great service by several surgeons.

Not being a medical man, I shall not dilate on the many applications that have been suggested for this new antiseptic. As a sanitarian, however, a year's experience and very close examination of the subject has convinced me that an agent has at last been discovered which is quite unobjectionable as a household disinfectant the medical professors can recommend, as they have done very extensively of late, without running any risk of accidents, or, what is even worse, neglect in attacking poisons, the existence of which cannot be traced beyond the sick room. The discharges of all fever patients should be neutralised as fast as they form, and the clothes and bedding should be dipped in chloralum, and then steeped in pure water, so as effectually to prevent the spread of disease during the transportation of linen to disinfecting chambers, or from the admixture of garments in the laundry.

TOBACCO.

TOBACCO CULTIVATION.

We have much pleasure in publishing some further correspondence on the analyses of different tobaccos grown in the Madras Presidency.

Mr. Broughton, referring to certain samples of tobacco sent for analyses, writes to the Secretary of the Madras Horticultural Society as follows:—

I have the honour to report on the specimens of tobacco, sent to me a short time since.

They were of five foreign kinds, and consisted of fine large leaves, especially the Manilla and Havannah. These leaves with care possess all the mechanical qualities for making good cigars. The [illegible] of the specimens were unequally and badly fermented, and had the appearance of having been carelessly handled, being [illegible] broken, as if not intended for making cheroots.

In the following table I append the results of their analyses. A full explanation of the meaning of the separate items will be found in a former report, Proceedings Madras Government, Revenue Department, 27th July 1871, No. 851, with which these results may be usefully continuous:—

No.	Description of Tobacco.	Per cent of Ash.	Per cent. of Carbonate of Potash.	Per cent. of Nicotine.
75	Manilla tobacco	24·51	·71	2·09
76	Havannah do. (rubbish manured).....	28·04	·65	4·11
77	Havannah do. (horse manured)	24·71	·69	2·45
78	Virginian do.	20·48	·74	2·50
79	Maryland do.	23·06	·78	6·96

The above table shows, that with the exception of No. 76, Havannah tobacco (where the amount of nicotine is too large) the strength of the tobaccos is nearly the same as that produced in their respective countries. But the quality of the whole of the tobaccos is entirely spoilt by the composition of their ash, which contains not more than three-quarters of a per cent. of potassic carbonate, instead of 9 or 10 per cent. This is a peculiarity quite fatal to the quality of all tobaccos for the smoking of Europeans.

I cannot but consider that the examination of these tobaccos is of great interest to the subject of tobacco cultivation. It appears to me to shew that the soil of the place on which it grew, and consequently probably that of the Madras districts, is unfit for the cultivation of tobacco. Whether this could be remedied by the application of potassic manures, such as wood ashes or nitre, I am of course unable to say, though such an experiment ought certainly to be tried. It seems however to be nearly clear that the Madras district will always be under greater difficulties than some other parts of the Presidency in producing good tobacco for European smokers. The ordinary deficiency of the ash of Indian tobaccos in potassic salts is most certainly the main defect they possess, and is undoubtedly a principal cause of their indifferent character in the European market. I desire to point this out emphatically.

I have had cheroots made of the specimens of each kind, and have smoked them. They were, with the exception of No. 77, utterly without flavour, and all useless for smoking. This deficiency is however to be attributed, in great part, to the want of proper fermentation, the tobacco being frequently almost uncured.

I have the honor to request that you will be good enough to communicate this short report to the Board of Revenue, it being a continuation of their Nos. 2278 and 3704, dated respectively July 27th and August 28th 1871.

Again, in a letter to the Secretary to the Board of Revenue, he says:—At the end of September I received a letter from Mr. McQuhae, Acting Collector of Madura, which informed me that he forwarded specimens of tobacco from the Dindigul and Pulni talooks of the district, and shortly after I received a case containing many samples of tobacco. As these tobaccos have a certain reputation in South India, I submitted them to analysis. The tobaccos are of three kinds, respectively, named in the districts of Pulni Vattacappal, Oosicappal, and Yerumaicappal. The method of cultivation and curing, of which accounts were forwarded, do not essentially differ from those followed in other parts of the Presidency. Subjoined is a tabular statement of the results obtained, which are given in the same form as in my first report, with which the present one is intended to be continuous:—

No.	Tobacco specimen from	Per cent. of Ash.	Per cent. of Carbonate of Potash in Ash.	Per cent. of Nicotine.
80	Dindigul, Nelacotta	21·98	2·45	2·77
81	Do. Tattaputti (Ramasamy).....	20·19	3·45	3·27
82	Do. do. (Vellacunnor Pillay).	23·28	10·93	2·27
83	Do. Cunny vaddy (Chickanah Gowden)..	21·49	4 37	3·34
84	Do. do. (Tirrumallay Gowden).	20·91	13·77	1·21
85	Do. do. (Supera Gowden).....	22·04	21·04	1·77
86	Do. do. (Coopoo Reddy)	20·21	10·04	2·42
87	Do. do. (Ramasamy)	23·43	3·49	1·63
88	Pulni Yerumaicappal	21·41	3·11	3·70
89	Do. Hasaputti Vattacappal	21·12	12·19	4·05
90	Do. Avayanputti do	25·93	2·22	1·35
91	Do. Cumiliputti do	21·52	3.34	2·42
92	Do. Thungamohrummapettay Oosicappal ..	18·95	9·2	3·41
93	Do. Poongara Oosicappal	23·86	7·11	1·99
94	Do. Sharrypettay do	22·97	4·88	1·99

It appears from the above that much tobacco of Dindigul thus examined possess certain qualities that are absolutely necessary for tobacco of good quality. Examined on the principles which I enunciated in the report abovementioned (Government Order, July 27th, 1871, Revenue Department, No. 1313), it will be observed that Nos. 82, 84, 85, 86, and 93, possess the amounts of potassic salt and nicotine which are found in good tobacco. By actual smoking I found the first three of these, or those obtained from Dindigul, to be not of bad quality; the two latter, though sound tobaccos, had an unpleasant flavour, undoubtedly due to careless curing. These two latter were from the Pulni talook. The whole

of the tobaccos were inferior to certain specimens which I received from the Godavery Lunkas, and all had the flavour of Indian tobacco. I may mention furthermore that I have met with cheroots sold by Messrs. Campbell & Co., Dindigul, which in flavour were superior to the best of the tobaccos I have received from Dindigul.

This clearly shows the importance of care in manipulation and curing, from the defect of which all native-grown tobaccos suffer more or less. The considerable variations in the amount of potash salts in tobaccos grown in the same village show most markedly the influence of cultivation on the quality. Had the finer foreign tobaccos been cultivated as Nos. 82 and 84, there is no doubt whatever that the result would have been successful. What is now wanted for the introduction of good tobacco cultivation in this country is for the finer kinds to be grown in any of the localities where the amount of potash in the ash of the present tobaccos is found to be in the necessary proportion. Suitable experiments with manures will hereafter doubtless extend the sites, but at first the general defect of Indian tobaccos should limit the trials to those places where this most essential quality is of natural occurrence. I do not think the analyses of carelessly prepared native tobaccos is likely to be of much further service, now that the general conditions of the field are known. Analyses of carefully grown and prepared tobaccos should take their place.

SUGAR.

One Mr. Raoul has announced to the Academy of Sciences that cane-sugar can be converted into grape-sugar by prolonged exposure to light. It took 5 months to convert 10 grammes of white-sugar into grape-sugar or glucose as it is called. This is of no practical importance, as we can get as much grape-sugar as we want from rice, and when that fails we can obtain it from old rags.—*Bangalore Spectator, January* 21st.

THE SUGAR INDUSTRY.

The Russian Government greatly desire to promote the introduction of the sugar industry on the Caucasus. The manufacture of sugar in the south of Russia, as is well known, has assumed features of undoubted importance; and we are informed that any person who may establish sugar manufactories in the Caucasus, will be most encouragingly treated by the Government, enjoying for two years a total exemption from all duties, and afterwards being subjected to very lenient imposts.—*Darjeeling News.*

THE COMMON PLANTAIN.

Sir,—Your editorial note on the propagation of the sugar-cane suggests to me an enquiry on that of the common plantain. This tree has long been propagated by transplanting the numerous offshoots which sprout out all round the root, that the seed, if sown, will not now germinate. A wild plantain of small size is very common on the cliffs and edges of the ravines along the Western Ghats. I should be thankful for an account from any of your readers of this wild plantain, and of any connection between it and the cultivated one.—*The Indian Statesman.* B. A.

GRAPE SUGAR.

Glucose, grape-sugar, or the sugar of fruits, is a sugar which differs from ordinary cane-sugar in containing a larger quantity of water. Ordinary cane-sugar is a compound of carbon and water in nearly equal proportions, but in grape-sugar the water is in excess. The sugar contained in grapes, in honey, and in the majority of sweet fruits, is glucose. It is easily extracted from candied raisins or from honey by washing with cold spirits of wine to remove the uncrystallisable syrup, then dissolving the glucose by warm water, clarifying and evaporating the syrup thus obtained. Pure glucose is white, much harder than cane-sugar, and less sweetening. It is the only sugar that is capable of fermentation, that is to say, conversion into alcohol. Cane-sugar, starch, and lignine must pass into grape-sugar before they can be fermented; and this change may be easily accomplished. An impure glucose is much used by brewers to increase the sweetness of wort, and consequently the strength of the resulting beer. A purer quality is much employed, especially on the Continent, in making up medicated lozenges, where sweetness is not so much a desideratum as hardness. On the Continent, as also in some parts of England, immense quantities of alcohol (spirits of wine) are manufactured from grape-sugar. In order to do this, advantage is taken of the fact that oil of vitriol has the power of changing starch, woody fibre, linen rags, or any other ligneous matter into grape-sugar. The following is an outline of the process followed:—The starch, paper, woody fibre, potato slices, or rags, &c., are mixed with half their weight of dilute oil of vitriol. When the mixture has stood twenty-four hours, it is dissolved in a large quantity of water and boiled for four hours. The oil of vitriol is then removed by means of chalk, with which it forms an insoluble precipitate. The liquor is now filtered through animal charcoal, which removes any colouring matter. The liquor is now a solution of grape-sugar, and may be fermented in the ordinary manner, after which it is distilled in order to separate the spirits of wine.—*The British Trade Journal.*

A MARTINIQUE SUGAR MILL.

We extract the following interesting notes on a Martinique sugar mill from the *Trinidad Chronicle*.—"At the Petit Bourg Usine the canes are ground in a mill of 40-horse power made by Cail and Co., of Paris. The rollers are much thicker in proportion to their length than the general run of mills manufactured in England and Scotland. Although of 40-horse power, the mill at the Petit Bourg Usine has rollers only 5 ft. in length. This mill extracts about 72 per cent. from plant canes, and from 60 to 70 per cent. from rattoons. The steam is applied both for the machinery and boiling by five multitubular boilers of the shape of locomotive boilers. Were coal only used, these boilers would be equal to 100-horse power each, but as the megass is consumed in the boiler furnaces immediately on its issuing from the mill by the aid of two tons of coal per diem for each boiler, their efficiency as generators of steam is diminished about one-half; that is to say, the five boilers barely supply 300-horse power. The amount of sugar manufactured is about fifteen tons per day of fifteen hours; and the waste of animal charcoal about fifteen tons per annum. Sixteen centrifugals are used, driven by two 12-horse engines. This Usine, which is not on a large scale, is fed by means of about six miles of railway; the rails weigh about 25 lbs. to the yard; the gauge is about 4 ft. Sixty cane waggons are employed, measuring 11 by 8 by 2½ feet, each capable of carrying about 6,500 lbs. of canes, and each drawn by one mule, of which there are twenty-five attached to the Usine, all small animals. The average cost of the tramway per mile, in an undulating country similar to the Naparimas, is about 7,000 dols. per mile; on level land the expense hardly exceeds 5,000 dols. per mile. There are three lines of rail laid down before the mill to facilitate the discharge of the waggons. The cane waggons on the tramroad are loaded by the cane growers, but they have nothing to do with the expense of traction on the tramway, or the cost of laying it down, and repairing it. From the mill the megass is carried by a web to a platform about 16 ft. above the ground; this platform is about 40 ft. square, close boarded to a height of about 6 ft., except where the web discharges the megass at the end of the platform opposite the discharging web, on five shoots leading direct to the furnace mouths of boilers, at an angle of about 50 deg. The megass is shoved into the furnace by the stoker, with sufficient coal to enable it to burn freely. The boilers contain from 120 to 130 tubes, 3 in. diameter inside, and about 18 ft. long. The grate surface is about 4½ ft. by 6 ft., the chimney is 70 ft. high, by 3 ft. in diameter, and of sheet iron. Each boiler has a separate chimney. The sides of the boilers are not coated with any non-conductor, as it has been found that the damage caused to the boiler by the contact of any insulator, and any leakage that may take place is not compensated for by the heat saved, which would otherwise be lost by radiation.' *The British Trade Journal.*

SUGAR-CANE SEED.

(The Sugar-Cane.)

Through the courtesy of Mr. Wm. Drumm, we have received a few seeds of the sugar-cane raised by him from the purple variety. We are taking steps to ascertain whether plants can be raised from them in this country under suitable conditions of temperature, &c. We hope Mr. Drumm will be successful in raising new and improved varieties of cane. The subject is one of great importance; we are glad that it is receiving attention.

The following letter is from *The Barbadoes Reporter*, of April 25th:—

(To the Editor of the Barbadoes Agricultural Reporter.)

Dear Sir,—We learn from *The Sugar-Cane*, for April, something further as to sugar-cane seed, showing us that the suggestions of Mr. W. Drumm as to the reproduction, crossing, and improving of the sugar-cane by growing it from its seed have been followed up with good promise of success in New Caledonia, and also established in the island of Reunion, p. 203, and 205. Here, in Barbadoes, as it is chiefly the transparent or purple cane which arrows and seeds, we do not care much for that variety, being fully satisfied that its seeds are procurable and fertile as natural grown plants, and perfect seed have been shown at our annual exhibitions. We would advise all who desire to procure sugar-cane seed to follow Mr. Drumm's advice, and cover the arrow or flower of the cane with a fine muslin bag as soon as it opens, and keep it covered and tight on the stem till the whole is fully ripe, and then to pick out the *few* perfect seeds from the multitude with which

nifying glass of good power. The sugar-cane seed shown for the last few years at our exhibitions, and now to be seen at No. 1 Broad street, cannot be seen distinctly with the best of good eyes, but with a magnifying glass they show themselves perfect seeds, very much like miniature oats. We are advised that we may have some cane seed plants to show at our next exhibition, and we have as good a right to hope and expect success with the sugar-cane, as the foresters of America had when they crossed the wild fox grape seeds of their prairies with the cultivated kinds, and procured the prolific wine and luscious table grapes of that Continent. It is a fact that we want *new* and better varieties of the sugar-cane.

DRUMM & Co.

THE SUGAR-CANE SEED.

(By Dr. Auguste Vinson.)

I am always surprised at one thing, and that is how people should have made and eaten so much sugar without knowing the origin of the cane which produces it. It appears to me a matter of importance, if not of duty, for planters and manufacturers of sugar to inquire into the history of the plant which leads them on either to fortune or to ruin. To me this has been an absorbing study, and I believe that by the observation of phenomena connected, with it, I have arrived at the truth. At present my conclusions appear to answer all the necessities and probabilities of the question.

The name of *saccharum officinarum* given to the cane is not a botanical designation, but purely conventional. The sugar-cane is nothing less than a conquest of humanity—a plant produced by artificial rearing—in short, an agricultural production which is entirely human. Being a thing which man has developed by depriving it of its means of reproduction, it would, if left to itself, inevitably perish; it continues to exist simply by cuttings planted by man, who is interested in its preservation; it is an ideal production, the result of the training of many centuries. To be convinced of this, it is only necessary to look into history. Sugar descends to us from the most ancient of the industrious peoples of Asia, particularly the Chinese, the oldest nation of workers on the earth. It is from China that the cane has spread into the islands from whence we have obtained it, and where we find the most beautiful, the richest, and more perfect species.

I am amused at the *naïveté* of those who are seeking for cane seed, and for the simple reason that, since it has required the lapse of centuries and the unremitting labour of successive generations, in order to train the cane so far from its original type, at least an equal period of time will be necessary to bring it back to this, together with such constant effort as mankind is incapable of without a direct interest, which shall be powerful and even instinctive. It would be necessary to undo that which has been accomplished—gradually to descend the same ladder by which the present elevation has so slowly been reached. It would be well if people could be convinced of this truth, namely, that far from obtaining cane seeds in order to regenerate the species, it will be necessary for the cane to degenerate to obtain the seed. Moreover, to bring this about would be a work of centuries; and even if it should be accomplished, what would be the result? Doubtless a common grass already known to botanists. Now I believe that this grass is the sorghum.

The pompous title of *saccharum officinarum* falls to the ground. The sugar-cane has no botanical existence—it is my firm conviction that it is not in nature. It is men who have made this plant, as I before stated; and therefore, being of artificial production, manured, denaturalised so far that it cannot reproduce its own forms, it is to be regarded as one of the greatest conquests of man over nature, one of the grandest marvels which industrial and agricultural power have yet achieved. The object was a necessity, in order to induce generations to work like bees for the production of this human honey which is called sugar.

Now, all the facts derived from observation and investigation, from practical cultivation, and from the study of dispersed and various species resulting from one common origin, serve to corroborate the truth of this my theory. In the place of the primitive and original reed—that meagre grass, with long knots and thick bark, with leaves slender, narrow, speckled, and absorbed into an enormous pyramidal tuft, which weighs down the whole plant under the weight of its monstrous seeds, we have a thick and well-nourished stalk, with shortened and inflated internodes, a delicate rind, containing a sap rich in sugar, well-nourished, and succulent, with fresh and graceful leaves, without seed plumes, or with simply a small sterile tuft.

Now let us consider how this applies to the species of cane which is the object of our study, and the parent of sugar industry. All our observations go to corroborate my theory concerning the origin of the sugar-cane. We distinguish between those canes which sprout and those which flower, and the latter we find have longer knots and harder rind. Wherefore? I think because they are less removed from the natural type. Again in canes which do not flower, we find the knots nearer together and thicker, and the rind less hard; the reason being, as I believe, that they are more removed from the original type. The former are more rustic than the latter, and the latter, like those races of animals which are most domesticated, are most liable to disease, and thus they have been more damaged by the epidemics to which this remarkable grass is subject, insomuch that the planters, to their great chagrin, have often been obliged to abandon the cultivation of the most perfect species of cane, and to confine themselves to those which are less rich.

I spoke of the races of domestic animals; these, like the sugar-cane, have all been produced by artificial means. It requires all the knowledge we possess to recognise the ignoble animal known as the wild horse, with his white coat, furry and curled, with his misshapen and vicious head and frightful hoofs, as the ancestor—remote it is true—of the high-bred English or elegant Barbary, or the intelligent horse of the Arab. It would require a strong effort of the imagination to suppose the exquisite lorrette, or the pointer, descended from the snarlish wolf-dog of nature. Our beautiful cane proceeds in the same way from the vulgar sorghum. This is my opinion. We must then drop the name of *saccharum officinarum*, if we would be found botanists. But animals do not, like vegetables, lose the faculty of reproduction. This is distinctive of animals, yet they also become less prolific or sterile when their form is improved by cross-breeding. It is likewise in this manner no doubt that all our fine roses, so rich in colour, so full of petals, of such great size, and of such various appearances, and so odoriferous, have descended from the simple briar. But Buffon has said long ago, with regard to the canary so much associated with man, that it was a human product, an artificial bird, and as such non-existent in nature. Has not wheat been a creation of the same kind, only that the art has been applied in an opposite direction; in the cane the seed disappeared to the advantage of the stalk, but in wheat the stalk has vanished for the development of the seed. Here is the hypertrophy of the seed, since art has provided for the indefinite reproduction of wheat by means of it—admirable design wonderfully executed. Therefore to seek for cane seed is to follow after a myth—an impossibility. The sugar-cane, as we are aquainted with it, cannot seed. The seed exists in a grass so remote from the sugar-cane of our day, that it has no resemblance to it, and should be differently designated. To search for sugar-cane seed, with a view of regenerating by this means, is to march in a direction diametrically opposite to that in which we have been going, and it will prove a delusion. Seed can only be procured by a prolonged degeneration, and no single observer could live long enough to obtain the result. It is planting, continued through previous and successive generations, which has produced the cane by deformation and cultivation; it is a human and artificial production.

At its highest point of perfection the sugar-cane does not flower. The cane that has not attained to this high state of cultivation, and which is nearer to the original, does flower. The mixed cane, which is an intermediate state, flowers upon a poor soil, but not when placed under privileged conditions. The sugar-cane presents numerous varieties, or species descended all from one unique type, which I believe to be the sorghum. These varieties or species have been gradually produced by geographic and climatic influences. Plants which have been artificially produced, cannot be other than artificially classified. In adopting efflorescence, as a criterion for purposes of classification, doubtless good observers have been in the right. But it is necessary that the resemblances should be complete, and not only partial. In this way three groups may be formed:—

1st.—Canes which flower.
2nd.—Mixed canes which flower on arid soil, and not on rich soil.
3rd.—Canes which never flower.

Since the internodes are long on the flowering cane, moderately long on the mixed sort, and short and thick in the cane which never flowers, the classification will be in accordance with the true criteria—namely, the greater or less perfection at which the plant has arrived.—*The Sugar-Cane.*

ORANGE TREES.

A warm, well-drained, friable soil is essential, not only to the well-being, but almost to the bare existence of orange trees, as they will not even live long among soil of a cold adhesive nature. In the N. W. Provinces it is by no means rare to see young trees suddenly exhibiting all the symptoms of decided bad health after having flourished almost luxuriantly for three or four years. Their leaves become yellow, fall to the ground, and the points of the leading branches die back. The cause of all this, I think, will usually be found in the fact that the roots have got beyond the artificial soil among which they were planted, and have entered the natural soil, among which they either cannot find nourishment for the branches, or the degree of heat which is essential to their active existence. In either case it is very plain that the natural soil must be removed, and substituted by mould of a more genial and porous nature; but should the natural soil be cold as well as poor, and so have chilled the roots, the points of them ought to be pruned away, and as a matter of course the branches should be pruned back at the same time, and so give the roots a fair chance of establishing

themselves among the new soil. I, some years ago, saw a few trees of a considerable size planted among soil of a strong, but by no means of a very retentive nature; and as soon as their roots got beyond the artificial soil which was placed about them when they were planted, they began to retrograde, and now they are fit for nothing save the flames. In the case of the trees in question I am convinced that ill-health was induced and confirmed by the coldness, and not by the poverty of the soil, as on the same soil peaches, limes, and mangoes grow luxuriantly. Neither in its natural nor artificial state can the roots of the orange tree be either frequently or long subjected to a temperature beneath 50° with impunity; and no soil, however good, can atone for the lack of the essential degree of heat. In the Azores, where, according to Mr. Wallace, the soil is composed of friable loam and volcanic matter, underlaid with a mass of shattered rock and rubble, a single tree has been known to produce in one season as many as 20,000 oranges. The mean temperature during winter in the Azores has been ascertained to be nearly 58°, during spring 61°, during summer 68°, and during autumn 62°; and so the difference between the temperature of winter and that of summer is only ten degrees; whereas the disparity between our winter and summer temperature is something greater than three times this. There is however but little difference between the temperature of our cold season and that of winter in the Azores; moreover, as the trees mature and ripen their fruit during November and December, the great difference of our summer temperature may have next to no influence on the trees either for good or ill. At any rate I feel almost confident that where orange trees thrive badly in the N. W. P., the soil, and not the climate, is at fault; and although we have next to no power over the latter, we can make the former almost what we please; and I think that every one who is anxious to produce good oranges should endeavour as far as possible, to imitate the soil of the Azores. From the facts above given, it is clear that drainage is of the utmost importance, and for this purpose I know of nothing better than brick rubble. To insure proper drainage the whole boarder intended for orange trees should be excavated to a depth of three feet. This done, put in about a foot of brick rubble and a slight blending of very roughly-ground bricks. If good, the surface soil of the boarder should be well-cleaned and mixed with fine leaf-mould and bazar manure, so decomposed as to have the appearance of dark, very rich earth. In mixing, put in two parts of this manure, to one of leaf-mould and one of earth, and if well done, this ought to produce a loam which will neither accept nor retain an injurious amount of moisture and in which the roots will find a genial temperature as well as a bounteous supply of nourishment. By some this may be considered a somewhat laborious method of planting orange trees, but apart altogether from the proverbial saying that "whatever is worth doing at all is worth doing well." I feel sure that this will ultimately prove the most economical as well as the most satisfactory method. Orange trees do not like the knife, in fact they cannot be pruned into anything like a symmetrical form. They *will* spread out long, lanky stems; shoot up and become pendulous, and in this perverse tendency may be seen the reason why even comparatively young orange trees are so frequently in a broken-down condition. The weight of the fruit and the strain of the weather almost invariably prove overmuch for them. Therefore, instead of cutting the branches away, their points should be tied down, and by so doing, the sap in its upward flow will in a manner be constrained to put the buds in motion where the strain on the branches takes effect. Thus, instead of wasting the substance of the plants in producing long, lanky, and anything but useful stems, it is utilized in maturing the bent-down branches, and in producing young ones, to be also bent-down in their turns. Orange trees respond to this treatment in a wonderful manner. At present I have some young plants on the bent-down branches, of which there are as many as ten and twelve young shoots. I do not think that anyone needs to be told that a symmetrical tree cannot be framed without plenty of young wood; and I know of no other mode of training, save this, that will cause orange trees to throw out young wood wherever in the formation of the trees it may be required. Their situation should if possible be high and exposed; water should be given most freely when the plants are forcing and maturing their fruit.—*Pioneer.*

THE COCOANUT.

(*Ceylon Observer.*)

Apropos de rien:—It is singular that in the various accounts that have been published of the cocoanut-palm, no mention is made (at least I do not recollect meeting with any) of the *edible* cocoanut, named by the Singhalese, *navesi*. This fruit in all respects like the ordinary cocoanut, differs from the latter in this particular, that the tender husk (within the outer rind) is sweet and palatable, and can be eaten or chewed according to fancy to very nearly half-way down the nut; only the bottom part of the shell being too tough to be masticated. Children are very fond of the *navesi*, and they will go on munching it with great gusto, until their lips and tongue become brown with its juice. The water, or rather the *milk* as some people call it, of this species, is insipid, being slightly saltish to the taste, unlike that of the ordinary young cocoanut, which is generally sweet and refreshing. The tree-rat is very destructive to *navesi* trees; seldom allowing the fruit to become ripe, they gnaw the tender ones whilst green and drop them on the ground. The King-cocoanut is *par excellence* worthy of its name; the golden clusters of this fruit on a healthy tree is a most beautiful sight not to be equalled even by the fabled apples of the Hesperides. Again there is another kind called the *Rang tembili*, from the brilliant red crown you find on it on removing the stalk. I have read of the fruitful cocoanut-trees growing on the banks of the Maha Oyat, (the same account that reached the hands of a gentleman settled in India who afterwards wrote to Colombo for plants of the wonderful trees), but I can without vanity show you here, trees bearing more than thirty nuts in one bunch, the result it must be confessed, however, of the care bestowed upon them for a quarter of a century. As a pendant to this, I may relate the tale of a cocoanut-tree somewhere near Matara, which I believe to be true. This tree bore plenty of fruit, but strange to say they were never plucked, until one morning the villagers discovered that someone had stripped the tree during the preceding night. While gossipping according to wont, an old man remarked that he was astonished at the hardihood of the thief, because the tree was infested by snakes. The *thief* who was present, on hearing this, started up in mortal alarm, cried out that he had been bitten by snakes, and eventually sickened and died, but not before confessing that he had robbed the tree in ignorance, and that he *had* been stung by what he thought at the time to be wasps. The poison did not take effect until after he had heard the fatal doom, and then the body succumbed to the awful truth realised by the mind! Talking (or rather writting) of trees reminds me of an extraordinary opinion current among the Singhalese. In several instances I have noticed that where cinnamon-trees were rooted out for building purposes in Maradana, the *cashew-apple* trees left for shade, gradually drooped and died. I asked several men the reason of this, and they all replied, the cinnamon tree supplied the cashew with nourishment, and that when it was removed, the latter pined away and died! Now these men were from different villages, but accustomed to field-work at Colombo, and all gave the same opinion at different times! That the cashew-tree flourishes luxuriantly in the midst of cinnamon is a fact that can be witnessed any day, but why should it not do so otherwise? I have seen the cashew growing among other trees, but not when the ground was laid bare for habitations. How unlike the friendly cocoanut-tree that loves the sound of the human voice and thrives best on the oxygen breathed by man! Then why this difference? Perhaps the barren soil of the cinnamon gardens has something to do with it, but I should like to have the opinion of your botanical correspondent on this point. Those stately trees in the Borella cemetery, now deprived of their companions, are fated to wither and die, but some who chose their last resting-places under their shade, are now beyond the reach of human hopes and wishes. Whence this mysterious affinity? Do "the loves of the plants" exist in reality, or are the poetical Germans wrong when they endow the vegetable world with passions like ourselves?

NEMO.

RICE CULTIVATION.

Result of the experimental cultivation of Carolina rice in the Madras Presidency.

The Board are called on to forward, for transmission to the Government of India, a report on the experimental cultivation of Carolina rice in the Madras Presidency, and a summary of the various reports received from Collectors and others who have undertaken the cultivation of the American rice since 1866, is herewith submitted. Supplies of the seed have been forwarded from time to time to all the Collectors, and the experiments have been made both with freshly-imported seed and also with acclimatised seed obtained from previous crops grown from the seed imported from America. In the following outline of the reports received by the Board, each district will be considered separately.

Malabar.—From Malabar reports were sent in June 1866, March and May 1867, and in May 1868. The first trial appears to have been a failure, which was attributed to the seed having been sown too late in the year, which however could scarcely have been the cause, as autumn has been shown to be a favourable season for sowing. The report dated March 1867 is very much more favourable. In one of the most successful trials made the seed was sown in June and reaped rather more than four months afterwards. The seed was steeped in water for five days before it was sown, and the ground was prepared by ploughing five times and manuring with cowdung, leaves, and ashes. The crop was transplanted before reaping. Almost all the characteristics of the Carolina paddy given in the "Resolution" of the Government of India on the subject were recognised in this case. The report

received in May 1867, dated from Tellichery, was on the whole highly favourable. All methods of sowing were tried, and the conclusion arrived at was, that it is most in accordance with the natural habit of the plant to sow it broadcast, but that the out-turn from a transplanted crop would probably be greater. It was found that the seed should not be sown too thickly as the shoots thrown out are very much more numerous than in the case of indigenous rice, and require more space. The best alluvial soil appeared to be most suitable for the cultivation of this plant, and, except under exceptional circumstances, the land should be artificially irrigated. The results of nineteen experiments were given, and in every case which did not entirely fail, the out-turn was far greater than that from indigenous paddy sown at the same time, the largest yield reported being one hundred and sixtyfold. The natives were said to be much struck with the superior qualities of the rice and straw, and to be anxious to cultivate it. The experiments reported on in May 1868, appear to have failed from over-irrigation.

North Arcot.—The first report received from North Arcot in March 1866 was unfavourable, the seed supplied having been at fault; but in March 1867, a very full report was received, which showed that the cultivation of Carolina paddy had been most successful. The Collector, the Sub-Collector, and Head Assistant, each conducted experiments, and all with a certain amount of success. The natives appear in each of these experiments to have been unanimous in praise of the qualities of the rice; they seemed, however, to think the straw too coarse for fodder. The method of cultivation adopted appear to have been similar to that employed in the cultivation of ordinary Indian paddy, the land being frequently ploughed, copiously flooded, and manured with leaves, cattle litter, &c. The seed after being steeped in water for three days, was sown broadcast, being then in an incipient state of germination, and the ground was not again irrigated for five days, after which time until a few days before reaping, it was constantly irrigated. A futher report from this district in April 1871, shows that the cultivation of the American rice has been continued with success. In one case six measures of seed produced 240 measures of grain and eight bundles of straw, and in another the produce of nine measures of seed was 345 measures of rice and 14 large bundles of straw, this latter being the result of an experiment conducted by the Collector. The results of cultivation by ryots, were reported in May 1871, from which it appeared that the experiments had failed, it is to be presumed from carelessness on the part of the cultivators.

Nellore.—Unsatisfactory reports were received from Nellore in 1866, 1868, and 1869, want of care in the cultivation being the reason of the failures. In April 1871, a very full and satisfactory report was received from the Deputy Collector at Naidoopet. No pains appear to have been spared to make this experiment a success. Three different systems of cultivation were tried, namely, sowing broadcast in seed-beds (to be afterwards transplanted), and in furrows, in this latter case a kind of hoe being used. The land was ploughed and manured as for ordinary paddy, one field being ploughed dry and the other two wet. The seed sown in furrows was not steeped in water nor prepared in anyway, and it was sown in the field which had been ploughed dry. The land in this case was not irrigated at all until the plants were eight to nine inches in height, or a month after sowing, and before irrigation the ground was twice turned up with a hoe between the furrows, and the crop was weeded. After watering had been commenced it was continued, and the crop was again weeded two months and a half after sowing. The crop was sown on the 18th of August, and reaped on the 2nd of the following January. The out-turn was not greater than that of ordinary paddy, but this was because only five per cent. of the seed sown was supposed to be vital, and it was confidently asserted that had all the seed sown been good, the yield would have been very much more than that of any indigenous paddy. Both the other crops failed, and, as will appear from a report of experiments made by Dr. Thompson at Chingleput, it seems probable that the plan adopted by the Deputy Collector at Naidoopet, of dry-sowing and irrigation after the lapse of a month, is favourable to the growth of the American plant.

Kistna District.—Reports were received from the Kistna District in June 1866, September 1870, and April 1871. The experiments do not seem to have been very successful. Various methods of sowing were adopted, and in some cases the seed was prepared by being soaked in water. The most successful result was an out-turn of eighteen fold; but the report does not state in what manner this crop was cultivated.

Godavery District.—The experimental cultivation of Carolina paddy in the Godavery District, was reported an entire failure until the present year. Reports were received in December 1866, January and April 1868, and August 1869, and the failures were attributed to ignorance as to the peculiar method of cultivation required. The latest report, however, is much more favourable. In this trial the seeds were soaked in water for sixteen hours, then watered in gradually decreasing measure for nine days, and then sown. The crop was treated as "wet" and was transplanted. According to the report it seems that 6 pounds and 6 ounces of Carolina paddy seed produced 2,464 pounds of rice, the yield from 308 pounds of Indian seed being 2,480 pounds. It was found that the American plant is liable to be damaged by over-irrigation.

Ganjam.—This latter characteristic of the Carolina paddy was mentioned in the reports received from Ganjam, the first of which is dated December 1866. Further reports were forwarded in September 1867, December of the same year, February, March, and December 1868. In all the experiments made, the method of cultivation was similar to that of the superior kinds of indigenous paddy, and it was found that a dry season was most favourable to the cultivation of the American paddy. The earlier experiments made in this district appear to have been fairly successful; but the later reports are not satisfactory, and the failures are stated to arise in most cases from carelessness on the part of the cultivators.

Kurnool.—A favourable report was received from Kurnool in February 1867; the seed was sown in the same manner as the Indian paddy, and the out-turn was nearly half as much again. Other reports were received in April and May 1868, and in the same months in the following year, but with one exception they were unfavourable. The trial reported on in April 1869, was a success, the out-turn being fifty-fourfold. This crop was a wet one, and had been transplanted. The latest report from this district is dated November 1870, and is unfavourable, the cause of failure being, as in so many other cases, want of attention.

Vizagapatam.—Several reports were forwarded from Vizagapatam, but the cultivation of the American rice in that district seems to have almost entirely failed. In August 1869, out of eight experiments reported on, two only were in anyway successful. But litte interest appears to have been aroused among the native cultivators. Their indifference and consequent carelessness is probably the cause of the failure.

Salem.—The Carolina paddy appears to have thriven well in the Salem District. The reports are dated April and August 1867, December 1868, and October 1869. In some cases the out-turn was sixtyfold, and in another as much as seventy-sixfold. This crop was sown in the early part of August, and reaped at the end of November. The advantages of the American over the Indian rice were fully recognized, and in a report from Mr. Fischer, the Agent of the Shevagunga Estate, the whiteness and superiority of the rice is noticed, and also the fact that the grain is not so liable to drop from the stalk when cut, as in the case of ordinary rice, thereby preventing waste. This same characteristic of the American rice is noticed in other reports, but rather as a disadvantage on account of the supposed difficulty of threshing. In the experiments made in this district, the seed was sown broadcast and was not transplanted, and it was noticed as in other districts, that less irrigation is required than with indigenous paddy.

Tinnevelly.—The earlier reports from Tinnevelly were not favourable, and the failure in some cases was stated to be caused by the seed having deteriorated from age. A full and satisfactory report was received in August 1870, of an experiment made by Dr. Thompson, Superintendent of the Jail at Palamcottah. When in charge of the Jail at Chingleput, Dr. Thompson had given his attention to the cultivation of Carolina paddy, and a very full and favourable report was forwarded on that occasion. The reports received from Dr. Thompson, will be noticed further on.

South Arcot.—The experimental cultivation of the rice in South Arcot appears to have been on the whole successful, although a great deal of the seed supplied to the cultivators was bad, being too old. The ryots were stated to take an interest in the culture of the new grain. Several instances are mentioned in the various reports of a fear which seemed to possess the ryots lest the cultivation of so productive a species of rice should entail some addition to the assessment on their lands, and in one report from South Arcot in July 1869, it was observed that in one of the most successful experiments by a ryot, a false report of the out-turn had been made, and the crop which was in truth very large, represented as very poor.

Tanjore.—The experiments made in Tanjore cannot be considered successful. In a report dated June 1867, the Collector states that out of nineteen trials only two could be considered in any way successful. He alludes to the known method of planting this rice, broadcast, in America; but observes that transplanting appeared the better method in this country. The two crops which succeeded were both transplanted. It may be here observed that in their orders on an unfavourable report from Ganjam in March 1868, Government recommend that the Carolina seed should be sown broadcast and not transplanted.

Several of the experiments in Tanjore were stated to have failed from the inequality of the rain supply. The latest report dated April 1871, was not encouraging. It is stated that more labour is required than for the cultivation of ordinary paddy. The land has to be ploughed deeper, and more caution is said to be required in transplanting. The difficulty of separating the grain from the stalk was also made an objection, although the same was quoted in other reports considered above, as a great advantage.

South Canara.—The earlier reports from South Canara in 1867, 1868, and 1869, showed that the same characteristics had been recognized in the American rice as in other districts; but the results

of the cultivation were not very successful. The seed was sown in the same way as native paddy. In 1868 the crop was transplanted, but was reported to be damaged by flooding, thus confirming the reports from other districts as to the liabilty of the plants to suffer from too much water.

The report in 1869 was more favourable. In two experiments the yield was seventy-fourfold and fourty-fourfold respectively. The crop in the first was transplanted and in the latter sown broadcast; but it appears to have been sown too thickly. From a report received in July 1871, it appears that the experimental cultivation in the previous year was not successful.

In two cases where adjacent crops had been sown, the one broadcast, the other transplanted, the former far exceeded the latter in yield and quality. These two crops were sown on one-crop land, whereas other seed sown on two-crop land entirely failed. It appeared also from these experiments that Carolina rice does not require so much manuring as Indian paddy. The crops appear to have been irrigated from the time of sowing, and the failure was probably owing, as in other cases, to over-irrigation. The most successful experiment appears to have been conducted by a wealthy proprietor in the Kasargod Taluk. In this case the ordinary native method of cultivation was employed, and the seed sown broadcast and not transplanted. The cultivator in this case was quite satisfied with the result, and has sown a considerable extent of land with Carolina paddy.

Madura.—The first experiments reported from Madura in August 1867, were not very successful. The seed was distributed to several native cultivators and the usual method of sowing adopted, which in this district is by transplanting. Some of the seed was also sown broadcast. The season was very unfaourable, but the ryots reported that but for this the yield of the Carolina would have greatly exceeded that of the native paddy. Failure was again reported in July 1869, and in this case it was attributed to the deterioration of the seed from age.

Bellary.—The report from Bellary in September 1867, corroborates the other reports as to the nature of the American rice, and the experiment was fairly successful. The seed appears to have been sown broadcast too thickly, and the soil was inferior, otherwise the out-turn would have been large. A further report from Bellary states that the experiments conducted in the following year were not very successful. The same method of sowing as before was resorted to, and the greatest out-turn was thirty-fourfold.

Cuddapah.—From a report received from Cuddapah in June 1868, it appears that the season was very unfavourable, and that of eight trials made by native cultivators one only succeeded. In this case the seed was sown in the ordinary way and no extra expense was incurred. The out-turn was nearly sixtyfold. In an experiment reported on in March 1870, great care seems to have been taken in the preparation of the ground, which was ploughed and watered a month before sowing, and received afterwards two ploughings each day on the fifth and second days before sowing.

The land was manured with leaves and dung and again ploughed, and the seed (which had been kept moist for three days after 12 hours' previous soaking, was then sown. The land was irrigated on each ploughing and on the day of sowing, but the water was not again let in till the plants appeared above the surface. The irrigation after that was continuous. The result however was not very satisfactory, the yield being less than that of ordinary paddy; the grain and straw were as usual of superior character.

Coimbatore.—The first report from Coimbatore was unfavourable; the want of success was attributed to indifference on the part of the ryots. A report was received in December 1869, of a very successful experiment conducted by a Mussulman ryot; the same features were observed as in other successful experiments. In a report on the caltivation of Carolina rice in this district from the Superintendent of the Government Farm, Sydapet, it is distinctly stated that by being sown broadcast, American paddy is placed at a disadvantage as compared with Indian paddy, which is generally sown in seed-beds and transplanted. One cause of frequent failure is also suggested. The American paddy is frequently sown at an unusual time of the year, and being, when ripe, the only ripe crop, is thereby more exposed to destruction by insects, birds, &c.

Trichinopoly.—The experiments made in Trichinopoly seem to have failed entirely.

Madras.—The reports from Madras include that received from Dr. Thompson, when Superintendent of the Jail at Chingleput, as well as reports from the Superintendent of the Government Farm at Sydapet. Dr. Thompson reports very fully, and the result of his experiment is most satisfactory. It will have been observed that in nearly all the experiments reported above, the seed was first soaked in water and sometimes kept moist. Dr. Thompson on the contrary had the seed thoroughly dried. Both wet and dry cultivation was tried, two crops of each being sown, the one broadcast and the other in seed-beds for transplantation. The land was prepared for the wet crops in the usual way, the seeds in this case being sown wet. The land was continuously irrigated, and one crop was transplanted from the nursery when about a month old.

The broadcast crop was reaped first, the other having been thrown back by the great heat at the time of transplating, but recovering and giving, it is said, an out-turn of one hundred and twenty-threefold. The land for the dry crop was well ploughed, cleared of leaves, and levelled. The seed was sown dry, and for some time both dry crops seemed unlikely to thrive. They were therefore, two months after sowing, converted into wet crops, and the result was an out-turn from the transplanted crop nearly equal to that of the transplanted wet crop, while the broadcast crop turned out the most successful of all. In their remarks on this result the Government observed, "The seed was sown in August, "having been previously well dried. The soil was sandy clay en- "riched with silt from the bed of a tank, and, where wet cul- "tivation was employed, leaves were incorporated with the soil of "the nursery bed. But a larger share of success appears to have "attended the cultivation of the paddy which was sown broad- "cast on dry land, and not irrigated until two months had elapsed." If the results of the experiment made by the Deputy Collector at Naidoopet in Nellore be compared with this, it may be inferred that this postponement of irrigation (although, in the experiment at Chingleput, accidental) is highly favourable to the growth of the Carolina paddy.

The experiment made by Dr. Thompson at Palamcottah was reported on by the Superintendent of the Government Farm. Among the reports from Madras is one received in June 1869 regarding experiments made in the sub-division of the district, which seems, notwithstanding, an unfavourable season, to have been highly successful. In one case, a Carolina rice-crop grown alongside one of the best native paddy, and under precisely similar circumstances, yielded one-and-a-half times as much as the latter. The advantages of the American rice are thus summed up :—

"(1.) It is a four months' crop.
"(2.) It requires not more than one-fourth of the water required "for the native kinds of paddy during the same period.
"(3.) Twenty-four measures of seed suffice for the same extent of "land as thirty-two measures of native seed.
"(4.) Each seed that germinates is capable of producing from ten "to seventeen plants without any particular care, a productive "power not possessed by native paddy to any appreciable extent.
"(5.) The ears are, out of all comparison, larger than those of "native paddy grown under the most favourable circumstances.
"(6.) The largeness of its yield.
"(7.) Its superiority as food-grain.
"(8.) It yields a larger amount of straw of a sort also more suc- "culent and palatable than that of ordinary paddy."

In this last point the report is somewhat at variance with most of the other reports received. One important point is noticed showing the estimation in which the American paddy is held, namely, that, whereas some months before the report was drawn up, the seed sold for 1 anna a measure (the same as native seed), the price had risen to 2 annas a *measure.*

Nilgiris.—According to a report received from the Nilgiris in March 1871, the experiments tried there were complete failures. The seed appeared to thrive until transplanted, when in every case it died. Hares and cockchafers were supposed to have destroyed the young plants. In addition to the foregoing, reports were received from Travancore and Mysore. In the latter territory the cultivation of the paddy (in Bangalore) was successful, and the grain appreciated by the native cultivators. The reports from Travancore and Cochin are moderately favourable, and coincide as regards the qualities of the paddy, with other favourable reports. In Travancore it was also noticed that the best soil for its cultivation is a mixture of clay and sand. Experimental farms were established by the permission of Government (accorded in September 1869), in the Kistna District and in Cuddapah, South Arcot, Madura, and South Canara, and some of the later experiments in these districts were conducted under the supervision of the Collectors and their Assistants. In March 1869, the Board forwarded a report to Government of the result of the experiments up to that time, of which the following is an outline :—With reasonable care and exertion Carolina paddy may be grown in most districts with profit. Failure, as a rule, has been attributable to causes quite within control in the average of seasons, and where real care has been taken, success has generally been the result. The Carolina paddy is harvested as quickly as the most rapidly growing native grains, and twice as quickly as most others, and is more productive in weight of grain and straw and less dependent on a full supply of water. A smaller quantity of seed also suffices. There appears from a review of all the above-mentioned reports, to be little to add to this statement of results, though one or two points regarding the preparations of the seed and the land may be noticed. It appears to have been usual to soak the seed and to sow it wet; but in one of the most successful experiments made, namely, Dr. Thompson's at Chingleput, the seed was well dried and then sown in dry soil. The reason given by Dr. Thompson for the preliminary drying of the seed is this :—On examining some of the seed sent to him he found, on peeling off the husk, a white spot occupying a third of the grain of rice and diminishing the size of the germinal spot, thereby rendering it

likely that the seed would not grow, or at least be productive. Whether this theory be correct or not, no opinion is offered; but the white spot was removed by the drying, and the successful result of the experiments made with the seed so dried seems to corroborate the theory. Dr. Thompson states that he acted thus on the advice of an experienced native cultivator.

In the preparation of the soil, deeper ploughing and less manuring and watering are required than for native paddy, and as remarked previously, the postponement of all irrigation for a month or two, seems worthy of further trial. As regards results, the summing up of the advantages of Carolina paddy contained in the "Resolution" of the Government of India, has been almost entirely corroborated by the experiments hitherto made in this Presidency. Of the three disadvantages named in the Resolution, the second and third have been found to exist, but not the first, for on all hands the superiority of the grain in colour and flavour has been recognized, and as appears from the report from Madras, this grain has commanded double the price of native paddy. In conclusion, it may in a few words be asserted that Carolina paddy is in everyway superior to native paddy, but that it is the growth of a higher system of cultivation than is generally prevalent in this country, which system is required to bring it to perfection and to prevent its deterioration. It is in the early stages of its growth more delicate and requires more care, especially in sowing (so as to prevent its being sown too thickly), than is usually the case here. The seed also is liable to deterioration. In the foregoing report no mention has been made of the cultivation as carried on at the Government Farm at Sydapet, as the Superintendent of the Farm has undertaken to compile a full report of the cultivation of the Carolina paddy throughout the Presidency, for which purpose copies of all reports and statements are forwarded to that gentleman when received by the Board, and a report concerning the results obtained under his own personal inspection will, it is presumed, form part of the report promised. A copy of these Proceedings will be forwarded to Mr. Robertson, who is requested to be good enough to state whether his promised report concerning Carolina paddy will be incorporated with the general report called for by the Government of India; and if not, when the former may be expected.

RHEEA FIBRE.

In a number of the *Edinburg Scotsman* brought to us by the last mail, we have an account given of the trial of one of the machines for the cleaning of the rheea fibre which is to appear at the competition at Saharanpore for the prize offered by Government as a reward for the best machine constructed for that purpose. It will be remembered that the Indian Government, announced about two years ago, its intention of offering a prize of Rs. 5,000 for the best machine capable of cleaning the valuable stems of the rheea plant at a cost of £15 per ton, and admitting of the sale of the fibre in the English market at £50 per ton. The fibre of this plant is the strongest and most valuable known; but from the peculiar gummy character of its stem, it has hitherto been found impossible to separate the fibre from the skin in the same manner as flax, hemp, jute, &c., by water retting, or macerating in water for several days to get rid of the vegetable matter. It is therefore necessary that the skins should be scraped away from the underlying fibre while the plant is in a green state. By this means its great strength, lustre (equal to that of silk) and whiteness are preserved. The plant has been described by many Indian writers, but it is known in several countries though under different names. It seems to be the same as that of which the beautiful China grass-cloth and other silky fabrics of that character are made. Its botanical name, we are told, is *Bochmeria Nevia, or Urtica Tenacissima*, which shows it to be of the nettle family. Indeed it is very like our common nettle, but is stingless, and much stronger. It is perennial. The roots form in great clumps, and send up green stems or shoots all round. These, as soon as they have reached the height of four or five feet, are cut down close to the root. Other shoots then spring up, and are ready for cutting in two months; so that with irrigation, rich soil, and a moist climate, as many as six crops have been obtained from the same roots within one year. The plants are propagated from cuttings, layers dividing the roots and from its seed, although the last-named method is the least resorted to. As already mentioned, rheea is the strongest of all vegetable fibres, and at the same time finer than the superior kinds of flax; and, when prepared ready for spinning, has the lustre of silk, with which it is intended to be mixed. It is capable of being cultivated in all tropical climates, but at present is chiefly reared in Northern India. Its value in a national point of view is therefore great; but the difficult, or rather impossibility, of preparing it in sufficient abundance by ordinary hand labour has hitherto prevented its introduction by our manufacturers, unless as a sort of curiosity, and to many it is only known by name. We all know how Lord Mayo, realising the importance of this fibre as an article of Indian Commerce, advertised His Lordship's intention of bestowing the afore-mentioned prize on anyone who should invent a machine capable of being worked so economically as to allow of the fibre being sold in the London market at £50 per ton. It seems that Mr. John Greig, junr, of the well-known engineering firm of D. & J. Greig, Edinburg, had in 1866, while in India, two years before Lord Mayo's moving the matter, with the aid of an eminent and enterprising merchant in Bombay, constructed a machine for the purpose of cleaning the fibre. This first attempt resulted in the construction of a machine capable only of cleaning half the stems at a time. Mr. Greig determined, on seeing the Government conditions, to construct a machine that would clean the whole length of the stems rapidly and by a single operation, the apparatus itself turning over the ends, which require to be held firm while the other portion is being scraped. Mr. Greig set to work in the preparation of designs which he forwarded to Edinburg, and afterwards followed them in person to superintend their execution. We are told now that the machine has been completed, and that at a public trial, previous to its being taken to India, the result was held to be most satisfactory, and is thus described. The stems with which it was tested were from three feet to five feet long, and averaged half-an-inch in diameter, tapering to a small point. A quantity of this are laid on an endless travelling web or feed-table, by which they enter the machine between a series of fluted iron rollers, which break the inside cores in short pieces, and flatten the green skin, where the fibre lies underneath an outer coating of tenacious mucilaginous vegetable substance. In order to clean the stems by mechanical process, they must be scraped by knives having a rapid circular motion, and while being scraped, the skins must be firmly held. In consequence of the scrapers rotating and the rollers which hold them being circular, there must be a portion of the length of the stems left untouched, representing the distance between the centres of the scraping cylinders and the centres of the gripping rollers. Herein consists the novelty of the invention. The small ends as they pass down are cleaned, and immediately blown by a simple contrivance between a pair of elastic catch-rollers, whence they are thrown out on the delivery web. The moment the crushing rollers let go the last portion or thick ends of the stalks (seven inches of which are still to scrape), the latter are thrown down (by the momentum given to them by the upper scraping cylinders and by their own weight) between another pair of scraping cylinders, which completes the cleaning of the whole length of the stalks, and this is done while the fibre is still held firm and travelling out of the machine by the delivery web. Thus the object of the machine is accomplished, viz., to clean a large quantity of rough rheea stems the entire length by one operation. It is equally suited however for cleaning any other description of fibre. Although it executed its work in a very easy and perfect manner, it is but right to state that the machine worked under certain disadvantages. It is quite new, though of beautiful workmanship, and was therefore somewhat stiff in action; and the rheea stems were greatly decayed, some of them indeed being almost rotten, in which condition it is very difficult to separate the fibre from the skin, as after being cut a few months, gum penetrates into the former. Nevertheless, on the stems being beaten by the ordinary flax scutcher, after passing through the machine, they were as perfectly cleaned as if they had been done by hand. The difference in production however between the two systems is immense. By hand each individual stem has to be cleaned by a tedious process while the machine worked by steam, and attended by say four coolies, will turn out the fibre at the rate of about 20 feet per minute in a "layer" 24 inches wide. At this rate, there is little doubt that Mr. Greig's machine will be able to produce unlimited quantities at a lower rate than the £15 per ton specified by the Government; and it is probable that within a few years the exports of rheea may rival those of jute from India. Mr. Greig will now be on his way to India with his invention, which we trust will be found worthy of the prize offered by Lord Mayo. Mr. Greig has spared neither time nor trouble in bringing it to its present efficiency, and we trust he may meet with the coveted reward for his great enterprise and ingenuity. Mr. Greig will have His Lordship's best reward, should the experiment prove successful.—*Deccan Herald.*

AGRICULTURAL AND HORTICULTURAL SOCIETY OF INDIA.

The usual Monthly General Meeting was held on Thursday, the 21st December 1871.

The Secretary read the following remarks by Mr. John Scott, on a vegetable substance found occasionally in the Neilgherry Hills:—

"The specimens sent from Coonoor under the name of "*little man's bread*" are the dried tubers of a salep-yielding orchid: the entire tuber being incrusted with an opegraphic lichen, while the other which is cut and paired, is as you remark, something like the '*salep misree.*' Both are evidently however of the same species, and very probably, one or other of the Neilgherry *Eulophias.*

Though the colour of these specimens is much less pure than the salep misree of the bazaars, they seem none the less rich in bassorin, so that extremely hard and horny though they are, portions of them immersed in boiling water readily swell up and acquire a gelatinous character. The specimens sent by Mr. Whynton must (judging by their hard and bony texture and lichen-coverings) have been dead for years, and it would be well to suggest to him, that in his future promised hunts for the 'little man's bread, he also sends fresh pseudo-bulbs or tubers of the terrestrial orchids which may then occur; this may enable us to determine the species which yields the 'little man's bread.'"

Sample of raw fibre from Sylhet, forwarded by the Officiating Collector.

Mr. Sutherland thus writes regarding this fibre:—I have the honor to forward herewith, for examination by your Society, some specimen of the fibre sent by Mr. W. Foley, who remarks thus:—"The fibre which I sent over some time ago was obtained from a plant called in the vernacular "oolta kamal;" it is found all over Bengal. I saw the plant in Rungpore, when I was in that district some years ago. It thrives on teelahs and high flat lands, and is propagated by seed which ought to be put down by the end of February or the early part of March. In good virgin soil, the plants will attain the height of 9 or 10 feet within the first year. The great advantage of this "oolta kamal" is that it is a perennial, and when cut down, (which should be done about a foot from the ground), it throws out a number of shoots; the stalks are treated precisely the same way as jute stalks. I believe a second crop may be obtained during the year. I tried the experiment on a small scale, and I obtained only few seeds, and that late in the season. I have now a quantity of seed and will try the experiment on a large scale, and will furnish you with further particulars.

The fibre in question is the produce of *Abroma augusta*. Mr. Hutchinson, of Messrs. Toulmin & Co., considers it good, and is of opinion that it might be used with advantage by rope-makers for mixing with Manilla hemp;—value £35 per ton.

Mr. John Martin submitted some apples in an excellent state of preservation with the following note:—"I have the pleasure to forward for the inspection of the Members of the Horticultural Society some English apples (Ribstone Pippins) picked by me from a tree in my garden in Devonshire, in the middle of September last. When picked they were tolerably ripe. I had them carefully rolled in tissue paper and with some soft clothing put in the bag in which I now send them. They were sent overland *via* Southampton, and arrived in India on the 22nd October. As you will see they are still in excellent preservation, though they have already been two months in this country. Judging by my success with these apples, I have no doubt, with ordinary care, many fine kinds might be brought to India."

HORTICULTURAL NOTES.

Submitted the following extracts of letters from Mr. S. Jennings of Allahabad:—

15th December.—"I have just received an excellent batch of cuttings from England, packed in moss, by sample post. Nearly the whole were fresh and green, and I entertain the strongest hopes of saving 10 out of 15, a very good proportion I think. They were planted in a mixture of sand and leaf-mould, under a glass frame, and consist of the following, all of which I believe are new to the country and will be great acquistions. They are *Crotons*,—Johannis, multicolor, undulatum, maximum, interruptum, irregulare, and Vietchii. *Draceenas*,—Gulfoylei, Regina, Macleayi, Mooreana and magnifica, *Ixoras*,—Colei, Dixiana and crocata rutilans."

10th December.—Advising despatch of a further collection of bulbs and a box of roses, a well known Nurseryman in London, gives the following instructions. I send them to you for general information, if you think them of sufficient interest.

"*Achimenes, Gemerias* and *Gloxinias*—Shake out the material at once and re-pot in a mixed light sandy soil, just covering the roots, that is to say, about ½ an inch of soil over them, and place them in a bath-room where there is plenty of warmth, and keep up a moist atmosphere by frequently syringing of the walls and throwing water about the floor for a few days; then syringe them slightly at first, still keeping up the moist atmosphere around them, and as the foliage develops itself, you will increase the quantity of moisture. They prefer shady situations for growing in.

"*Caladiums* will require the same treatment, except that the crown of the bulb must stand above the soil, and they must not have any water on them till they show symptoms of growth. This will be induced by the damp atmosphere and the warmth of the room. Immediately they commence developing their leaves, give water moderately, and ultimately stand them in pans of water, or plant them out in marshy situations, or places where they will get plenty of irrigation.

"*Amaryllis* including *Valotta purpurea*—Plant out or shift into 7-inch pots, and let them have the bath-room for a little time just to excite growth; you may then put them where you please.

"*Curcumas*—Treat much as you would *Caladia*.

"*Begonias*.—Let them remain in the pots they are sent in, being established there, when they commence growing, shift them into pots a size larger, and when in full growth, they take water freely.

"*Eucharis*—Shift this at once into a larger pot. Give it a few days in the bath-room, in a damp atmosphere, after that give it abundance of water and warmth. If you have a pond, you may plant it in the margin, where it will be flooded occasionally. It delights in moisture and is a native of the Brazils where heat and moisture prevail. *Imantophyllum* will do very well where the *Eucharis* does.

"*Cyclamen persicum*—If you plant them out, be sure that you put a considerable amount of rubble, brick-bats, anything in that way, either incorporated with the soil or what is better a foot or eighteen inches under the bulbs, and about a foot of soil above the rubble. Three things *Cyclamen* dislike, 1st, too much moisture at the root; 2nd, too much exposure to the sun; and 3rd, cold winds. How hot winds will affect the plants will depend upon their being in leaf or dormant at the time.

"Lillies prefer a moderately stiff soil, and like growing where there is a little shade. They must not have any manure except in a clear liquid form when they are in growth, and you may give as much as you like then. The plant likes it, but it is death to the bulb to have any gross manure about it. Grow lillies either in pots or plant them out. If the latter, let them have shade at the roots and attend to them with moisture in dry weather.

"The *Clivia* will take the same treatment as Imantophyllum.

"*Gloriosa*—The same as Achimenes.

"As to the roses, 1st, when the case reaches you, place it in a dark room and unscrew the lid. The second day let a very little air in. The third day remove the lid. The fourth day unpack the roses, then pot them at once, and place them in a bath-room syringing the sides of the room to give a damp atmosphere, but give no water at the roots for say a week. Twice a day syringe the roses just to moisten the wood, and at the end of the week give just a little water at the roots, and as the plants show symptoms of growing, increase the water. When out of all danger, and you know that they are alive, gradually accustom them to the air, then cut back to within three or four eyes of where they were pruned last."

The only point upon which I have doubts is the advisability of planting out *Achimenes*, *Gloxinias*, and *Caladia* when received, instead of keeping them dry till March and April; the rest is good useful advice.

MISCELLANEOUS COMMUNICATIONS.

Letters were submitted from Lieut. J. F. Pogson, suggesting the introduction into Upper India of the gigantic yam of British Burmah. The following is extract of Mr. Pogson's letter:—

"I may here mention, that the "*Climax*," potatoes, were very superior, and as two gentlemen in this station have now a supply of them for next year's sowing, this valuable variety will soon be established.

"The potatoe disease has apparently extended to all potatoes raised in Simla. Those sent for sale to this station are very fine to look at, and of large size, but when boiled they are yellow and waxy, and have a peculiar smell. The best in the market are small potatoes, and of these one-half show signs of disease.

"When the entire stock of this diseased potatoe dies out, there will be some chance of better varieties being introduced by the authorities, in the meantime however I think it would be advisable for the public good if some other vegetable was introduced for general consumption. Colonel Brown, the Deputy Commissioner of the Mergui District, British Burmah, has recently submitted his Report on the "Selons," and states that this peculiar race of people spear fish and wild pigs which constitute their principal articles of food. Turtles and shell-fish also afford them subsistence, together with yams, which grow on the islands, and are sometimes found of thirty pounds weight.

"If this splendid yam was introduced into Bengal, the N. W. Provinces, Oude, and the Punjab, we should have something to fall back upon when potatoes are not procurable; and it is just possible that the natives will eat boiled and roasted yams, if they can get them at the same price as rice, or inferior flour.

"The constant recurrence of famine shows that something should be done to meet the evil, and about the simplest plan would be the formation of plantain plantations, in the vicinity of villages, far removed from high roads and railways. The yam planted near a plantain, will come to perfection, even if the fall of rain is slight, and with these two additions, to the ordinary stock of food, the advent of a drought need not be looked upon as a dire calamity, which can only be met by appealing to the European public for charitable subscriptions.

"There are few villages in India, so highly cultivated, as to have no officially recognised waste, or unculturable land, and as such land will answer for plantain cultivation, official sanction to grow it free of cost (or revenue) is all that is needed to start the project; of course where the plantain is unknown, the authorities will have to supply young plants.

"I feel certain that if the Government was once convinced of the great value of the plantain as a producer of food, that it would offer inducements to the ryots and zemindars of districts more or

less liable to famine, to grow plantain by the acre as regular crop. We are told by Baron Humboldt that "the same space of a thousand square feet, which will yield only 469 lbs. of potatoes, or 38 lbs. of wheat, will produce 4,000 lbs. of bananas, and in a shorter period of time."

"The unripe fruit is sometimes used as bread; it is dried in the oven, and in this state is eaten in the manner of bread. When thus dried, it may be kept for a long time without spoiling, and is usually carried with them in this dry state by the natives when they are proceeding on a long journey."—(*Vide Chemistry of Common Life, Professor Johnston*, pp. 100 *to* 111.)

"In tropical America, about 6½ lbs. of the fruit or 2 lbs. of the dry meal, with ½ lb. of salt meat or fish, form the daily allowance for a labourer, whether slave or free.

"The plantains of Martaban and Burmah are famous for their size and flavour, and very good descriptions exist all over Bengal Proper, so there can be no difficulty about obtaining young plants and suckers; and if the experiment of planting them was tried in the District of Sirsa, where famine is now raging, (*vide* Mr. Deputy Commissioner R. G. Melvill's letter), the starving poor would have the satisfaction of knowing that they have seen their last famine."

It was agreed that Col. Brown be addressed on the subject.

From the same on the subject of the Muko and Mukoe plants, with reference to previous correspondence.

"I have noticed" observes Mr. Pogson," the remarks on the subject of the *Mukoe*. (Sarsaparilla) which appears in the Society's Proceedings of 23rd November last. The "*Muko*" of Shakespear's Dictionary is distinct from the "*Mukoe*" of the same work. *Muko* means name of a species of Solanum (Nigrum). The word *Mukoe* is Sarsaparilla, *vide* Dictionary. This latter plant has a leaf very like the "Zizyphus Jujuba." There is lots of it in the jungle at the foot of the hills, and its fruit is by no means bad, being somewhat like a small "*Bair*," size that of a large marrow-fat pea; colour deep purple like the "*Jaunun*." I believe the kernel of the seed is edible. I will secure samples if I go to the Sewallicks."

The Foresters' Gazette.

BOMBAY, 21st FEBRUARY 1872.

FOREST CONSERVANCY AND LEGISLATION.

We published recently a collection of most valuable papers on Forest Conservancy. They convey the result of M. Eugene Tallon's examination of the question of reform in Agriculture and Irrigation, so loudly called for in France after the fiery ordeal that unhappy country went through, during one of the greatest conflicts between nations that have ever agitated the face of Europe. It was the perusal of this report to the French National Assembly that induced us in our last issue to call the attention of Government, as well as of the public, to the great importance of woods and forests in tropical climates. If it be deemed essential to preserve forests in the more favourable and humid countries of Europe, how much more essential is it to secure and encourage the existence of such a grand agency of humidity and rainfall in tracts where the sun in his glory, and in the absence of counteracting influences, burns and dries up the exposed soil. It will be seen that even before the recent disastrous war, France had resorted to legislation to cover her mountain sides with trees, as one of the essential steps in the course of agricultural progress; and this system of promoting the larger vegetation had its good effect, we are told, in the undoubted mitigation of the violence of storms, in the greater uniformity of the rainfall, and in the paralyzing of the disastrous alternatives of sudden floods and prolonged droughts, which are the very ruination of any country. The chief feature in the report however is the pointing out of the errors that had been made in legislating for arboriculture, of which compulsory plantation seems to have been the principal element. The discovery of these errors suggested a revision of the laws, to consist in the abolition altogether of the system of compulsory planting both in public and private lands; the continuance of Government subventions, in money and kind, to public bodies and private persons as an inducement to plant; the encouragement in some cases of re-turfing in lieu of re-planting; and the introduction of a sort of self-government in the election of agricultural committees to fix the areas of the lands to which grants-in-aid were to be made. Is it not possible for us, in the inevitable legislation that must sooner or later take place, to avail ourselves of M. Tallon's suggestions in order to avoid the mistakes committed in France? Our attention has been still more forcibly directed to this subject by perusing another paper, on the mountain system and distribution of the forests and the water-supply of Algeria. From the description given by M. Jules Duval in the *Economiste Francois* there would appear to be a remarkable similitude between Algeria and India in respect to seasons, fitfulness of streams, aridity of soil, and atmospheric influences. The periods of rain and drought may not exactly correspond: the similarity consists in prolonged drought over several months and a periodical fall of rain within a limited time, when the river-beds and hollows fill with water which impetuously rushes away to the sea. The language which M. Duval employs, in advocating successful administration in Algeria for the promotion of the physical welfare of its inhabitants, is singularly applicable to the condition and requirements of India. "Since there is always a risk in Algeria," writes M. Duval, "of failure of the water-supply for agriculture, intelligent cultivation and policy should unite in the application of their entire force to utilise all the water which falls from the clouds, which flows over the earth, and which penetrates the soil. Since rain falls only in winter and is altogether absent in summer, the excess of the winter fall should be preserved for the necessities of summer. Every influence favourable to atmospheric humidity should be developed by natural methods, viz., by the conservation of existing woods and the planting out of others. The pasturing of cattle in the woodlands, which involves the destruction of the young trees, should be forbidden or checked with vigilant severity, at any rate on the highlands: means should be taken to prevent (or, at least, to punish the originators of) the fires which ravage the forests—profound forests which formerly nurtured the elephants destined for the Roman Circus." "Not only have streams of liquid gold and silver been allowed to run down to the sea, but Arab cattle and Arab fires have been allowed to devastate the forests, *i.e.*, to increase the natural dryness of the country; and when the Forest Department, understanding and doing its duty, endeavoured to repress these abuses, it was accused of odious interference with native customs: when just sentences were pronounced against the incendiaries, they were freely remitted as an act of grace. Following on this, Algeria was divided into longitudinal zones, which for purposes of surveillance, separate the heads of the rivers in the south from their courses and termination towards the north. Thus, the forests, those precious sources of humidity, have everywhere, notwithstanding the wishes of Councils-General, and in spite of the protests of the press, been more and more abandoned to devastation. The Arabs have reaped famine and drought as the result of scattering cattle and fire through the woods, a fatal expiation which, following the laws of universal order, creates evil from evil, as it brings forth good from good." Every line of this might have been written at all events a few years ago, of Southern India. Referring to the grand requirement in Algeria, just as in Egypt, Greece, Italy, the south of France, and Spain, "water," emphatically exclaims M. Duval, "more water, and more water still, such is the pivot on which agriculture in these countries turns even more than on railways. Allied with heat, water endows the soil with prodigious fertility; while, on the other hand, soil of the best composition remains sterile without irrigation." And how is this great desideratum to be secured? As in Algeria, so in India, by the conservation of forests and the construction of dams. These two must go hand in hand. The forests will provoke humidity and rain; rain will create rivers and streams; and dams must be built to prevent the water running to waste into the sea. At present, however, we have only to do with forests, which we are told act in two ways—as agents of absorption, and as agents of evaporation. It is the opinion of M. Marie-Davy and other French authorities that in uncovered, and especially a light soil absorbs a larger quantity of water than a wooded soil; but this doctrine is combated as being only true of plains and perhaps very gentle slopes. Wherever there is a slope more or less steep,—and of course this would be especially the case with our mountain sides,—absorption takes place in proportion to the diminution in the rapidity and volume with which water flows along the surface, taken in connexion with the permeability of the soil itself. In this point of view, therefore, it is thought that forests, by dividing the currents of the water and opposing resistance to its flow, present advantages for absorption not to be looked for from unwooded soil, which in some cases cannot resist the movement of the mass of water, and is consequently washed away; so that in many cases both soil and water are lost for the purposes of cultivation. On the other hand, wherever forests exist, there they will retain for the benefit of springs, water which otherwise would be carried away with the vegetable mould; while, by retarding the flow over the surface of the soil, they, in the opinion of the French writer, moderate the rapidity of the rise of the water and diminish the dangers of the floods. Then as to evaporation it is well-known that, in addition to the protection afforded by wooded regions to water-springs, forests spread a portion of the water of the soil through the atmosphere in the form of vapour, thus exercising a most beneficial influence on climate by tempering the excessive heats of tropical regions.

Much has been done in recent years for the preservation of forests in India; but a great deal more has to be done yet, both by departmental reform and by legislation, to spread the benefits already secured to the country, the practical blessing of which we may be said to have already commenced to reap in the better rainfall and the larger supplies of water we have been able to command in the last year or two. In addition to Governmental fields of action, we must also encourage forest planting on the part of private individuals; and

we must diminish as much as possible the unsystematic cutting down of timber for the purposes of mere ordinary fuel. Above all, as M. Duval says in the case of Algeria, we must have water; and to have as much water as we want, we must have the control of its supply. As long as great landholders, often on the verge of bankruptcy, have absolute power to cut down hundreds of square miles of forest, as, for example, in Tinnevelly forest conservancy, which (practically in India) is a term synonymous almost with water-supply, is impossible. Hence, to complete the work of progress already begun, it will be necessary to pass a Forest Act to give back to Government the control over private or communal forests, which ought never to have been given up by the State. The spread of coffee cultivation and tea planting, and the continuous demand of our extending railways for wood fuel, make the necessity for reform more imperative; and although the Board of Revenue have objected to the Forest Bill prepared in the North of India, there is no doubt of the absolute need for legislation that remains to be carried out. Meanwhile we have reason to think that the Board have advised that all private forests in Tinnevelly be taken upon lease, or if necessary, under Act X. of 1870—that powerful engine invented by the State for acquiring land for public purposes. This step however sound as it is, can only be preliminary to legislation, to which we must finally resort to overcome all the difficulties that will be interposed in our way. One of the greatest difficulties with which we shall have to contend, is the unceasing demand of the iron horse. Our railways must have the means of making steam, without which they cannot be worked for the advantage of man or in the cause of commerce. But why should it be wood alone? In parts of Bombay where fuel is scarce, we hear that the railway is not allowed to burn wood at all; and why should not the same be enforced here, when there is a ready substitute in the shape of peat? Peat is easily procurable on the Neilgherries; and we have no doubt that if proper care were taken and sufficient encouragement afforded, large quantities of peat would always be available for the purposes of the railway, or even for domestic use on the hills. A Madras Civilian of well-known experience recently addressed a letter to the East India Finance Committee, in which he included the preservation of wood as one of the subjects to be anxiously considered in connexion with the agricultural prosperity and land revenue of India. He gives it as his deliberate experience that the strict orders of the Home Government for the conservancy of existing woods, and their extension wherever practicable, are being virtually nullified by the way in which whole classes are allowed by Government to cut fuel free of charge; and that in consequence there is a steady denudation going on all over India that has a most serious effect in diminishing the moisture retained after the rains. He is of opinion that when leave is given to cut fuel free of charge for domestic purposes because the people are poor, it is a cruel kindness, as it is simply encouraging the ryots to cut their own throats. We cannot but attach importance to the words of a man who has filled the office of Collector of a district with distinction, when we find him delivering himself in language such as this—"If the existing woods are placed under careful conservancy, and suitable measures are adopted to secure in due course, reproduction, so that there shall be some wood, if possible, in every village, we may depend on there being a steady supply of water all the year through in the small rivers which are left at the disposal of private enterprise, and a steady supply in the wells which play so important a part in Indian Agriculture. It is impossible to over-estimate the importance of this question. The cultivation that is carried on from rivers and wells furnishes a steady employment for labour nearly the whole year round. And wherever this description of cultivation obtains, there a healthy centre is established for the dry cultivation that usually stretches beyond the rice and garden crops. The subject we have ventured to place before our readers is of the deepest importance, because it is pregnant with the future prosperity of India. Let the supply of water fail, and the whole scene is changed. The subject is not a new one. It has been written upon again and again, and the questions involved in its discussion are fully conceded on all hands. But it appeared to us necessary to call the attention of Government to the papers which we publish, and by means of our feeble voice to get the public to see the question in its proper light, and to appreciate the crisis before it is too late.—*Madras Revenue Register.*

FOREST CONSERVANCY.

THE question of the conservation of forests in India is attracting a great deal of attention, and the suggestion has been made to the Government to pass a Forest Act to give back to them the control over private or communal forests, which ought never to have been given up by the State. We admit the necessity of legislation with the object of the preservation of the forests, and we must add that the necessity for such a step is urgent. The denudation of the forests in India that is at present going on must greatly affect the future agricultural prosperity of the country, and unless legislative action be taken to prevent it, the destruction of the forests will increase in proportion to the increasing demand for railway fuel. There must of course be the means of making steam for railways, but peat may be used with as much advantage as wood fuel. In urging the necessity of legislation for the conservation of forests, the *Madras Revenue Register* makes the following observations:—"Much has been done in recent years for the preservation of forests in India; but a great deal more has to be done yet, both by departmental reform and by legislation, to spread the benefits already secured to the country, the practical blessings of which we may be said to have already commenced to reap in the better rainfall, and the larger supplies of water we have been able to command in the last year or two. In addition to the Governmental fields of action, we must also encourage forest planting on the part of private individuals; and we must diminish as much as possible, the unsystematic cutting down of timber for the purposes of mere ordinary fuel. Above all, as M. Duval says in the case of Algeria, we must have water; and to have as much water as we want, we must have the control of its supply. As long as great landholders often on the verge of bankruptcy, have absolute power to cut down hundreds of square miles of forests, as for instance, in Tinnevelly forest conservancy, which (practically in India) is a term synonymous almost with water-supply, is impossible." There has been something like action taken by the Board of Revenue, we understand, to prevent the destruction of forests in Tinnevelly. The Board have advised that all private forests in Tinnevelly be taken upon lease, or if necessary, under Act X. of 1870, which has been passed to enable the State to acquire land for public purposes. But the subject should be dealt with in all its bearings, and legislative measures must be adopted to meet all difficulties in regard to forest conservancy. If we wish to save the country from continual drought and constant famines, we should pay all attention to the preservation of the forests; for the importance of woods and forests in tropical climates cannot be denied. It is well-known that in Europe, the conservation of the forests is commenced to be strictly attended to, and in France particularly, legislation has been resorted to in order "to cover her mountain sides with trees as one of the essential steps in the course of agricultural progress." Our contemporary of the *Revenue Register* points out how much more essential it is to secure and encourage the existence of such a grand agency of humidity and rainfall in the country, where the sun in his glory, and in the absence of counteracting influences, burns and dries up the exposed soil.

It is a fact that wherever forests exist, there water is retained for the benefit of springs, and a great portion of it becomes spread through the atmosphere in the form of vapour. This theory is held by French authorities on the subject and is put forth by the *Madras Revenue Register*, to indicate the beneficial influence by the process on tropical climates. Irrespective therefore of the increase of water-supply, the conservation of forests must affect beneficially the health of the people, by tempering the excessive heat of tropical regions as pointed out above. An experienced officer, who had filled the office of Collector of a district, writes on the subject of forest conservancy in unmistakeable terms. "If the existing woods," he states, "are placed under careful conservancy and suitable measures are adopted to secure in due course reproduction, so that there shall be some wood if possible in every village, we may depend on there being a steady supply of water all the year through in the small rivers which are left at the disposal of private enterprise, and a steady supply in the wells which play so important a part in Indian Agriculture. It is impossible to over-estimate the importance of this question. The cultivation that is carried on from rivers and wells, furnishes a steady employment for labour nearly the whole year round. And wherever this description of cultivation obtains, there a healthy centre is established for the dry cultivation that usually stretches beyond the rice and garden crops. Let the supply of water fail, and the whole scene is changed." It is undoubtedly true that in preserving the forests and in promoting "larger vegetation," we secure uniformity of rainfall and prevent "the disastrous alternatives of sudden floods and prolonged droughts, which are the very ruination of any country." The subject of the conservation of the forests it will be thus perceived, is one of vital importance, and although it has been constantly discussed, we think that it is the duty of the press to bring it before the public from time to time, until the earnest attention of the Government be drawn to it.

It is here necessary for us to point out to the Government of Travancore and Cochin, that the indiscriminate felling of trees in their forests must eventually tell seriously on the agricultural prosperity of the States. While annually large loss of timber are brought down from the forests, and trees are being felled without regard to their age, there is hardly any steps taken to secure reproduction. Forest conservancy in Travancore and Cochin is, as our intelligent correspondent, "SHADE OF THE PERUMALS," would have it, a myth and a delusion. It is a disgrace to the administration of both States that such should be the case, and we hope that a proper system of forestry would soon be initiated by the two Sircars or by those under whose control the Forest Departments have been placed.—*Cochin Argus.*

TREE PLANTING IN THE PUNJAB.

We give in our correspondence columns, a letter by Lieutenant Pogson, corresponding member A. L. H. Society of India. The valuable suggestions therein made merit the highest consideration, and it is to be hoped, all Civil Military Authorities will pay that attention to the subject which its importance deserves.

What we would desire to draw attention to, is the wilful destruction of the forest trees, such as peepul, banyan, keekur, &c., by the country people cutting off the tender branches for fodder for elephants, camels, goats, &c. Denuding trees of leaves and branches, stunts their growth or destroys them. In the vicinity of our residence two fakeers have taken up their lodgment; the peepul and keekar trees on the spot are nearly entirely bare of upper branches and leaves. We make no doubt, it would be found on enquiry that these rogues have no right to the trees, and are destroying them for the sake of firewood and fodder, simply because there is no one to hinder them—but it is a question, whether trees in the vicinity of a station or even those in the country can be cut down at the option of the landowner. In Military Stations not a branch can be lopped without sanction.

Surely there must be some conservancy laws, if so, why are they not applied—is it owing to the apathy of somebody who ought to look to it, or what is it? While Government is spending thousands upon thousands on forestry and arboriculture, fine healthy full grown trees are every where being wantonly destroyed, and there is no one to stay the process. Let the Deputy Commissioner or his energetic Assistant ride round the stations some pleasant morning, and note the number of trees in the condition we have described, and he will see that the evil is not an insignificant one.

THE PAGET PARK, UMBALLA.

To the Editor of the Mofussilite.

Dear Sir,—In a recent impression of your journal, you brought to notice the *Funds* being available, certain improvements in the station of Umballa were in progress, and others were to follow.

The site of the old town "*Beebee-aul*," now called the "*Paget Park*," possesses a very good soil, and is well provided with ancient or "*Badshahee*" wells, some of which have been filled up by order, and others have fallen into dis-repair. Now as want of water, is one of Umballa's greatest wants, I would suggest that all these old wells be cleaned out, and arrangements made for filling them up with rain water brought to them by suitable cuts being made from the numerous drains, or water-courses of this remarkably well-drained cantonment.

In various parts of Punjab beyond the Sutledje Canal, water is during the winter conducted to old wells, the mouths of which are closed when filled, and when the summer or hot season and winds commence, the water drawn from these wells is found to be not only clear and pure, but deliciously cool as well. These facts show that old dry wells when filled with canal or rain water, may be advantageously made use of as *pucca* reservoirs, whether the water be used for drinking purposes or not.

With a supply of water the "Paget Park," may be made a formidable rival to the beautiful Botanical Gardens of Saharunpore, from whence choice fruit trees suited to the climate might be freely obtained, as also young forest trees, to re-place the very numerous "*Babool*" and "*Keekur*" (*Acacia Fragrans*, and "*Catechu*"), trees with which all our roads and compounds, &c., &c., are freely stocked. The "*Acacia Catechu*," is a short-lived tree, which on acquiring maturity, commences to bleed, and when this discharge of ripe sap is over, the tree dies, its leaves fall, and the trunk and branches await the forester's axe. In a few years all the old *Keekur* trees (none of which are more than 28 years old), will bleed and die off; and arrangements should be made at once for re-placing them, and other small-leaved trees with something better. The researches made by scientific men in Europe and America has satisfactorily demonstrated that trees having large leaves, and *umbrageous foliage*, attract the *rain cloud*, whilst trees whose leaves are small, (and the leaves of the "*Babool*," and "*Keekur*," are the smallest of the small), and the resulting shade nominal, as a rule repel the rain cloud.

This holds good at Umballa, as it very often rains heavily from the Native Cavalry Lines, to the right flank of the Dragoon Lines (where the large-leaved trees terminate), and more or less sparingly in the European Infantry Lines, whilst there is a mere sprinkling in the Native Infantry Lines.

I think on counting, it will be found that there are more large-leaved trees within the "*Paget Park*" than in the Lines named. If therefore we would extend the rain-falling bounds, we must plant a suitable number of umbrageous trees and of these one at every seventy yards is sufficient. The "*Peepul*" (*Ficus Religiosa*), and "*Banyan*" (*Ficus Indica*) are both long-lived umbrageous trees and as branches of from ten to twelve feet of either will take root if properly cut off and suitably prepared for planting, a very trifling sum would be needed (say two annas each) to cover Umballa with trees so planted.

The *Ficus Elastica* or India rubber tree, grows at Seaforth and at Saharunpore, consequently it will grow at Umballa as well, this variety of the fig may be successfully grafted on the *Ficus Indica*, or banyan, and as the grafted tree so obtained would in due time yield a good supply of marketable *Cheut Chouc*, or India rubber, by adopting the suggestion, a considerable income would be derived from this source, and as the leaves of the India rubber tree are much larger than the banyan, (or stock) the increased expanse of foliage, would be a desideratum.

In conclusion, I would wish to mention, that the hill date tree, met with almost half way between *Kalka* and *Dhurrumpore*, on the Simla road, and which yields good sweet fruit when ripe, would probaly thrive in the "*Paget Park*" and add greatly to its beauty. I am, Yours faithfully,

FRED. POGSON,
Corresponding Member A. L. H. Society of India.

15th January 1872.

Official Gazette.

BOMBAY, 21st February 1872.

THE MODEL FARM—MADRAS.

Major-General Frederic Cotton to the Under Secretary of State for India, Wrexham, North Wales, 11th November 1871.

Sir,—I beg to acknowledge the receipt of your letter (5309) forwarding two reports on the management of the Sydapett Farm, Madras, and to express my thanks for the opportunity afforded me of reading and remarking upon these interesting papers. Though constantly reading papers on farming affairs from all parts of the world, I have rarely met with any of so great interest as Mr. Robertson's reports on the Madras Government Farms for the years 1869-70 and 1870-71. Mr. Robertson has indeed turned to the best account the means placed at his disposal, and all that he is doing will not only be of extreme value in India, but of high interest to those engaged in farming everywhere. No question arises that is not at once tested by experiment, and as each trial is kept distinctly to the one point under investigation, its results are clear and unquestionable, and, if they are not decisive, it is either because the experiments were of necessity made on too small a scale, or are such as require confirmation from repetition, which we may rest assured they will have. In three years Mr. Robertson has not only brought his farm into order, but he has already shown what important results may be obtained from it, small as it is. By proving the practicability of raising green crops at all seasons of the year, by the introduction of some new plants well suited to that purpose, and by showing clearly the profit to be derived from them, a most important service has been rendered to the country.

His practice of economizing cattle manure, and his successes with mineral manures, are of incalculable value, and will eventually lead to the restoration of that vast area of land in India which exhaustive cropping has reduced to a minimum of fertility. The trials which seem to have established the fact that it is only necessary to steep the gram, which hitherto has always been boiled, and is the food of every horse in the south of India, ought to lead at once to the economy of a great amount of fuel, as well as a saving of a very considerable portion of the nutriment in the food. It is extraordinary that this should have escaped detection before, as the other pulse used (Bangal gram) has always been steeped only. This point is of so much importance to the Cavalry that it will of course be thoroughly tested on a large scale. One important result of this change would be the saving of a great deal of good manure, which is now burnt to aid in the boiling of the gram. The introduction of a new breed of sheep will be, no doubt, a success, as with sheep it does not require many generations to establish a new type. This will be a great advantage in the Carnatic, where both mutton and wool are of an inferior quality. And although it is not probable that there will ever be a heavy fleece on any sheep where there is no winter, still the wool may be found to have some useful quality. And I would recommend that, however coarse it may seem, it should be sent from time to time, as it changes its character, to England, for examination, as no one but the manufacturer can determine the value of any material, or can point out what change would improve it. Indeed, in all efforts to effect a change in both animal and vegetable products, the guidance of the consumer should be constantly sought for, as it has frequently been found that the production of a finer appearance has been gained by the sacrifice of some useful quality. Fortunately, in Dr. Forbes Watson, the Government has an able and energetic man, always ready to communicate with the manufacturers, and interest them in a new introduction, so there need be no difficulty now in obtaining their advice. Mr. Robertson's

remarks upon the effects of good and deep cultivation are of great interest, and he is right in pointing out the advisability of manuring, not the surface only, but the whole of the soil stirred by the plough. Indeed, he might have gone further, and said that the best position for the chief part of the manure is as far below the surface as the roots can reach, for where the soil is richest, there the roots will be most abundant. Manure near the surface is not only wasted by its volatile ingredient being carried off, but its effect on the crop is that the roots are found in the most insecure position, where they can only be saved from withering by a constant succession of rainfalls. In the reports under review, it has been shown that there may have been an abundant, even an excessive, fall of rain, and yet the crops lost by drought. No plant can exist long in its growing season without moisture at its roots, and as the soil dries from the surface downwards, the number of days or weeks, or months a crop can live without rain depends on the depth at which it has its roots. Even in the tropics the soil does not dry to a great extent very rapidly, so that each additional inch in the cultivation adds materially to the security of the harvest; and as that is the most important object that the Agricultural Department will have to work for, Mr. Robertson's experiments on deep cultivation are of extreme value. It was with a view to the trial of deep cultivation over large areas that the steam plough was sent out, and either by its means, or by some common subsoil plough, I hope its good effect may yet be shown on a scale that shall leave no doubt of its efficacy to reduce materially the risk of scarcity and famine; and as in land under ordinary good tillage the yield is almost in proportion to the depth of cultivation, and an acre ploughed to a double depth will save the farmer nearly a whole acre's rent, the profit will be so immediate, that even the poorest ryot may afford to purchase this better security without reducing the acreage of his farm. Interesting as all Mr. Robertson's experiments are, I will not be tempted to comment upon them further. If my observations can be of any value, it will be by pointing out what I consider the deficiencies of the farm, and the means I would adopt to supply them. I must, however, while congratulating the Government on the present hopeful state of agricultural affairs in Madras, remind those writers on the subject who are inclined to underrate every effort made before the appointment of Mr. Robertson, that the most important step was taken by Sir William Denison when he established the farm; and, judging from the pace at which agricultural improvements move in England, the Government has gained as much advantage by the very small sum of money spent from first to last, as could under the circumstances be anticipated. I have before warned the Government that, although the Sydapett Farm was doing such good service, it is not fit for its purpose either in area or position, and I must reiterate my advice that another site should at once be selected. The extent of the farm is even now insufficient for the trial of the preliminary experiments in progress. Farming on the scale of gardening, however interesting and suggestive, is altogether delusive when made the basis from which to calculate farm profits. No one with any experience in farming would be satisfied when told that a little plot of land had produced 60 lbs. of cotton, and therefore he might reckon on 1,000 lbs. on every acre. The weights and measures of arithmetic may be ever so carefully treated, but the multiplication of a slight error has too often led to disappointment for any practical farmer to consider a small experiment trustworthy. The Government trials must be on a scale large enough to be conspicuous and convincing, and the list of subjects touched upon in their account of the infant farm at Sydapett, can hardly give the faintest idea of the multitude of questions that will have to be investigated. The Farm Committee have declared, that the Sydapett soil is too light for it ever to become a good seed farm, which is rather a serious fault; and they give up all hope of breeding cattle from the want of suitable land for the purpose. In short it must be admitted, that there is not extent of land or variety of soil that fits it to become the central farm for the Presidency. Nor is the want of space the only defect of the present site. The absence of a stream of water for irrigation is a still more radical fault, as it prohibits entirely the examination of the most important of all questions,—the value of water, and how it can best be economized.

I have seen lately, in the estimates for completing the great irrigation works, that every calculation is based on the supposition that rice and rice only, is to be grown on all the land that can be watered. Is this advisable? I have, in a former paper, pointed out that irrigated rice is only grown where land is taxed, and the water is given by Government in unlimited quantity. But where water is raised from wells, at the cost of the cultivator, it is rarely or never grown, other crops being cultivated which yield a better return for the cost of the water. In India the water is the property of the Government, and on it depends not only the prosperity of the country but the lives of its inhabitants, it behoves the Government therefore to guard it as its most precious treasure. It will no doubt be the first object of the new Agricultural Department to determine how this invaluable gift can be best economized, and to ascertain this, its actual value on every crop must be tested by experiment. In these all-important investigations, the Sydapett Farm, with its able Superintendent, can give no help whatever. Nor can the pupils educated there carry into the provinces any knowledge of the treatment of land under irrigation. I cannot but think that the Government will agree with me as to the advisability of correcting this; and that permission will be given for a farm being begun where there will be land enough, and water enough, to make their experimental farm and place of agricultural tuition complete.

I am glad that His Grace the Secretary of State has given me an opportunity of calling attention to this subject now, while, the Sydapett Farm is in a condition to be disposed of, without probably any loss to the Government. That it is in that condition is due to the good management of the Committee, and the rigid economy of their Superintendent, who, if I read the accounts rightly, has built a very considerable homestead and a residence for himself for less than 500*l.*, about one-seventh of the estimated cost of the smallest station, or shed, as it might have been, on the projected narrow gauge railway in the Valley of the Indus. I must be allowed to express a hope that this cheap engineering may not be lost sight of by the Agricultural Department,—a warning, as it appears, not unnecessary in the present day. I have always considered the Sydapett Farm well placed in being near the seat of Government, and I would not that the farm I propose should be far from Madras. In the Carnatic, it is true, it cannot have the advantage of the most certain irrigation, because that can only be had under the influence of one of the great rivers that rise in the Western Ghauts, and receive their supply from the south-west monsoon. The next source of supply within moderate distance of the Presidency will be found under a large tank supplied by the Palaur river; and Caverypauk, which is about 60 miles from Madras, is the finest of these works. If a channel could be led from this on a high level to command a strip of land on the edge of the present irrigation, it would have every advantage of position, being within moderate distance of the railway, and having any extent of dry land available for unirrigated cropping, or for cattle and sheep breeding.

If the farm were in such a position as this, the Superintendent would have so good an opportunity of gaining information as to the result of the native mode of working the wet land, that he need not himself go largely into rice cultivation. And working with the ryots as his immediate neighbours, he would be able to give them advice; and there would be a far better chance of having his improvements in agriculture adopted than he could hope for in Sydapett. Now that the Government has taken under its supervision the agriculture of the country, I hope an effort will be made to convince the native cultivators that it will be well for them to break through their present system of doing everything in their own houses, and leave all that can be done better and more cheaply for them to those who make it a special business. It was with a view to this that many of the implements supplied at Sir William Denison's request were sent by me to Madras. If these could be brought into use, as it was my hope they would, for the benefit of a whole village, the ryots would all have the advantage of aid from machinery, although their capital was insufficient for the purchase of it.

I can remember when the travelling threshing machine, worked by cattle, first came into use in England, and the system has now been extended, till not only is all the threshing of the small farms done by itinerant machines, but the steam plough, the cider-mill, the corn-drill, and other implements, are all to be hired when wanted. As there has hitherto been no one to move in this matter, much of the machinery sent out by me and others seems to have been unused, and its lying idle has always been attributed to the poor ryots not being able to purchase it, which it was never supposed they could. The Farm Committee has had no power of doing anything in this matter, it was out of their province; but I hope something now may be done, and I would repeat a suggestion made when I first sent out the chaff-cutters, that one or more, with a horse or bullock gear to work them, should be set up at one of the halting places near Madras, where straw is purchased every night for some hundreds—it may be thousands—of bullocks; and it would be a great saving to the consumer if he could purchase it cut by the machine. I should imagine that some one could be found to undertake this, if the apparatus were given to him for the trial; and if he succeeded, the value of the machinery would be money well spent by the Government. I have no knowledge of some of the machinery still in store, as it was not sent out by me; but I can hardly imagine any English agricultural apparatus not being applicable to some good purpose in India, where the rudest mills, worked by cattle, are employed to advantage. And I strongly recommend, instead of abandoning it, that every effort be made to bring it into use in such a way that it could be employed on hire. As for the Government loss, if the implements were given to those who would make the first attempt to introduce the system, the whole sum spent from first to last is so small compared with the object to be gained, that it need not be taken into consideration. Before closing my remarks, I would express a hope that this farm, transferred, as I propose, to a better site and developed to the utmost, may become a place of instruction for agricultural teachers of every class, and I would endorse the suggestion of Mr. William Robinson, in his admirable Minute on the agricultural scheme for the Madras Presidency, that agriculture should not only be taught on the Government farm, but that it should be recognized as a science worthy of a Professorship in the Madras University.

SEASON REPORTS, JANUARY 1872.

GENERAL REMARKS.—If we trisect the Continent of India by east and west lines, running—one through the great Central mountain ranges above Nagpore, and the other through the high table-land between the Godavery and the Kistna rivers,—we shall find each of the three divisions presenting a uniform and distinct phase in the subjoined Returns.

In the northern-most, including the Punjab, N. W. Provinces, Oudh, and the greater part of Bengal, the weather has been damp or showery, and the spring-crops generally give fair promise, though in places especially in Oudh and the N. W. Provinces, they have been injured by rain, hail, or blight. To the extreme east the weather has been drier, and the prospects are uniformly good.

In the Central division, which comprises a portion of the Central Provinces, the Berars, parts of Chota Nagpore, and Cuttack, and the two northern districts of the Madras Presidency, there continues a marked, though not as yet severe, drought, felt most apparently in the districts of Ganjam and Vizagapatam.

In the southern division, that is, in Mysore and the remaining districts of the Madras Presidency, the weather has been dry, and the agricultural prospects are almost universally favourable.

No report has been received from Bombay and Rajpootana.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
Madras	Ganjam	January 31	Nil	February 1	Water-supply diminishing; well-sinking in progress; market well supplied; grain imports large; prices high, but not rising; health good.	In the Northern Circars the effects of drought are more marked as the season advances. The markets are well supplied by imports. Relief works have been started in Ganjam. Elsewhere prospects are fairly good.
	Vizagapatam	„ 31	Nil	„	Drinking water diminishing; market well supplied; prices unchanged; health good.	
	Godavery	„ 29	Nil	„	Market well supplied; prices steady; health good.	
	Kistna	„ 31	Nil	„	Markets well supplied; prices steady; harvest fair; prospect fair.	
	Kurnool	„ 31	Nil	„	Markets well supplied; prices steady; crops fair; health good.	
	Negapatam	„ 31	1·25	„	Prices falling: prospects good.	
	Trichinopoly	„ 31	Nil	„	Prices steady; crops fair; harvest below average.	
	Calicut	„ 30	Nil	„	Prices low and steady; harvest fair; prospects good; health good.	
Bengal	Rhaugulpore Division—					
	Monghyr		1·1	January 31	Weather seasonable; crops very good; rain very beneficial.	
	Bhaugulpore		·1			
	Sonthal Pergunnahs		..	„	Light showers in Rajmahal and Godda: mustard being reaped; cold weather crops want more rain.	
	Patna Division—					
	Patna		1·3			
	Sarun		1·5			
	Shahabad		1·3			
	Tirhoot		1·3	„	Spring crops in Tirhoot, Gya, and Chumparun are promising; in the other districts slightly injured by rain; dense fogs threaten to produce blight in them.	
	Chumparun		Slight			
	Gya		..			
	Rajshahye Division		..	„	Light showers in Dinagepore and Malda; crops good everywhere.	
	Burdwan Division		...	„	Weather fair and cool; prospects of winter crops favourable: in Bancoorah they are not doing well for want of rain.	
	Presidency Division		.	„	Weather seasonable: crops good, except in Nuddea, where they are not good.	
	Dacca Division		Nil	„	Crops good.	
	Chittagong Division		..	„	Weather fair: crops good; in Chittagong out-turn unusually good.	
	Cuttack Division		Nil	..	Cold weather crops good, except in Pooree, where they are suffering from want of rain.	
	Chota Nagpore Division		...	„	Weather fine: crops good; in Maunbhoom, suffering from want of rain	
	Assam Division		...	„	Weather dry and cold; most crops gathered; out-turn good.	
	Cooch Behar Division		..	„	Some rain at Julpigoree and Darjeeling: crops good, mostly reaped.	

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding	Date of report from Local Government or Administration.	State of agricultural prospects.	Remarks of Local Government or Administration.
N. W. Provinces	Allahabad	.....	1·	February 1 ...	Spring crops excellent.	Rain fell pretty generally during past fortnight; agricultural prospects good.
	Benares	.....	1·4	,, ...	No serious damage; wheat and barley mildewed in some low-lying lands.	
	Meerut	.....	2·4	,, ...	Prospects good; hail fell in Haupper Tehseel, and did much local damage.	
	Agra	.....	1·	,, ...	Rape crop injured by fog and storms; wheat and gram not much damaged.	
	Bareilly	.....	1·1	,, ...	No harm done as yet.	
Punjab	Delhi	.....	0·6	,, ...	Weather cloudy; state of crops good.	
	Umballa	.....	0·2	,, ...	Agricultural prospects good.	
	Jullundhur	.....	0·1	,, ...	Rain highly beneficial to crops.	
	Lahore	.....	0·2	,, ...	State of crops good; hail on 29th, but no damage reported.	
	Mooltan	.....	Nil	,, ...	Crops as reported before.	
	Rawul Pindee	.....	2·	,, ...	Agricultural prospects excellent.	
	Peshawur	.....	0·7	,, ...	Agricultural prospects good.	
Oudh	.....	....	...	,, ...	The rain has proved unfavourable to the rubbee, and considerable damage is to be feared; gram and mustard crops have been injured in some places by insects.	
Central Provinces	Raipore	January 27 ...	Nil	,, ...	Rubbee crops have suffered in parts from want of rain. The late dews have done good, and prospects on the whole better than heretofore.	
	Belaspore	,, ...	Nil	,, ...	Crops progressing favourably, except *Alsi* somewhat injured by cloudy weather.	
	Sumbulpore	,, ...	Nil	,, ...	Prospects unchanged.	
	Jubbulpore	,, 31	27	,, ...	Prospects of rubbee good throughout division. In Saugor pulse crop slightly suffered from excessive frost.	
	Hoshungabad	,, ...	Nil	,, ...	No rain, and prospects consequently not so good as before. Baitool same, not favourable. Less area sown. Blight on wheat has appeared.	
	Nursingpore	.. ..	...	,, ...	Rubbee in two Tehseels particularly promising; in third not so good.	
	Nagpore	,, 31	Nil	,, ...	Khurreef all cut. Rubbee crops have suffered from occasional cloudy weather; wheat not so promising as last year. Prices stationary. In Wurdah no rain. Prospects of crops moderately fair.	
Hyderadad Assigned Districts	East Berar	.....	...	,, ...	No improvement since last report. Rubbee crops still in backward condition. Partial failure in some parts of the division anticipated. Rain urgently required.	Weather cloudy and warm; a change in the season now would do no good to the crop. It would improve the water-supply which is fast failing, and with the scarcity of fodder is causing serious distress and an increase of cattle sickness.
	West Berar	,, 30	...	,, ...	No improvement in the prospect of spring harvest. In many parts a total failure of crops.	
Central India	Indore	,, 31	...	,, ...	No change since last report.	
	Gwalior	,, ,, ...	·32	,, ...	.....	
	Baghelkund	,, ...	1·3 at Sutna.	,, ...	Crops generally promising; slight fall of hail on 24th.	
British Burmah	.....	.....	Nil	,, ...	Rice crops reaped.	
Mysore	Bangalore	February 1	Nil	,, ...	Most of the crops have been harvested; their condition is favourable.	Agricultural prospects continue favourable.
	Mysore	January 30	Nil	,, ...	Most of the crops harvested; cotton, sugar-cane, &c., thriving.	
	Coorg	,, 31	Nil	,, ...	Paddy being threshed; dry crops thriving. Bengal gram being reaped. Picking and despatching of coffee still continued.	

RECLAMATION OF "OOSUR" OR "KULLUR" SOIL IN THE PROVINCE OF SINDH.

Memorandum by COLONEL W. L. MEREWETHER, *Commissioner in Sindh, on the papers forwarded under endorsement of the Deputy Secretary to Government of India, Public Works Department, 19th August* 1871.

THE land called "oosur" in the North-West Provinces is styled "kullur" in Sindh, and is very largely met with throughout the Province. Salts are present more or less thoughout the soil, and in some places to such an excess that vegetation cannot exist. These are, of course, easily distinguishable, and are generally of a deep brown colour, and after rain become greasily slippery, quite impassable for camels and difficult for horses. In other places there is no perceptible sign, but on the first use of fresh-water saline effervescence follows injuring attempted crops. This was, I believe, the case on land first watered by the Jumna Canal, and caused great alarm amongst the land-holders. All of this kind of soil is however found capable of reclamation. The time, trouble, and expense being only in proportion to the extent and quality of the salt prevailing. When the salt is not excessive, the process is both speedy and simple. A crop is sown in spite of the saline appearance. It of course is only poor, but whatever is produced, excepting any heads of grain, which are cut off, is left on ground, ploughed afterwards and allowed to decompose. With the next rise of the River Indus the water spread over the ground gives a film of good soil, which is also ploughed in, and improvement is markedly manifest; the second crop being very much superior to the first, and so on until the soil is fit for any crop. Observing this, a similar process was tried in proposed garden ground, where clear well water was used, and gave good results. Plain stalks of jowaree were chopped up, and a top dressing of good soil added. These having been ploughed, the plot was watered, and then afterwards reploughed; where before little or nothing would grow, cereals, vegetables, and flowers flourished excellently. Vegetable manure would assist well in this process, but care should be taken how manure obtained from towns or villages is used, as in that case the very substance desired to be removed or neutralised may be added to.

The Planters' Gazette.

BOMBAY, 21ST FEBRUARY 1872.

THE ESTATES.

THE Coffee-market is steadily recovering from the effects of the Franco-German war. The *Ceylon Times* points out how steady and continuous has been the rise in the price of fine Middling Plantation Coffee during the last twelve months. From 78*s.* 6*d.* in January 1870 the price fell to 63*s.* upon the outbreak of the war. The quotations at the beginning of last year were 66*s.* 6*d.* and the course of the market since has been as follows:—

1871.	*s.*	*d.*		*s.*	*d.*
January	60	6	to	66	6
February	66	0	„	71	6
March	64	0	„	69	6
April	63	0	„	69	0
May	63	6	„	69	6
June	62	6	„	68	6
July	65	6	„	71	0
August	65	0	„	71	0
September	70	0	„	75	6
October	70	6	„	76	0
November	72	6	„	77	0
December	73	0	„	78	6

The short crop in Brazil has been the cause no doubt of the recent rise, which is likely to be maintained. The Home papers tell us that "the export deliveries in November were nearly equal to those of 1870, and the total for eleven months continues to exhibit an increase of 13,260 tons, and as the imports were about 3,300 tons relatively smaller, the deficiency in stock at the end of the month was increased to 4,855 tons."

IPECACUANHA.

MR. McIVOR of the Government Cinchona plantations at Ootacamund, reporting to the Commissioner of the Nilgiris, under date November 6th, says:—

"I have the honour to inform you that the plants of Ipecacuanha, planted in the Burliar garden in May last, are making very satisfactory growth, and that the climate seems well suited for the production of this valuable medicine. I trust therefore that a portion of the plants now being forwarded to India by the Secretary of State may be sent here for trial, as probably they may be grown more successfully in the neighbourhood of Burliar on the Nilgiris than in the north of Bengal.

"The natural locality of the Ipecacuanha is strictly tropical, and the great difference of temperature of summer and winter caused by higher latitudes may possibly affect the growth of the plant.

"The Government of Madras have therefore applied to the Government of India for a few additional plants for the Ootacamund Plantations."—*Indian Statesman.*

CINCHONA.

MR. McIVOR, the Superintendent Government Cinchona Plantations, has submitted to Government a comparison of the growth of Cinchona plants in British Sikkim and in the Neilgherries. He finds that on the Neilgherries four years growth of *Cinchona Succirubra* exceeds that of the same species in British Sikkim by 3 feet 10 inches in height and 7 inches in circumference of stem, or three times the bark-producing surface. When the greater thickness of bark of the Neilgherry plants is taken into consideration, the yield may be estimated at about four times the quantity of bark produced during the same period of growth by plants of this species in Sikkim.—*Madras Mail.*

CINCHONA BARK.

(To the Editor of the Pioneer.)

SIR,—"C. R." who gives a "nut to crack" in your issue of the 4th instant, is a little in error when he states Cinchona bark was not introduced into Europe till five years after Oliver Cromwell's death, as it is a well-known fact that the Countess del Chinchon, wife of the Viceroy of Peru, imported the bark into Europe in 1639, about 19 years before Cromwell's death, and in after-years, some Jesuit missionaries distributed it among several of their converts throughout the stations in Spain and Italy. It then fell much into disuse through being employed by quacks without due discrimination. The bark was introduced into England by Sir R. Talbot in 1671, or 13 years after Cromwell's death, when a pound of the bark sold at 100 louis-d'or, or about Rs. 830. What effect it might have had if Cromwell had sent to the continent for quinine is hard to conjecture; and it is also doubtful whether the "Pulvis Comitissae" of those days in the hands of empirics would have cured one of the greatest of England's rulers of that dire disease.

ROYALIST.

Letter from the Resident in Travancore and Cochin to the Secretary to Government, Revenue Department, Fort St. George, dated Quilon, 6th November 1871.

I HAVE the honour to enclose copy of a letter to my address from the Conservator of Forests, pointing out that an enormous percentage of the Cinchona trees in the Travancore Government plantations of Peermede are dying out apparently from canker. Major Beddome suggests that, if possible, the services of Mr. McIvor should be obtained to visit the plantations, "as the visit could not fail to be interesting and instructive to that officer," who might also be able to give some valuable advice. The Travancore Government have incurred a good deal of expense in connection with the plantations without much prospect of direct return. It would be glad if Mr. McIvor could be spared to visit the place, and would be prepared to pay his travelling expenses between Coimbatore and Peermede and back, if Government is pleased to direct an inspection, which may, besides benefiting the plantation in question, throw some light on the important subject of Cinchona culture generally.

From Major R. H. Beddome, Conservator of Forests, to the Resident of Travancore, Trevandrum, dated Ootacamund, 10th October 1871.

LAST month, when passing through Peermede, I visited the Cinchona plantation belonging to your Government under the charge of Mr. Sinclair, and I was astonished to find an enormous percentage of the trees dying out; in fact, I believe, all that have flowered are dying, both the trunk and branches seemed suffering from canker; and from Mr. Broughton's description of the disease on the trees at the Darjeeling plantations, I believe the trees at Peermede are affected in exactly the same way. The soil at the Peermede plantation is very good, and the sub-soil is fair, though much laterite is present in the latter. I brought a piece of this laterite up to Mr. Broughton, and he thinks it can be in no way the cause of the disease. The primary cause is probably excessive moisture at a low elevation, and the epidemic once appearing, of course its spread is very rapid in a plantation of all the same trees. It would be advisable I think to cut out every diseased tree, both with the object of stopping the epidemic and of getting the bark off before it deteriorates; but I would certainly advise your Government to

obtain the services of Mr. McIvor, if possible, to inspect the plantation, and give his advice, and the visit could not fail to be both interesting and instructive to that officer. I was glad to see that trees were being planted out here and there amongst the indigenous trees in the Sholas, and I think it is very probable that these trees will escape the disease.

From the Superintendent Circar Garden, Peermede, to the British Resident of Travancore and Cochin, &c., &c., &c., dated Maryville, 21st October 1871.

I BEG to state that out of the 3,192 *Cinchona Succirubra* trees, averaging from 5 to 20 feet in height, there are not more than two-thirds of them in a healthy state. I have examined the roots of some of the dying trees, and they appear all healthy enough. The only place the disease appears to attack them is close to the ground, and works upwards. The bark gets quite dry and destitute of sap. What it really can be owing to I am at a loss to know, unless it is what I stated to the Dewan, excessive moisture and rock together. I find that the Cinchona, from the second to the fourth year, grows very rapid, and keeps a healthy robust appearance; but after that time the growth generally becomes slow, and a sickly yellow appearance sets in. I also find that any of the *Cinchona Succirubra* that shows any sign of flowering or seeding always die out. The remaining five varieties, I may say, are in no way affected. I am at present getting the bark off as quick as possible from the dying trees: but if it is the case that Mr. McIvor will visit the Cinchona garden here, I would propose that the dying trees should be left so as he can see the general state of the plantation, and he will be better able to form an opinion what really is the cause of the trees dying out.

TEA.

THE special correspondent of the *Indian Daily News* with the Chittagong column of the Lushai Expedition, mentions in his letter, that on the line of march from the Tewrong Klang North, tea, growing wild, is to be found. He has sent us a specimen leaf, which, on examination, appears to be somewhat longer and narrower than the leaf of the ordinary cultivated plant as seen in Assam. The specimen however has the serrated edge of the tea plant, and there can be no doubt about the correctness of our correspondent's conclusion that the leaf forwarded is of the tea species, and that the tea plant is indigenous in the locality indicated.—*Indian Statesman.*

FROM an English paper we extract the following paragraph on the chemistry of tea:—

"Zoller, in Liebig's "Annalen," shows that the *age* of tea leaves may be determined by the analysis of the ash. Young leaves, of which all the best teas consist, contain large amounts of potash and phosphoric acid, of which constituents the older leaves are comparatively deficient, while they become richer with age in lime and silica. In the practical examination of tea, therefore, there is a very simple guide. Much potash and phosphoric acid, with little lime and silica, indicate good tea; the reverse, bad tea. The ash of a sample of young tea grown in the Himalayas amounted to 5·63, grains per cent., and it contained in 100 parts 39·22 of potash, 1·21 of lime 4·38 of oxide of iron, 4·35 of silica, and 14·55 of phosphoric acid. On these data, the analysis of the ash may also be employed to detect the adulteration of tea with spent or exhausted leaves. From the same sample of tea 4·94 per cent. of theine was obtained, and 13·7 of proteine compounds."—*Indian Statesman.*

THE following remarks on the tea districts of Assam are taken from the *Indian Observer*:—

"Active enquiry is, we hear, being made in Assam and the north-eastern tea districts generally as to the condition of the waste lands granted under the leasehold rules. Government is, it is said, determined to resume in all cases where the stipulations as to clearing and reclamation have not been carried out. There have undoubtedly been great abuses under these rules. Large tracts of country were taken up by land-jobbers who have neither had the capital nor the intention to cultivate them. There can indeed be little doubt that during the 'tea mania' land was recklessly given away in every direction. Even the local officers were carried away by the excitement, each thinking to develop his district into a new Goshen. If anyone can remedy this state of things so late in the day, Mr. Campbell is the man. We see so much well-directed energy in his revenue administration of Assam, that we are disposed to regret the severance of that province from Bengal just as the Lieutenant-Governor's policy regarding it is taking shape. At the same time we trust that in dealing with the question, Mr. Campbell will take care that no injury is done to *bona fide* planters. The tea interest is just recovering from the crisis of 1866, and promises to be as profitable a branch of industry as any the country possesses. We should be sorry to see its progress checked in any way by a want of liberality on the part of Government. There exists somewhere, we understand, a valuable paper on the revenue system of Assam, drawn up by Mr. Campbell when on tour last rains. Will he not make it public?"

TEA CULTIVATION.

A BOMBAY newspaper says:—Here is good news for Punjab tea-planters. Letters have been received at Cabul (so says a correspondent) from Turkistan by merchants, stating that the Punjab hill tea had been found so far superior to China tea in Bokhara that people had ceased using the latter; the price of the former had consequently risen very considerably. The Cabul merchants had therefore instructed their agents to buy up all the hill tea that could be procured at Umritsur.—*Colombo Observer.*

THE TEA-TRADE OF FORMOSA.

THE island of Formosa bears unmistakable evidence of a volcanic origin. This is particularly noticeable in the northern portion, where there are many extinct volcanoes, the steep sides of which are favourite spots for tea-planting. In many places the Chinese have, with great patience and skill, levelled the rugged masses of lava and formed terraces, which they keep covered with earth brought in small baskets, on men's heads, from the plains. The tea-trade of Formosa is entirely confined to the northern ports, and nearly all the tea grown in this island is exported to the United States or Australia. With the exception of very poor people, the inhabitants use an imported article, brought from Poo-choo-foo. They give no reason for this, beyond "that they have always done so," from which it may be inferred that custom, more than the superior quality of the Chinese tea, has caused them to overlook their own article.—*Frank Leslie's Illustrated Newspaper.*

HIMALAYA TEA.

(BY T. ZOELLER.)

THE May number of the *Annalen der Chemie* and *Pharmacie* contains the result of an interesting investigation on Himalaya Tea, by Th. Zoeller, which is of considerable value.

The author begins by stating that the opinion that the different sorts of tea are derived from various species of the tea-plant had been refuted by Siebold, and more completely still by Fortune's inquiries. Black and green tea are both derived from *Thea sinensis*, and the many varieties of tea in the trade are not products of different plants, but merely results of differences in climate, soil, cultivation, and in the preparation of the leaves, but, above all, of age. Although the tea-plant itself is hardy enough to bear considerable fluctuations in temperature, still the quality of the leaves greatly depends upon the soil, cultivation, and, as stated just now, upon the age, while their preparation has no effect upon the quality, but only alters the outward form. Zoeller had previously shown that with beech-leaves the composition of the ash constantly changes with the age of development in the leaves, inasmuch as the amount of potash and phosphoric acid gradually decreases with progressing age, while lime and silica constantly increase in quantity. Taking this observation as his basis, Zoeller concludes that if the quality of tea is in the inverse ratio to the age of the leaves, the analyses of the ashes of it must enable us to determine the age, and consequently the quality. A high percentage of potash and phosphoric acid with little lime would indicate a young tea, or a superior quality; while, on the other hand, much lime and little potash would be the characteristics of an inferior quality. The author succeeded in obtaining some samples of Himalaya tea, collected when very young, and the analysis quite bore out his anticipation. These leaves had been gathered very early, the lanceolate form was not quite developed, they were of a fine black colour, and produced with hot water the most delicate aroma.

The analysis gave 4·95 per cent. of water, and 5·63 per cent. of ashes, containing much potash and phosphoric acid, and little lime, boiling water extracted 36·26 per cent., of which 4·91 per cent. was theine. To separate the alkaloid, the cells of the leaves were completely broken up by maceration with concentrated sulphuric acid: the acid was then neutralized by moist hydrated oxide of lead, and the mass repeatedly extracted with alcohol; the alcoholic extract was treated with animal charcoal, and after filtration slowly evaporated, when most of the theine separated in shining silky needles.

Further evaporation did not yield any more crystals, because the sugar formed by the action of sulphuric acid upon cellulose interfered, and made the solution too syrupy; the rest of the theine was therefore separated by ether. The alcoholic extract on standing over-night deposited crystals, which Liebig took for theobromine; although the minuteness of the quantity prevented exact determination, the observation is important, as the presence of theobromine in tea had not before been shown. The nitrogen in the tea leaves amounted to 5·38 per cent.

The complete analyses of the different constituents showed the following results, viz :—

	Ash of tea leaves.	Ash of aqueous extract.	Ash of leaves after extraction.
Potash	39·22	55·15	7·34
Soda	0·65	0·68	0·69
Manganese...	6·17	3·13	11·35
Lime	4·24	0·95	10·76
Oxide of Iron	4·36	1·73	9·53
Oxide of Manganese	1·03	0·43	1·97
Chlorine	0·87	0·57	traces
Phosphoric Acid	11·55	7·89	25·41
Sulphuric Acid	traces	traces	traces
Silica	4·55	2·99	7·57
Carbonic Acid, &c.	24·30	26·30	25·28
	100·00	100·00	100·00

Percentage of Nitrogen.	Air-dry leaves.	Dry extract.	Exhausted and dried leaves.
Nitrogen	5·38 p. c.	10·09 p. c.	3·48 p. c.
Ash	5·63 „	11·46 „	3·06 „

100 parts of ashes of the leaves are composed of 30·82 parts of ashes of the exhausted leaves, and 69·18 parts of ashes of the extract.

The results lead to the conclusion that Himalaya tea is quite equal to the best Chinese tea, but it must remain undecided whether the presence of theobromine is accidental, or constitutes a distinction : the results also bear out the experience of tea-planters, that the youngest leaves of the tea plant give the best quality.

In the determination of the age of the leaves by analyses of the ashes, the amount of potash must always be compared with that of phosphoric acid and lime, because the older plants often show a high percentage of potash if grown on soil rich in potash salt, but the amount of lime and phosphoric acid invariably decreases according to the age.

Remarkable and characteristic of the ashes of tea is the large quantity of iron and manganese. The effect of iron in the infusion of tea upon the vital functions has been noticed by Liebig in his Chemical Letters, and the importance of iron in vegetable life is well known, whereas that of manganese has not yet been ascertained.

In making infusions of various samples, they show a difference, inasmuch as the best tea was most readily exhausted. The component parts of the ashes are dissolved in different proportions ; chlorine almost entirely, potash very considerably, lime, magnesia and phosphoric acid, but slightly. The different solubility affords a ready means to distinguish exhausted leaves from not exhausted ones ; and this may be of practical importance, as exhausted tea is often made up and brought again into the trade. The ashes of exhausted leaves contain but little potash, but much of the above-named insoluble substances.

In reference to the action of tea upon the human system, the author again points to the richness in potash, the importance of which in nutrition has been demonstrated by Kemmerich's experiments. But as the infusion of tea contains but little phosphoric acid the alkali is enabled to convert the acid phosphates of our food into less acid ones, *i. e.*, into those which act as solvents of insoluble albumen, and which form part of the normal conditions of blood.

Hot water desolves 3·50 per cent. of nitrogen ; tea contains 4·04 per cent. of theine, equal to 1·73 per cent. of nitrogen ; the difference in nitrogen, namely 2·14 per cent. is, according to Peligot, part of caseine, and corresponds to 13·7 per cent. of caseine, a quantity sufficiently large to play an important part in the process of nutrition.—*Pharmaceutical Journal and Transactions.*

COFFEE.

A PLANTING correspondent, writing from the vicinity of Kandy, takes an unnecessarily gloom view of Coffee prospects at the present moment; he says :—"Leaf disease is very bad, and the next three months will open our eyes as to what the future of old estates is to be. To anyone about to invest in Coffee, I should give Punch's advice to those about to marry."—*Ceylon Times.*

A PLANTING correspondent, dating the 20th June from this district, says :—Here as elsewhere crops, I am sorry to say, turn out short of even our very moderate estimates. As a rule estates are well on in work and in capital order, with perhaps one or two exceptions easily accounted for. I hear one of our oldest, indeed I may say the oldest planter in the district, has discovered that the leaf disease is beginning to shew itself in the bean. We are all anxiously awaiting the onward progress of the rail from Peradenia, and if, as is said, the contractor will enable us to get our crops away from Gampola by the end of this year, we will vote him a jolly good fellow. Weather fine and quite in favour of the forthcoming blossom, for which we shall soon be looking.—*Ceylon Times.*

CAPE COFFEE.

ACCORDING to Natal advices, the coffee crop in that country was estimated at 1,000 tons. Planters are said to be full of hopes in the future, and were convinced that, "with careful cultivation and prudent choice of locality, the enterprise is a remunerative as well as an easy and pleasant one." Very likely, but let them wait until they get the leaf disease amongst their properties !—*Ceylon Times.*

LEAF DISEASE.

DEAR SIR, As anything relating to our new pest, "Leaf Disease," must be interesting to you, I will tell you what I really saw of it in Dimboola The places up here do not look so badly, but then there are crops! Leaf disease too where it has appeared is very bad, and not only is the type of it seen here as elsewhere, but it also takes another form ; the leaf not spotted but half of it burnt clean through, as though scorched.

The young places seem all that one could wish, but the old hands are becoming anxious about future supply of labour, more especially as not only is a large tract of land coming into bearing within a year or so, but the land to be planted up will alone demand a large increase in the force of coolies. Do you know the altitude of some of the last lots of land sold was as much as 6,000 feet this on our side is far too high for Coffee, even if Jack Frost does not have something to say to them.—*Ceylon Times.*

January 15th. TRAVELLER.

COFFEE CURING.

HOWEVER strange it may appear under the circumstances of unusually short crops, it is nevertheless the case that during the present season Parchment Coffee has been received in Colombo in a much wetter state than in any previous year. The extra cost of curing under such circumstances is felt by preparers very materially, we know of Parchment having in many cases been exposed on the barbecue in Colombo for seven days before it could be placed under the peeler, a state of things which certainly could not have improved the quality of the parcels in question. Coffee Curers in Colombo have frequently the greatest difficulty in preserving parchment from damage during cloudy weather in the early months of crop season, by reason of the large quantities of wet coffee hurried down to them and which rapidly accumulates in their stores.

If managers of estates would in the matter of despatch, act more in concert with their Colombo Agent, it would be to the advantage of all parties : they may, and no doubt are, often put to some inconvenience in wet districts, by the accumulation of uncured parchment in their estate stores, but they will not mend matters if they hasten their Coffee to Colombo Stores, already choked with parchment in a similar condition, besides which they should remember how much extra Railway freight they pay by sending down Coffee containing a large percentage of water.—*Ceylon Times.*

THE *Bangalore Spectator* remarks :—Surely no cultivation was ever so tormenting as coffee planting. It is not long since the bug was looked upon as the *fons et origo mali* to the coffee plants, and everybody was up in arms to get rid of the pest. Now the coffee leaf disease has started up and will probably drive some coffee planters frantic. The worst of it is that no one seems to know the cause of it. Drought has been assigned as the cause, but in places where there has been rain enough, acres have been troubled with it. When some very hot weather set in the attacked leaves dropped off, leaving no sign of the disease. This has been corroborated with reference to another district which had suffered severely from wet weather, and the trees gradually improved as the dry weather succeeded. One planter has suggested that it is caused by the extensive use of artificial manure, and especially by *bone dust* : the fields manured with this having caught it first and suffered most, part of the estate did not suffer at all. In flat opposition to this theory another writer says that estates which have never had any manure applied to them have suffered severely. Manuring *per se* could never originate the disease, though it might be introduced through the medium of manure. The disease is said to be a well-marked fungus, and not a mere degeneration of the tissues of the coffee tree. It is an independent growth, deriving its sustenance from the juices of the coffee tree. It is widely propagated by means of its spores, which are light enough to be carried long distances by the wind. From this it is difficult to suggest any remedy for stopping the pest. As the spores are fed upon by the larva of a species of fly, it is thought that it may tend to destroy the spores as fast as they are produced. Nothing is known of the way in which the coffee was first infested, but it is supposed that it affected some of the indigenous plants, and thence found its way into the cultivated coffee. Perhaps the best way is to be particular as to the vigour of the young plants, and the seeds. This seems to be the only barrier available against the blighting effects of this fungus. It is a pity too that planters should be thus tantalized at a time when coffee prospects are brightening.

A CORRESPONDENT of the *Madras Mail* writes :—"The cultivation of coffee has already proved so ruinous to many of those who wished to open up the resources of this Presidency for their own and their country's good, that an invasion of a fresh enemy and drawback may well-nigh be its *coup de grace*. What is the '*leaf-disease*,' what causes it, and what is effectual in banishing it from an estate! The result of it is, that trees affected by it have not a leaf on them, and all the young wood dies. The disease is supposed (a mere conjecture) to have been brought on by the late unusually long monsoon. It appears as a tiny black speck on the back of the leaf, and by evening pervades the whole leaf, which turns *black* and drops from the tree during the night. When examined under a microscope, it seems to be a kind of black fungus. Is this the last of the cheerful trio of B's—bug, borer, and blight—that one's friends talk so gliby about *after* one has invested savings, the sweat of one's brow, in coffee. I think it must be. Leaf-disease! Nothing was said about it in the prospectus of our company, though intending shareholders were assured that this estate was peculiarly favoured in having escaped both bug and borer. The shares were issued at 100 rupees each, and fell at once on a rumour of '*bug*' to 35, but the shareholders, re-assured by a 'bumper-crop,' treated it as a *hum*. In the following year, the *borer* made some havoc in the estate, and shares fell to 25 and 20; while this year, with the *blight*, and nothing but leafless sticks visible as far as the eye can reach, shares are quoted at 5 rupees, with no buyers, in the open market. A few have been saleable at this price to some speculative natives, but to induce them to allow the transfer to their names, it has been necessary for the seller to make them an advance of Rs. 4-15-0 in cash. As a shareholder I, of course, was able to procure a sample of last year's crop, and wishing to satisfy myself as to the quality of our brand, I gave a small parcel to my boy with particular instructions not to roast it black but to *brown* it nicely. Imagine my horror, in reply to my enquiry, if it was ready, when my boy informed me—'Done Brown, Sar?' Was he laughing at my beard? Did *he* too know the name of our company? Every tale should have its moral. The moral of this little episode, in the life of one hasting to be rich, is *stick to government paper, if only at 4 per cent.* Distrust all schemes which offer 10, 15, or 20 per cent. on the venture, and turn a deaf ear at the outset to those which prophecy smooth things, even to 50 per cent.',

MR. TYTLER'S THEORIES OF CYCLES, &C.

(Ceylon Observer.)

DEAR SIR,—I have a great respect for Mr. Tytler's opinion on most subjects, but in this one of "wet cycles" and "seasons out of joint" he may be somewhat mistaken. For instance he says "that when we have dry cycles, human and other animal life prospers, whereas at that time, vegetable life is exposed to disease, &c., whereas, when there are good crops, with vegetation healthy, and everything seed-bearing we find for animal life * * all the ills human life is subject to." The years 1866 and 1867 were particularly *dry* years in Ceylon, and both Natives and Europeans suffered a great deal from fever and other complaints, the natives particularly so. In wet seasons it is generally understood the country is healthier, I have heard old planters say that the climate used to be much wetter 15 or 20 years ago than it is now, or has been for sometime back. If it was so much wetter before the planting period the climate must have been almost unendurable. As to leeches, if Mr. Tytler will come up to Dimboola we will give him leeches to his heart's content in the jungles, but as the coffee is generally so clean very few will be found there. Leech-gaiters are as essential in the forests of Dimboola as they ever were, to those who are afraid of being bitten. I have seen a few of our planters suffering from these bites at the present time. The reason why the leeches have disappeared, is doubtless because there is no place for them to conceal themselves in the coffee, now that estates are kept so much cleaner than formerly, and the heavy jungle having all been cut down in the neighbourhood of the older districts. As for land-slips after heavy rain, was there not one on the railway recently? And they may be seen in the roads up-country, though not to the same extent, simply because the road-makers are more careful in back-sloping and back-draining.

India has been in a chronic state of famine from the earliest times, and probably will be again, unless wise laws and the spread of education enlighten the natives as to the benefits to be derived from the construction of tanks and irrigation works.

The coffee tree does not send its roots so deep into the ground as to require such terrific deluges of rain as Mr. Tytler anticipates are coming upon us, rain that would tear and rip up the ground to a depth far below what is required for the sustenance and life of a small coffee tree. Sea Captains' ideas with regard to Ceylon are that it is an Island blessed with very gentle showers, and I remember rather surprising one by telling him of the heavy rains we sometimes have in the interior. So soon as ships get as far south as Galle, they think their troubles over. Lieut. Maury's theory of the monsoons, if I recollect rightly, not having the book by me, is that the immense deserts in the interior of Asia get heated up, causing an immense vacuum, towards which the vapour clouds on the north side of the equator are attracted, causing the south-west monsoon. This vacuum being filled, the cold air again rushes back towards the equator, causing in turn the north-east monsoon. This theory is sustained by the fact that the south-west monsoon begins far to the north first, and works its way downwards, not, as many suppose, rising in the neighbourhood of the equator, and working its way upwards. The quantity of rain that falls here may depend upon the greater or lesser quantity that may have descended before it reaches Ceylon, and hence perhaps the variableness of our south-west monsoon rains.

The oldest districts of the Island have had their day, and done good service, and it is scarcely fair to lay the blame on the clerk of the weather, if they wont continue to give good crops, even although the trees are crammed from root to branch with Sombreorum. We must just trust to Him who says that while the earth remaineth seed-time and harvest shall not cease.—Yours truly.

S. S. W.

9th December 1871.

PRIZES FOR COFFEE.

A CORRESPONDENT writes as follows:—"The well-meaning Committee of the Agri-Horticultural Society have again offered a prize for the best sample of coffee, the produce of the Madras Presidency, or of Mysore, Coorg, Travancore, or Cochin. Now I do think this is altogether a mistake. What possible good do the Committee expect to follow. It is right on the part of the Government to offer every reasonable and proper encouragement to so important an industry as coffee planting, but this industry has advanced far beyond the stage at which a prize such as is now offered can be of any benefit. The Committee invite competition from planters in every different climate and circumstance embraced by the extensive country stretching from Gopalpore to Cape Comorin. The difference in the quality of the coffee produced in the various districts are well known, and it is absurd and futile at this time of day to ask the owner of a low-lying estate, say in Wynaad, to send his coffee to compete with the produce of the high lands of Mysore. In the infancy of coffee cultivation some good might have resulted from bringing together the coffees from all different coffee-growing districts in the country, and affording planters an opportunity of making comparisons under the stimulus of a prize for excellence ; but it is useless at this time of day to offer such inducements. If the Committee persist in giving the prize is, I believe most people who know what cofiee planting is will agree with me that the prize will be altogether thrown away. I would suggest to the Committee and the Government that if they really wish to reward a coffee-planter for merit in the exercise of his calling, they should depute a person of experience to visit the coffee estates throughout the country, examine into the mode of working, and all the details of the cultivation, and the after-processes of curing, &c., and empower him to present a prize to the Manager who is found to have his estate in the best order, who manages his coolies best, makes the most of the money entrusted to him for working, has the largest yield with reference to locality, and the best coffee. I may also suggest to the Government that something may be done to encourage coffee-planting and increase the revenue, if the ambassador I have proposed should have the power also of presenting a prize to the Public Works Department for a road in the coffee districts properly looked after, a bridge properly constructed and creditably maintained in a passable condition, and a police or other public building fit for the purpose it was constructed for. The prize offered should be large. Far better for the Government to look to the proper and efficient expenditure of the public money in the communications through the coffee district, than to throw however little of it away on this Agri-Horticultural prize.

"Tea-growing is still in the experimental stage in this Presidency, and the prize offered for it is not open to any strong objection ; but I shall be glad to know what good is to be done by the prizes for Western Guntoor, Coimbatore, and Tinnevelly cotton and Indigo. They are possibly new products to the Agri-Horticultural Committee, but I trust I shall not surprise these worthy gentlemen too much by assuring them that they have been long known to the traders of this Presidency, who have some better encouragement for obtaining good quality than this prize."

THE FUNGUS ON THE COFFEE-TREES.

(Ceylon Observer.)

THE following is an extract from a letter of Mr. Thwaites, of Peradenia, to a correspondent:—'I wish people who publish that the coffee-leaf disease is attacking other plants would send me specimens. They are doubtless deceived by appearances not well investigated. I have not yet been able to detect the *identical* disease upon any other plant but coffee—not even on *Ixora*. I thought I had found it on *Pavetta Indica* a few days ago, but my pocket microscope had proved it to be quite another thing, though in general appearance very like. The wild assertions some people make would be amusing if they were not more or less misleading

and mischievous.'—We are indebted to a planting correspondent who sent home a couple of coffee leaves affected with the desease, for the following interesting report made by Mr. Cochran and Dr. Muter, whose names are familiar to us as contributers to the 'Food Journal':—'Associated with Dr. Muter of the South London School of Chemistry and Pharmacy, I examined the leaves by his fine microscope, first with a low ($\frac{1}{4}$ inch) power. The blight resembled a crystaline deposit on parts of the surface. A higher power displayed a dense mass of fungoid growths, having a yellowish, greenish hue. I afterwards scraped off a portion of the blight on a glass slide, moistened it with a drop of distilled water, covered it with a thin glass disk, and subjected the object to the $\frac{1}{8}$th inch power, the highest in practical use. The appearance presented was that of kindly-shaped cells, having serrated edges of a greenish, yellowish hue. At the first examination, Dr. Muter suggested that this blight might be the pollen wafted from some parasitic plant, and adhering to the coffee leaves, had undergone fermentation on them. After discussing the subject thoroughly, we agreed that from whatever source derived, the blight was a true fungoid growth. It might be well to ascertain therefore, whether or not there is any extensive waste land adjoining the coffee plantations producing weeds having a greenish, yellowish flower; to watch what wind was likely to carry the pollen in the direction of the coffee-plant; then to interpose a barrier of bamboo, cocoanut, or other coppices, so as to interrupt the flight of the minute organism if the waste land cannot be reclaimed.—William Cochran, M. R. A. S.—3rd Nov. 1871.'

CEYLON COFFEE SOILS.

The following results were obtained in the analyses of these soils, by Dr. Augustus Voelcker, F.R.S., Consulting Chemist to the Royal Agricultural Society of England.

Loole Condera W. M. L. L. C. 3.

100 parts of this soil, dried previous to analyses at 212° Fr. in order to expel all accidental water, and to admit of comparison with the composition of other soils, which were all dried at 212° before the analyses, contained:—

Organic matter (loss on heating to redness)	12·01
Oxide of iron	8·39
Alumina	9·04
Sulphate of lime	·17
Carbonate of lime	1·38
Magnesia	·82
Phosphoric acid	·30
Potash	·27
Soda	·17
Insoluble silicious matter	67·45
	100·00

This is a rich, dark-coloured coffee-soil, very superior to the majority of Ceylon coffee-soils, which have been brought under my notice from time to time.

It is rich in organic matter and contains appreciably more phosphoric acid than most soils on which coffee is grown.

I have no doubt it will maintain its fertility for a succession of years without manure, but would recommend an occasional manuring with a view of preserving and possibly increasing its fertility, rather than to exhaust it by continual cropping without manure.

On this soil poonac, especially castor-oil poonac, which is greatly more valuable as a manure than cocoanut poonac will be of the greatest use to the coffee trees, and I would recommend the use of castor-oil poonac on this soil, in preference to all other manures as likely to yield the most profitable return.

W. M. L.

Loole Condera L. C. 5.

100 parts of this soil dried at 212° Fr. contains:—

Organic matter	8·19
Oxide of iron	10·59
Alumina	9·40
Sulphate of lime	·03
Carbonate of lime	·37
Magnesia	·27
Phosphoric acid	·02
Potash	·04
Soda	·07
Insoluble silicious matter	71·02
	100·00

Although this soil has the appearance of a good coffee-soil, the receding analyses shows that it is extremely poor in all the more important mineral elements which enter largely into the composition of coffee. It will be noticed particularly that it contains merely traces of phosphoric acid and but very little potash and soda. It moreover contains much oxide of iron in a state of protoxide, which imparts a peculiar dark colour to the land, and indicates that it is imperfectly aerated. This probably is due to the nature of the sub-soil, which probably is not well drained.

I do not find anything decidedly injurious in this soil, and can well understand that the trees do not grow satisfactorily and yield a poor crop, for of all mineral constituents of coffee, phosphoric acid and potash are by far the most important, and the soil contains scarcely any of these vauluable fertilizing matters.

The contrast, in the composition of the soils No. 3 and No. 5, is very striking to anyone who understands what intimate relation there is between the stores of phosphoric acid and potash in the soil, and the healthy development of the trees which are grown upon it.

The amount of phosphoric acid in good soils seldom exceeds ·20 per cent., and hence ·30 as the percentage of this acid in the soil No. 3, has to be regarded as unusually high, and that in No. 5 soil as very small and altogether insufficient to meet the requirements of the coffee trees. The same remark applies to the deficiency of potash in No. 5.

Unless this soil is heavily manured with matters abounding in phosphate of lime and potash, it will never grow good coffee. Before incurring the expense of applying bone-manure in conjunction with potash-salts, fertilizers which naturally suggest themselves for increasing the fertility of soil No. 0, I would suggest to stir up the sub-soil without however bringing any to the surface, and mainly with the view of improving the drainage of the surface soil and admitting the air more freely into it.

Loole Condera Soils marked Nos. 1, 2, 3½, *and* 4.

Only partial analyses were made of these 4 soils, chiefly with a view of comparing the relative proportion of organic matter in them.

The following are the results of this examination:—

	W.M.L. L. C. 1.	W.M.L. L. C. 2.	W.M.L. L. C. 3½.	W.M.L. L. C. 4.
Organic matter	10·30	11·41	7·53	8·93
Oxides of iron and alumina	12·13	14·82	18·32	20·61
Carbonate and sulphate of lime	·81	·72	·83	None
Magnesia and Alutas	1·11	·84	·34	·17
Insoluble silicious matter	75·62	72·41	72·98	70·29
	100·00	100 00	100·00	100·00

No. 1, as far as I can judge, is likely to be a good coffee soil.

No. 2 contains rather more organic matter than No. 1, and a great deal more than No. 3½ and No. 4 and No. 5, but not so much as No. 3.

Although rich soils contain frequently much organic matter, there is not necessarily a close and invariable connection between the amount of organic matter in different soils, and their relative fertility. Indeed some soils which do not contain more than 5 per cent. of organic matter, but which abound in essential mineral plant constituents, I have found to yield good crops. Such soils generally have a bright red colour. Dark-coloured soils, when poor in organic matter invariably are infertile. On the other hand, if the dark colour is due to the presence of organic matter, as in newly-cleared and burnt land, the soil is productive.

No. 4, it will be seen, contains no lime, and probably is much exhausted by frequent croppings.

For the more or less exhausted Loole Condera soils, I would recommend the following artificial manure, which I have found in practice to answer remarkably well.

20	parts of muriate of potash, containing 80 per cent. pure muriate of potash
20	,, of fine bone-dust.
40	,, of superphosphate of lime, containing 25 per cent. of soluble phosphate
20	,, of sulphate of ammonia
100	

About 5 cwts. of this manure will be a good dressing per acre.

The preceding mixture is best prepared in England by any well-known large manufacturer of artificial manures. It can be made for about £10 a ton, and is far superior to any of the special coffee manures which are sold in the colonies at much higher price. In giving an order for the manufacture of the preceding artificial manure, I would recommend that a fairly drawn sample from the bulk, taken by an independent person, should be sent to me for analysis, in order that the purchaser may be assured that he obtains the constituents which enter into the compositions of this manure and the right proportions, and that he obtains the full value for the money he has to pay for the manure.

Naranghena Soil marked W. M. L. No. 2.

This soil dried at 212° has the following composition:—

Organic matter	6·66
Oxide of iron	7·19
Alumina	5·83
Sulphate of lime	·11
Carbonate of lime	·88
Magnesia	·06
Phosphoric acid	·09
Potash	·44
Soda	·02
Insoluble silicious matter	77·82
	100·00

This soil is not a bad coffee-soil, but it is somewhat exhausted in phosphoric acid. The preceding artificial manure will suit it remarkably well, and 5 cwts. per acre, I have little doubt, will not only maintain it in good condition, but will raise materially the produce, and the increase in the crop will pay for the outlay in manure.

Instead of 5 cwts. of the preceding manures, 3 cwts. of it mixed with 4 to 5 cwts. of poonac might be tried by way of comparison.

As a rule, I do not recommend saltpetre as a manure for coffee trees, for the effects of saltpetre are very evanescent, and in a wet season the saltpetre is rapidly washed out of the soil.

Potash, which is generally defined in Ceylon coffee-soil, is much better supplied in muriate of potash than in nitrate of potash (saltpetre) which latter moreover is a more expensive salt than muriate of potash.

Bullatwelle Soil, No. 1.

100 parts of this soil dried at 212° Fr., contains:—

Organic matter	9·34
Oxide of iron	12·84
Alumina	16·47
Sulphate of lime	·47
Magnesia	·75
Phosphoric acid	·07
Potash	·26
Soda	·23
Insoluble silicious matter	59·57
	100·00

It will be noticed that this soil is poor in phosphoric acid and in potash. It contains no carbonate of lime, and abounds in alumina and oxide of iron.

Coffee trees like a free-growing soil. The Bullatwelle soil No. 1, appears to be too retentive, and probably is a cold and wet soil. Perhaps it is not well drained. The surface of this soil should be well stirred.

A good manure for this soil is the following mixture:—

20	parts of muriate of potash.
20	,, of fine bone-dust.
30	,, of superphosphate.
15	,, of nitrate of soda.
15	,, of sulphate of ammonia.
100	

4 to 5 cwts. per acre.

Moratenne Soils, No. 1 & No 2.

The following is the composition of these two soils, dried at 212° Fr.:—

	No. 1.	No. 2.
Organic matter	7·03	13·13
Oxide of iron	10·05	6 67
Alumina	15·44	6 01
Sulphate of lime	·30	·34
Carbonate of lime	None	·35
Magnesia	·27	·71
Phosphoric acid	·10	·25
Potash	·12	·15
Soda	·03	·12
Insoluble silicious matter	66·66	72·27
	100·00	100·00

No. 1 differs greatly in composition from No. 2.

It is much richer in oxide of iron and alumina, constituents of no special value than No. 2.

On the other hand it is much poorer in organic matter than No. 2, and also in phosphoric acid and potash.

No. 2 likewise contains more lime than No. 1, and altogether No. 2 is still fertile, although rather poor in potash, whereas No. 1 is evidently an exhausted soil which, however, may be greatly improved by appropriate manures.

The following artificial manure will be found serviceable for, reclaiming the fertility of No. 1 soil.

25	parts of muriate of potash.
25	,, of fine-bone dust.
35	,, of superphosphate of lime.
15	,, of sulphate of ammonia.
100	

9 cwts. per acre should be applied to the land.

For No. 2 soil Moratenne, I would recommend 4 cwts. per acre of the following mixture:—

20	parts of muriate of potash.
20	,, of fine bone-dust.
40	,, of superphosphate.
20	,, of sulphate of ammonia.

Pendleton Soil No. 3.

This soil dried at 212° has the following composition:—

Organic matter	5·07
Oxide of iron	2·64
Alumina	7·86
Sulphate of lime	·17
Carbonate of lime	1·01
Magnesia	·85
Phosphoric acid	·02
Potash	·30
Soda	·05
Insoluble silicious matter	82·23
	100·00

It will be seen that this soil contains hardly any phosphoric acid, and not much organic matter. It appears to be exhausted thoroughly of its phosphoric acid, and hence phosphoric manures, in conjunction with organic manures, should be applied to it I would recommend for this soil an artificial manure composed of:—

25	parts of muriate of potash.
25	,, of bone-dust.
25	,, of superphosphate.
15	,, of sulphate of ammonia.

5 cwts per acre mixed with 4 cwts. of castor-oil poonac.

Gona Adika Soil No. 14.

This soil contains in 100 parts, when dried at 212° Fr.:—

Organic matter	10·23
Oxide of iron	7·04
Alumina	12·39
Sulphate of lime	·11
Carbonate of lime	·46
Magnesia	·33
Phosphoric acid	·05
Potash	·30
Soda	·03
Insoluble silicious matter	69·06
	100·00

This soil is poor in phosphoric acid but otherwies a good coffee-soil. It should be manured with bone manures.

The following artificial manure will suit this and similar land on the estate well:—

35	parts of fine bone-dust.
35	,, of superphosphate of lime
15	,, of muriate of potash.
15	,, of sulphate of ammonia.
100	

5 cwts. per acre.

Speaking generally nearly all Ceylon coffee-soils are much improved by phosphoric manures, combined with salts of potash and a moderate amount of sulphate of ammonia. Much however depends on the relative proportions in which these matters are applied to the land. The composition and character of the soils must regulate the composition of the manure best suited for a particular soil.

MARKET REPORT.

LONDON, *18th January* 1872.

TEA.—The deliveries in London, estimated for the week, were 2,019,937lbs., which is an increase of 174,499lbs. compared with the previous statement.

SUGAR.—The market is steady for medium and lower qualities, at previous prices; good and fine dull of sale. 187 casks British West India sold: Jamaica, 32s. 6d.; Demerara, 30s. 6d. to 32s. 40 casks Demarara melado, at 24s.; and 6,000 bags Mauritius, brown to low yellow, 28s. 6d. to 31s. 6d.; a small part fine crystalised 37s. 6d. 3,200 bags Mauritius were offered by auction, and mostly sold; low gray syrups, 31s.; fine grainy brown, 32s. 6d. Refined dull of sale, but prices are supported, owing to the small supply offering for sale.

COFFEE.—The market generally is less buoyant. At the auction previous prices were about maintained, although the parcels offered went off slowly. 250 casks 60 bags Plantation Ceylon chiefly sold: triage, &c., 66s. 6d. to 71s.; small to low middling 74s. to 77s.; middling to bold, 78s. 6d. to 88s. 6d.; peaberry, 84s. 6d. to 89s. 650 bags Native Ceylon chiefly sold: good ordinary, 69s. 6d. to 70s.: fine bold 72s. to 72s. 6d; peaberry, 73s. 210 cases, 70 bags Coorg sold: triage 67s. to 69s. 6d.; ordinary to fine ordinary, pale 72s. 6d. to 74s. 260 cases Naidoobatum: triage and ordinary, 70s. to 72s. 6d.; low middling and middling, 75s. to 77s.; bold, 81s. 6d. to 82s. 100 packages Mocha—ordinary green, 87s. 6d to 88s. 130 bags damaged from Mauritius, 66s. 6d. to 67s. 160 bags Guatemala, pale, 66s. 6d. to 67s.; and a small part of 1,300 bags washed Rio—good ordinary 72s.; middling, 75s. 100 bags Honduras bought in at 71s.—*Home News.*

CALCUTTA, *2nd February* 1872.

INDIGO.—One Public Sale has been held during the week, comprising 543 chests, which consisted for the most part of lots which had been previously bought in at former sales and rejected parcels so that there is but little alteration in the quantity disposed of, the quantity sold up to date being very little more than 91,000 maunds. There is still a little European to come forward, as there are about 200 chests of the Gale mark, which are not expected to arrive for a few days, on the arrival of which the season will close. There is no alteration to note in prices, which continue to be irregular. It is probable that out-turn Season '71-72 will total 94,000 maunds.

INDIAN TEA.—Public Sales held during the week comprised 1,958 chests offered, of which 1,207 chests were sold and the remainder withdrawn; a portion of the latter however were disposed of privately after the sale. The Teas mostly were not of very desirable quality, and prices obtained were about on a par with late rates.

BENGAL SILK.—Some 20 bales of last year's March and Rainy Rund held in speculators' hands since that time have recently been taken off the market, but with this exception the article remains in the same stagnant state that it has done for months past. The November Rund is coming to hand, and some 200 bales are available, but buyers and sellers cannot be brought to terms as yet, although prices offered are fully equal to the equivalent of quotations in London, which are well known to be nominal. The heavy stock held in London, viz., 7,500 bales, has almost entirely shaken the confidence of shippers in the article.—*Tpulmin & Co.'s Circular.*

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DEPOSITS.

Deposits of Rs. 500 and upwards are received for fixed periods, the terms for which may be ascertained on application at the office in Calcutta.

No Interest is allowed on Current Deposit Accounts.

EXCHANGE.

The Corporation grants drafts on London payable at any term not exceeding six months. On Scotland and Ireland payable on demand only, also on the Bank's Agencies and Correspondents in India, Ceylon, China, Mauritius, Australia, and New Zealand at the exchange of the day.

Drafts are drawn for sums of £1 and upwards.

Circular Notes of £10, £20, and £50 each, useful for travellers to any part of the world, are also issued.

N. B.—It is requested that in all cases of application for drafts, the Christian name of the person to whom the money is to be sent should be given; and if a married lady, her own Christian name, not that of her husband, is required.

JOHN S. SCRYMGEOUR,
Agent.

Calcutta, 1st February 1871.

ORIENTAL BANK CORPORATION.

Bombay Agency.

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THE CORPORATION grants Drafts on London on Demand and at from one day to six months' sight, and Drafts on Scotland and Ireland on demand, also Circular Notes negotiable in Egypt, Syria, the Continent of Europe, the Australian Colonies, New Zealand, and the Cape of Good Hope.

No Draft at six months' sight is granted for a Sum under £50. Sums under 20*l.* are only drawn for on Demand.

COMMISSION.

The rate of Commission charged by this Agency on the purchase or sale of Government Securities negotiable in Bombay is one quarter per cent., and on the collection of Bills one per cent. and Postage.

The Corporation takes charge of Government Paper, Shares in the Bank of Bombay, and other local Stocks, free of all charges, and will draw Interest and Dividends on the same as they fall due on the following terms:—

If to be remitted through the Corporation	Without charge.
If to be paid in India, a Commission will be charged of	¼ per cent.
On delivering Securities out of safe custody	¼ do.
Hours of business	10 to 3
Saturdays	10 to 1

Bombay, 1st October 1869.

CHARTERED MERCANTILE BANK OF INDIA,

LONDON, AND CHINA.

Bombay Branch.

The Bank grants *Drafts* payable in *England, Scotland, and Ireland*, and in the principal Towns of all the *Australian* Colonies.

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The Bank purchases Bills and grants Drafts payable in Calcutta, Madras, Ceylon, Hongkong, Foochowfoo, Shanghai, Hankow, Singapore, Penang, and Yokohama.

INTEREST.

On Current Deposit Amounts Interest is allowed at 2 per cent. per annum, on the minimum Monthly Balances up to Rupees one Lac, but no interest will be allowed on balances of less than Rs. 1,000.

INTEREST ALLOWED ON FIXED DEPOSITS.

When fixed for	12 months	5 per cent. per annum.
	6 do.	4 ,, ,,
	3 do.	3 ,, ,,

All letters should be addressed, and Hoondies made payable, to the Chartered Mercantile Bank.

NATIONAL BANK OF INDIA, *(Limited.)*

Bombay Branch.

CURRENT DEPOSIT ACCOUNTS.

Interest is allowed on Current Deposit Accounts at 2 per cent. per annum on the minimum monthly balances up to Rs. 1,00,000, but no Interest will be allowed on balances under Rs. 1,000.

FIXED DEPOSITS.

Deposits of Rupees Five Hundred and upwards are received for Fixed Periods, the terms for which may be ascertained on application at the Office in Bombay.

EXCHANGE.

The Bank negotiates and collects Bills payable in London, Calcutta, Madras, and Hongkong. It also grants drafts on London, and on its Branches and Agencies, at the current rates of Exchange

By order of the Directors,

Bombay, 1st July 1871. JAMES WINDRAM, Manager.

NEW BANK OF BOMBAY, *(Limited).*

RATES.

DISCOUNT.

On Government Bills	6 per cent.
On Private Bills and Notes	8 do.
On Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.

INTEREST.

On Fixed Loans on deposit of Government Paper, Bullion, or Railway Shares	6 do.
On do. do. do. Goods or Shipping documents for Goods	8 do.
On Cash Credits, on Security of Government Paper, Bullion or Railway Shares, subject to a Commission of ¼ per cent. on the amount of Credit	7 do.

The Bank is prepared to arrange Credits to be negotiated through its Agencies in the Cotton Districts.

Bombay, 15th July 1869.

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DARJEELING.

Fixed Deposits.—Interest is allowed on deposits of Rs. 100, and upwards on the following terms:—

On sums lodged for	3 months certain	3 per cent. per annum.
Do.	12 do.	7 do.
Do.	2 years certain	8 do.

Interest is allowed at 2 per cent. per annum on floating deposits or Current Accounts, when the Balances exceed 500 Rupees.

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Manager.

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Bombay, August 1870.

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India.

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, THURSDAY, 21st MARCH 1872. [No. 8.

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EDITORIAL.

THERE are some vacancies on the Staff of Contributors to the *Madras Mail*. Gentlemen possessed of the requisite ability who are desirous of discussing current topics from a liberal and independent stand-point, are solicited to place themselves in confidential communication with the Editor, from whom all information can be obtained as to the requirements and honorarium of this Journal.

Madras, 7th June 1871.

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There is clear purpose, special knowledge, and literary skill visible in its articles.—*Pioneer, Feb. 14.*

It is well written, well arranged, well edited and well printed.—*Lucknow Times, Feb. 8.*

The articles are ably written, the tone moderate, and it is altogether an acquisition to the Indian Press.—*Mofussilite, Feb. 9.*

In print and style it is superior to any other Indian paper, and its articles are of the highest class.—*Indian Church Gazette, Feb. 11*

The favourable critiques that have appeared in different papers, fully bear out our own opinion respecting this neatly-printed and ably-edited hebdomadal.—*Bengal Times, Feb. 15.*

The project of a master-mind, and the offspring of a master-hand.—*The Progress, Feb. 10.*

It promises to be one of the best conducted Indian weeklies.—*Hindoo Patriot, Feb. 6.*

Indeed, the paper bids fair to be a first class journal, and as such we wish it all success.—*The Bengallee, Feb. 11.*

We wish the *Observer* every success, and trust he may have many readers.—*Rangoon Mail, Feb. 18.*

It is very well got up and compares favorably with any of the Indian weeklies we have seen.—*Penang Argus, Feb. 12.*

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To the Editor of the "Times of India."

DEAR SIR—Whilst thanking you very much for the kindly mention which you have made in your paper of my appointment as a Knight of the Star of India, I must ask you to correct an error which appears in your notice, if it has not already been corrected. I did not serve in Affghanistan. The officer who served in the first Affghan campaign with the troop of Horse Artillery, which made the difficult march to Bameen (one of the finest on record) was my brother, now Brigadier-General Edward Kaye, C. B., who thus commenced a long career of good military service. The best service which I ever rendered *to* India, or indeed *to* India, was the establishment, single-handed, of the *Calcutta Review*, which has done far more for Indian literature than anything I have written under my own name. In opening out a channel for the literary contributions of such men as Sir Henry Lawrence, Sir Herbert Edwardes, Sir William Muir, Sir Henry Durand, Colonel Baird Smith, Mr. Seton-Karr, and others, I conceive that I did far more good than by my own labours; and I trust that the impetus thus given to the literary industry of the two services may last long after I am in my grave. I am, yours faithfully,
Athenæum Club, June 23, 1871. J. W. KAYE.

The CALCUTTA REVIEW, though mainly occupied with miscellaneous and general subjects, have given us valuable articles on the army. Some from the pen of Sir Henry Lawrence, who wrote with the spirit of prophecy of the coming storm of which he was one of the noblest victims.—*Address of His Excellency the Commander-in-Chief, at a meeting held on the 16th May 1871, at the United Service Institution of India, Simla.*

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THE

SUPPLEMENT TO THE "INDIAN ECONOMIST."

Agricultural Gazette of India,

A MONTHLY JOURNAL DEVOTED TO THE IMPROVEMENT OF INDIAN AGRICULTURE.

VOL. III.] BOMBAY, THURSDAY, 21st MARCH 1872. No. 8.]

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NOTICES TO CORRESPONDENTS.

Will you tell me the best method of laying out a Lucerne Garden, so as to save expense in weeding, watering, &c. ?

Much will depend upon the area of land you intend to put under this crop, and the nature of your soil; but the following general instructions may be useful:—

If the ground is under natural grass, or is covered with surface weeds, you may plough or dig it slightly (2 or 3 inches), then harrow or rake the grass, &c., together into lines; cart this to some convenient corner of the field, and burn the whole to a black ash; keep these ashes until the land is ready for seeding, and then spread them carefully over the surface. After paring and burning, or if the land is *already* under arable cultivation, plough or dig deeply, and harrow or rake the surface fine, to offer every facility for the germination of all weed seeds; and as these appear above ground, repeat the ploughing or digging 3 or 4 times. Then plough or dig in about 20 loads per acre of good farm-yard manure. Harrow or rake the surface, and roll heavily; then spread broad-cast over each acre 20 cwts of lime powder, and the ashes before alluded to, and harrow or rake in lightly. Then sow about 20 lbs. of seed per acre, in rows 12 inches apart. Keep the space between the rows clean with the hand hoe, &c., *see carefully to this, for, if well-weeded during the first year, the after expense of weeding will be greatly lessened.* After the first year, or after the crop is fairly established, you may greatly reduce the cost of weeding, by using a light bullock hoe between the rows. Always cut the crop before the flower appears. Under good management the crop will last 9 or 10 years, and yield regular and abundant crops; but you must manure liberally, always bearing in mind that lime and potash manures are of the greatest value for Lucerne. So far we have alluded to Lucerne—under dry cultivation—in a district with a favourable climate. If you wish to grow the crop—under irrigation—you may, after cleaning the land, ridge it up with the plough or spade as is done in turnip cultivation in Scotland the ridges may be 12 inches high from the bottom of the drill, and 15 inches apart from centre to centre. In the drill between ridges spread manure at the rate of 20 loads per acre; then split the ridges with a plough or spade, throwing one-half on either side, thus raising the new ridges over the manure and making furrows or drills where the ridges stood: sow the seed on the ridges, and the water will flow down the furrows between. Dust lime at the rate of 20 cwts per acre, and the ashes over the land. Roll or harrow the ridges carefully, and sow the seed at the rate of 20 lbs. per acre; do not sow deeper than 1 inch; and chain harrow, or rake the surface lightly afterwards to cover it. We have replied to you at this length, believing that some of our readers who keep horses or cattle, may be induced to try a plot of this valuable plant.

1 MARCH.

I wish to use the refuse of a slaughterhouse as manure; how shall I proceed?

We presume that you refer to the solid and liquid refuse: if so, in our opinion, the best and cheapest plan is to make the whole into a compost. Dig 2 or 3 large receptacles, the size being regulated by the amount of refuse at your disposal. Over the floor of one of these, lay 1 foot of ashes, leaves, saw-dust, peat, or anything of the sort, and spread over this the daily supply of refuse matters, taking care to cover each addition to the heap, with a covering of 3 or 4 inches in depth of ashes; continue this daily, adding layer after layer until the heap has reached the surface of the ground, then cover the whole with a foot of peaty earth, and commence a fresh heap in a similar manner. Each heap may remain 3 months unopened, after which it will be difficult to detect its ingredients; indeed we have seen caste coolies working amongst composts of this sort, without offering the least objection. It will be well to get a light iron sewage cart for conveying the liquid and solid matters to the depôt: such a cart, should not cost more than 200 Rs.

What is a fair crop of Maize in this country?

About 2,000 lbs. of grain and 5,000 lbs. of straw.

What price would I pay for a good thorough-bred short-horn Bull in England?

You may purchase an ordinary animal at from 50 to 100 guineas; but high pedigree animals command prices varying from 500 to 1,000 guineas.

LETTERS TO THE EDITOR.

To the Editor of the Agricultural Gazette of India.

SIR,—The ducks sold all over this presidency are divided into two classes known as Goa ducks and *Gaotee*, or country ducks; and the former though smaller are more valued than the latter. The Goa ducks are, with few if any exceptions, of a plain grey-brown colour; whereas the others have more or less black and white upon them, and are often distinguishable by blue secondary wing-feathers, and a metallic green lustre on their heads. There is also a marked difference in the shapes of the two birds. Can any naturalist tell me the history of the two varieties? A. B. C.

MR. LOGIN'S EXPERIMENTS.

To the Editor of the Indian Statesman.

SIR,—I regret to observe in your issue of the 26th instant, that you think that "the Model Farm at Cawnpore is not suitable for the growth "of cotton," "as the result was a qualified failure," "though superior "care was given to the choice of ground and manure, and to the details "of cultivation." The above conclusion arrived at is, I think, premature, for at the 10th para. of Mr. Parson's report, he says:—"By "August 7th, the greater portion of the plants were 5 feet in height, and "were then topped, which induced them to throw out several branches," and in the next para. he continues to say,—"The plants began to bloom "August 15th, but owing to the heavy rains during that and the follow-"ing month, the produce of these flowers was very inferior, owing to "the attacks of the boll worm."

The fact is, the plants were not healthy after the beginning of August, but up to the 7th they had grown exceedingly well, as the "greater portion of the plants were 5 feet in height," and had commenced to "throw out branches." So up to this time all was flourishing. As soon, however, as the heavy rain began to fall, the plants failed; so the question is, why this failure? And I think the cause is given in the 2nd to 7th paras. of this report, for at para. 2nd, Mr. Parson says, "the site of the experiments is situated on the north-east side of the farm, and is *sheltered by tall trees on the west, south, and south-east sides,*" and at para. 7th he continues to say, "Plot 1st, consisting of a quarter acre, was treated as recommended by Mr. Login. Ridges 4 *inches in height* were thrown up at intervals at 3 feet."

Now the above at once explains to me how the experiment proved a failure, for as I have already more than once reported, all shade from trees is studiously to be avoided, for the cotton plant is a *sun plant* and requires light, so in this case the field was surrounded by *tall trees on*

three sides, only being open to the north. The fact is, therefore, that the field, being only a quarter of an acre, must have been always in shade, the very thing to be guarded against.

Again, the ridges were only *four inches* in height when they should have been *eight inches* high at least, and I believe that even ten or twelve inches, in localities liable to flooding, would be better. I certainly tried eight inches, but t.en particular care was taken of the drainage; thus the water could never reach to the top of the ridge, so as to come in direct contact with the plant. To this, in my report of October 1870, I drew particular attention, and at considerable length tried to assign a cause why the plants were injured, by stagnant water coming in direct contact with the stem of the plant; but be these reasons correct or not, there can be no doubt of the fact that the cotton plant is very seriously injured, and in many cases killed, by water coming in direct contact with the stem, of which I had convincing proofs both this and last season.

In Egypt the ridges are eight inches high, but it should be borne in mind that it is almost a rainless country, and there everything depends on irrigation; thus they can so arrange that the water can never be more than 4 or 5 inches deep between these ridges leaving 3 or 4 inches of these ridges above water, so it can never come in direct contact with the plants, and hence the wonderful out-turn of cotton in Egypt compared with India. So all the greater need of even higher ridges in this country, where we often have excessive rain, and also the necessity of attending to the drainage of our fields, so as to prevent these being flooded.

To me therefore it appears self-evident that excessive *shade* and excess of *water* have been the sole causes of the failure of the cotton experiments at Cawnpore, which is very much to be regretted, for in other respects a considerable amount of care appears to have been bestowed on the experiments; so I hope these essential points will be attended to next season wherever the Egyptian system of growing cotton is tried; and as you take a great interest in this important question, I hope you will find space at an early date for the insertion of this letter.—I remain, dear sir, yours truly,

T. LOGIN.

MINERAL AND SALINE MANURES.—III.

To the Editor of the
Agricultural Gazette of India.

According to the analysis of *Erdmann*, the ashes of wheat, after deducting per oxide of iron (1·33 per cent.), silica and sand 3·37 per cent.), contain of,—

Free phosphoric acid	27·69
Alkaline phosphates	49 18
Earthy phosphates	23·13
	100 00

Phosphoric acid, in combination with soda and potash, constitute the alkaline phosphates, and when united to lime and magnesia, the earthy phosphates, all these are invariably present in the blood of man and beast.

The richness of blood in red corpuscles is intimately connected with its richness in iron, and as recent analysis has demonstrated that the blood of the Hindoostanee is, as compared with the blood of the European, deficient in red corpuscles, it is evident that the degeneration is due to the deficiency of iron, and as a sequitur, everything else corresponds. The difference in strength, bone, and muscle between the two races, requires neither comparison nor comment, though it excites contemptuous commisseration.

The most interesting part of the matter is that no artificial addition of suitable preparations of iron to the food will act beneficially on the blood, unless the alkaline phosphates are fully and sufficiently present. Baron Liebig informs us that "the free alkali" gives to the blood a number of very remarkable properties. By its means the chief constituents of the blood are kept in the fluid state. On the alkali depends a remarkable property of the blood,—that of dissolving the oxides of iron, which are ingredients of the colouring matter of the blood, as well as other metallic oxides, so as to form perfectly transparent solutions. All organised solid parts contain alkaline bases and phosporic acid, in such a proportion, that if we suppose them combined, the phosphoric acid predominates." Further on the learned Professor states:—"The phosphate of soda has an alkaline taste and re-action, like the corbonate and its solution, in presence of free carbonic acid, takes up as much of that acid as the carbonate of soda does, and like it, only more easily, gives it off by agitation with air, *in vacuo* or by evaporation, without losing its power of again absorbing the carbonic acid." Liebig's letters, page 408—412.

The phosphate of potash converts common salt into the phosphate of soda. If it be deficient, and the supply of salt low, the alkaline strength of the blood is reduced, and with it the power of dissolving iron, hence the white blood corpuscles predominate in consequence of the want of iron, and I presume the inferior quality of the blood, produces the constitutional weakness and want of stamina of the people of Hindoostan.

Man and beast alike require phosphoric acid, and derive it from the plant,—"which is so wonderfully formed, that it refuses to grow, unless it can obtain the phosphoric acid, &c., which it is bound to gather up and supply to the growing animal."

This phosphoric acid is indestructible; we operate upon bones and fossil phosphate of lime which contain it, and produce phosphorous. We set fire to 100 lbs of it, and lo, in place of obtaining a small quantity of ash, we gather 227½ pounds of phosphoric acid, which in the dry state consists of about 46½ per cent. of phosphorous and 53½ of oxygen. This acid dissolves very freely in water, and it combines with lime in the proportion of 51½ of acid, and 48½ of lime. Soda, when saturated with its solution, forms pure phosphate of soda, and the carbonate of potash similarly treated forms the phosphate of potash, which is the principal mineral matter present in the flesh of man and animals.

The Mogul Government, when in power, knew nothing of these matters, and perhaps considered the act of stinting millions of human beings, in their consumption of salt, a harmless one. We cannot blame them, for England during the last century groaned under salt laws, and salt taxation, which however were abandoned as soon as the common sense of the nation, so ably represented in the British Parliament, was convinced that neither fish, meat, nor curds, could be salted, nor soap nor glass be cheaply manufactured, nor an improved system of agriculture be introduced and maintained, if culinary salt was looked on as a luxurious condiment, and taxed accordingly.

The Indian convict is allowed one hundred grains of salt per diem, and if an honest man uses 180 grains of salt daily, he will consume 4 *seers* and 9 *chittacks* in the year, the value of which at two annas (three pence at par) per *seer*, is eight *annas* and nine *pies* (0.1*s*. 1½*d*). But if this man's acre of wheat land was manured with a bushel, or 30½ seers of salt, obtainable for agricultural purposes, at a cost of fifteen annas and-a-half (1*s*. 11½*d*). and his salt as condiment, supplied to two annas, his salt bill would amount to Rs. 1-1-6, in place of 8 as. 9 pies, or just double. But this is not all, inasmuch every additional acre of land manured with salt increases its consumption by 30½ seers, or even sixty-one pounds, and brings a corresponding sum of money into the Exchequer.

It is by no means necessary that the rock salt of the Punjab, or imported British salt, should be used as manure, as crude or unrefined sea salt is better fitted for the purpose, and so is the salt eliminated from saltpetre. One thousand parts of sea water contain 5·3 sulphate of magnesia, 3·5 chloride of magnesium, 0·2 carbonate of lime and magnesia, 0·1 sulphate of lime, besides 1/2000 of sulphate and muriate of potash, and in addition, iodide of sodium and magnesium in smaller proportions. These various substances are present in sea water with 25 of chloride of sodium or salt.

All grain contains a certain proportion of magnesia, and wheat more than any, and as crude salt contains a considerable percentage of magnesian salts, its value, as a wheat manure, is apparent.

I think it is quite possible to render all crude sea and earth salt totally unfit for culinary purposes, by imbuing every hundred pounds of such salt with five pounds of sulphate of iron, in aqueous solution.

The British manufacturer could prepare such feruginous salt at a very low rate, and in India, to pay for this sulphate, a duty of five annas per maund should be levied on saltpetre, which should be paid by the purchaser, the Government receiving the duty, and supplying the saltpetre manufacturer with the sulphate of iron. By this means, cheap salt would become plentifully available for agricultural purposes, and all restrictions being removed from the manufacture of nitre, that most important manure would be freely used by agriculturists, desirous of producing first-class wheat, tobacco, and sugar crops.

It is quite unnecessary to go further into the question of the value of salt as a manure, but it will interest the reader to know that the Chinese, the best and most ancient agriculturists in the world, have from the remotest times used salt and sea water as a manure.

M. le Goux, in his history of the cocoanut tree states that the inhabitants of those parts of China which border on the sea coast, sprinkle their rice fields with sea water, and use no other manure; and that in the interior they sprinkle the lands with salt before they are tilled, and that this practice has been followed for ages with the greatest advantage.

The quantity of salt to be used varies from one to six bushels per acre, pasture lands requiring most. I may mention that as much as 2 cwts of salt have very rencently been applied to an acre of land under potatoes; but this profusion is quite unnecessary. Before proceeding to the next manure, I would wish to state authoritatively that salt is as much needed by all grannivorous animals as by man.

If proper inquiry were made, it would be found that want of salt is at the bottom of the various cattle diseases for which India is becoming so famous. We hear constantly of butchers' meat being unfit for use, because horrible living things were present therein. On this subject, Professor Johnston states:—"From time immemorial it has been known that without salt man would miserably perish; and among horrible punishments entailing certain death, that of feeding culprits on saltless food is said to have prevailed in barbarous times. Maggots and corruption are spoken of by ancient writers as the distressing symptoms which saltless food engenders, but no ancient or *unchemical modern* could explain how such sufferings arose." Further on we are told that "the bile also contains soda as a special and indespensable constituent, and so do all the cartilages of the body. *Stint the supply of salt* therefore, and neither will the bile be able properly to assist the digestion, nor the cartilages to be built up again as fast as they naturally waste."

I trust after this that we shall hear no more official nonsense, on the question of giving or witholding salt from cattle food. The unchemical officer of excise cannot be blamed for not understanding such matters which belong to the domain of the agricultural chemist, and not to the Preventive Department of India.

After crude salt, the next most valuable saline manure for wheat and all cereals, is the nitrate of potash, or saltpetre. An immense quantity of this valuable salt was annually sent to China, and much of it was there destroyed by being made into fireworks. A good deal went to London for conversion into gunpowder, and nitric acid. But as Peru

now supplies England with the nitrate of soda, at a cheap rate, the nitric acid is made therefrom, in preference to the expensive saltpetre of Bengal.

I know of no more useless way of disposing of nitre, than converting it into fireworks, and for every 102 pounds of nitre, so consumed, 46·55 of potash and 53·45 of nitric acid, are lost to the farmer beyond redemption.

Scientific agriculture teaches us that the gluten of wheat is derived from nitrogen, and we know that 26 parts by weight of nitrogen, and 74 of oxygen, constitute 100 parts of nitric acid, as also that 82·53, of nitrogen and 17·47 of hydrogen constitute 100 parts of ammonia.

Farmyard manure contains ammonia in abundance, which, though unseen, is constantly passing off as vapour, and thus the greater part of its nitrogen is wasted; but the nitrogen of saltpetre is fixed, and by being in combination with potash, it supplies the growing plant with that most valuable alkali; and as the phosphate of potash, the principal mineral matter in the flesh of man and beast, cannot possibly be produced from the constituents of ammonia, it follows that saltpetre possesses *per se* very valuable chemical properties in a most convenient compact and economical form.

It has been carefully explained that gluten is the most valuable part of wheat, and according to the analysis of "*Kekule*," "gluten obtained from a starch manufactory, yielded from 1 to 1½ per cent. of ashes, which contained of,—

Potash	7·87
Soda	2·14
Lime	17·31
Magnesia	12·08
Per Oxide of iron	7·31
Sulphuric acid	0·89
Chlorine	0·09
Phosphoric acid	52·08
Loss	0·13
	100·00

From a consideration of these facts and figures the following conclusions may be safely drawn, viz:- That the large proportion of phosphoric acid and potash needed by wheat, can, in India, only be produced by the liberal use of fossil phosphate of lime and saltpetre, and as the notable proportion of soda and magnesia, present in first class wheat, is beyond a doubt, derived from the salt used as manure, it is demonstrated that unless the incalculable mineral wealth, now locked up in the "*Sewallicks*," is turned to pratical account, and cheap salt and nitre (as well as the saline manures required for other crops) are freely placed within the means and reach of the agricultural classes, the laudable intentions of His Grace the Duke of Argyle, and of His Excellency The Earl Mayo, Viceroy and Governor-General of India to confer on Hindoostan, the great and lasting benefits of an improved agriculture, will be, I regret to say, entirely and absolutely frustrated

Kussowlee, 29th June 1871. H.

INDIAN PESTS.—I.

THE MUNGOOSE.

THE mungoose is one of the most prominent, perhaps the most prominent of Indian pests. Bold, wary, and active, he carries on his depredations at our very doors, and is off to cover again so sharp, that rarely indeed is even a glimpse of the culprit caught. When his conscience is clear however, or rather (for his conscience is never clear) when he feels confident that no definite fault can be certainly laid to his charge, he is more ready to assert his privileges as a free citizen, though he cannot conceal his consciousness that he is not popular. He sleeps little, though strictly speaking, a nocturnal animal. At all hours of the day we may see him stealing along our hedges, taking advantage of every bush and clump of grass, stopping every few yards to see if the way is clear, and making a sudden rush across any open spot in his road. His presence is generally proclaimed by the out-cries of the minas and bulbuls, ever the foremost of the feathered tribe to announce a foe. Habitually on the alert, he sneaks along as if he saw nothing and cared for nothing; and if discovered where he cannot instantly plunge into the vegetation, he looks about with a look of innocent wonder, and then retires modestly to some retreat; only to re-appear however, when the coast is clear, at some spot nearer his destination—the most suitable cover in the vicinity of the poultry-yard. Once there, the wily creature manages to be ubiquitous without ever showing himself. But let a hapless chicken come within a yard of any part of the grass or the shrubbery, and a tremendous cackling from the whole inhabitants of the yard brings out a host of servants, who after a lengthened search can report only that feathers were flying all about the place, and that a bird is missing. This will be repeated day after day in spite of all precautions. In watchfulness, the mungoose surpasses perhaps all other animals not guided by scent. You may stand sentry, gun in hand, hour after hour without avail. If you could see the mungoose, the mungoose sees you first, and resists the most tempting opportunities to spring on his prey. But on the spot he is; for only withdraw for five minutes, leaving some one to watch for his coming if you like, and a sudden uproar among the fowls will tell you that he came long ago and was there all the time. By night his tactics are the same. The verandahs, the stables, the servants' quarters are unmolested; but omit for a single night to close up the rat-hole at the bottom of the fowl-house door, and in the morning you will find five or six of your finest hens with their throats torn. But once leave your bird-cage out till after dark, and wherever the mungoose may have been other evenings, that evening he is sure to be passing your door. We remember a friend who was rearing a brood of chickens in a large parrot cage. After feeding them one evening at sundown under the porch, he thoughtlessly left them standing there. He came out again in about a quarter of an hour, but found that three of his pets had had their heads torn off through the bars of the cage. About a hundred yards off master mungoose was trotting along, apparently on some private errand.

There are the usual ways of getting rid of this intolerable pest, the gun and traps. When a mungoose takes up its residence in a compound, it passes certain ways at nearly the same hours every day; and if there be a family of them, they often go together in a string. As the mungoose, though easily alarmed, is not suspicious unless it has good cause, it may by a little care be met and shot from behind a bush or wall on these occasions. As to traps, the mungoose is very cunning, but we have twice known one (the same one we believe; it escaped the first time) caught in a box-trap after it had been left in the animal's haunts for several days. Before entering, the mungoose went round and round the trap many times, and one day mounted on the top of it. Of course a steel snap-trap, if large enough, would be more effective. The bait used on the above occasions was first a dead chicken, and the second time a dead bandicoot. Though essentially a beast of prey and eager for warm blood, the mungoose will, if hungry, eat carrion. We have not mentioned poison, simply because we never heard of its being employed to destroy these animals; but there can be none but a superstitious doubt that if introduced into the body of a dead bird, snake, or other animal, it would be swallowed by and kill the mungoose.

The mungooses are a genus of the *Viverrinæ*, of Civets, a sub-family of the great order of *Carnivora* (beasts of prey). The sub-family are at once conspicuous by their long and slender bodies, and by their short legs and consequent small height. Their muzzles are more produced than in any others of the order, and they have all long tails. This general appearance will be at once suggested when we name the civet-cats, mungooses, and *menoores* (tree-cats or toddy-cats) as belonging to the *Viverrinæ*. Other points of similarity, appearing on a closer inspection, are that they possess the power of contracting their pupils *circularly*, are nocturnal in their habits, and have, with one or two exceptions, rough, coarse, hair. Some have the hind feet plantigrade, but most walk on their toes like the cat and dog tribes. Nearly all secrete a powerfully odorous substance, typified in the much-prized perfume of the civet-cat. They have twelve incisors or cutting teeth, and four canines; but the molars vary in number, not always being the same even in the genera. The scientific name of the genus of mungooses is *Herpestes*; they are marked by several very distinct features. The hair is always long, and has in a conspicuous degree the harshness characteristic of the sub-family. In general, moreover, each hair is of several colours alternately arranged, giving the animals their peculiar pepper-and-salt appearance. But what first strikes the eye in this genus is the tail. Long, as in all the *Viverrinæ*, in this class the tail is also bushy, especially at its junction with the body, whence it tapers to the point which is black in several species. Without the hair, the tail is very slight, except at the base, and the skin of it is much finer than that of the body, so as sometimes to come away if the animal be lifted by the tail. In marked contrast to some of the other genera, the mungooses have small powers of climbing and seldom leave the ground. With the exception perhaps of one or two Himalayan

species, this genus, though possessing the civet-pouch, do not give out the odorous secretion. They are further marked by small rounded ears, not sticking up above the head as in the civet-cat, which gives them a lizard-like aspect. They have five toes to each foot, hind and fore; and can partially draw in their claws like the cat. Mungooses have sharp snouts, short powerful limbs, small feet, and brown dull eyes with a stolid and horrible expression. Their habits are very active, and their disposition savage. The type of the genus in the ichneumon of Egypt.

Seven species of mungoose have been identified in India. They range from thirty to forty inches in length, of which the tail is almost half. The largest is *H. vitticollis*. Five seem to be confined to jungles, and have been killed principally on the Eastern and Western Ghauts, the Himalayas, or the Neilgherries; very little is known of their habits. They vary in colour from tawny to reddish; and a Himalayan species, the smallest in India, is prettily freckled with yellow. One, conspicuous by the black tip to its tail, is very common on our own hill stations, Matheran, Khandalla, &c. They may be seen at any hour of the day prowling about in search of lizards and small birds, or coming out of their holes at dusk, followed by their young. The other two are found all over the plains of India: one, *Herpestes Malaccensis*, being confined to Bengal and North India, with Assam and Burmah; and the other, *H. Griseus*, replacing it in Southern, Central, and Western India. They differ very little in colour, but the latter has the advantage in size, some specimens measuring nearly three feet.

In this part of India, the mungoose is known to bring forth its young (three or four at a birth) in the hot season, but they probably have a litter about the end of the monsoon also. They devour snakes, rats, mice, and birds, and are very greedy of eggs: but must depend chiefly for their food on lizards, many varieties of which abound in the grass and undergrowth in the hot season. The slender and supple form of the mungoose enables it to follow its prey into much narrower holes than one would suppose, judging from the size of the animal. It can however, easily enlarge or deepen a hole, as its claws are formed for digging. The mungoose has great courage, and will readily seize poultry and rabbits; and they doubtless destroy hares in the fields at night. Mungooses live generally in pairs, and are found in all descriptions of country, in jungles, or living in holes in open plains, in the neighbourhood of villages, and in the compounds and hedgerows of every cantonment. They seem indifferent to wet, and are to be seen moving about in the long grass during the rainiest days of the monsoon. The mungoose is often tamed; and, unlike many animals, has no disposition to go back to a wild state, but stays about the house, showing much attachment to its master. In confinement it loses some of its sharpness and cunning, and occasionally falls a prey to Jones's dog. It is however rather tenacious of life. Its cry is a short, sharp, bark, which is seldom uttered. The mungoose moves at a steady, shuffling trot, its head low, and its belly close to the ground; but when reconnoitring, or watching its prey, its movements are graceful and agile as those of a serpent. It runs by a succession of powerful bounds.

Many experiments have been made with the view of ascertaining the truth of the popular idea of the insusceptibility of the mungoose to snake-bite. The thickness of the animal's skin renders it difficult to make sure that the snake's fangs have reached the blood vessels, in cases of apparent immunity; and on the other hand, when the mungoose has died, it has been suspected to have been the result of rough treatment during the trial. Mungooses are known to eat small snakes, and they are so expert at catching them that it is doubtful if they ever get bitten in a state of nature. And this may probably be said of the different hill species as much as of the well-known animal.

The family of *Viverrinæ* is unrepresented in Britain, and all Europe has but one species of ichneumon or mungoose, *H. Widdringtonii*, found in the Sierra Morena mountains. The genus, comprising many Asiatic species unknown in India, is also largely represented in Africa; and it is interesting to find travellers, from Egypt and Abyssinia down to the Cape of Good Hope, remarking the same active habits, grizzled appearance, and tameable disposition, so familiar to us in this country. The oft-mentioned skill too, with which the mungoose seizes snakes by the throat and avoids their bite, has been observed in the African species. *H. badius* is described as apparently restricted to sandy districts covered with brushwood, and as occasionally caught sight of rushing from one copse to another. Curious to state, only insects were found in the stomachs of those examined, though the natives said that they preyed upon lizards, snakes, rats, &c. It is quite likely that locusts and other large insects are eaten by the Indian mungooses. Strangely enough, the knowledge of an antidote to snake-bite is attributed to the African species by the natives of that continent.

Dr. Horsfield tells of a Java mungoose that it is found most abundant in the large teak forests, and that it is very expert in burrowing in the ground in pursuit of rats. It possesses, he says, great natural sagacity, and it willingly seeks the protection of man. In a domestic state it is docile and attached to its master, whom it follows like a dog. It frequently places itself erect on its hind legs, regarding everything that passes with great attention. It is of a very restless disposition, and always carries its food to the most retired spot in the place where it is kept, to consume it. It is very cleanly in its habits. It is exclusively carnivorous, and very destructive to poultry, employing great artifice in the surprising of chickens. It has been observed that its sanguinary character shows itself occasionally in a manner that renders it dangerous as a domestic animal: and it indulges at intervals in fits of excessive violence.

Mungooses closely resemble in their habits, and seem to replace in the torrid zone, the martens and weasels (*Mustellidæ*, a different family) of more northern latitudes. Several of the latter (a brightly painted weasel included) occur in the Himalayas; and one species (a marten) is found in the Neilgherries. A curious semi-aquatic animal, allied to the mungooses, is found in Nepal. It is said to feed on crabs and frogs.

EDITORIAL NOTES.

The land under cultivation in Australia, in 1871, was 960,000 acres against 530,000 in 1861.

Offal is being now turned to account as manure. Thus we learn that in France the bodies of dead animals are utilized by immersing their soft parts in a feeble solution of hydrochloric acid, which soon transforms them into an odourless pulp. This, when mixed with phosphate of lime, gives a manure of the best quality.

It is stated by an American journal that the eggs of the common hen, with those of many other birds, present certain external characteristics by which we can determine beforehand their sex. If male, the egg has, at its pointed end, small folds and wrinkles; while, if female, it is quite smooth and well rounded off at both ends.

A Machine for planting potatoes has been patented in America, which, we are told, makes the furrow, deposits the seed, and covers it up going only once over the ground, and the machine can be used with either one or two horses. Machines of this character are much needed in India, but it will be years, we fear, before improved agricultural implements are introduced generally throughout the country.

Forestry in the Punjab, according to our Lahore contemporary, is no better managed than in any other province in India. Regarding the Punjab forests, *Indian Public Opinion* writes:—

"It is quietly admitted that while the forests are being made to yield up their wealth, 'plantation has been too long neglected in the province,' and that the efforts hitherto made to ensure a sufficient stock of new trees have been 'desultory and unsystematic,' and the local Government insist on the necessity for systematic and energetic effort to plant largely and maintain the supply equal to or in excess of the demand. Until this be done on the most liberal scale we cannot accept the entire value of timber brought into market as assets in revenue account of profit and loss. It is indeed reaping where we have not sown."

A BEAUTIFUL orchid of the genus *cælogyne*, species *cristata*, is, the *Pioneer* informs us, now in fine bloom at the Khoosroo Bagh at Allahabad. This is believed to be the first instance of any orchids of this very delicate genus flowering in the plains of the North-West. In the elegance of its shape and the purity of its colour, it is supposed to be unrivalled among orchids: the petals are of a dazzling white, and the labellum tinged with bright yellow.

THE *Pioneer* speaks of the existence of a tree in Tasmania, known as the *fever tree*. It is now being largely cultivated in Algeria, the South of France, and Corsica. The tree is of rapid growth in marshy soils from which it arrests the generation of marsh miasm, its wood is hard as teak, impregnated with a camphor-like odour, and gives an extract of notably astringent power, and an alkaloid allied to quinine. Should such a tree thrive in India, its introduction would be a benefit of no small amount.

THE *Lucknow Times* furnishes us with several instances of plants that will not propagate by seed. We lately mentioned the sugar-cane as one. The bamboo it says is another. The rose is never propagated except by cuttings, and our contemporary has not heard of strawberry-plants growing from seed. The same journal mentions a fact in connection with the plantain-tree which furnishes a curious illustration of the effects of human interference with the processes of nature. The parent tree will give a good yield for the first two years, and begin to degenerate in the third. The mangoe grown from seed is seldom equal to the parent tree in quality.

THE Paris correspondent of the *Indian Statesman* writes, that from experiments made in the Hotel Dieu, it has been shewn that the least nutritive food in the world is the meat of prize cattle. "Adipose degeneracy is the result of preventing oxen destined for the slaughter-house, taking natural exercise while the fattening process goes on. The protoplasm or vital energy of the beast is lower than in a vegetable, and men fed upon its flesh, run down in strength and activity. Nature has made severe enactments against overfeeding in the brute creation, no less than in the human family. The languid heart, the feeble digestion, the swollen liver, and the absence of recuperative force, are the penalties which man and beast must undergo, if either goes beyond the limit of temperance."

THE *Friend of India* learns from a Melbourne paper that a tree was lately felled at Sandy Creek, Wagga Wagga, for the purpose of securing honey, which it was known had been collected there by a rather large swarm of bees. It says:—"When the tree was cut down there was found in the hollow one of the most astonishing collections of honey ever known, probably to have been gathered by one swarm of bees. There were several immense layers of comb ten feet in length, and of great density, extending along the inside of the trunk, and almost entirely covering the hollow of the tree. After it had been carried home (having been wasted considerably by the fall of the tree, and the primitive mode in which it was collected) the comb yielded over two hundred pounds of honey of the purest quality."

THE Madras Government have received some genuine Manilla tobacco seed for experimental cultivation in the Presidency. According to the local journals, the seed will be distributed to the Agri-Horticultural Societies at Madras and Ootacamund, to Mr. E. A. Campbell (Dindigul), and to the Collectors of the Godavery, Trichinopoly, Tinnevelly, Coimbatore, South Canara, and Malabar Districts; also to the Collectors of the Ganjam, Vizagapatam, Kistna, Tanjore, and Madura Districts, with the request that the results (with sample of produce) may be reported to Government through the Board of Revenue. A supply of the seed will be sent also to the Chief Commissioner of Mysore and to the Resident of Travancore and Cochin for experimental cultivation in those territories, with the request that Government may, in due course, be informed of the results of the experiment with sample of the produce.

3 MARCH

THE *Delhi Gazette*, quoting the Batavia *Handelsblad*, gives an account of a vegetable wonder to be seen in that city. In the garden attached to a Chinese residence is a wonderful plantain-tree, about five feet high, and of moderate thickness. It shows but two large leaves, but has more than twenty flower clusters hanging down along its sides, some of which have already opened. People, old and young, rich and poor, come from far and wide to witness this wonder; and the Javanese and Chinese pay great respect to the plant, and place offerings and smoking incense all around it. "Some bring flowers and strew them under the tree, others gather some of the plantain flower, hold them over the smoke of the incense and afterwards wrap them in their pocket handkerchiefs with great care. All lay money down, and an eye-witness says that he saw the pile of coin becoming greater and greater to the intense joy of the owner of the tree."

THE obstacle to the development of an extensive trade in the fibre of Rhea or China grass, is the absence of suitable machinery for separating the fibre and bark from the stem, and the fibre from the bark, the cost of effecting this by manual labour being very great. With a view of removing this difficulty, Government, as our readers know, have for some time held out a prize of £5,000 for the best machine or process for effecting this purpose, and the *Gazette of India* announces that the public competition for the prize will take place on the 1st of April. The competition will be held at the Government Rhea Plantation at Saharunpore, where competitors are to have their machinery ready for trial by that date. The prize machine is to be transferred, if required, to Government at 5 per cent. above cost price, the patent rights also, if required, on payment of a royalty of 5 per cent. on the cost price of all machines manufactured under the patent during its currency. Rewards of moderate amount will be given for meritorious inventions, even though failing to meet entirely the conditions laid down for the competition.

ACCORDING to recent observation, oak timber appears to be rapidly disappearing from Europe. We get the following information from an English journal:—"In France, since 1669, no oak has been felled until full-grown, that is, until within thirty years of its probable decay. The consumption of oak timber in France has doubled during the last fifty years. In 1866, £170,000,000 worth was consumed, of which £500,000 worth was imported against £5,000,000 worth consumed in 1820, of which £400,000 worth was imported. France requires every year 15,000,000 cubic feet of oak timber for wine casks, 600,000 for her fleet, 150,000 for railway stock, and 780,000 for building purposes. In 1826, the total value of imported staves was £800,000; at present the total value is £5,000,000. A similar increase of the importation of oak for the next thirty years would probably double the price. France, after losing Alsace and Lorraine, contains 135,000,000 acres, of which 20,000,000 are covered with forest. The same enormous consumption is going on all over Europe, and the supply decreases yearly."

A CORRESPONDENT in Plymouth County, Massachusetts, writes to the Department of Agriculture, Washington, urging the formation of Farmers' clubs and the frequent meeting of farmers for comparison of views, &c. He says:—

"If we had Farmers' clubs organized in all the towns, and these in communication with a central head, any important fact established could be at once made known to all the clubs throughout the country. The most important work for the clubs would be to establish facts by actual experiments. This is our great want at present. We have very little positive knowledge in regard to the best methods of applying labour or material to the soil for any crop. This ought not to be. It is true that climate and soil have something to do with the methods; but with organized effort and experiment, the best methods of planting and cultivating our principal crops may be developed, and thereby some progress be made in the right direction. Let a Farmers' club be formed in every town, and let no year pass without the institution of some experiment in agriculture for the instruction of the members, and when the results are important, let the facts be communicated to the Department of Agriculture for more general dissemination."

At the Institution of Civil Engineers on January 30, Mr. George Gordon, M. Inst. C. E., read a paper "on the value of water, and its storage and distribution in Southern India." The object of the paper was to deal with the probable results of works of irrigation as commercial speculations. The author submitted the following conclusions:—

1st. That irrigation would benefit the cultivator to such an extent as to enable him to pay a water-rate equal to two-thirds of the increased value of his crop, and still leave his own profits from 50 per cent. to 400 per cent. in excess of those derived from dry cultivation. 2nd. That the most profitable application of capital would be found in the construction of storage reservoirs as an addition to distribution works already in existence, and that these would yield a net return of 46 per cent., after paying one-third of the gross revenue to the existing works, and increasing the revenue of such works by 4½ per cent. 3rd. That the arbitrary water-rate of 12s. per acre was, on the data assumed by Government, insufficient to yield a fair return directly on the average of new irrigation works, unless these included the storage of water for a second crop. 4th. That the profitable employment of capital in irrigation depended chiefly on the recognition of the principle that the water-rate should be fixed with reference to the value of the crop produced by and the cost of the works in each case, and that otherwise many very beneficial projects would remain unexecuted.

According to the *Englishman*, the Commissioner of Sindh has discovered a process by which "Oosur" soils may be reclaimed:—

"When the salt is in moderate quantity, a crop is sown in spite of it, and the stalks of whatever is produced are cut off and left on the ground, into which they are afterwards ploughed to decompose. Where the land is subject to inundation, the next rise produces a film of good soil, which is also ploughed in. Another crop is then sown, which gives a superior yield; and repetition of the process described leads to further continual improvement. The same plan has been tried where fresh water was used for irrigation, and given good results; and there appears to be no reason why it should not be generally adopted. The possibility of remunerative success depends of course on the proportion of saline matter present in the soil."

A similar process says the *Lucknow Times*, is already in use among the native cultivators, with the addition of deep ploughing and turning up of the soil. "Whenever the quantity of "reh", or "loni" in the soil is not too great for the attempt to be remunerative, and the landlord consents to forego his rent for the first few years, our cultivators manage to reclaim it. The trial crops sown are generally the inferior cereals like *bajra*, &c. If a plant could be discovered which might possess the virtue of absorbing or decomposing the salts in a greater degree than other plants, the process perhaps might be somewhat simplified. There are certain plants that grow vigorously in an over-saline soil, and might perhaps be made use of."

A correspondent writes:—Is it known by whom or when the forage plant Lucerne was introduced? If so, a monument should be erected to his memory. Like many other long cultivated plants, its native habitat is rather hazy; the South of Europe Persia, and Peru have each had the honour acceded to them. An easily managed crop, producing nearly 50 tons per acre yearly, and sold cheap at 100 lbs. for a shilling, is worth attention. Let us see how it is managed; the seed is sold in Poona about 10d. per lb., the natives lay out the ground for irrigation in beds about 6 feet by 6 feet, and sow the seed broad-cast about 25 lbs. to an acre. I prefer sowing 20 lbs. to an acre with the common native seed drill, as the weeding is more easily effected, and where a good head of water can be obtained, I have the beds 60 feet by 20 feet, so that the irrigation does not require such constant attention, and the man in charge can be weeding or cutting the crop while the watering is going on.

"November to February is the best sowing season, as at that time it has fewer weeds to contend with while young. Lucerne is not particular about the kind of soil, provided it is rich and deep. In the Deccan one sowing lasts about 3 years, it is fit to cut six weeks after sowing, and on a good soil three hundred pounds per acre can be cut throughout the year. About Bombay it is generally killed by the soaking rain during the monsoon season, but if the drainage is thorough, it will bear a heavy rain-fall. Irrigation is required about once a week in hot weather."

Mr. Emerson discourses in one of his "Essays" upon the occupation of the farmer, as follows:—"The glory of the farmer is that, in the division of labour, it is his part to create. All trade rests at last on his primitive authority. He stands close to nature: he obtains from the earth, the bread and the meat. The food which was not, he causes to be. The first farmer was the first man, and all historic nobility rests on possession and use of land. Men do not like hard work, but every man has an exceptional respect for tillage, and the feeling that this is the original calling of his race, that he himself is only excused from it by some circumstance which made him delegate it for a time to other hands. If he had not some skill which recommends him to the farmer, some product for which the farmer will give him corn, he must himself return into his due place among the planters. And the profession has in all eyes its ancient charm, as standing nearest to God, the first cause. Then the beauty of nature, the tranquillity and innocence of the countryman, his independence, and his pleasing arts—the care of bees, of poultry, of sheep, of cows, the dairy, the care of hay, of fruits, of orchards, and forests, and the reaction of these on the workman in giving him a strength and plain dignity like the face and manners of nature—all men acknowledge. All men keep the farm in reserve as an asylum, where, in case of mischance, to hide their property, or a solitude if they do not succeed in society. And who knows how many glances of remorse are turned this way from bankrupts of trade, from mortified pleaders in Courts and Senates, or from the victims of idleness and pleasure! Poisoned by town-life and town-vices, the sufferer resolves:—"Well, my children, whom I have injured, shall go back to the land, to be recruited and cured by that which should have been my nursery, and now shall be their hospital:—

"The farmer has grave trusts confided to him. In the great household of nature, the farmer stands at the door of the bread room and weighs to each his load. It is for him to say whether men should marry or not. Every marriage, and the number of births, are indissolubly connected with the abundance of food; or as Burke said, 'man breeds at the mouth.' Then he is the Board of Quarantine. The farmer is the hoarded capital of health, as he is also the capital of wealth, and it is from him that the health and the power, moral and intellectual, of the cities come. The city is always recruited from the country. The men in cities who are the centres of energy, the driving-wheels of trade, politics, or practical arts, and the women of beauty and genius, are the children or grand-children of farmers, and are spending the energies which their father's hardy silent life accumulated in frosty furrows, in poverty, necessity, and darkness. In English factories, the boy who watches the loom, to tie the threads when the wheel stops, to indicate that the thread is broken, is called a minder. And in this great factory of our Copernican globe, shifting its slides, rotating its constellations, times and tides,—bringing now the day of planting, then of watering, then of weeding, then reaping, then of curing and storing—the farmer is the minder. His machine is of colossal proportions; the diameter of the water-wheel, the arms of the levers, the power of the battery, are out of all mechanic measure, and it takes him long to understand its parts and its working. This pump never "sucks"; these screws are never loose; this machine is never out of gear; the vat and piston-wheels and tires never wear out, but are self-repairing. We see the farmer with pleasure and respect, when we think what powers and utilities are so meekly worn. He knows every secret of labour. He changes the face of the landscape. Put him on a new planet, and he would know where to begin; yet there is no arrogance in his bearing, but a perfect gentleness. The farmer stands well on the world. Plain in manners as in dress, he would

not shine in palaces; he is absolutely unknown and inadmissible therein. Living or dying he never shall be heard of in them. Yet the drawing-room heroes, put down beside him, would shrivel in his presence—the solid and unexpressive, they expressed to gold leaf. But he stands well on the world, as Adam did, as an Indian does, as Homer's heroes, Agamemnon and Achilles do. He is a person whom a poet of any clime—Milton or Cervantes—would appreciate, as being really a piece of the old nature, comparable to sun and moon, rainbow and flood: because he is, as all natural persons are, representative of nature as much as these. That uncorrupted behaviour which we admire in animals and in young children belongs to him, to the hunter, the sailor—the man who lives in the presence of nature. Cities force growth, and make men talkative and entertaining, but they make them artificial. What possesses interest for us is the natural part of each, its constitutional excellence. This is for ever a surprise, engaging and lovely; we cannot be satiated with knowing it, and about it, and it is this which the conversation with nature cherishes and guards."

AGRICULTURE IN EUROPE.

THE COST OF GROWING AN ACRE OF TURNIPS.

THE subject was discussed at the recent meeting of the Western Ross Farmers' Society. Mr. Arras, Fodderty, read the following paper:—

In opening the discussion of this evening, I am anxious to clear away some difficulties that suggested themselves to me on first attempting to handle the subject. It may be asked at the outset what is meant by the cost of an acre of turnips. Is it what they can be grown for, or is it what they can be bought at? The first question is the one I will endeavour to answer as best I can. Then comes the question what is a crop of turnips? and that resolves itself into other two, viz., is the crop to be understood as a small crop grown at least expense; or as a large crop grown at a relative cost? You may grow a crop of 30 tons at a cost of £10, or you may grow a crop of 15 tons at a cost of £5, and you may of course grow a crop of "crops and roots" at a cost of little over the rent of the land. Which of these are we to consider the best system to follow? and it is a difficult question to answer unless viewed in relation to other crops. If turnips must be eaten upon the farm, the answer is easily given; if they be removed, the answer is more difficult. But in calculating the cost of growing this acre of turnips, future crops must be kept out of view, as in the present case we want to arrive at their cost as a crop, and as having no bearing on any succeeding crop. In other words, can we grow an acre of turnips on one year's tenancy to pay all outlay of labour, manure, rent, and other expenses? Or to put it in another way, do we grow our turnips as an auxiliary crop to have an influence on the whole rotation; or do we grow them because they are the cheapest food we can prepare for stock? I made the remark the other day to a friend that I thought we might try to grow each crop because we get intrinsic value for it. Oh, then, he said, what intrinsic value do you get from a crop of fallow? I said that is a manure, and ought to stand against the following crop. Farm operations are so strung together, as it were on one string, that it is very hard to isolate the cost of any one crop. But in the present hypothesis I will endeavour to do so, and will aim at having as good a crop as I can grow, on the footing that rent and labour are the same, whether I have a 50 ton crop or a 10 ton crop—labour the same of course in preparation, sowing, and hoeing, if not in storing. But I have detained you too long on preliminaries, and will now proceed to details. By the end of September we obtained access to our acre of land, from which we hope to obtain a crop of Swedish turnips equal to the labour, anxiety, and expense lavished upon it. We will suppose the land to be good friable loam, of ample depth to allow the top roots to bury themselves beyond the reach of over an average drought, rather too full of couch grass to suit the tastes of an economical estimater. The first subject of consideration is whether we ought to manure it on the surface before ploughing, or manure it in the drill in spring. Out of deference to generally existing custom, we resolve to defer the manuring till spring. The next matter to consider is how to plough it. Whether to give a single furrow of ten inches deep, with two horses; or two furrows, seven inches deep each, the one plough following the other, the last one having the mould-board removed; or a single furrow twelve or thirteen inches deep, drawn by three horses. We reject on this occasion the double furrow, as the benefit of such deep stirring would not be reaped from one crop, and to the cost of one crop we are to confine ourselves at present. The same plea holds good in the three horse-furrow. Having got that point settled, we proceed to have our acre ploughed by two stout horses ten inches deep. They manage to turn over four-fifths the first day, finishing the remainder next forenoon. Calculating ten shillings a day as a fair average value of a pair of horses and man, the cost of our first ploughing has been 12s. 6d. Leaving the frost to mellow and sweeten the new turned land, we leave it to the care of our wintry friend, till spring calls for its more multitudinous labour. During winter and when frost sets in, we take the first opportunity to cart out manure from the folds to a large heap conveniently placed for spring work. We fix on twenty-five loads of rough manure as a suitable quantity, the filling, carting, and unloading of which costs nearly 15s. About the middle of April we give a single turn of the harrows, at a cost of 10d., to level the surface and make the next ploughing or grubbing more easily done. Now comes the oft-debated question, whether the spring cultivation should consist of grubbing in opposition to ploughing, or a mixture of both systems. In the present case we grub first, as the land is dirty and not very stiff, the weeds coming up better than when cut by the plough. This is done at a cost of 2s. 6d. To reduce the clods and harrow out the weeds, we require to give four turns of the harrows, two in one direction, and two at an angle or at right angles to the first, at a cost of 3s. 4d. Immediately after the harrowing, and before the sun hardens the knots, the land is rolled at a cost of 1s. To disengage the weeds from the crushed knots and shake them out, a double turn of the harrows is given at a cost of 1s. 8d. This is followed by a turn of the chain-harrows to roll up the weeds into rolls, at a cost of 10d. The weeds are then gathered into heaps by hand, and removed by a man with horse and cart, at a cost of respectively 1s. 3d. and 1s. (2s. 3d.) As these workings have rather consolidated the land we now give it a light ploughing, which costs close upon 7s. 6d. (1¼ acres.) This is followed by three turns of the harrows, to separate and bring to the surface all the remaining weeds, at a cost of 2s. 6d. The weeds not being in this second gathering very numerous, nor the land very full of knots, we escape the expense of another rolling, followed by harrowing, chain-harrowing, and reharrowing, gathering the weeds by hand, at a cost of about 10d., and removing them for about 9d. (1s. 7d.) We next have to decide what portable manures to use, and fix on the following mixture, viz:—1 cwt. Peruvian guano, 2 cwts. dissolved bones, and 2 cwts. crushed bones, costing 44s. 6d. The expense of mixing and cartage brings up the portable manures, after being placed on the field ready to apply, to about 46s. We select a fine morning, say on the 12th of May, to begin sowing operations. On a farm of about 500 acres, the usual staff required for putting down turnips is five pair of horses, nine men, one boy, and ten women, finishing seven acres a day, consequently one acre is drilled up and sown for about 9s. 10d. The twenty-five cart-loads of manure carted out in winter may now measure 10 yards, which valued at 5s. 3d. per yard comes to 52s. 6d. The quantity of Swedish turnip seed sown has been 3 lbs. at 1s., making the value of seed sown 3s. Hitherto there has not been much in the management of our acre that has caused anxiety, as the working of it has been very much in our hands, but now comes a change. If when we shut the gate on the straight and regular drills with their six-drill edging round them, we could shut out all intruders, likewise it would from many a trouble free us. In the course of a few days, the tender shoots are seen here and there, and after a gentle shower and the sun at our back we can glance the eye along the rows from end to end; the question of expense which had been intruding itself on our thoughts is shelved for the present, and brighter thoughts fill up their place. We return to take a fresh look at our new friends in a couple of days. An eastern wind and a cloudless sky we had not noticed on first setting out, and as we open the gate about ten o'clock in the forenoon, we wonder where our friends have gone. Alas, here they are, looking very blue, round holes in some, decapitated stumps are others, and the rest decidedly hard up. As we gaze in sorrow, a sudden movement here, another there, and others everywhere reveal the cause. Thousands of Haltica preemorum are holding high carnival on the young leaves. The name is by far too good for them, and if they would remain where they come from and halt there, we could understand their name better. However, the wind veers round due west, a refreshing shower brings health and vigour to our plants, and our vaulting friends are done out of their dinner. The rough leaf comes quickly on, and we send a man and horse to scrape the drills with a horse-hoe, which he does for 2s. 5d. The thinning we calculate at 3s., as it is better to spend an extra sixpence now than have the work hurried and ill-done. Again our enemies come to the attack in the shape of wood pigeons, and it is now that 2s. 6d. per pair of horses would be willingly paid if that would convert them into pies. Had we fixed a sum per acre for herding, none could have found fault. Before long another horse-hoeing is given, at a cost of 1s. 5d. This is followed by hand-hoeing at a cost of say 1s., and according to the cost of this last operation may we estimate whether the thinning has been done well or ill. Thus far the working expenses have been £3 11s. 2d., and the manures have amounted to £4 18s. 6d. together the figure is £8 9s. 8d.; but as we may find some difficulty in persuading anyone to give us that figure for the turnips grown on our experimental acre—for on asking a price we would feel inclined to add the rent of the land, say 40s., not forgetting tenant's

profits, taxes, and tear and wear of implements—we resolve to go on to the end. To occupy our spare time in autumn, we may turn now and again, and not without profit to ourselves, to consider our balance-sheet. Former calculated cost £8 9s. 8d., rent £2, tenant's profits at the modest sum of 10s., superintendence by grieve 2s. tear and wear of implements 1s. 4½d., taxes 2s. 4½d., together, £11 5s. 5d. It can easily be imagined how every damaged turnip is now looked upon with a jealous eye, the more so as we know by sad experience this winter that everyone broken by wood-pigeons, rabbits, and hares, requires the aid of no machinery to reduce it to pulp. Having these extra fears to push us on, we commence to store them. It is not my place in this paper to give other people's experience as to the best method of storing, either for speed or cheapness, consequently I will keep still, as I have strictly done hitherto by detailing my own experience.

To return to our 6,453 lineal yards of turnips to be lifted, we find it costs close upon 4s. to root and top them. To cart them home and have them thatched costs, in ordinary circumstances, 29s. 2d. When all is finished, the bill of costs, which I have now the pleasure of placing before the club for approval or otherwise, consists of the following items :—

	£	s.	d.
Working expenses	3	11	2
Manure	4	18	8
Rent	2	0	0
Tenant's profits	0	10	0
Superintendence	0	2	0
Tear and wear of implements	0	1	11
Taxes	0	2	11
Expenses of storage	1	13	2
	£21	18	7

The scope of my present paper does not permit me to enter into the question of how much of that cost ought to be distributed over the other years of the rotation. Certainly, a deduction for unexhausted manures is more than legitimate; at the same time I cannot see how anyone could expect to grow a good crop of turnips by a much less liberal management, even if the following crops were to belong to another interest. Were he allowed to sell them from the farm the value might cover the cost, but that I have nothing to do with to-night. It certainly seems a vast sum to talk of £1,202 as the cost of one hundred acres of turnips, but let us glance for a moment at a few rough details. Few give less than two pounds' worth of portable manures, and still fewer give less than ten carts of heavy manure in spring, which would be gladly bought in many districts for fifty shillings. In this club we have been told by a very practical farmer that he gave twenty loads per acre, or at the rate of five pounds. The working expenses, as I proved before, cannot be done for less than 71s. per acre, then we have rent, £200, and profits at 10s.—£50. In these five items we run up to £1,055 at once. Then we have seed, taxes, tear and wear, so that my former figure is nearly reached. Before sitting down I may mention that by manuring the stubbles in autumn we save fully 5s. 1d. per acre, besides being able to do double the work in spring, with the same staff of horses in drilling and sowing. A most successful and practical engineer made the remark to me the other day in answer to my question, if he could not devise some plan to enable us to lift our turnips independent of human hands—"Well," he said, "it is clear in the first place, that when you have the crop you must secure it at whatever cost, if you don't you lose it, and all your former outlay is gone too." I fancy we don't keep this enough in mind, and, if by writing this paper I have indelibly stamped on my own mind that our turnip crop is a most costly and valuable one, and worthy of being cared for after we have got it, I shall have no cause to regret having taken up the subject of the cost of growing an acre of turnips.

THE AGRICULTURAL LABOURER IN ENGLAND.

As correspondence in our columns has lately borne witness, the condition of our agricultural labourers is engaging increased attention. It is, to say the least, not altogether satisfactory even to those who are in the closest connection with them, and are in some degree responsible for them. Complaints of their gross ignorance, their superstition, their squalor, even of their half-fed and half-clothed condition, appear from time to time in the papers and now there are added to these complaints intimations of their unrest and discontent. The country gentry find that the peasantry are not as humble and as obedient as they were; the farmers have heard rumours of agricultural strikes; and such portents have actually appeared as a canon of the Church of England urging the labourers, and even assisting them to help themselves: and one of the members for Birmingham has presided at a public meeting in which they called attention to their grievances. That there is some cause for this rural disquite stands confessed in the fact that only lately a Royal Commission has inquired and reported on the employment of women and children in agriculture. That there is a strong element of hope in it is shown by the very discussion of the condition and prospects of the labourer in the Farmers' Clubs. The magnitude of the question thus discussed is scarcely appreciated. Agriculture is the most wide-spread and the largest of our industries. The cotton manufacture gathers together great communities in Lancashire; the woollen trade make the vast country of York busy and populous; iron and coal cover whole districts with grimy and prosperous communities; but agriculture flourishes in every portion of the island, and dots over the whole surface with its little villages of labourers. Taking the Registration Districts of England and Wales, we find that the three millions and a quarter of acres which constitute the urban districts contain nearly thirteen millions of the population; but we also find that on the thirty-four millions of acres which constitute the rural districts, nearly ten millions of people live. The condition and prospects of the agricultural labourer is therefore not merely a question for the farmers and the squires—it is one of national importance and of imperial magnitude.

It is sometimes confidently said that, notwithstanding all our prosperity and progress, there was a time when agricultural labourers were better off than they are now. Perhaps the exact truth about them is that they have made little progress, while all around them the standard of comfort has been rising. Yet even the agricultural labourer is better off now than he was in the reigns of the last two Georges. The parson and the squire look after him better than their grandfathers did; he is himself more conscious of his degradations, and society is more alive to its duty. The particular evil from which he suffers in the present day is that which is incident to a transition state. Agriculture has changed from a patriarchal pursuit to a scientific business. Its old patriarchal relations are therefore dying away, and the new relations of the employed have not yet fully established themselves. The villagers are no longer dependents on the squire, as they were. The farmer no longer looks on his labourers as a part of his family, as he did when they dined together, the farmer and his family at the top of the table and the labourers at the bottom. But the traditions of agricultural wages date from those times, and the farmer pays the men and boys, whom he merely engages as an employer, very little more than his great-grandfather paid those whom he regarded as his natural dependents. The labourer, on his side, does not at all realise the change in his ralation to his master. He has no idea of making his own way in the world. All his life long he lives from hand to mouth, eking out his miserable wages by perquisites and charities, and looking forward to Poor Law relief in some form as his natural and inevitable refuge in declining years. He rents his cottage as a favour from the landlord, for he cannot pay rent enough to make it worth-while to build for him; if he gets a little bit of allotment garden, it is granted him as a kind of charity to eke out his wages; and if he keeps a pig, which the farmers often regard as too great a temptation to peculation, he gets its food by fetching kitchen refuse from respectable houses. As to a farm-labourer keeping a cow, the thing is impossible, except in the remote Arcadia upon the border described by a Northumbrian landlord at a recent meeting in Croydon, "where the labourers can all read and write, and where it is not at all uncommon for one labourer to remain thirty or forty years on the same farm." There is no kind of encouragement to men to be provident, helpful, and thoughtful. If they saved money it would only spare the poor's rate. But how can a man save when he must keep his family on wages of from ten to fifteen shillings a week? So far from saving, such a man will squander. He will live literally from hand to mouth, as our agricultural labourers do. They marry without thinking whether they can keep a home; have large families, and never think of any duty they owe their children. As to health, education, and decency, such things belong to the squire, or the parson, or the farmer, or the parish. The labourer himself lives for the day, remembering that to-morrow he goes to the workhouse. The cure for these evils is not entirely in legislation. The Education Act would do something towards producing a better state of things if it made education universal. But unfortunately it is just in the rural districts that it fails to induce the people to establish School Boards, and where there are no School Boards there will be no compulsion. Yet as Mr. Forster has admitted, in these rural districts compulsion is much needed, and it is much to be hoped that he will succeed in making it universal. But how will education improve the condition of the agricultural labourer? It will certainly not make him more content with low wages and poor food and tumble-down cottages and undrained villages, with hard labour for all his active days and the workhouse in his broken-down old age. It may make him a better labourer, more active, more intelligent, more self-helping; and may thus make him worth better wages; but the farmers must learn that it is better wages to which education will lead and to which in fact, the whole social movement of the age is leading We are told that it does not pay to build good cottages; and many landlords are building them at a loss out of good feeling; but no class of men ought to be dependent for healthy homes on the good feeling of another class, however certain it may be not to fail them. As a rule, however, the good feeling does fail, for the agricultural labourers live in hovels compared with which the poorest cottages of Lancashire factory hands are palaces. It may be hoped that the progress of sanitary legislation will lead to an enforced

improvement of these village dwellings; but the greatest hope of improvement is in the creation of a desire for something better. The farmers themselves are needing a better class of labourers; and in the countries in which scientific and commercial farming has become most general, a better class of men has already been created by better wages. Agriculture is becoming a commercial pursuit, and the farmer a manufacturer, and he must pay his workmen on commercial principles, and not after patriarchal traditions. It is always better to pay high wages to good workmen than low wages to inefficient hands. The heavy, lumbering, ineffectual men who till the fields of so many of our southern farmers, are as much anachronisms as the oxen who here and there still draw the plough. The steam-engine has invaded and is fast conquering the fields, and with it there will come a race of men quicker in movement, readier in observation, and more prompt and resolute in action. Such men will not only be more useful to the farmers but more helpful to themselves; and their influence and example will do more to stir up the energies and improve the position of the existing race of labourers than any other agency. Meanwhile we are glad to see that the farmers are themselves awake, and are willing to do what they can to raise a class whose present degraded condition is at once a danger and a disgrace.—*Daily News.*

AGRICULTURAL STOCK.

VALUE OF CORN-FODDER.

In the annual report of 1870, a digest of the views of numerous correspondents of intelligence and experience is presented, from which the following conclusions were drawn:—

1. Green corn-fodder is neither worthless nor the poorest of all soiling material.
2. It is best when planted in drills or hills, not so thickly as to prevent normal growth and development, cultivated to destroy weeds and grasses, and cut between tasseling and earing, when the elements elaborated for production of the ear are stored in readiness for immediate use.
3. It is probable, both from the *rationale* of the case and from facts presented above, that in the more northern latitudes, a mistake has often been made in sowing thickly southern corn which cannot mature, the fodder from which, fed in August, must be very nearly worthless. On the contrary, the fodder from northern corn, especially sweet corn, drilled widely and cultivated, and fed just before earing, is found to be very valuable.
4. Its value compared with lucern, millet, the best grasses, and other plants, containing a large percentage of nutriment, taking into consideration the quantity produced and the cost of its production, has not been determined fully, and should be decided by a series of thorough and exhaustive experiments.

Confirmations of the correctness of these conclusions are received from every direction, as the result of further and more careful experiment during the present year. Among the authorities repeatedly quoted to show the assumed worthlessness of corn-fodder, is the Boston Journal of Chemistry. The position of that journal is that "when raised from broadcast-sowing it is nearly worthless, but when sown in hills or in drills and cultivated with access of air and sunlight, it is of high value." An experiment made by the editor this season shows that fodder-corn planted in drills contained of dry matter, the water being evaporated in a drying closet, 17 per cent., while that from corn sown broadcast contained but 8 per cent., in which sugar and gum were almost entirely wanting. This illustrates the great superiority of stalks collected just as the ear begins to form.

At a meeting of the Western New York Dairymen's Association, in September, Mr. Lewis F. Allen stated that, in experimenting with fodder-corn, he had planted one acre in sweet corn, which grew to a height of about 2½ feet, feeding being commenced when the corn began to tassel. The acre supplied sixteen cows twenty-three days, (equivalent to feeding one cow three hundred and sixty-eight days), yielding about 8½ tons. Common Ohio green corn, of which the crop was double that of the sweet corn, was then fed, and the cows appeared to relish it equally well. The result was a steady increase of milk and a large increase of butter.

In respect to a substitution of lucern in place of fodder-corn, Mr. Martin said that the value of the former as a food for dairy cows would appear to have been over-rated to some extent. It belongs to the clover family, and the milk of cows fed upon it is not equal for purposes of butter and cheese to milk from the grasses proper; and the butter and cheese obtained from feeding it are deficient in keeping qualities.

Mr. E. W. Stewart brought forward the practice of Mr. Fry, who raised corn in drills, dropping the seed in every third furrow. One acre supplied one hundred and five cows four days, equivalent to feeding one cow four hundred and twenty days. Mr. Stewart held that when the corn-plant began to tassel, it contained all the constituents of the grain.

Mr. Pierce, of East Hamburgh, said that he had not found sowed corn capable of increasing the production of milk after it had fallen off, but that if the feeding was commenced in season the flow would be kept up, and the cows sustained in good heart and flesh.—*Department of Agriculture, Washington.*

DETERIORATION OF WHEAT.

The causes of deterioration in the yield and quality of certain crops, so manifest in the experience of a majority of American farmers, demand investigation. The fact that one field produces double the quantity of another adjoining, and that the yield of virgin soils diminishes year by year, calls for explanation and even reiteration of the reasons for such deterioration, and suggestions of remedies and means of recuperation. Recent inquiries have been directed to the present Commissioner of Agriculture relative to the diminution in the average yield of wheat. He has felt a personal interest in this subject, and enjoyed the advantage of many years of experience and investigation, and thus responds to such inquiries:—

Many farmers look upon the culture of wheat as the most profitable work in which they can be engaged, while some claim that corn is a more profitable crop. Let the question be settled by the fact that land is sometimes better adapted to corn than to wheat; but, be that as it may, the wheat crop is certainly of sufficient importance to claim our attention to all the prominent errors which exist with regard to its proper cultivation.

It is a curious and no less remarkable fact, that, in the midst of the use of highly improved implements, guided by experienced hands and superior knowledge of the science of agriculture, the production of wheat has gradually and certainly diminished in quantity in all the wheat-growing States. Why is this? May the evil be overcome? It is no solution of these questions to answer that the soil has been exhausted of those peculiar constituents essential to the growth and maturity of wheat, for this argument would lead to the conclusion that nature had not by her laws made provision for the perfect growth of wheat at all, and that ultimately this production must become utterly extinct. But this is an unwise as well as unprofitable conclusion. We must, therefore, resolutely face the fact that the cause of the failure is to be found in the farmer's want of skill and inquire how this skill may be improved.

Examine the present mode of cultivation in the wheat-growing States. Finding a field in clover, it is plowed in the fall or in the spring, and planted with corn. The corn having been taken off, it is plowed again the next spring and sown with oats, and upon this oats-stubble all the manure of the barn-yard is put. It is then plowed under, and the field sown with wheat; and when this crop is taken off it is either sown again with wheat, "stubbled in," as it is called, or it is sown with timothy in the fall, clover in the spring, and again is laid down to grass, remains two years, and then goes through the same rotation. This is the ordinary process of cultivation throughout all the Middle States, and it is by this process that our wheat crops have diminished at least one-third in the last twenty-five years, while there is not the same diminution in any of the other crops which make up the whole course. The products of corn, oats, and grass are as large if not larger than they ever were. The marked failure is in the wheat crop. It is visited by fly, midge, rusts, mildew, or it grows into straw without a corresponding production of grain. An experiment made upon my farm, and running through a period of ten years, induces me to say that the failure of the wheat crop is occasioned, in a great measure, by the improper use of barn-yard manure. Wheat is a delicate plant, both in its organic structure and the food it consumes, and yet we apply, in aid of its germination and growth, the gross raw product of the barn-yard, filled with embryos of worms, bugs, midges, and beetles, giving a nauseous dose to the first germ of the wheat, and furnishing an unfit food throughout the whole life of the plant. Add to this the vermin which the contents of the barn-yard have brought upon the field, and then we may account for the midge, Hessian fly, mildew, rust, and all other evils which we have been accustomed to deplore when harvest comes.

I trust I may not be understood as depreciating the use of barn-yard manure; so far from this, I am convinced that human skill has never been able to concoct a combination of plant food so excellent as that which comes from the stable, when properly used. But the proper use of it is upon corn ground. After the grass has been cut and made into hay the second year, and when the tap-roots of the clover have attained the size which makes them valuable as renovators of the soil, let the grass grow up for few weeks; then haul all available barn-yard manure upon it, and scatter it over the ground; and as late in the fall as the season will allow plow it under deeply. Corn is a voracious plant, and will consume any food, however gross. Its roots are all-reaching and far-reaching; they will find the manure readily, and the crop will tell the story of its value. When the corn is taken off, and during the next winter, let the corn-stubble be broken close to the ground, raked off, and burned, or, what is better, hauled to the barn-yard, and in the spring as soon as the ground is dry enough harrow with a sharp and heavy harrow until the surface is smooth; sow oats without plowing, and roll after sowing. The manure is yet undisturbed, and not likely to make the oats so rank as to cause them to lodge. Oats will grow better and be more productive without plowing than with it. As soon as the

oats are off, let the stubble be plowed in as deeply as possible, by which the manure, covered before corn-planting, will be thrown to the top, and the scattered oats will have an opportunity to vegetate; then stir the ground again with the plow, thus destroying the growing oats, and thoroughly mixing the earth and upturned manure, which, by the lapse of time, has undergone a thorough decomposition and combined with the earth, and in this way has been made a food properly prepared for the wheat plant. The earth through its influence has been assimilated to the humus which was originally so productive of wheat. If the land under this treatment tends to become too mellow, let timothy be sown in the fall with the wheat, at the rate of one bushel to the acre, and clover in the spring at the rate of one bushel upon five acres. If no timothy be sown in the fall, the wheat will be greatly benefited by harrowing it with a sharp harrow in the spring. No fear need be entertained of injuring the roots, and the ground will be freshened and well-prepared for receiving the clover-seed. When it is sown, a roller passed over the ground will fix the clover-seed for immediate germination, and level the surface for the reaper and mower; and I may add, that the habitual use of a roller upon cultivated land, whether in corn, oats, wheats, barley, or clover, has a tendency to destroy the larvæ and pupæ of insects to an extent rendering them harmless, while all these crops are benefited by it.

In the Southern States there is no reason why cotton or tobacco may not be substituted in this course for wheat. It may be suggested that, when either of these crops is cultivated the last time, the land may be sown with clover, which by by the following June will grow to its full size, and may then be plowed under. If the ground be again plowed in September, it will be in the best condition for a wheat crop, or, what is better, if the clover be left until the following spring, when it shall have attained its full growth, the land will be in a condition to grow corn, cotton, tobacco, or anything else. This system, pursued for a series of years, may be relied upon for the production of crops perpetually, always using barn-yard manure upon the clover sod, and planting with corn. It is the enriching influence of clover roots and the rotation of crops which produce the result. Let it be remembered that there is little reliance to be placed upon the effect of a green crop turned under by the plow; ninety per cent. of it is water. It is the full-grown *root* of clover that enriches the soil.

Care in the selection of seed wheat is of the very first importance. Discard all idea of mixing ingredients with it to destroy smut, rust, mildew, or anything else; for, beyond the mere operation of washing or the manure they may furnish, is it questionable whether they produce any good effect. Smut is a fungoid growth from a diseased grain of wheat, which by contagion will be communicated to the mass, but from which the mass may be purified by washing with soap and salt water. Mildew is a parasitic fungus upon the straw, by which the seed is never affected otherwise than by the destruction of the straw and consequent shrinking of the wheat in the head. The midge, Hessian fly, and weevil, are insects the consideration of which should be introduced in any discussion on the subject of the cultivation of wheat. The midge is a small-winged insect, the larvæ of which is an orange-coloured maggot, found between the skin and chaff of the grain of wheat while it is in its milky state. The egg is deposited between the chaff and the kernel, and is so minute as not to be discoverable by the naked eye. The larvæ extracts the milk and destroys the grain. The Hessian fly deposits its egg, which is about the size of the smallest grain of clover-seed, upon the blade of wheat, from which it falls into the crotch of the plant or upon the ground; if upon the latter it perishes, and if upon the former it is hatched into a larvæ resembling a flax seed. As it grows, it lives upon the sap of the straw, and destroys it at its point of contact, which is usually in the first joint, so that it is broken off by the wind or its own weight. The weevil is a hard-shelled beetle, which preys only upon grain after it is matured. The remedy for smut and mildew is careful cultivation, frequent rolling, and selection of clean, pure, heavy seed. The weevil may be driven from barns or bins by any strongly smelling plant, such as mint or burdock.

There are involved in this discussion two simple principles of agriculture—the timely application of manure, and the proper rotation of crops. It may and probably will be said that clover will not grow successfully in the Southern States. With all due respect to the little experience which southern farmers have had in the use of this grass, I must insist that such is the character of the clover-plant, with its deeply penetrating tap-root, which nature intended for the supply of moisture and nourishment, that no other grass will endure more drought. Lime is one of the largest constituent elements of clover, and, if it be applied to the land, clover will grow almost anywhere, and wherever it grows the soil is renovated and enriched by it.

HORTICULTURAL SHOW AT SECUNDERABAD.

THE January flower and vegetable show of the Secunderabad Horticultural Society took place on Wednesday and Thursday, 17th and 18th instant. Despite a season of unwonted drought, and the proportionate difficulties which must have assailed the gardeners of Secunderabad and its neighbourhood, both the flowers and vegetable exhibited were quite equal, if not superior, to the produce of more favourable years. Recollections of Ootacamund and Bangalore were still fresh within us, yet we were forced in honesty to confess ourselves astonished at the out-turn of vegetables, and not a little surprised at many of the flowers. The former, whilst (as a whole) equal in every way to the best seen in Bangalore, in two or three instances surpassed the most successful efforts (hitherto) of vegetable growers at that favoured station. I refer especially to cauliflowers, parsnips, and celery—all equal in size and quality to the finest I remember having seen on the Neilgherries. The total absence of market-gardeners from competition struck me at once; natives, I learnt, do not grow for the market at Secunderabad, as they do at Madras, Bangalore, and Ootacamund. Inasmuch however as Horticultural Societies have done much to encourage and develop the latent talent of native husbandmen at the three places mentioned, it is to be hoped that as Secunderabad now boasts of a similar institution, its market will eventually command a supply of vegetables as plentiful and good as that of Bangalore. Private kitchen-gardening at Secunderabad is on the other hand almost universal; and to judge by what I saw last Wednesday, highly successful. The large and varied collection of English vegetables exhibited by Majors Swete and Pereira, would have claimed prominent notice anywhere, and Mr Cole's contribution from the military prison (even allowing for his large command of labour) was beyond praise.

In flowers we found ourselves behind Bangalore, yet treading the ground she trod some three years ago, when Iresine Herbsii was prized and a Celeus was viewed with universal envy! The double pink were unusually fine and varied; vernenas as good, and phlox Drummondi very fair. All the other flowers, if not quite as novel to the eye as some of the recent introductions at Bangalore were, at all events quite up to show form, well grown, and vigorous.

The energetic Honorary Secretary Colonel Thomas, deserves much kudos for the excellent arrangements made for the public, and for the tasteful staging of the plants in competition.—*Madras Mail.*

WOOL AND ITS IMPURITIES.

THE SUBSTANCE OF A PAPER READ BEFORE THE ASSOCIATION OF COMMERCE OF ROUBAIX BY M. FERON.

IF it sufficed for the necessities of the divers industries dependent on wool, that the carded wool of commerce should be of good colour, its fibres smooth, clean, and parallel, we might congratulate ourselves on the progress made of late years in wool carding. But, unhappily, it is altogether different, when we come to consider the same wools with regard to their absolute industrial values; that is to say, their aptitude for taking dyes and their suitability for spinning and dressing. The great majority of wools used at Roubaix are but imperfectly purified from the earthy and fatty manners which they naturally contain, and from those with which they become contaminated in the process of carding, either accidentally, or to facilitate the operation. Now, these impurities are the essential cause of numerous imperfections in each of the subsequent operations, and, if not removed, perfection is impossible, either in dressing, spinning, or dyeing.

Conditioning.—This first operation has for its object to ascertain by absolute desiccation the true weight of wool in any bale. Samples are taken from the bulk of the cleansed and carded wool, of which it is desired to know the degree of humidity and carefully weighed; they are then submitted to a temperature of 105° to 108°. By this means the water they contain is evaporated, and, on reweighing, the absolute weight is supposed to be obtained. If the wools were really pure, this mode of ascertaining the value of the wools would be very rapid and sufficiently exact; but it is a matter of fact that all substances dissolved in a liquid hinder its evaporation and elevate its boiling point, and the influence thus exerted becomes greater, with increase of the affinity of the liquid for substance in solution.

Amongst the most common impurities of carded wool are to be found: salts of lime, derived from the water in which the wools are washed, and which form, with the oils of the wool and with the soap used, insoluble soaps, which add to the weight and deteriorate the wool, rendering it dusty and greasy; soap, and the substances used to adulterate it; starch, kaolin, resinous matters, silicate of potassa, &c., animal moisture, and glycerine, all increasing the boiling point of water; so that the effect produced on wool by heating to a temperature of 105 degrees is proportionate to its degree of purity, and in no way to the amount of moisture which it contains. Under these circumstances it is useless to deduct the amount of moisture evaporated and estimate the remainder as so much pure wool, since it really contains salts of lime, insoluble soaps, glycerine, &c., which hold water with a tenacity incapable

of being ruptured at 105 degrees. With this state of things conditioning will never be anything but an empty word, an illusion.

Dyeing.—Good dyeing is not possible, unless the wool has previously been thoroughly purified from all fatty matters and from animal moisture. Bleaching—that is to say, this thorough cleansing and purification—therefore, constitutes an integral part of dyeing, and it is of the utmost importance that it should be most efficiently carried out; in fact, the dyer should watch this part of the process constantly.

The next point to be attended to is mordanting. Nearly all the colours used in dyeing require, in order to form a stable dye, that they should have for their base some metallic substance, the bodies used for this purpose being the mordants. Now, if the compounds formed between the colouring matters and the dyes are insoluble, the compounds formed between the mordants and many of the impurities in the wool—the soap in badly-washed wool, for instance—are not less fixed and insoluble. If the mordants be a salt of iron, for example, it forms an insoluble iron soap, which effectually prevents the wool from taking a good pure tone of colour. In order to get a good result under such conditions, dyers are constantly in the habit of evading the obstacle, and dyeing without any mordant whatever; so that mismanaged cleansing gives rise to fraudulent dyeing, colours thus put on being merely superficial and valueless.—*British Trade Journal.*

PUNJAB COTTON CULTIVATION.

From an official statement we see that the estimated extent of land under cotton cultivation in the Punjab during the past year was 706,000 acres only, as compared with 811,740 acres in the year 1869-70, and 670,240 acres in 1868-69. The decrease is said to be mainly attributable to unseasonable rain. The estimate of the out-turn, however, is larger by nearly sixty thousand acres than in 1869-70, when the crop entirely failed in a part of the Delhi and Hissar Divisions. The average price during the year was Rs. 17-1-10 per maund of forty seers. Of the entire out-turn the trade returns show 107,041 maunds to have been exported from the province chiefly to Sind and the North-Western Provinces, and presumably for export from India. Country cloth, to the extent of 13,301 maunds, and European cloth, to the extent of 22,539 are also estimated to have been exported from the province. At the same time 35,781 maunds of cotton were imported, so that the net export was only about 70,000 maunds; and 9,204 maunds of country-made and 47,713 maunds European cotton cloth were also imported, leaving a net import of cloth of about 21,000 maunds. In the previous year the net imports of cloth were only about 3,000 maunds. The statement contains no information regarding the local manufacture of country cloth, though this is a subject of the last importance to the piece-goods trade. Some experiments were made by Mr. Login in the cultivation of cotton after the Egyptian method, which appear, as far as they have gone, to be remarkably successful, and certainly justify an extension of the trial. The Financial Commissioner who had recently had an opportunity of seeing one of the fields in which cotton had been grown on this plan, found the plants exceedingly healthy, well-grown, and prolific. From information afforded by the Sub-Overseer in charge it appeared that the success of the experiment was mainly due to the mode of sowing and to the thinning of the plants, by which means they had room to spread. The field had not been irrigated, but the rain-fall had been copious.—*Englishman.*

SILK.

The report of the Assistant Commissioner, Tharawdy Subdivision, states that silk culture has been pursued from time immemorial along the Pegu Yoma range of hills, and adds that the cultivators, who are principally Burmese, are looked down upon because their professed occupation involves the taking of animal life, and they live chiefly in villages apart from others. Fresh mulberry trees are planted each year, the previous year's trees being cut down in July, and the cuttings planted out in fresh ground and ready for the worms about the end of September.—*Bangalore Spectator January, 31st.*

MISCELLANEA.

Nature says that a Frenchman M. Raoult, in a paper read before the French Academy of Sciences, stated that cane-sugar becomes transformed into grape-sugar under the prolonged influence of light. Having dissolved ten grammes of white sugar, in fifty grammes of pure water, and boiled the solution for a few minutes, he placed equal portions in two white glass tubes, which were then hermetically closed. One was deposited in a dark place, while the other was exposed to light. Five months afterwards the tubes were opened and the contents of that which had been exposed to light gave the reaction of glucose.—*Delhi Gazette.*

6 MARCH.

The Foresters' Gazette.

BOMBAY, 21st March 1872.

FOREST CONSERVANCY IN CEYLON.

In discussing the question of Railway Extension, we must not forget what is involved in such words as fuel and forestry. In India it has been found that 30 acres are required to supply fire-wood for each mile of railway. We suppose the proportion in Ceylon is much the same. Care must therefore be taken that at convenient distances along our line provision is made for supplies of fire-wood. And has not the time come to imitate India in her special efforts to conserve forests which will yield not merely fire-wood, but good timber for railway, building, and cabinet purposes? Something has been done in checking the wasteful chena system, and the various Government Agents are expected to devote some attention to the conservation of forests. But unless we are to be, by-and-bye, entirely dependent on other countries for our supplies of timber, it seems time that a special department of forestry were here created. India has now a large number of men, who having graduated in Germany, have added the knowledge gained by local experience. A Ceylon officer, if deficient in training could be detached to India, and in a few months obtain all the knowledge that was necessary in addition to that contained in Forestry Manuals and in recently published Indian Blue Books. Special attention is required with reference to preserving existing timber and growing fresh forest near lines of railway and roads, while perhaps it might pay in some parts of the Island to form common roads on light tramways with reference mainly to reaching and rendering available supplies of satin wood and similar timber trees. Beyond some small experiments by the Director of the Royal Botanical Gardens, no efforts have been made to utilize, for timber-growing purposes, the vast prairies of the hill-country, which we call patenas. And even in the plains of the low lands, many of them too unhealthy for the systematic cultivation of cotton or other produce, surely timber trees could be planted and allowed to grow. We have vast tracts of forest which are not come-atable. We want means to reach these, and we want forests raised in localities where it can be readily available. Posterity will find that we worked hard to destroy the forest on which so much of the beauty and the salubrity of a country depends. But do we not owe to posterity the duty of restoring with one hand at least a portion of what we remove with the other? In Australia, as well as India, this question of forest conservancy is receiving much attention, and we think it is one which in all its important bearings, ought to be submitted for the consideration of our new Governor when he arrives. The Eastern Province of the Island is fast advancing as a rice-producing territory. We must see to it that this and other portions of the Island do not retrograde in their function of supplying useful timber. The danger is that all timber near means of conveyance will be exterminated, no fresh supplies being put down. There is much information on the subject scattered through Government Records which could be condensed and rendered available, and we hope one of the earliest Sessional Papers added by Mr. Gregory to the valuable collection which this Colony owes to Sir Hercules Robinson, will be a comprehensive report on the Forest Resources of Ceylon, and the best means of utilizing, conserving, and extending them.—*Ceylon Observer.*

FOREST CONSERVANCY IN THE ANDAMAN ISLANDS.

The recently issued Parliamentary Papers, relating to forest conservancy in India contain a revised report by Mr. Kurz, of the Royal Botanical Gardens, Calcutta, on his visit to the Andaman Islands, in the Bay of Bengal, in 1866. At the Middle Straits, which divide Middle from South Andaman, he observed signs which he regarded as indicating that the Islands have a tendency to sink, and at various points along the coast he noticed the encroachment of the sea. Estimating the gradual submersion to be one foot in one hundred years, it may be expected that in 1,000 years, all the stores and houses along the beach at Ross Island, Port Blair, must be submerged, and Middle Straits become open for navigation. The small fertile valleys of South Andaman opening towards the sea are preparing themselves gradually for mangrove swamps, and kuppalee trees are destroyed by the extending influence of sea-water. These trees however are still abundant, and their growing along the shores makes the working of the forests the more practicable. The kuppalee or palava is a valuable timber tree, growing up straight, and attaining a height of 80ft. or more, with a clean stem of 40ft. or 50ft., and a girth of 12ft. to 19ft. The wood is used for gun-stocks, and would be available for railways, machinery, &c., where great durability and strength are required. The tree belongs to the same natural order which yields the bullet-wood of Guiana. South Andaman is a hilly country, and the hills are clothed with dense forests of trees, often found entirely covered by climbing plants, which hang

from the tops of the trees-like gigantic festoons, and render the forests nearly impenetrable. The geological formations are identical with those of the Arracan coasts. Mr. Kurz gives a full account of the vegetation, so far as he could observe it; but he was obliged to leave the central region still a *terra incognita*. When he was entering the interior he was seized by the Burmese convicts assigned to assist him in his work, and was left tied up in the jungle by hand and foot; and in fact he found it impracticable to make his proposed excursions through the Islands. Around Port Blair and the penal stations, where the jungles have been cleared and cultivation has been begun, introduced plants are rapidly increasing and spreading towards jungle ... yet trodden by a European. Mr. Kurz remarks that, owing ... the low scale of the inhabitants, and their living isolated ... communication with surrounding countries, the Andaman ... ds have never been influenced by the agency of men, and ... fore the type of their natural productions is still most pecu... but in a few years it may become untraceable in consequence ... portations. With reference to the origin of the Andamanese ... nes, he suggests as of importance the fact of their having ... liar name for almost every plant. An opinion prevails that ... vel lands when cleared, are unhealthy, and hence it is no ... to see cultivation begun on the highest summits, and the ... valleys or level lands left covered by dense jungles. Mr. ... ggests that the temporary unhealthiness of cleared virgin ... lessened where clearings are effected by burning down ... s; and that, wasteful as this may appear at first sight, ... ves and time. The forests on the hills require to be pre... or the sake of water and moisture.—*South of India Ob-*

FORESTRY IN INDIA.

... eight hundred years ago England was almost covered with forest: now it is difficult to find more than a few acres of wood together. But for this disappearance a very good and satisfactory reason can be given.

It was found that land could be used more profitably in many ways than for growing timber, and as civilization advanced the woods were cleared away, until at last there was not enough to supply the demand, and wood had to be imported from other countries. In this respect, India has been following in the steps of England as fast as she can go, but with this difference, that we in India have not a shadow of the same excuse. Our forest lands have *not* become so valuable as to make such a step a necessity; and yet it is a fact that through bad management and reckless extravagance we were in danger of running short of wood. It is well we are able to say *were* not in danger: but it may be hoped that the attention of the Government has now been fully directed to the subject and that the impending calamity may be averted. A "Blue-book" has appeared giving an account of all that has been done in the way of forest conservancy up to the end of 1868. This volume will be followed by others which will bring the returns down to a recent date, but enough has been already published to shew that the conservators are in earnest, and if the actual work is carried out with as much care as is shewn in drawing up the report, the results can hardly fail to be satisfactory. This department has had an official existence only during the last ten years or so. Before that time local authorities having no special instructions on which to act, did pretty well as they liked in the matter of forests. Here and there a man might be found alive to the value of timber, but for the most part, there was no check upon its use or abuse; in short the supply was considered inexhaustible and the idea of economizing never seemed to enter anyone's head. The introduction of railways has probably opened people's eyes more than anything else. Wherever a line was made, every bit of available wood was cut as near the spot as possible so as to avoid the expense of carriage. Nothing is better for sleepers than teak, and therefore every teak-tree within a reasonable distance was ruthlessly chopped down without the slightest regard to its age, and as long as these lasted and the other kinds of timber served as fuel for the locomotives all went swimmingly. But the consequences of this penny-wise and pound-foolish policy soon began to show themselves. The sleepers wore out and the fuel got exhausted and there was nothing to supply the deficiency, but timber brought from a distance at a heavy cost; and the worst of it is that the ground which had thus been robbed of its trees had degenerated in many places into worthless jungle. Now all this might have been avoided if the young trees had been spared and saplings planted to take the place of those which were fit to be felled; but it was nobodys' business to see to this, and no body did see to it until the evil had become so pressing that it could no longer be ignored, of course whatever has been said about railways is equally applicable to the indiscriminate cutting which has been going on for generations for building and other purposes; the first timber to hand was invariably used and the future was left to take care of itself—as to planting forest trees, whoever thought of such a thing? And so the supply was not equal to the demand. It would be absurd to say that the timber in India was all used up; there are of course immense tracts densely covered with forest, but if they are in such inaccessible spots as to make the timber more costly than it would be if imported from Norway or America, they are for all practical purposes, as useless as if they did not exist at all. What we want, and what we ought never to have been without is a sufficient supply of the best kind within easy reach of the most thickly-peopled districts; and this we hope and believe the Forest Department is now bringing once more within our reach by its plantations and nurseries, joined to a well-judged restraint of the unlicensed use of the axe. The wisdom of employing scientific men specially trained for their work is already apparent, and the experience they must be gaining day by day cannot fail to add still further to the efficiency of a staff which must be called an excellent one.

We recommend those who take a real interest in the matter to look through the Blue Book in question, but if information is sought from a more taking source a very good idea to part at least of the Indian forest system may be formed from a book recently published in London of which the author is the late Captain J. Forsyth. It is called "the Highlands of Central India," and, though the production of a veritable sportsman, it contains much valuable information about a district of which little has been known hitherto. He speaks of it in glowing terms as a land of picturesque scenery spacious vallies of wonderful fertility, rivers in plenty and mineral wealth unbounded, wherever there is sterlity it might easily be overcome by judicious irrigation. A country possessed of such natural advantages as these will probably play a considerable part in history some day or other; and if not for our own sakes, at least for the sake of posterity we are bound to protect its interests to the best of our power. According to Captain Forsyth the same wanton devastation has been at work in the forests of Goudwana as in other better known districts. The Gou'd is a very bad farmer but a very good woodman: so he fixes (or rather, used to fix) on some likely spot in the recesses of the woods, fells the timber over as large a space as he desires, burns it and mixes the ashes with the earth. This patch he scrapes over, and lives on what he can grow there for a short time: and when the soil shews any symptons of giving in, he just moves his quarters a little further on and repeats the operation. On the deserted ground there does indeed come up some kind of vegetation, but it is jungle and timber of the poorest kind, and you may look in vain for the much-prized teak tree.

There may be some who think the forest question of comparatively little importance, foreseeing for India a great future through the agency of her coal fields; but even if this were assured to us, it would be folly to waste the riches we have ready to our hand. Instead of receiving timber from abroad, India ought to supply teak enough to build the Navies of the world, and it is little short of a national disgrace for us to be importing railway sleepers from Norway.—*Poona Observer.*

FOREST PLANTING IN INDIA.

WE have recently written as strongly as we can on the necessity of legislating for the more effectual preservation and extension of woods and forests all over this country, with the paramount object of increasing and securing the rain-fall, mitigating the severity of the climate, and commanding the sources of our irrigation. In doing so we must not be understood as depreciating the policy of the Government, or the efforts of its officers, to conserve the existing forests and to plant fresh ones. We do not intend in any degree to underrate the work of the Forest Department. From the day that a very humble individual, known to a few perhaps as a cabinet-maker of Madras, suggested the idea of a Forest Department to Mr. Bourdillon, Revenue Secretary to Government, and from the day that that suggestion was taken up, and a special agency inaugurated under the auspices of Dr. Cleghorn, the forest operations hav been a clear gain to the State in a pecuniary point of view. But what we would wish to impress upon all interested in the question is that the Forest Department does not appear to have yet fully grasped the importance of its mission in this country. It is not sufficient that a definite additional source of revenue has been created for the advantage of the State, or a respectable and useful means of employment provided for the younger sons of our best families, though neither of these advantages is to be despised in the light of desirable elements in our political economy. The great object should be, over and above money gain, the promotion of rain-fall, with its attendant advantages of atmospheric amelioration and improved fertility of the soil. By keeping this object steadily in view and making it the ruling principle of all planting operations, that dread scourge—famine—may be for ever driven from our doors, and the horrors of wholesale starvation and death prevented, as an inevitable and periodical incident of the laws of nature. It is not in the power of the Forest Department to attain this object by its own unassisted efforts. Our revenue authorities must warmly espouse the common cause, and by their immense local influence and power, both actual and moral, contrive to turn every available spot of waste into plantations of wood. With a rare exception here and there, we fear

that our Collectors and Assistant Collectors are indifferent to the subject; and, of course, their indifference perniciously extends itself throughout the sphere of their influence. One of the most energetic men in the service of Government is the present Collector of Tinnevelly, and happily for the promotion of the object in view he appears to have a taste for planting. But even he does not seem to be governed in his efforts for the good of the district by the grand principle which we urge should be kept in view. A zealous man like Mr. Puckle is apt rather to consider what immediate return he can secure to his employers. Good as this motive may be, he must mix with it the far higher aim of effecting the permanent physical improvement of the province ruled by him. We cannot command the rain to fall at will nor the rivers to run to repletion, neither can we throw a curtain of clouds above our heads to mitigate the rays of the sun; but by slow and certain efforts we can plant the river banks with trees and clothe the mountain sides with wood, which will provoke the dews of heaven, contribute to the supply of every channel and river bed, and disperse a humidity through the atmosphere favourable to crops as well as to man and beast. We know of no tract of ground on the plains more favourable to arboriculture than the valley of the Tambrapoorny. It is simply teeming with richness. We were once treated to a picnic on an island near the Sutamally anicut, and were astounded with the size and magnificence of the splendid *Maruda*, and the umbrageousness of the *Poongoo* tree. We had also our attention pointed to a waste planted by Mr. Puckle, and it was here, from the character of the trees set, that we imbibed the impression that he was trammelled in his efforts for the improvement of his district by a regard to the immediate gain to be returned to Government for time and outlay expended. And now we learn that he has directed his attention to forest planting with the object of raising a stock of fuel for the purposes of the railway. This is one of the directions in which we apprehend the greatest obstruction to the physical improvement of the country. As fast as the trees grow the railway will burn them, and no advance will be made in increasing the water-supply of the country and the humidity of the atmosphere. Until other substitutes are found for consumption on the railway, we must be prepared with wood-fuel; but it is for the Government to consider whether, in planting trees for this purpose, they should not also consider the policy of planting to a far greater extent than is needed for the limited object in view, and to consider also whether it is not possible to encourage the production of peat in entire substitution of wood-fuel. The tract of country through which the railway is to be extended towards Tinnevelly has been carefully surveyed, and it is found that there is abundance of rich land available for planting all along the banks and *padugay* lands of the Tambrapoorny and its tributaries, as well as along the several channel banks and on the banks of about 60 river-fed tanks. Hundreds of thousands of the babul, the *Acacia Arabica* and the *Acacia planifrons*, and innumerable seedlings, are already growing all over this tract of country. No difficulty whatever is anticipated in being able to provide sufficient fuel for the railway, if the tracts of ground occupied by the trees and seedlings are fenced in against the depredation of cattle. It is also reported that, with the view of supplementing the indigenous growth, nurseries can easily be formed in various trenches and pits. On six acres of land on the left bank of the Chitravathy river, about a quarter of a mile from the village of Sivilipari, there are now standing about 300 to 400 babul trees besides a thousand seedlings. On about sixty acres near the same village, but on the left bank of the Tambrapoorny, there are about 7,000 to 8,000 babul trees said to be among the finest of the kind, while innumerable seedlings are growing up all round. On a tank-bed near the village of Kalliyoor, on about seventy acres of ground, there are about 15,000 babul trees besides a host of seedlings springing up all of themselves. Near this village also there is a spot of 150 acres, extending from the anicut along the river and channel banks to the village of Vullanad, containing about 60,000 trees. This spot is described to be a magnificent tract of jungle, capable of extension by planting and sowing. Other tracts are also described as available, with a number of trees now growing on them. Altogether we find that at present, without a rupee being laid out on the work of improvement, there are no less than a lakh of trees and more growing of their own accord, as it were, on about 441 acres of ground. Why should all this fertility go to waste? In the olden days pious Hindoos of means—it might have been by way of "conscience money"—dug wells and tanks and planted clumps of trees around them for the comfort and solace of weary travellers. All these refreshing objects of sight and sense have been allowed to pass away, and the consequence is that the very face of nature has almost been changed. Every nook and every cranny, the banks of every stream and rivulet, the sides of every irrigating channel, every hollow and every ditch, should be sown broadcast, or frescoed with seedlings. Trees of every kind should be grown, profitable and unprofitable as to their products; and all Departments should unite—Forest, Revenue, Public Works, and Police—in raising vegetation wherever it can be raised. We will very soon have the face of nature smiling upon us even in this tropical climate. Dams and channels, and the primitive picottah where the level of the water is below the land to be irrigated, will be grand auxiliaries in carrying out the benefits of physical improvement. It may seem superfluous to urge so warmly the necessity of planting forests, and thus encouraging the rain-fall in a country where the want of water is so great as to be palpable to the most superficial observer, and where a tank or a well is fought for as though it were a mine of diamonds. We fear however that the natural results of climate on overtaxed men prevent those, who would otherwise devote themselves to the physical improvement of the country in which their lot is cast, from espousing the good cause we are so strongly advocating. The Indian official overworked, worried, and in a constant state of nerve and brain tension, is too apt to fall into what we may fairly call the *laissez aller* style of public duty, and give way too readily to the eternal *nâlâi* (*Anglice*, to-morrow) with which the native of the country constantly meets any demand on his time or labour. It is not easy to find men of the intellectual vigour and physical strength that is needed to carry out a task like this. Still we need not despair in the cause of proper forests planting, when we find that pisciculture has its energetic apostle in Henry Sullivan Thomas, and archæology its martyr in the much-lamented John Alexander Corrie Boswell, who has just died on a visit to England; but we would rather hope that when the minds of our public officials are thoroughly imbued with the magnitude of the principle to which we feel we have but too feebly referred, even so vast a scheme as the re-planting of Southern India will not long lack champions, earnestly to co-operate with each other in developing one of the greatest sources of material wealth, prosperity, and comfort in this wide and sunny land.—*Madras Revenue Register.*

ARBORICULTURE.

THE Collector of Salem has kindly chosen to give to the pub[lic] certain hints on pruning trees. As a rule, Mr. Longley states deciduous trees should be pruned when leafless. In India, ferent trees, winter and summer, at different times, but as a the hot weather is the best for pruning. 1. Never cut [off] from the ball of a tree a branch which is more than 4 in. in diameter at base, and of this size only, if the tree is large and in full health. 2. Shorten all the large branches that have the appearance of gaining on the leading shoot of the tree; of these branches from ¼ to ½ should be allowed to remain. 3. Trees should be pruned when the wood is full of sap. 4. When after some considerable time has elapsed, the remnants of the shortened branches have thrown out young shoots, these remnants should be removed close to the stem. 5. When a number of branches spring from close to the ground, and it is difficult to fix on one as the main branch, the only plan is to cut the main stem by the surface of the ground, and allow a new set of shoots to rise up. The chances are that all the new shoots will rise in an upright position, and then a choice can be made. 6. In cutting off any branch of a tree from its stem with the pruning knife, take hold of the branch with the left hand a little forward from the base, ease it upwards and at the same time apply the knife to the base of the branch, cutting upwards, parallel to the stem. Care must be taken, when the branch is to be entirely removed, not to enter the knife upon the plane of the stem, but a little,—say ¼ in. above the base of the branch to be cut off. By this means the stem of the tree is not injured, and the damp is thrown off the wounded part. In cutting off whole branches from the stem of a tree, the wounded part should be made perfectly smooth, paring it neatly all round with the knife which should be kept very sharp. Care should be taken to cut *upwards*, not downwards, to avoid tearing the bark.—*Madras Standard.*

Official Gazette.

BOMBAY, 21ST MARCH 1872.

SEASON REPORTS, FEBRUARY 1872.

GENERAL REMARKS.—Except in Assam and Eastern Bengal, and setting aside some scattered showers in a few other places, the fortnight has been one of fair weather. The spring crops are harvested or rapidly approaching ripeness, and on the whole their out-turn is likely to be satisfactory. In certain districts of Bombay and in the Berars the short rain-fall has however resulted in a bad harvest. In the Northern Coast districts of Madras and that portion of Orissa bordering on the Chilka Lake some distress is anticipated, but measures have been taken to provide relief, and neither in the price of food or in the public health is there any sign that any dearth exists. Steps have been taken to meet the possibility of distress in Mhairwara also.

Presidency or Province.	District.	Date of District Report.	Rain-fall for fortnight preceding.	Date of report from Local Government or Administration.	State of Agricultural prospects.	Remarks of Local Government or Administration.
Madras	Ganjam	February 29	...	March 1	Slight rain in some places on the 22nd and 23rd; prices slightly fallen; health good on the whole; cattle disease prevails.	Prospects in the Northern Coast districts remain unchanged: relief measures are extending. Elsewhere the condition of things is satisfactory.
	Vizagapatam	,, 28	Nil	February 29	Drinking water failing; prices unchanged; market well-supplied by importation; health good.	
	Godavery	,, 26	Nil	...	Market well-supplied; prices steady; health good.	
	Krishna	,, 28	Nil	...	Prices steady; markets well-supplied; health and prospects good.	
	Karnul	,, 28	Nil	...	Prices steady; markets well-supplied; health good; murrain present.	
	Negapatam	,, 28	Nil	February 29	Prices falling; prospects fair.	
	Trichinopoly	,, 28	Slight and partial.	...	Prices steady; crops in fairly good order; harvest fair.	
	Calicut	,, 27	Nil	...	Prices low and steady; health fairly good.	
Bombay and Sindh	Kurrachee	February 28	Nil	February 29	Rubbee crops have suffered from frost a little in the Sihwan District, and considerably in Jharrak and Shah Bandar Districts; cotton pickings over.	
	Guzarat Ahmedabad	,,	...	,,	Rubbee harvest very promising; cotton picking in full operation.	
	Khaira	,,	...	,,	Late crops, including cotton, good; picking of latter going on.	
	Surat	,,	...	,,	Three-fourths of cotton crop picked; out-turn light; late crop dried up a good deal.	
	Khandeish	,,		,,	Grain and cotton prospects unfavourable.	
	Poona	,,	Nil	,,	... Harvest already reaped; cotton crops not satisfactory.	
	Satara	,,	...	,,	... All late crops bad; reaping nearly over; cotton picking begun.	
	Ahmednagar	,,	...	,,	... No rain.	
	Dharwar	,,	...	,,	... Late crops almost reaped; cotton picking in progress.	
Bengal	Presidency Division			,,	Weather fine and clear; prospects of crops good.	
	Dacca Division		...	,,	... Cloudy and rainy, than fair and dry; crops promise well.	
	Chittagong Division			,,	... Weather fine; crops good.	
	Cuttack Division		...	,,	... Weather in Puri windy and variable, but no rain: crops excellent in Cuttack and Balasor; in Puri generally satisfactory; relief works in operation in the distressed tracts on the Chilka Isthmus.	
	Chota Nagpore Division		...	,,	... Weather fine; crops favourable.	
	Bhagalpore Division		Nil	February 28	Weather favourable; prospects of crops excellent.	
	Sonthal Pergunnahs		Nil	,,	Weather hot and dry; wheat and gram doing well; sugar-cane sowings getting on favourably.	
	Patna Division		Nil	,,	... Weather fine; wheat and barley generally good; pulses have suffered somewhat from the late rains.	
	Rajshahy ,,		Nil	,,	... Weather fair and seasonable; crops generally good; in Dinajpur mústard scarce for want of rain.	
	Burdwan ,,		Nil	,,	... Weather getting hot; crops doing well; in Howrah spring crops somewhat damaged by hailstorm of the 20th.	
	Assam ,,		Nil	,,	Weather stormy and cloudy; crops satisfactory.	
	Kuch-Behar Division		Nil	,,	... Weather seasonable; almost all crops reaped; those remaining are good.	

N. W. Provinces	.....	.....	...	February 29	No rain at any of the reporting stations during the fortnight; prospects of the harvest good.	
Punjab	Delhi	February 29	Nil	,,	Crops good; weather variable.	Agricultural prospects generally much as before.
	Umbala	,,	...	,,	Agricultural prospects good.	
	Jullundhur	,,	...	,,	.....	
	Lahore	,,	...	,,	Heavy fall last night at Lahore itself; none in district in previous fortnight.	
	Multan	,,	Nil	,,	Rain wanted; gram crops greatly damaged, and wheat crops slightly, by insects in Sarai Sidhu.	
	Rawul Pindee	,,	1·1	,,	Agricultural prospects good.	
	Peshawur	,,	...	,,	Ditto ditto.	
Oudh	Lucknow	February 28	Nil	February 29	The fall of rain and fogs have proved injurious to the crops, but present westerly winds are doing good; prospects favourable.	
	Faizabad	,,	Nil			
Central Provinces	Jubbulpore	,,	Nil	,,	Prospects of crops good throughout the division; in parts of the Jabalpur District the wheat has been attacked by "Girva," but very trifling damage has been done as yet.	
	Nagpore	,,	Nil	,,	Rubbee crops reaped in most places; prices steady.	
	Wardha	,,	Nil	,,	All crops, except opium, harvested; quality good, but quantity short.	
	Hoshungabad	,,	Nil	,,	Wheat suffering; gram good.	
	Chindwara and Baitul	,,	...	,,	Rubbee being cut; yield average, and three-fourths of an average, respectively.	
	Nimar	,,	Nil	,,	Khurreef below the average; rubbee not favourable; wheat and gram being harvested.	
	Nursingpore	,,	Nil	,,	Crops favourable; might be better.	
	Raipore	February 26	Nil	,,	Cloudy; wheat two-thirds of an average crop expected; pulse crops gathered; yield average; oilseeds three-fourths of an average.	
	Belaspore	,,	Nil	.....	Three-fourths of an average rubbee crop expected; oilseeds have suffered considerably.	
	Sumbulpore	,,	...	...	No change.	
Hyderadad Assigned Districts	East Berar	February 29	Nil	February 29	Spring crops mostly harvested; out-turn less than usual average; want of water increasing; health good.	
	West Berar	,,	...	,,	Harvest now over; want of water and fodder for cattle is increasing.	
Rajputana	Siroby	February 17	...	February 23	Same as last report.	
	Meywar	,,	Nil	,,	Water becoming very scarce; prospects very poor, crops being parched up.	
	Marwar	,,	Nil	,,	Water-supply good; prospects fair.	
	Deoly	,,	Nil	,,	Prospects continue good.	
	Kotta and Jhalawar	,,	A few drops.	,,	Water-supply average; prospects good.	
	Jaipur	,,	Nil	,,	In Ajmir, water-supply tolerable; spring crops healthy; in Mhairwara tanks empty; rubbee prospects very poor; measures adopted to prevent distress.	
	Ajmir and Mhairwara	,,	...	March 1	No change since last report.	
Central India	Western Malwa	February 29	...	,,	No rain during the last fortnight: prospects of crops very good.	
	Baghelkand	,,	...	February 29	In a few places the Bengal gram crop is blighted, and the sugar-cane crop is withering from want of water: both are being harvested; the hot-weather paddy crop is progressing satisfactorily.	No material change in the prices of grain since last report.
Mysore and Khurg	Bangalore	,,	Nil	,,	Sugar-cane, cotton, and castor-oil seed are thriving.	
	Mysore	,, 27	Nil	,,	Threshing of paddy crops nearly completed; fields being ploughed and manured in North Khurg; gram crops thriving: picking of coffee completed, and almost all exported.	
	Khurg	,, 29	Nil			

The Planters' Gazette.

BOMBAY, 21st March 1872.

THE ESTATES.

We are glad to learn from a Ceylon paper that the leaf-disease is disappearing from the coffee-plants. It says :—" Leaf-disease has but a slight effect on coffee generally, and is disappearing. The weather is favourable and the prospects of crop are very good. The blossom now appearing on the native coffee is almost unprecedentedly fine."

The quality of last year's Plantation Coffee, sent to the London market, with "Coonoor" and "Neilgherry" marks is spoken of in *Messrs. Patry and Pasteur's Annual Price Current*, as having been superior to the generality of Wynaad coffee; the inferior quality of the latter being attributed to exceptional circumstances, such as unfavourable weather for picking, and the setting in of the monsoon on the Malabar Coast. Fortunately, remarks the *South of India Observer*, the demand for coffee at home, has been good for almost all kinds, and high prices have been realized.

The Committee of the Planters' Association has resolved to prepare a memorial to the Chancellor of the Exchequer praying for the abolition of the present Imperial duty on coffee. Coffee is *not* the magnificent investment it was once supposed to be. A correspondent of the *Madras Mail* recently advised us to stick to Government paper at four per cent., rather than trust to schemes which offer 10, 15, or 20 per cent. on the venture. Indeed, it has been a miserable business for most engaged in planting, and it is the requirement of plain justice to suspend all taxation thereof. In advocating the abolition of the present tax on coffee, the *Ceylon Observer* remarks :—

Unfortunately for coffee planters, the staple drink of the English people is not a decoction of the fragrant berry which is so universally popular with the Danes; the rate of consumption of coffee at Copenhagen being thirteen pounds per head of the population per annum, while in England the rate per head is not more than a fraction over a pound of Coffee, and about four pounds of tea. Well would it be for English working men if they were induced to substitute coffee and tea in place of the beer and gin of which so great a quantity is consumed by them. One means of helping a movement towards this end which is now engaging so much of the attention of philanthropists and public men generally in England, will undoubtedly be found in lessening or removing burdens which interfere with "a free breakfast table;" and the arguments used by Herr Ulstrup in the Danish House of Commons may well be reiterated, although from less disinterested motives, by the Planters' Association of Ceylon in praying for the abolition of the tax on coffee, and for stringent regulations against adulteration. Any means of promoting the sobriety of the working classes of Britain claim the attention of statesmen at the present moment, and the great difference between the English workman and his continental *confrere* in this respect, is that beer and gin are to the one what coffee is to the other. There cannot be much to commend to the House of Commons a tax so insignificant in its actual production in comparison with the expense of collection as that on coffee is

ANNUAL TEA REPORT.

1871 has been satisfactory, inasmuch as the deliveries show an unprecedented increase, on the one hand proving the elasticity of consumption consequent upon a low rate of duty, and on the other reassuring to those who feared that our export trade would decline owing to the direct communication by steamers now established between Russia and China. The result to importers threatened at one time to be serious, for not only was the system of hurrying forward the new crop by the Suez Canal carried to a dangerous extent, but much higher prices were paid in China than the quality warranted, and as a natural sequence, under the pressure to realize, some sharp losses were at first experienced. Subsequently the unexpected large demand helped to support the market, and has secured for the bulk of the imports a profit in place of the loss which before seemed imminent; while of late a belief that the total export from China will not reach the figures at one time anticipated has also tended to confidence. The large deliveries of last year will probably lead to a speculative market in China for the coming season, and sanguine buyers may argue that, as stocks will be so much reduced, a generally high range in price must follow. The late large deliveries, we consider, has only placed tea in the position of a healthy trade. Looking to the present course of commerce, and so long as supplies keep pace with the current demand, there is every reason why rates should not advance. The home consumption has doubtless been stimulated by the low retail price, and any change in this direction would at once operate as a check to the present favourable statistics. It also must be remembered that the export from India will increase, while the general improvement in quality enables the dealers to mix most advantageously. The total deliveries were 163¾ millions, showing an increase of over five millions in home consumption, and ten millions in export. The stock was three-and-a-half millions above that of last year. A marked improvement in the manufacture of Indian teas, continues to be developed, and many gardens that were noted for inferior produce now rank among the best. It may be fairly said that the ignorance and folly, which unhappily in too many cases mark some of the early undertakings, have been succeeded by industry, science, and skill, so that tea now promises to become one of the soundest staples of growth in India. It is increasing in favour with the public, and must continue to do so for all the full and strong qualities. The imports into the United Kingdom have been 167,250,000 lbs. against 140,500,000 lbs. in 1870; the deliveries for home consumption 128,000,000lbs. against 117,750,000 lbs. in 1870, the deliveries for exportation 40,750,000 lbs. against 30,750,000 lbs. in 1870; the stock remaining on the 31st of December was 83,250,000 lbs. against 79,750,000 lbs. in 1870.—*British Trade Journal.*

IPECACUANHA.

BENGAL.

The Government of Bengal is engaged upon the prosecution of one of those enterprises the results of which besides benefiting this country, are likely to extend themselves over the whole civilized world. It is no secret of trade that the sources from which the Ipecacuanha plant is obtained from the forests of Brazil, are failing fast, owing to the wanton destruction which has been going on for a long time, and the medical faculty have long been conscious of the impending calamity, the nature of which can be estimated only by those who are acquainted with the invaluable uses to which the principle of the plant is applied in the treatment of disease. Some four years ago, a representation was made by the head of the Indian Medical Department in Bengal to the Government of India, in which the advantages likely to follow the successful cultivation of the Ipecacuanha plant on the Darjeeling slopes were set forth with great earnestness and force. On the proposals being referred to Dr. Anderson, then Suprintendent of the Calcutta Botanical Gardens, they met with his heartiest support, and a spot in the Sikkim terai was pointed out by him as most eligible for trying the experiment. These recommendations were approved by the Government of India, and shortly afterwards Dr. Anderson, proceeding to England for the benefit of his health, entered into personal communication with the Secretary of State for India and the Directors of the Royal Botanical Gardens, Kew and Edinburg, for the selection of a suitable number of plants for trial in India. The death of Dr. Anderson, by which a great loss was sustained by the scientific world, prevented him from having any further share in the prosecution of this undertaking. Lately a batch of upwards of two hundred Ipecacuanha plants has been received from the Botanical Gardens in Edinburgh, and they have been made over to Dr. King, the present Superintendent of the Botanical Gardens, Calcutta. It is understood that they are to be planted out in Sikkim, and when sufficiently grown they will be transferred to other localities in order to test the circumstances of soil and temperature which are most conducive to their vigorous growth. It is to be hoped that the experiment upon which the Lieutenant-Governor has fully set his mind, will justify the anticipations which have been formed in respect of it.—*Indian Examiner.*

CINCHONA.

CINCHONAS IN INDIA.

We understand that the Travancore chinchonas are a failure. Planted in laterite, their roots become water-logged, the bark peels off, and the plant dies. Certainly there is no tree grown which is more impatient of moisture at its roots than the *Succirubra*. Mr. Cross, writing of the *Pitayo* bark trees, describes them as clinging to the sides of hills, growing anywhere, in fact, where the drainage was perfect.—*South of India Observer.*

CINCHONA IN MYSORE.

From an analysis by Mr. J. Broughton, Government Quinologist, of cinchona bark, grown on the Biligiri Rungum Hills, Mysore, it appears that the bark was of good appearance, and consisted entirely of that of *C. Succirubra*. Its analysis gave in

percentages of dry bark, total alkaloids 7·50 per cent., quinine 2·01 per cent., cinchonidine and cinchonine 5·49 per cent., pure sulphate quinine obtained crystallized 1·00 per cent., other sulphates do., 4·84 per cent. The bark is of high quality for *C. Succirubra*, and quite compares with that of the Neilgerry Plantations. It possesses both the defects and the excellencies of Indian red bark.—*Madras Mail.*

CINCHONA IN TRAVANCORE.

HAVING recently made an inspection of the Peermede Cinchona Plantations, Travancore, Mr. McIvor regrets to state that he found the plants very seriously affected with disease. As he is unable to suggest a remedy, he thinks it advisable that all the diseased plants be at once cut down, and the bark removed and despatched to Europe for sale. He has brought away numerous specimens of the roots and diseased parts of the plant, and so soon as he is able to complete a careful examination of these, he will submit a detailed report on the subject to Government. Any delay in securing the bark will seriously affect its value, as the bark of trees which are allowed to decay and dry up becomes of no value; therefore, the sooner the bark is removed the better. There are about two-thirds of the entire number of trees on the Peermede Plantations so seriously affected with disease, that it appears to him advisable they should be at once cut down and barked.—*Madras Mail.*

SALE OF CINCHONA BARK.

The Right Hon'ble the Secretary of State for India wrote as follows to the Right Hon'ble the Governor of Madras with regard to cinchona bark:—With reference to your Excellency's despatch dated 21st August (No.30) 1871, reporting the transmission by the Suez Canal of 3,188½lbs. of cinchona bark for sale in the London market, I have now to inform you that the bark was sold in the ordinary way with other lots from South America on the 22nd of last December, without any reserve price. The prices obtained at the sale are satisfactory, ranging from 2*s.* 1*d.* to 2*s.* 10*d.* the pound. The highest prices were fetched by the unmossed Succirubra and the unmossed Condaminea barks, which reached to 2*s.* 9*d.* and 2*s.* 10*d.* the pound. The old mossed Succirubra only sold for 2*s.* 3*d.* the pound.—*Madras Times.*

CINCHONA IN THE N. W. PROVINCES.

IN November last, Dr. Jameson, Superintendent of the Botanical Gardens, N. W. P., visited Ranikhet with a view to ascertain its capabilities for cinchona cultivation. The soil he found light and free, the natural drainage everywhere admirable, and the prospects of the proposed experiment generally very encouraging, provided that the frost was not severe. There are now at Ayarlotie about 800 healthy young plants which will be planted out in selected sites next March, some 200 others being at the same time made over to Colonel Ramsay for distribution among the local zemindars. The experiment of cinchona plantation has already been tried in the Kangra Valley, where it was a failure; but Dr. Jameson, believing that a series of experiments on a small scale but extended over several sites may prove successful, on these grounds has asked for an extension of the experiment for another eighteen months. This request has been complied with by the Local Government, which considers that the experiment ought without doubt to be prosecuted until the question, a very important one for the poor, is finally settled either *pro* or *con.*—*Pioneer.*

CINCHONA PLANTING.

MR. R. B. ELWIN applied last year to Mr. MacIvor, the Superintendent of the Government Cinchona Plantations, for 5,000 plants for his estate, the "Mary Ellen," in the Wynaad. He was charged one anna per plant for that lot. Mr. Elwin applied for another 5,000 this year, but at the same time remarked that the high price charged for the first lot materially restricted his operations and he gave it as his opinion that unless Government were prepared to supply plants at a nominal cost, cinchona planting in the Wynaad will continue to be on a very limited scale. Mr. McIvor in forwarding the letter to the Commissioner of the Neilgherries, suggested that the charge should be reduced to six pies both for last year's supply and for this. As plants can now, Mr. McIvor says, "be cheaply and abundantly produced," and the Secretary of State has lately expressed his desire that cinchona cultivation should be encouraged in Wynaad, the Commissioner has suggested to Government that the price be not more than two pies a plant for all the commoner varieties of which the Government plantations possess abundance. Mr. Brooks has also requested the sanction of Government to give orders to the Superintendent that in future no plant leave the Government estates until the pice, at the rate of two pies each, has been received. Government have approved of the Commissioner's proposals.—*Daily News.*

TEA.

THE PUNJAB HILL TEA.

IT is stated that the Punjab Hill Tea is coming into vogue in Bokhara and Cabul, the people of those countries having begun to prefer it to the China tea either imported through Bokhara or India. It is also stated, with what amount of accuracy is not known, that the Cabul merchants have instructed their agents to buy up the Hill Tea sent by the planters to Amritsur.—*Times of India.*

THE BRITISH-INDIAN TEA COMPANY.

THE following is from the half-yearly report of the Directors, to be presented at the meeting on January 29:—

The directors have to report to the shareholders that the crop of tea of 1871 has yielded about 280,000 lbs., being an increase of nearly 20,000 lbs. on the previous year. Final weights of the crop have not yet come to hand. The falling off, as compared with the estimate given in July last, is chiefly owing to deficient yield in the garden at Minniepore. The quantity arrived to date is 221,000 lbs., of which 189,000 lbs. have been sold at an average of 1*s.* 9½*d.* per lb. gross, or 1*s.* 7½*d.* per lb. net. If the remainder of the crop realises only 1*s.* 6*d.* per lb. net, the total value of the teas of the past season will be about 22,000*l.*, against an outlay which, it is believed, will not exceed 18,000*l.*, leaving a surplus on the season's operations of about 4,000*l.* Messrs. Jardine, Skinner, & Co.'s claim has been paid off with interest, and there are no now liabilities, except those arising from current operations, which the crop of tea will more than cover, so that practically the company has no liabilities except to its own debenture stock-holders, and the properties are entirely without encumbrance. The books of the company for the past six months have been audited by Dr. Tripe and found correct, and the accounts of the season will, as usual, be presented at the annual meeting in July. In conclusion, the directors feel they may congratulate the shareholders on the improved condition and hopeful prospects of the company, and they trust at the annual meeting, that the accounts to be then presented will fully substantiate the estimate they have given in this report of the result of the past year's operations.—*The Overland Mail.*

INDIAN TEAS.

MR. ALEXANDER CAMPBELL, late of Assam, who served as a juror on articles of food in the London International Exhibition of 1862, and exhibited all the Indian teas on that occasion, remarks in a letter to a London paper that his collection consisted of about 150 specimens of green and black teas from the tea-growing districts of India, viz., Assam, Cachar, Darjeeling, Kumaon, Dehra Dhoon, Kangra, and Chota Nagpore. "These teas attracted great attention from their novelty as an Indian product, and from the perfect manner of their manufacture, I was constantly interrogated by visitors to the Exhibition about their quality, price, the mode of manufacture and cultivation, and especially as to their economy in use compared to China teas. They were also highly approved by the jurors and other persons who had opportunities of drinking them, and the result was the award of medals and honourable mentions to eight or ten of the manufacturers. So far, something was done to bring this new article of food, which is of the purest and best kind, to the notice of the British public, through the intervention of the International Exhibition, but it was very inadequate to the wants of the public in general, who had no better means of judging of these teas than admiring them in a glass-case. What I propose for the consideration of the Food Committee is that, at the Exhibition of 1872, the public should have the opportunity of drinking Indian teas as well as looking at them, that intending exhibitors should be informed of this opportunity, and invited to send sufficiently large samples of the teas to admit of this being done without much cost to the Society of Arts. From my experience on the last occasion, I feel very sure that the tea-planters and tea-companies who desire to exhibit will respond liberally to this invitation. In 1862, large samples—20 lbs. in some instances—were sent to me, and went eventually to the India Office, as the Indian Government had provided free carriage for them from India. On that occasion, I believe that the exhibits represented no more than a crop of a million pounds for all India. It will be very different in 1873, as I have good reason to believe that more than 20 millions of pounds will be the out-turn of this season (1871).—*Madras Mail.*

INDIAN TEAS.

THE Madras Agri-Horticultural Society, at their recent exhibition, not only gave prizes for the best flowers, rare plants, and vegetables, but also to the producers of the best tea, tobacco, Carolina rice, Indian-corn, cotton, and silk. Four competitors, we are told, sent specimens of tea. The prize for the best was awarded to the Curzon Estate at Kotagherry on the Neilgherry Hills. This specimen excelled in manipulation, aroma, as well as

the quality of the leaf. We are glad to notice that everywhere the improved quality of the Indian teas is remarked upon and confidence in their quality is more relied on by the dealer. The *Produce Markets' Review* tells us that the consumption of Indian teas has been somewhat checked by the high prices which have ruled throughout the past year, *the supply having barely kept pace with the increasing demand.* This however is regarded as only temporary, as with the present highly remunerative scale of prices, cultivation is sure to be largely increased, and as the Indian growth continues to advance in popularity, a regularly and extensive demand may be relied on. It is certain that as the quality of the Indian teas is known and appreciated, the demand will go on increasing. The accounts which we continue to receive from all the tea plantations in India are most encouraging. The *Pioneer* tells us that their prospects are brightening in the North-West Provinces and that prices varying from two shillings and two pence to upwards of three shillings had been given for tea from the Western Dhoon. The progress of the industry in Darjeeling in 1871 has been most satisfactory—the increase in the quantity and quality of the season's crops having been marked and steady. The rapidly increasing employment of machinery in tea houses has been regarded as significant of the permanent character of the investments made by the dealers. The truth is, that everywhere a knowledge of the advantages and disadvantages of engaging in tea cultivation are becoming fully known, and the days of wild speculation have passed away. Men undertake the work as the business of their life and steadily set themselves to the task of making themselves comfortable, while they strive to make their work remunerative. Greater skill has also been acquired in the perfecting of the growth of the plant. Pruning, manuring, and tillage are becoming scientific operations. The great difficulty now is to get native workman to understand the work, especially the work of pruning—the kind of stems and branches they are to remove; and, as Dr. King says, it will require much ingenuity and care and incessant watchfulness on the part of the manager to keep them from doing harm. As is the case with other matters, he says, it is infinitely easier to prune badly than to prune well; but there are few operations where the different results between good and bad work is more striking. In order to prune really well, each clump ought to be treated on its own merits; but as it is pretty nearly hopeless to think of getting native workmen who are capable of doing this, it would be necessary for the manager (after having clearly defined to himself what it is that he wants to effect and the best way of doing it) to give his pruners a general idea of the kind of measures suitable for each patch of tea in the garden as they come to go over it, illustrating to them practically what kind of stems and branches should be cut quite away, what kind should be merely trimmed, and what left entirely untouched. We should think that such delicate work should always be performed under the eye of the manager, and no part of it left to the discretion of his native workmen. The English farmer never trusts even English workmen to execute difficult parts of the work on an English farm. We see the master present at the manuring, sowing, and even ploughing of the fields. No one ought to engage in either farming or tea planting who is not prepared for regular work and to take the entire superintendence of all that goes on in his farm or plantation. A young man, possessed of a little capital, asked us the other day what we thought of his prospects if he embarked his capital in the purchase of a tea plantation. We answered candidly that we thought very badly of them. He had not the energy and application necessary for carrying on farming at home, so we felt sure that his undertaking plantation-work in India would only lead to utter failure. The qualities requisite to ensure success in land cultivation at home are the very qualities necessary to secure success in the same work in India.—*Deccan Herald.*

UPPER INDIA TEAS.

(To the Editor of the Delhi Gazette.)

I RECENTLY noticed, with much satisfaction, some very *apropos* observations from your own pen on the disadvantages under which the tea-planters of India (by whom as I take it, you more especially mean those gentlemen possessing or managing tea plantations in Kumaon, the Dehra Dhoon, and the Kangra valley) labour in not being effectively represented in England, and I am entirely of your opinion that it is even more serious than it appears at the present moment to be.

No doubt many of these gentlemen now find a fair, perhaps a ready market for their produce in India, but if they continue to thrive in proportion to their existing prospects and expectations, they will soon find that the supplies they are rearing are becoming greater than the local demand, and that they must submit to a fall in their prices, or look out for other and more profitable markets. That such can be found only in England is beyond a doubt.

But unless the planters take time by the forelock and at once look about them to secure not only a market at all, but a good market, they will find themselves strangely adrift when necessity will compel them to look westward for customers.

I am afraid your half-jocular half-earnest suggestion as to aid from official quarters in this country is not likely to turn out to any advantage. So careless is the Secretary of State of the commercial wants and prosperity of India, that he has actually not only ignored a strongly-manifested opinion of the House of Commons, that he ought to have some one conversant with mercantile affairs in his Council, but has preferred to take a lawyer to assist in riding to death the legislative horse of India, already so sorely overworked. The old adage of *aide toi et Dieu t'aidera*, is thoroughly applicable to the case in print. Let all the planters put their shoulders vigorously to the wheel, let them unite, make some joint movement, and look about for some house of business of good standing in London that would suit their purpose and be prepared to make, not only reasonable advances on their produce in India, but to look after it when it arrives in England, taking measures to make it thoroughly known both to the trade and to the public at large, pointing out to the planters what course they should follow to make their wares more acceptable in flavour and appearance.

These are points at present totally ignored by the two or three individual agents who do receive small consignments. All that is required of them in their opinion, is to make over the tea to the broker, prepare account sales, and draw their commission.

If those I address, through your columns, are inclined to adopt my recommendation, I feel quite assured that, commencing with small but well-selected consignments, supported by such an active Agency as I suggest, they would, within a very few years find themselves in a condition to ship not only a large proportion, but the bulk of their teas to London on highly advantageous terms, and still retain enough for Indian consumption.

The facilities offered for transporting merchandize to the seaboard are increasing every day, and I am certain that if the railway Companies found it to their interest to promote a growing export of tea, they would hasten to meet the requirements of the planters by lowering the rate of carriage to considerably less than now rules. The eastern provinces of Cachar, Sylhet, and Assam, now export their teas by millions of pounds, and there is no reason why the North-West Provinces and the Punjab should not do the same, if they will only adopt proper means.

But unity and fixity of purpose are indispensably required at least for a commencement and the establishment of one great Upper India Tea Agency in London would be attended with signal success, while the nomination of separate agencies with a variety of conflicting interests would do more harm than good. I can hardly ask you to give more than a reasonable portion of your space to matters of this kind, involving special mercantile interests, but the amount of capital at stake is very considerable, and growing every day, the prosperity of a large branch of industry is in question, and I therefore venture to ask you to say a few words in support of my proposition (an offshoot of your own) that joint action on the part of the Upper Indian tea-planters, to whom I more specially allude, would lead to highly satisfactory results. There is or was a Kangra Valley Planters' Association. If still in existence it might take action in this matter, place itself in communication with the gentlemen af Dehra Doon and Kumaon, and come to some well-defined resolution in promotion of the future well-being of all concerned.

Your article has been copied largely, and has no doubt attracted attention.

London, 5th January 1872. * * * * *

TEA CULTIVATION.

MORE pressing matter having occupied our space during the last month, we have been obliged to discontinue our *resume* of Dr. King's remarks on the pruning of tea. Our last article on the subject showed the injury the plant received from indiscriminate plucking, which causes the leaves to increase out of proportion to their means of nourishment, the stem not having increased proportionately to the number of leaves which the plucking has forced into existence. Were plucking to be discontinued for a time, the stem might recover strength to transmit sufficient sap for the support of the young leaves. This however would involve time and retard the "flushes." The planters therefore prune off the old sprays crowded with leaves too old to be made into tea, although they drain a certain quantity of sap from the stem; and thereby deprive the new shoots of the necessary amount of nourishment. Without incessant care and watchfulness on the part of the manager, ignorant workmen may do infinite damage in a garden. Each clump requires its own peculiar treatment, and the pruning necessary to produce a fine succession of healthy flushes on one set of plants would irretrievably ruin others. One plan only is applicable to all, *that old wood is to be cut away within a few inches from the root*, as this wood rarely bears good leaves, and when cut low down, fresh new shoots may spring from the root and absorb the sap formerly wasted upon the worthless broom-bearing sprays. Sometimes this may be spared to carry on the collection and transmission of the sap for the benefit of the young shoots, which will appear when the old wood is cut down. When a plant is vigorously pruned there is always a

possibility of its dying before it can recover sufficient vitality to supply the increased demands upon its strength, for this reason it is advisable to prune by degrees, and not be wholly dependent upon the new shoots. Unhealthy plants should be very tenderly dealt with, first well-manure the soil round them so as to get them into better condition, then prune them lightly and during the succeeding cold weather cut down to the root. This treatment of course supposes that there is time enough to proceed carefully with the plants; where money is an object, time must be sacrificed. Useless stems may be easily recognized by the appearance of their bark being lichen-grown and always grey-coloured, while young healthy stems are of a brownish colour and often marked with dark lines. The suckers springing from the road only exhaust the plant and should be removed. The clumps should not be too close to each other, but light and air should have free access to the centre. Pruning should be carried on when the plant is at rest, and although a time must come when it will cease to bear the fresh demands on its strength, with careful treatment plants may bear profitably for 15 or 20 years or even more; yet this does not obviate the necessity for laying down each year fresh bushes. It appears to us that the principles of good gardening are applicable to tea planting, and the same means which we use to bring our gardens to perfection—manuring, weeding, and hoeing—will have an equally beneficial effect upon tea bushes. Let once good seed be obtained, and the plan of operations detailed in Dr. King's pamphlet, though requiring watchfulness and industry, will not fail of success.—*Bengal Times.*

TEA PLANTING ON THE NEILGHERRIES, PAST AND PRESENT.

More than twenty years have elapsed since the tea plant was first introduced on these hills; and although the results hitherto obtained are small in comparison with the amount of capital and labour expended, there is little doubt but that tea planting, properly conducted, will prove a success. All our large tea districts have risen to their present degree of importance and prosperity from small beginnings. Their rise has certainly been more rapid; but they have had at the same time, greater difficulties to encounter and overcome, ere tea planting could, in any one of them be pronounced a financial success. Their greatest trial perhaps, was the rush of reckless speculation, which took place between 1863 and 1865, and ended in the hopeless break-up of many large concerns. In the year above-mentioned, Joint Stock Companies were formed for the purchase of gardens,—no matter how badly they were laid out,—at fabulous prices; and when purchased, these same gardens were worked regardless of expense. Any man was then considered competent to manage the tea estate,—no matter if he were wholly unacquainted with the business, or how questionable his antecedents might have been. Very few years sufficed to show that a share in one of these gardens was not the sure foundation of a fortune that many had believed it to be; and the gardens themselves were sold and re-sold at a considerable loss. With the exception of a few cases, in which the purchase money was exorbitant, these gardens are now paying a dividend; and, in the hands of experienced managers, are not only becoming a source of profit to the owners, but also to the revenues of the country. The greatest successes however have been achieved in private undertakings; but as the returns of these gardens are never made public, nor their dividends honoured with a place in the share lists, the real advantages to be gained from the enterprise are known only to the planters themselves. It is hardly necessary to re-capitulate here all the difficulties and turns of good and ill fortune which have befallen Assam and Cachar, from the outset of tea-planting down to the present time; but this much may be said, that districts which are now well-populated with a fair area of cultivation, were, but a few years back, wastes of grass and tangled jungle; that labour, in our acceptation of the word, was wholly wanting; the climate previous to the clearings made in the formation of tea estates, malarious in the extreme; communication of all kinds wanting; and the whole undertaking, from the ignorance of those who embarked in it, fraught with much danger.

That tea planting in India has, of late years, made rapid strides forward, is beyond all question; and it has done so not only in the quantity of tea produced, but in the quality too. A good authority writing to the *Agricultural Gazette*, states the export of the past year will, probably, not fall short of 15,000,000 lbs. against 11,000,000 lbs. in 1870, and this estimate is exclusive of all the tea produced by the districts of Kangra, Kumaon, Dehra Dhoon, and the Neilgherries. Further on the same author states that the total export from India in 1862, amounted to only 2,000,000 lbs., so that within 10 years the production of tea has multiplied almost ten-fold. The demand however has in no way abated, for good fine teas find a ready sale in any quantity, both in London and Calcutta, and many years must yet elapse before the supply is likely to be in excess of the demand.

The discovery of the indigenous plant in India, seems to be due (*cide* letter in *A. G.*, Dec. 21st), to the traveller Moorcroft, and not, as has been generally stated, to Mr. Bruce. To the latter however is due the credit of having first subjected it to cultivation. The China plant seems to have been introduced very soon after; and at the present time hybrids of every type are to be seen in all the gardens of India. Experience however has shown that wherever a suitable soil and climate can be found, the indigenous variety is that which best pays the cultivator, and that when that fails, the better class of hybrids can, from the hardiness imbibed from the China plant, be grown with the greatest chance of success. The cultivation of the China plant, except at extreme elevations, has almost become a thing of the past. Up to the present time the indigenous plant has only been found in its wild state in Assam, Cachar, Munnipoor, Nepal, and the hill tracts of Chittegong. With regard to Cachar, an author states that it is only found in Southern Cachar, and never on the northern side of the river Baruk.

In the North-West Provinces, tea was started under somewhat better auspices; but the results up to the present time, owing to the severity of the climate, the class of tea planted, and gross mismanagement at the outset, have been less satisfactory than in Eastern Bengal. Government gardens were established under the superintendence of Dr. Jameson and shortly after their establishment, Mr. Robert Fortune appeared on the scene with fresh supplies of seed from both the black and green tea districts of China, and a gang of trained Chinese coolies. The district first selected as a field for experiment was the Kangra Valley, and tea planting is still carried on there with considerable success. All the good land however may be said to have been taken up long ago, and an outsider at the present time, would stand a poor chance. Excepting on the score of cheap labour, the Neilgherries hold out a far greater inducement to the intending planter; the soil being richer, the climate less severe, (and consequently more suited to the cultivation of the better kinds of tea), and the rainfall, if not greater in quantity, more evenly distributed throughout the year. From Kangra the Government experiments were extended to the neighbouring district of Kumaon, and a few years after their establishment, liberal supplies of seed raised from the imported plants, were distributed to planters gratuitously. In fact, Government sought strenuously to encourage tea planting and induce settlement in both of these districts; and though their efforts were in some cases misdirected, and the advice given by their Superintendent hardly of a kind that would go down in the present day, much good was done, and tea planting established on a pretty firm footing in these districts. Had the Government of Madras imported from Assam moderate quantities of indigenous and good hybrid tea seed, the enterprise would have been ere this on a much better footing. The pioneers here were none of them tea planters, and having no connection with the Bengal side, did not know how to get good seed, and those who did try, through sending to the wrong quarter, received mere rubbish. Having been bitten once, and in many cases lost some thousands of rupees needlessly, they preferred naturally to get on as well as they could with the article they found at their doors, the result of which has been that there is hardly a garden on the Neilgherries in which a good class of plant is exclusively cultivated. Considering the rapid rate at which tea cultivation is extending, it is not yet too late for Government to take steps in the matter.

The Government gardens in Kangra and Kumaon, can hardly be said to have been a success from a financial point of view; and some six or seven years ago they were sold to private individuals for trifling sums.

It is asserted that there are some gardens in Kumaon, which under high cultivation and scientific pruning, yield their 300 lbs. and upwards per acre per annum. This assertion, though must, until properly authenticated, be taken *cum grano salis*, as the plants are mostly of the China variety, and from the elevation at which they are grown, subject to protracted winters, and in many cases, severe frost and snow. Labour in Kumaon is cheap and plentiful, but this district too holds out but small inducement to a settler, having in addition to the above disadvantages, a more serious one, viz., the distance which the tea has to travel (part of the way on men's backs) before it can reach a market. Trade may hereafter be opened up with Central Asia, but in this case, some different system of manufacture must be discovered, by which tea calculated to suit the Tartar palate can be turned out.

In all the hill districts large gardens (300 acres and upwards) are the exceptions, and not the rule. They are mostly owned by men of moderate capital, who either work their own property, or leave it in the hands of a manager on a moderate salary, allowing him to purchase, or giving him some share in the profits of the estate. This principle is undoubtedly a good one, and with many men the inducement which it holds out to them to work goes a long way. When this system is not acted upon, the manager knows that his salary will come to him whether he works or not, and his time therefore is devoted to the superintendence of the estate from an easy chair in the verandah, and writing reports on things which he has not seen, and for which he is indebted solely to a fertile imagination. Of all classes of managers, this is the

worst, for so long as he does nothing, the writers, maistries, and coolies will strive hard to emulate his example, and the ruin of the estate becomes a mere matter of time.

On the whole, Eastern Bengal is the best district for a man of large capital, or for the man of strong constitution, who is willing to work hard on a good salary, and entertain a hope in time of being given or of purchasing a share in the concern which he superintends. To a man of limited capital, who wishes to work his own property, and live in a healthy climate, the hills are best suited.

In point of general advantages the Neilgherries seem to be a happy medium, possessing a climate equal, if not superior, to that of the Himalayas. They are capable of producing at suitable elevations, a yield little short of the average of the best districts of Eastern Bengal: labour is to be had in fair quantity, and at moderate rates, while from the nature of the climate, and the comparatively slow growth of weeds, &c., a smaller staff, in proportion to the area of the estate, will suffice. The rainfall seldom fails to any injurious extent, and when this does happen, the loss extends merely over a month or so, and not over the whole season, as in the case of coffee or any other plant cultivated for the sake of its fruit. All parts of the hills are accessible by a network of good roads, and means of carriage are cheap and abundant. But before going further on with this subject, it will be better to take a short retrospect of the past, to show how the earlier experiments in tea cultivation fell short of the ideas entertained of them, and how these errors of the earlier stages of tea cultivation not only may, but in many cases have been rectified. We think it an undoubted fact, that for the last two or three years, each succeeding year has seen on these hills some hundred additional acres brought under tea cultivation, and that if those interested do not relax their efforts, and the Government render what assistance they can, the Neilgherries will, ere a couple more are out, hold no dishonorable position among the tea-producing districts of India. We may safely say, that whereas in the year of the Neilgherry Agricultural Exhibition (1869), not 500 lbs. of Neilgherry tea found its way into the Home Market, the export of the present year will not fall far short of some 75,000 lbs.; and this out-turn may be expected to almost double itself every year for some time to come.

We learn from Colonel Nassau Lees' work on tea cultivation in India, that the first consignment of China seed sent to this country was that despatched by Mr. Gordon, in 1836. He remarks that:-

"In both his missions, Mr. Gordon sent round to Calcutta several "casks of seeds, some plants, and eight or ten Chinamen. From "this seed about 12,000 plants were reared, which were distributed "as follows:—

"Madras Presidency	2,000
"Assam	20,000
"North-Western Provinces	20,000

"* * * * * * The plants sent to Madras "for distribution were planted at Coorg, Mysore, the Neilgherry "Hills, and in the Horticultural Society's gardens in Madras. "Six months after they arrived, (22nd August 1836), the Chief "Secretary reported to the Supreme Government, that the experi- "ment had completely failed, and with the exception of a few "plants on the Neilgherry Hills and in the Nugger country, the "rest had withered away."

Col. Lees states further on: -"It must not be concluded from "this that no part of the South of India will grow tea, as from "the unavoidable ignorance of those entrusted with these early "experiments, no other results could have been anticipated."

It appears however from statements made further on in the work above quoted, that the seedlings sent at this time to Assam and the North-West Provinces fared with little better success, and that the first successful attempt at the introduction of China seed to India was made by Mr. Robert Fortune, some years later.

As far as these hills are concerned, tea planting, as a speculation, was first attempted by Captain Mann and Major Rae, in 1859. The seed from which their plants were raised was of the China variety, and in Captain Mann's case, obtained, we believe, direct from China. In consideration of their being the pioneers of tea cultivation in this Presidency, Government gave them a free grant of land, and later on in 1862, when their estates came into bearing, sent down four Chinamen from the North-West Provinces, to instruct their coolies in the manipulation and drying of the leaf. The knowledge brought to bear upon the subject by these individuals appears to have been of little use, as their mode of preparation was not only found to be more costly, but also, we believe, to turn out tea of an inferior class to that which the proprietors had, without the assistance of the Chinamen, previously manufactured.

The real facts of the case are, that the sole information relative to the manufacture of tea in the earlier days of its cultivation on the Neilgherries, was gathered from descriptive accounts written by Chinese travellers, or from the pamphlet written by Dr. Jameson on the Kangra and Kumaon gardens, which were under his superintendence. Every work which contained any information on the subject of tea cultivation in China or Java, was at a premium; and as the opinions expressed by the majority of these authors was at variance one with the other, there must have been some little difficulty in following out all the instructions given.

Dr. Jameson's treatise was based on his own experiments, carried out with the aid of a few imported Chinese labourers, and might be termed in our opinion, but a second-hand and stale edition of the systems advocated by previous authors. The advice given in this report would badly meet with the approval of the experienced planter of the present day. Mr. Fortune seems to have had a slight skirmish with Dr. Jameson on the systems of cultivation and manufacture in vogue in the Government gardens, and Col. Lees in his work, sides somewhat partially with the latter gentleman. He remarks, "Though not a "practical tea-planter, Mr. Fortune was a respectable botanist, a "fair agriculturist, and I believe an excellent horticulturist. He "had visited the finest tea districts of China, and was fully com- "petent to express an opinion on the suitability of the soil and "localities selected in the Himalayas, and the health and vigour "of the plants, as compared with those which he saw in China. "* * * * That Mr. Fortune had no practical experience of "tea cultivation and tea manufacture, was well-known."

The former portion of these remarks seems to damn with very faint praise one of the ablest horticulturists of the present day; the latter to lead us to believe that he travelled in China with his eyes shut. For our own part, we have not the slightest doubt but that he was better acquainted with the subject in question than Dr. Jameson, and that had his recommendations been carried out, the Government gardens would have benefited thereby. We doubt much if there is a single planter in the North-West Provinces, who will not declare that the system of cultivation practised in the Government gardens was not a tissure of blunders, and that it was left to private enterprise to undo the errors which the Government Superintendent had led planters into, and that they had to pay somewhat heavily for the privilege of doing so.

As for the Chinese manipulators, who, in these days were considered a *sine qua non*, we are all aware that the Chinese are not a progressive race, that, as Mr. Fortune remarks of them, "The Chinese farmer is not a chemist; he knows little or nothing "of vegetable physiology; but his forefathers have hit accidental- "ly upon certain systems, which are found in practice to succeed, "and to these he himself adheres, and hands them down to his "children." And these remarks are equally applicable to the native of India. He considers that what was good enough for his fathers, is good enough for him; that as they lived so may he; and that any effort on his part to raise himself in the social scale is not merely a mistake, but almost an insult to their memory. And, closely allied to this impression, is the idea that those who try to raise him, have no humane object in so doing, but merely serve their own interests.

In China, a country teeming with population, and where labour and the necessaries of life can be obtained for an almost nominal cost,—little inducement is held out to the peasant to improve himself. The system of tea cultivation differs entirely. Instead of gardens extending as in India over from 200 to 500 acres of cultivated land, there are small holdings of a few acres, each worked by the proprietor's own hands,—a system of land tenure analogous to that prevalent in many parts of Ireland at the present day. In India, a single estate may send Home half-yearly a break of about 600 full chests (of 82 lbs.); in China as many hundred "estates" as chests would be necessary to meet the demand. There, the tea passes through the hands of some half-dozen middlemen, each of whom has to make a profit on the article, and adulterates it if he has the opportunity. Here, it goes direct into the market.

In this country, the labour difficulty is undoubtedly a drawback; but a remedy has in a great measure been found, viz, in the adaptation of machinery for the preparation of the leaf, in the improvement of the implements employed in the cultivation, and last but not least, the impossibility of adulteration before the tea reaches its market. These advantages throw a great weight into the scale, and added to these, the superior strength and more delicate flavour (the latter especially in the the case of hill teas), account for the high prices which they fetch in the London market, and the increased demand which arises year by year for Indian teas of fine descriptions. We believe the time is not far distant when Indian tea will be drunk throughout Great Britain to the exclusion of the China article; and we cannot fail to recognise how great an advantage would be gained thereby, not only by the consumers, but also by the addition that would be made to the revenue of the country.

The errors and mistakes made by the pioneers of tea cultivation have been remedied at a great sacrifice to those concerned in the enterprise; and planters in Southern India have, as a rule, availed themselves late in the day of the experience gained in other districts. Better late than never though, and we believe a successful future lies before them.

The first real onward movement, in the matter of tea cultivation commenced about the years 1805 and 1806, when several estates were opened out at Kodanaad, and one or two smaller ones at Coonoor. Seed was imported from Bengal, and though in many cases as we have before stated, heavy losses were sustained by those concerned through the importation of damaged seed, the owners of these estates, nothing daunted, kept on; and it is probably owing to their energy, pluck, and perseverance, that tea planting on the Neilgherries bids fair to be an undoubted success.

These pioneers had not as in other districts, large supplies of seed distributed gratuitously by Government to fall back on. They had not grants of land, procurable at the upset price of two rupees and-a-half per acre, the period for payment prescribed,—extending over 10 years from the date of purchase, and their land free of assessment for ever; but they had at the very outset, to import seed from Bengal at a great risk, to pay as much for their land here in the first instance, as they would have had to pay in Bengal; and during the first three or four years of their occupancy, when they were spending money without getting any return, to pay an annual assessment of two rupees per acre for forest land, and one rupee per acre for grass land, in perpetuity. In purchasing the site for an estate, the purchaser has not only to consider how much land he requires for actual cultivation, but has also to ensure a sufficient supply of wood suited for building purposes, making boxes and fuel in addition to a certain area of land required for grazing purposes. On every acre of this land a heavy assessment had to be paid annually, and it is only within the last year that the Government have seen fit to remove this heavy burden, and to allow the planters to hold their land free of assessment for the first five years of their tenure.—*South of India Observer.*

COFFEE.

COFFEE CROP.

We are sorry to learn that, as anticipated, the coffee crop in Munzerabad and Coorg, for the season just closing,is considerably below the average, and to add to the troubles of planters, the leaf rot is making its appearance in Munzerabad, though we trust to no great extent. It is feared that if the disease should spread at this season of the year, it may materially affect the blossom on the setting in of the wet season, and the natural consequence will be little or no crop next year. Truly the coffee planter has hard times of it.—*Bangalore Herald.*

LEAF DISEASE.

A planting friend sent us the other day some leaves from the "Dimboola forest" clearly affected with disease, which we submitted to the Director of the Peradenia Gardens for his opinion. Mr. Thwaites favours us with the following:—"The white spotted leaves exhibit the attacks of a leaf-mining insect—a very minute fly which feeds between the upper and under cuticles of the leaf. The spots upon the mangoe leaves are caused by a common epiphyllous lichen; and are not at all alarming. The third kind of leaf has also been attacked by one of the insect leaf-miners of excessive minuteness, which in its progress, while feeding under the cuticle of the leaf has caused the beautiful spiral arrangement seen in the individual spots. I have not yet detected the coffee leaf fungus upon any leaves but those of the coffee, although specimens of leaves from a number of various plants have been sent to me lately."—*Ceylon Observer.*

COFFEE LEAF DISEASE IN WYNAAD.

We are aware that many estates in Wynaad have suffered from the leaf disease; in fact, we believe, that very few are entirely free from it. It is a disease to which all plants are liable: and we have the authority of a learned gentleman, who has paid much attention, not only to botany generally, but to the coffee tree in particular, and has, before now, been chosen by Government to report on cultivation in India, for stating that it is unlikely to do any damage to the trees. Practical planters also, who sometimes (too seldom we are sorry to say) favour us with their views, assert that though some temporary loss of wood, and perhaps even a diminution of next year's crop may ensue, the tree themselves will not suffer a bit more from this disease than they would from a rather heavy pruning. A few young estates, where it has been worst, may have the *shape* of the "rusty" trees spoilt; but on the other hand, many places that have had it mildly, will not suffer at all. Practical men are quite content to wait till the effects of the leaf disease, or any other ailment to which coffee, like all other plants is liable, have passed away secure. that in the long run steady cultivation conducted liberally, though not wastefully, will bring in a good return. They do not expect bumper crops every year,nor do they consider their properties as ruined, if for one year the produce hardly covers the expenditure. —*South of India Observer.*

COFFEE IN EXCELSIS.

When any article is in particularly good demand, and when people are not certain what its price may eventually be, or how much of it may be forthcoming, there is generally a rush to all kinds of substitutes or inferior qualities or shams, with which to supplement the short supply. Coffee is in no way an exception to this rule, and thus it has happened that since the 1st October last, not less than ten thousand cwts. of triage, brown and black coffee, have been shipped to Europe as native coffee, or about one-sixth of the entire exports of that quality. All this has sold readily, and at prices highly remunerative to the shippers. Against this proceeding there is not a word to be said; on the contrary we have always urged Colombo merchants to export these descriptions whenever their proceeds will cover cost and charges, as by so doing, they remove from the native dealer the means of "blending" his parcels of native coffee. Deprived of so large an amount of mixings as the above, the Moorish and other dealers are now resorting to another material, or rather they are extending their use of an adulterant previously much less extensively employed, we allude to those peculiarly coloured stones met with in nearly all parcels of parchment and native coffee, pieces of quartzy gravel, about the size of peas. These having been sifted from the coffee in merchants' stores have been thrown aside in heaps, until in some large premises, tons of them may be seen piled up. For some time past a regular trade has sprung up in these coffee stones, storekeepers thinking themselves fortunate in obtaining 6d. per cwt. for them. In one case a Moorman applied to the proprietor of a certain curing establishment—say for instance the Wattiepoll Mills, offering 6d. a cwt. for all the coffee refuse, but in vain; finding the sturdy proprietor resolute, the small-capped trader advanced his terms, but was exceedingly mortified to find that not only was his tempting offer of 9d. a cwt. rejected, but he was further told that his object was perfectly well-understood, and that he would not be allowed to carry on his nefarious trade through that establishment, on which the Mahomedan dealer departed, evidently much hurt in his feelings, if one can fancy a Mussalman's feelings capable of feeling hurt. We state these few plain facts, in the hope of putting others on their guard as to these stone bargains.—*Ceylon Times.*

REFUSE COFFEE.

An Ouvah planter writes:—"Should it be any information to you, and worth a paragraph in your paper, you may mention that I have to-day sold at my store, a quantity of rice coffee, the produce of tails, refuse parchment, pounded and cleaned, at 22 1 per bushel—2½ bushels making 1 cwt.! If my brother planters would occasionally record the price of coffee, rice, rates of cart hire prevailing in their immediate neighbourhood, &c., it would be of great service to many."—We have already alluded to the greatly increasing business in refuse-coffee:—the purchase of trash in Colombo to be sent by rail to Kandy to be mixed up with lots of garden parchment and sold once again to the merchant as good coffee. The practice has so largely extended that a high Railway Official has been heard to say the traffic in so-called coffee up would soon equal that of coffee down! The temptation to utilise refuse-coffee during the present season of short crops and high prices is especially strong, and we fear there is little prospect of exporters uniting to get rid of their refuse in a way that would prevent it being brought again into circulation. Some time ago, we believe the experiment was made of shipping a quantity to Mauritius where, of course, it would only be taken for what it was worth in a consuming market, but we do not know if the result was satisfactory. It is quite clear however that if the present process is to go on, the Planters' Association and Chamber of Commerce will have to look nearer home for a system of adulteration which may require repression equally with that carried on in the United Kingdom. If coffee-dealers in Ceylon cheat each other with impunity, and everybody concerned winks at certain practices, how can we criticise the British grocer when he exposes for sale 90 per cent. of chicory and 10 of coffee, as "a mixture of coffee and chicory?"—*Ceylon Observer.*

ENEMIES OF THE COFFEE-TREE.

(From the Ceylon Observer.)

We have been favoured with a copy of the *Gardener's Chronicle* in which the following contribution of interest to Ceylon Planters, appears:—

"We have recently received from our excellent friend, Mr Thwaites, a specimen of a minute fungus which has caused some consternation amongst the coffee-planters in Ceylon, in consequence of the rapid progress it seems to be making among the coffee-plants. A few trees were noticed to be infected in May last, and at the same time of Mr. Thwaites' communication (July 24) two or three acres were showing the fungus upon the leaves. These latter fall off before their proper time, and fears are entertained as to the effect on the amount of the crop.

"The most curious circumstance is, that amongst more than a

thousand species of fungi, received from Ceylon, this does not occur; and that it is not only quite new, but with difficulty referable to any recognised section of fungi. Indeed it seems just intermediate between true mould and Uredos, allied on the one hand to Trichobasis and on the other to Rhinotrichum. Though the fungus is developed from the parenchym of the leaf there is not any covering to the little heaps such as is so obvious in Uredo and its immediate allies, while the mode of attachment reminds one of Rhinotrichum. We are obliged therefore to propose a new genus for its reception.

"As the fungus is confined to the under-surface of the leaves, and the mycelium is not superficial, it may be difficult to apply a remedy; but we should be inclined to try sulphur by means of one of the instruments which are used in the Hop grounds in Kent, or syringing with one of the sulphurous solutions which have been recommended for the extirpation of the Hop mildew. *M. J. B.*" [Rev. M. J. Berkeley.—Ed. C. O.]

THE FERTILITY OF SOILS.

(*Queenslander.*)

In a recent letter to the New York Farmer's Club, Professor S. W. Johnson, of Yale College, says:—"The labours of chemists to discover positively all the causes of the fertility of soils, have not yet met with conclusive success. The mechanical structure of soil is of primary importance. Naked rock grows lichen: the same rock crushed into coarse grains grows a much higher order of vegetable; pulverised fine, the cereals grow in it. Geology, chemistry, botany, physiology, meteorology, mechanics, hydrodynamics, heat, light, and electricity are all intimately combined in the grand process of vegetation. There are sandy soils in our Eastern States which, without manure, yield meagre crops of rye and buckwheat: but there are sandy soils in Ohio which, without manure, yield on an average eighty bushels of Indian corn an acre, and have yielded it for twenty to fifty years in unbroken succession, the ingredients of these soils being, by chemical analysis, the same. At present no difference is known between them, except the courseness of the particles—the first being coarse, while the Ohio sand is an exceedingly fine powder. The power of soils to attract and imbibe moisture and oxygen, was well shown by Schubler of Hoffen, forty years ago. Of thirteen different soils, quartz sand absorbed in thirty days 1·1000 parts of oxygen and no moisture, while humus absorbed thirteen of oxygen and 120 of moisture."

Surface water that flows off the land instead of passing through the soil, carries with it whatever fertilizing matter it may contain, and abstracts some from the earth. If it pass down through the soil into drains this waste is arrested.

The principles above enunciated exemplify the difficulties of coffee-planting. We cannot plough and harrow the soil so as to pulverize it and expose it to the action of the atmosphere, nor can we build sunk drains to receive water filtered of its fertilizing materials by the earth. But by means of manure and water holes, and forks to puncture the earth, we can do a good deal to bring inert soil into action.—Ed. C. O.]

COFFEE CULTIVATION IN INDIA.

The cultivation of coffee in some parts of India has ever been beset with difficulties, and it may be said that it is a wonder it has been nevertheless carried on to a great extent in those parts. The planters, besides the disadvantages incidental to extensive cultivation of coffee, have had for some time to wage war with the borer, that pest which threatened to ruin permanently many estates in Coorg and other districts. They have now the coffee-leaf disease to contend with, and this promises to become a formidable enemy against the cultivation of coffee in India. The cause of this disease appears to be as yet undiscovered, although various theories have been put forth by planters regarding it. Some ascribe the appearance of the fungus on the coffee leaves to hot weather, but it has been found that in places where much rain had fallen, the coffee plants have not been free from it. A Mofussil contemporary makes the following observations, which would afford to our readers some idea of the nature of the disease. "One planter has suggested that it is caused by the extensive use of artificial manure and especially by *bone dust*: the fields manured with this having caught it first and suffered most, part of the estate did not suffer at all. In flat opposition to this theory another writer says that estates which have never had any manure applied to them have suffered severely. Manuring *per se* could never originate the disease, though it might be introduced through the medium of manure. The disease is said to be a well-marked fungus and not a mere degeneration of the tissues of the coffee-tree. It is an independent growth, deriving its sustenance from the juices of the coffee-tree. It is widely propagated by means of its spores which are light enough to be carried long distances by the wind. From this it is difficult to suggest any remedy for stopping the pest. As the spores are fed upon by the larvæ of a species of fly, it is thought that it may tend to destroy the spores as fast as they are produced. Nothing is known of the way in which the coffee was first infested, but it is supposed that it affected some of the indigenous plants, and thence found its way into the cultivated coffee." Some of those who have examined the coffee-leaves affected with the disease declared it as their opinion that it is a true fungoid growth. The report of Mr. Cochrane on the subject will be read with interest:—"Associated with Dr. Muter of the South London School of Chemistry and Pharmacy, I examined the leaves by his fine microscope, first with a low (¼ inch) power. The blight resembled a crystaline deposit on parts of the surface. A higher power displayed a dense mass of fungoid growths, having a yellowish, greenish hue. I afterwards scraped off a portion of the blight on a glass slide, moistened it with a drop of distilled water, covered it with a thin glass dish and subjected the object to the ⅛ inch power, the highest in practical use. The appearance presented was that of kidney-shaped cells having serrated edge of a greenish, yellowish hue. At the first examination, Dr. Muter suggested that this blight might be pollen wafted from some parasitic plant, and adhering to the coffee-leaves had undergone fermentation on them. After discussing the subject thoroughly, we agreed that from whatever source derived, the blight was a true fungoid growth. It might be well to ascertain therefore whether or not there is any extensive waste land adjoining the coffee plantations producing weeds having a greenish yellowish flower; to watch what wind was likely to carry the pollen in the direction of the coffee-plants: then to interpose a barrier of bamboo, cocoanut, or other coppice so as to interrupt the flight of the minute organisms, if the waste land cannot be reclaimed." The freedom from the blight of the coffee-plants in Travancore and Native Cochin is a matter of congratulation to those who have invested their capital in coffee planting, and to those who intend to open out other estates, in these States. The opinion entertained by Dr. Muter, and, as far as we can see, by Mr. Cochrane as well, that the disease might be caused by pollen wafted from some parasitic plants, would appear to receive confirmation by the state of things in Travancore and Cochin. In these provinces, the coffee estates have no contiguous waste lands, and they are surrounded by larger vegetation such as to interpose the "flight of minute organisms" if there be any, from parasitic plants. And hitherto, as we have said, the cultivation of coffee in Travancore and Cochin has been unattended with the coffee-leaf-disease difficulty. Whatever may be the cause of the blight, we fully expect that it will not appear in Travancore and Cochin, unless perhaps, when coffee cultivation becomes very extensive and the surrounding larger vegetation are cut down. In the district of Wynaad, we may add, the disease does not seem to have attacked many plants; in fact, from intelligence we have received, we infer that it has not made its appearance there.

COFFEE ESTATES IN SOUTHERN INDIA.

Many of our readers being interested in coffee-planting, it may perhaps be acceptable to them if we pass under brief review, from time to time, the present circumstances and prospects of the chief growing districts in the South of India: we may begin with the Coorg districts.

The coffee estates in Coorg may be classified in three groups: the Mercara plateau, the Ghat, and the Bamboo estates. Each group has its peculiar characteristics, advantages, and disadvantages. The Mercara plateau on an average elevation of 3,500, and in its planted higher portions rising to upwards of 4,000 feet, enjoys a bracing climate, being equally exposed to the sweeping monsoon rains and to the dry east winds. With an average rain-fall of 121 inches, extended over almost the whole year, the moisture is ample. The granitic soil consists generally of a red felsparic clay, more or less mixed with gritry ferruginous stones, and covered with a layer of humus. The lay of the land being steep, it is evident that unless cultivation is carried on with due precaution against the "wash" of the surface soil, by terracing, draining, or a judicious system of weeding, the trees will in a few years be deprived of the coolest and most nourishing portion of the soil, and the land become sterile. Artificial shade is not required. Sheltered hill sides and gently sloping valleys are here covered with the most luxuriant and productive trees. The last crop proved a most satisfactory one, except where an estate had borne heavily in the previous year. Such a periodical ebbing is however in the nature of things. From the general appearance of the trees after crop, the prospects for the coming season are again, we understand, very fair. Some of the finest estates in this group are the Abbial, Haleri, Beltimullay, Glenmore, and those belonging to the Coorg Coffee Company.

The Ghat estates extend over both sides of the Sumpaji valley on the road to Mangalore, and on the Perambady Ghat beyond Verajapet, on the eastern and western declivities of the range of the Western Ghats. This group of estates being originally covered with primeval forest, possessed a spendid soil for cultivation, its fertility being heightened by a heavier fall of rain, and by an invariable condition of atmospheric humidity. The extensive felling of forest however, combined with a probably faulty system

of cultivation,—planters vying with each other in *mamoty* weeding to show a clean surface—the best portions of the soil of the steeper plantations seem to have been washed away, leaving the exposed roots without nourishment, and during successive seasons of drought these fell an easy prey to the borer. Besides this well-known enemy to coffee, the bug, the leaf-rot, and now the leaf disease, have severely affected some of these estates; but still there are many plantations in this group, which favoured by natural conditions and judicious management unmistakeably prove, by their present yield, the high capabilities of this range of land. The leaf disease has made sad havoc, we hear, especially on the Parambady Ghat, where several estates present a most desolate aspect, the trees being not only devoid of leaves, but many of them actually dead and dry.

The Bamboo district which comprises the third group of estates lies between the river Cavary and the Mercara trunk road to Verajapet, and thence to Attur Tittymutti. Its elevation varies from 3,000 to 3,300 ft. Its annual rain-fall amounts to about 65 inches. The nature of the land generally presents undulating slopes, and but few steep hills; the soil is of the richest kind, as the humus from an exuberant vegetation which annually decays or is consumed by jungle fires, has accumulated for ages without being disturbed by heavy floods. The rain-fall is gentle and seasonable, and the growth of coffee throughout the district most luxuriant and productive. In fact, if anywhere in Coorg, the Bamboo district is the very habitat of the coffee-tree, and had it not been for borer-pest, which committed its most destructive ravages here, the Bamboo estates would have secured the first rank in Coorg from the very beginning. The borer is however no longer the dreaded enemy to the insidious ravages of which the planter has helplessly to resign himself. Its destructive progress has not only greatly subsided, but experience has taught the planters by vigorous and timely measures to keep it down to a minimum. On these estates artificial shade is deemed necessary; the local varieties of the fig-tree, with jack, toon, and uttari, seem to answer best. Foremost of all the plantations in the Bamboo, and perhaps in the whole of Coorg, is the Pallay-Betta estate under the able management of the joint proprietor, Mr. H. Minchin. The next place is due to the Nellagotta and Catherine estates. The productiveness of these estates, and especially that of the first-named is extraordinary; a crop of 250 tons is expected we hear from an area of about 400 acres in bearing. One small portion of the estate, of about fifteen acres, looks like the ideal of perfection in a coffee-plantation. The lay of the land is a gentle slope, the soil a deep brown mould, the trees faultless in regular growth, and nearly six feet in height, though only two years old, the rows of trees in exact geometrical lines, at equal distances, so as to preserve, wherever one looks, the utmost precision. But the most satisfactory result is, as stated by Mr. Minchin, that this small portion of two years' old coffee, repays with the first crop the total outlay on it from the commencement, a fact perhaps never yet realized in coffee cultivation! Some of the oldest of the trees have given, we are told, fully a ton of coffee per acre. Fears are justly entertained that such an excessive productiveness cannot last, that the trees must kill themselves by overbearing. Left to themselves, this prognostication might be true enough, but where the trees are properly treated by a system of high cultivation, a steady annual crop of a high figure may, we should think with favourable seasons, be confidently expected.

The season of the past year, though by an excessive rain-fall injurious to the Ghat estates proved, by the early showers in January, March, April, and May, and by the long-continued gentle monsoon weather, and the latter rains in October and November, most welcome to the planters in the Bamboo district and on the Mercara plateau, where the amount of new-bearing wood in the trees holds out the prospect of a promising crop for the ensuing year. The total rain-fall in Mercara from 1st January to 31st December 1871, amounted to 130·08 inches, or 22 inches over that of 1870, and 9 inches over the average rain-fall in that station; and it is hoped that with the past year Coorg, at all events, has entered upon a series of seasons, more favourable to the cultivation of crop than heretofore.—*Indian Statesman.*

COFFEE PROSPECTS IN COORG.

REFERRING to the above article which appeared some time before in the *Indian Statesman*, a correspondent of the *Madras Mail* writes:—

"I think it would have been more to the point, if the brief review of the prospects of coffee-planting and coffee-planters' crop in Coorg, with which your contemporary indulges the public, had been put off till after crop. Estimates are not always realized, and they are, if published, and not afterwards as publicly compared with the crop really harvested, calculated to do harm. I have been a coffee-planter in Coorg for some ten or eleven years, and I believe I am justified in saying that the prospects of coffee-planters in Coorg, on the whole, are worse now than they have ever been before."

THE PRODUCTION OF BRITISH INDIA COFFEE.

ONE of the greatest articles of consumption by the British public is coffee. During the past year the quantities imported amounted to no less than 180,000,000 lbs., valued at 4,943,000*l.* sterling. The chief coffee-planting country in the world*—namely, Ceylon—sent us 98,000,000 lbs.; the Brazils and Central America, where the berry is of comparatively recent growth, 28,000,000 lbs.; our Indian Empire contributed 19,523,000 lbs.; nearly the whole of this quantity being produced in the Mysore districts of the Madras Presidency. Compared with any former period—twenty years ago—the contrast in the whole of the imports of Great Britain seems marvellous. As an article of re-export, coffee stands out prominently in the transit account—no less than 144,821,000 lbs.—the Germans, the French, and the Dutch being even larger coffee-drinkers than ourselves. The croakers about unwholesome condiments seem to possess some grounds to rest their complaints upon, for with all its recommendatory qualities—and they are not a few—the consumption has fallen from 1¼ lbs. per head in 1860, to less than 1 lb. per head of the population in 1870. For such a decline there must exist some cause deserving the attention of coffee-roasters and retailers; and this is still more apparent when we compare the results of the consumption in the other articles of cocoa, tea, and sugar, which have vastly increased. Whilst our West Indian possessions have actually declined in their production, British India has advanced rapidly. The exports of Indian coffee shew this: they were, in 1850-51, 7,257,421 lbs.; and in 1860-61, 19,119,209 lbs.; and in 1870 our share alone was 19,523,000 lbs.

The success of the coffee-planting has given an example to other parts of India, and the plant, originally taken from the Babooden Muth, is now extending over Coorg, the Wynaad district, the Neilgherry Hills, and along the Western Ghauts, north and south. The plantations in Mysore number 21,538, and cover 107,971 acres; 263 belong to Europeans, the remainder to natives, the average size of the former being 121 acres, of the latter 3½ acres per garden.

The average produce per acre of the best coffee districts is however probable not half that of Ceylon; these districts are confined to the region of the Western Ghauts and the Babooden Hills. Some attempts have been made to cultivate coffee in the open country, but without success; it seems to require forest land and considerable elevation and moisture. The Ceylon planters who have undertaken the cultivation for the Indian proprietors, into whose employ they have entered, are said to have been greatly misled by their former experience. They were induced to follow the system of Ceylon where, in many districts, rain-falls more or less during eight months out of the twelve, and where there is scarcely a month without some moisture, but in India the climate is exactly the reverse. Taught by what was an ample and sufficient experience in a moist climate, those who had shade to preserve their coffee in the long dry months cut it down as fast as possible, and numerous plantations were found where not a tree was left standing. The consequence was enormous loss, which took many years to recover. The proper plan appears to be, to allow a secondary growth of forest trees to spring up, and to supplement such by planting trees most suitable for coffee shade. The advantages derived from growing coffee in the shelter of the original forest are numerous. From the greatest part of the land being only cleared at first from underwood, and from the fact of that being burnt in heaps, a large proportion of the soil remains uninjured by fire, and the valuable surface of the mould is entirely preserved. The forest trees afford shelter to innumerable birds which are of incalculable service as insect-eaters. Then the planter, with his shade, if he does not altogether laugh at dry seasons, in a great measure neutralises their influence by preventing the sun and the wind from drying up the soil and parching the plant. He and his people can work away all day and seldom feel the fierce rays of the tropical sun, which consideration alone is of immense value to an estate.

In appearance a full-grown coffee-tree very closely resembles a Portugal laurel which has sprung up rather tall and slim. At the distance of many yards it would be difficult to tell one shrub from another; but the growth of the coffee-trees is more regular than that of the laurel. The branches spring in opposite pairs from the stem, and each pair shoot out at right-angles to the pair above and the pair below; thus supposing that the pair below shoot out north and south, the pair above will grow east and west, and so on alternately. The distance for planting should be regulated in accordance with the soil, aspect, and climate; in some instances a tree may be grown that requires 6 feet by 6 feet, and it may also happen that even 4½ feet by 5½ feet may be too far apart. If allowed to grow to its natural height the coffee-tree will commonly be found to measure from 12 feet to 15 feet, and trees of that size may often be seen near the houses of the farmers. But the European planter reduces his shrubs to, at the most, 4½ feet, and sometimes as little as 3 feet; and in windy and exposed situations 2½ feet have often been adopted as the best height. After a tree has been topped, it soon throws out shoost

* A curious slip for "the Grocer," Brazil produces five times as much coffee as Ceylon does. What the writer meant was that Ceylon produced the larger quantity of coffee imported into Britain.—Ed. C. O.

all over the stem branches, and the early removal of the shoots on the stem and the thinning of those on the branches require immediate attention. If the tree be not carefully kept in order at the outset, the difficulty of getting it into form will be very great, as all neglected trees present an impenetrable mass of twisted branches which are a puzzle to the pruner; and where the tree has been long neglected, the lower branches die off altogether, leaving a sort of matted umbrella at the top of the tree. The crop will be ready to gather from October to January, when the ripe berries should be carefully picked from the trees by hand every morning, and dried in the shade—the sun being apt to make them too brittle. They must be carefully turned to prevent fermentation, and when sufficiently dry the husks must be removed and the clean coffee separated from the broken berries. After being picked out and put aside, and then again dried, it is fit to pack.

For an individual to start with in coffee-growing, "The experiences of a planter in the jungles of Mysore" have led to the conclusion that a capital of 5,000*l.* is necessary. In purchasing an estate, too, there is one sure guide to the value of a district which may be firmly relied on. If the estate frequently changes hands, it is certainly a bad or indifferent one: if seldom, you may be pretty sure that coffee pays very well—and further than that a man need give himself no concern, for hardly any investment pays so well in India as good sound coffee property, and people are therefore seldom inclined to part with it. There is also another useful suggestion for those who do not make their fortunes in a few seasons (and such persons are probably the majority), and that is, to commence by putting down cinchona plants amongst the coffee, and in any corner that will hold a few trees, plant the swampy ravines with cardamoms, and margins of their lands with sandle-wood-trees. "Be aye sticking in a tree, it will grow while you are sleeping," should never be forgotten by those who wish to profit by the experience of others.—*Grocer.*

COFFEE IN ALL COUNTRIES.

("A CUP OF COFFEE," HARPER'S NEW MONTHLY MAGAZINE.)

As the beverage came more and more in demand, inquiries were also made after the plant which produced the bean—a word not derived from our English word bean, but from the Arabic *bun* or *bunn*, which is the name of the fruit of the coffee-tree, and so happily coincided with the views entertained by French physicians on the subject that they reasoned that a fruit called *bon*—good—could not possibly be hurtful. Efforts were at once made to acclimate the shrub; but it would not thrive in the severe climate of Europe, and hence it became necessary to cultivate it in distant colonies. The indolent son of the East thought so little of deriving an advantage from this most valuable gift which nature has bestowed upon him that he not only failed to raise it, and to make it an article of export, but to this day allows the more active Western man to provide him, at a great profit, with the product of his own soil. As early as 1650 the industrious Dutch carried the seeds of coffee-trees from Mocha to their rich colony of Batavia, enlarged the enterprise rapidly, and were able in 1719 to appear in the great markets of the world with large supplies of Java coffee. Encouraged by this success, they established similar plantations in Sumatra, Ceylon, and other Sunda islands, which now furnish over two hundred millions of pounds: the French and the English followed their example, and in a short time the coffee-tree had made the voyage round the world. There is a little fragrance of romance connected with the first French effort of this kind, which was made in Martinique. Louis XIV., who, in spite of all his foibles and vices, was fully able to appreciate the importance of such apparently small matters as a potatoe tuber or a coffee-bean, had in his private gardens a coffee shrub of five feet height, which before his death (1715) bore ripe fruit. Having heard of German coffee plantations in Surinam, and of Dutch establishments in Berbice, his ambition was aroused, and he desired to have French plantations also in his West India colonies. He entrusted, therefore, a slip from his pet tree to a naval ensign, Des Clieux, with orders to carry it safely to Martinique. Unfortunately the ship on which he served had an unusually long voyage, fierce storms alternating with provoking calms, and at last the water casks were empty. The ensign however sacrificed his own wants for the sake of the young plant, and shared with it his scanty ration of water. But his troubles were not at an end when he at last reached the island: storms and tempests, men and beasts seemed to have united to threaten the tender shoot, and Des Clieux had to place a guard over the plant, who, under his own supervision, watched it by-day and by night. Fortunately it grew and throve, till it became a fine large tree, the ancestor of all the French coffee plantations on the West India Islands. It may safely be said that never was tree more carefully tended, and never more usefully employed. Another worthy patron of the pretty shrub was the famous burgomaster of Amsterdam, Nicholas Wythsen, who raised young trees in his hot-houses in Holland, and then sent the fruit-bearing plants to Surinam and Africa, and through his friends to almost every portion of the globe. All the West India Islands, as well as South America, soon had their plantations, Arabia its "gardens," as they are called there, and even Madagascar and Ile de France and Bourbon succeeded in entering the lists against the older colonies. The shrub and the fruit have remained nearly the same everywhere, but the manner of raising the tree differs according to soil and climate. At home, in Arabia Felix, where the most valued of all varieties, the golden Mocha is raised, the trees present a strange contrast with the aspect of the landscape further northward. There a low sandy shore affords a free view over vast treeless plains which stretch in sad monotony as far as eye can reach, while the cloudless sky sends down an almost unbearable heat. Only here and there a limited pasture, with lean grass and a few graceful palm-trees, breaks the mournful uniformity; in the grateful shade a few Bedouins rest under their black tents, while their brethren hasten on the uncouth dromedary through the yellow desert. Very different is the scene on the southern slope of the great peninsula: for here an abundant fragrant vegetation unfolds its riches and enchants the senses; incense grows like the juniper of our woods, whole forests of palm-trees overshadow the lower part of the mountains, and vast stretches of durra wave like golden grain in the gentle breeze. This is the home of the coffee-tree. The shrub rises in the form of a pyramid to a height of forty feet: the leaves, resembling those of the laurel of Greece, shine with a dark lustre in the bright sunlight, while lighter hues give life to the beautiful scene whenever the breeze turns up the lower side. During spring, a profusion of white blossoms covers the tree with their pure colour. They are shaped like those of the jasmine, and break forth from between every leaf and the stem, filling the air far and near with their perfume. Butterflies flutter incessantly around them, for they are rich in honeyed stores; birds fly about; lively tiny streams murmur at the roots, washing every tree with their welcome waters, and allure at times the shy gazelle that comes running up in timid haste, and anxiously looking around, to slake its thirst. Locusts are chirping on every branch, and a cloudless blue sky looks down upon the exuberant splendour, till the blossoms fade and droop, the winds carry away the light, shrivelled leaves, and the small green button peeps out, which rapidly increases and grows into a scarlet-red berry. After a while these berries become dark violet, but at the same time—thanks to the effects of a tropical climate—the tree produces a second and third crop of snowy blossoms, so that the beautiful green pyramid is covered with buds and flowers and fruits at every stage of development. When the fruit is ripe, the Arabs spread soft mats under the tree, ascend it, and shake the branches till all the berries have been gathered. They are then spread out on mats for six or eight months, till the fleshy part is completely dried, when a powerful roller passes over them, crushing the hard shell and leaving the two twin beans which each fruit contains to be carefully collected and cleaned. The latter are then still further dried for some time, being hung up in loosely woven bags, after which they are baled and sent to Beit-el-Fakih, the principal market of Arabia, where over twelve millions of pounds are annually shipped. As the coffee-tree is the principal source of income for Happy Arabia, it is, of course, most carefully tended and nursed. The coffee gardens are laid out on terraces which rise to a height of 3,000 feet, and on each of which there is an artificial pond with thousands of small canals that irrigate the whole, falling gently from terrace to terrace, to keep the soil always moist. The trees are planted so closely that not a ray of the sun can pierce through the thick shelter of their foliage, and the young plants can grow, thus protected, to supply the places of their short-lived predecessors; for the shrub, which begins to bear fruit in the third year, gives annually from three to five pounds, but declines at the age of twenty-five. The coffee plantations in Cuba and the West Indies are very different. Here also irrigation is all important, but much easier than in arid Arabia; hence the enchanting gardens are here all on a level, divided into squares with three or four rows of shrubs, and intersected by canals which incessantly feed the thirsty plants. To protect the latter against the immoderate heat of the sun and the frequent tempests of of those regions, lofty trees surround the plantations on all sides and superb avenues of palm trees, pass through them at right angles. In the rear, overshadowed by gigantic banana trees stand the huts of the labourers, each of whom attends to a thousand shrubs. The latter are not here allowed to grow higher than about six feet, and the process of drying and preparing the bean for market is both much shorter and more thorough. While Jamaica coffee bring the highest price in England, the taste of other nations is so different that every variety finds a ready market, and what is perhaps, most remarkable, we are told upon high authority that the worst coffee produced in America will, in ten to fourteen years, become "as good, and acquire as high a flavour, as the best from Turkey." The fact is that soil and climate determine the quality of raw coffee far more than the mode of collecting and drying it, and that the flavour and quality of the beverage, again depend almost entirely on the manner of roasting the bean and preparing the infusion. Nor is the manner of enjoying the cup of coffee less varied in different parts of the world. The son of the Orient, drinking his coffee unmixed, swallows

the black but nutritious sediment with the infusion, and consumes at times not less than eighty cups daily. Far out on the burning desert he sits under his black hair tent, silent and motionless, till in the other half of of his airy dwelling the Nubian slave has prepared his refreshment. When his pipe and his cup are handed him he leans luxuriously back on his cushions or his bales of goods, casting an indolent glance at the drooping horse, tied to a post before his tent, or the weary camel crouching on the sand and chewing the cud; but soon his eye becomes animated, his fancy revives, and he thinks of the fate of his beloved ones at home, or he weaves fantastic fairy tales into bright stories and graceful verses. The monotonous noise of the mortar in which, all day long, the small beans of dark yellow colour are crushed, so as to furnish an unbroken supply, alone accompanies his thoughts, and fills up the vacant moments by its uniform rhythm. Or he is in Stamboul, the Happy City; a marble paved court-yard, overshadowed by mulberry trees and pomegranates and freshened and cooled by a merry fountain in the centre, which cast its spray in fitful showers on roses and jasmine; an open staircase leads up to a well-lighted room, with bright-coloured hangings on the walls, and richly dyed rugs scattered over the inlaid floor; gold lists, arabesques, and mother-o'pearl in profusion adorn the ceiling; and in pretty niches, behind skilfully carved doors, stand delicate cups and boxes for tobacco. The windows look down upon the cool yard, and a long, low divan, with soft cushions, runs along the wall. There is no chair, no mirror here; no table and no picture as in European coffee-houses; but black servants in brilliant costumes walk slowly about offering chibouk and coffee-cup to every guest. Silently he enters, in silence he smokes his pipe and drinks his cup of coffee, and silently he leaves the house again. A few guests perhaps are busy at chess; others may listen to the story-teller on the little platform there with the Persian rug on which he sits, or they gaze with stolid eye at the juggler, who produces from under his thin strip of carpet whatever is asked for by his audience. But no one opens his lips; no one reads a journal; there is no interchange here of thoughts; no making of acquaintances or forming of friendships. The dreamy still life of the Orient knows no other enjoyment but listening in silence while smoking and sipping the cup of coffee. Far more lively is the coffee-house in the noisy cities of Persia. The muezzin has no sooner announced the hour of morning prayer from the balcony of his minaret then fearful sounds are heard floating down the narrow tortuous streets. They proceed from the keeper of the public baths, who blow their cow-horns to announce that the water for the women's bath is ready. The dogs raise a terrible howl to express their disgust at the hideous sound, donkeys bray in deep gutturals, cocks are crowing in every yard and every garden, and sleep is soon out of question. In an instant the whole city is alive, and tall men in loose trousers and ample cloaks are seen hurrying from all sides to their favourite coffee-houses. Through a rounded door they enter a court with a fountain, and ascend by a wide, easy staircase to the vaulted hall above, where there is a large number of windows adorned with diminutive pieces of coloured glass, and the dazzling whiteness of the walls is relieved by a multitude of leaves and flowers engraved with a chisel, and filled out with blue and gold. Here also a fountain plays merrily in the centre; one whole side is taken up with niches, and along the other sides crowd the smokers and drinkers, listening to the songs of Hafiz, the wise sayings of Sadi, or the heroic poems of Firdousi. How different the café of France or Italy, where all is splendour and magnificence, while busy, noisy crowds gather there from morn till night! how different from the more silent, almost lugubrious coffee-house of England, where already in the days of the Stuarts affairs of such importance were transacted that Macaulay could compare the regular visitors at these places to the "fourth estate of the realm!" It may well be regretted that coffee-houses are, except in New Orleans, unknown to this country where the bar, with its fiery drinks and its mixed assemblies, has furnished but a sorry substitute. We may well ask, in conclusion, what magic power, what irresistable charm there is in the cup of coffee to make it such a universal favourite, and if not a necessity, at least the daily and most cherished drink of a hundred millions of men? Its influence on the well-being of our race and the tendencies of modern culture is enormous, and its effect on social life almost beyond calculation, because, in detail, it escapes observation. It would seem as if all the nations of the earth had instinctively recognised in coffee a benefactor, whose kindness they must acknowledge, though they cannot ascertain the precise mode of action. Its sensible effects are too well known to require explanation. It exhilirates, arouses, and keeps awake; it allays hunger to a certain extent, refreshes the weary, and imparts a feeling of comfort and repose. It makes the brain more active, while it soothes the body generally; and, physiologically speaking it makes the change and waste of matter slower, and thus lessens the demand for food. Strong black coffee is most active, and may be dangerous, and yet it is a greater favourite with thinkers and all brainworkers. Nervous persons, who are easily excited, people of full habits or of melancholy disposition ought to avoid the cup of coffee in spite of all its attractions. On the other hand, it has been found invaluable for soldiers upon the march, and even in camp, and especially far superior to brandy in protecting them against fatigue and exposure. Wherever it has become a favourite it has superseded spirituous beverages, and its refining effect is felt as much in the lower classes as its gently stimulating powers are appreciated by the writer and the thinker. If Queen Elizabeth, it has been well said, had taken a cup of coffee in the morning, instead of breakfasting upon half a pound of bacon and a quart of beer, she would have probably felt in a gentler mood all day long, and her unfortunate sister Mary might have been saved the horrors of the scaffold. Unfortunately the ordinary cup of coffee contains but little of the precious substance, the caffeine, to which all its pleasant and benign influences are attributed by men of science. The adulteration begins in Arabia already. Dalgrave, the best and most recent authority on that subject, tells us that of the best variety, the Mocha, but little ever leaves Arabia. Even before the bales reach the nearest ports, Alexandria, Jaffa, or Beyrout, they have already been picked again and again. Expert hands inspect it grain by grain, and instead of the hard, round, semi-transparent beans, which alone are fit to make the genuine cup of coffee, only opaque, defective, and whitish beans ever reach the outward-bound vessel. Hence the quality of coffee diminishes with increasing rapidity as the distance becomes greater from Djeiness, and the process of sorting and picking is repeated again and again. In Arabia the Mocha bean holds the first place, next comes the Abyssinian, then the Indian, and, as the worst of all, at the end of the list, the American bean, mainly because of the want of care in gathering the fruit. On the Continent of Europe, Java is preferred; in this country Rio is probably the favourite with the masses, on account of its stronger aroma.

ANNUAL COFFEE REPORT.

1871 has been remarkable for an extension of trade beyond any yet recorded; not so much as regards the increased importations as the greatly augmented exports, which have kept the stock at almost all times below that of 1870, and as advices of considerably diminished crops in the larger producing countries have been constantly received, the demand for all descriptions has been animated, causing a continual upward movement in value, and the severe depression of the previous year has not only been wholly recovered, but, in many instances, very importantly exceeded. The greater decrease in the production having however occurred in Brazil and Java, the demand has extended to all qualities below a medium point, and exhibited an actively far exceeding that for colory kinds, and the rise in value has been much more extensive. In fact the scarcity of the lowest qualities has led to such an eager demand that the value, which in the previous year was 35s to 50s, has advanced to the extent of 20s. to 25s. per cwt., better ordinary and pale kinds at the same time showing a total rise varying from about 18s. for the former, to 10s. for good Eastern growths. Whilst commoner descriptions of Plantation produce have participated in the above enhanced currencies, and medium colory to the extent of 10s. to 13s, the advance in better qualities is gradually less, until in the best there is but slight alteration.

The total imports of coffee into the United Kingdom exceed those of last year, which was the previous largest quantity recorded by about 6,250 tons, fully two-thirds of which consist of Foreign.

Export deliveries have however increased in a much larger ratio, and the total shows an excess of 13,500 tons, bringing it to 78,000 tons, being the heaviest amount ever known. The slight improvement in the home consumption which occurred in 1870, has been sustained, and a further insignificant increase established. These movements have caused a reduction of about 7,000 tons in the stock, Foreign being 3,000 tons and Colonial 4,000 tons less than at the close of 1870.

Ceylon Plantation. 1871 opened with a decided advance for Plantation of about 8s per cwt., which lasted till the end of February; good to fine middling 75s. to 80s, middling colory 66s. to 72s. per cwt. At the end of March and throughout April prices receded to about 1s. less than opening rates. During May there was a general but not very decided improvement, and the market remained steady at April rates. A firmer tone prevailed during July, without much alteration in prices, but in August the reports of deficiencies in Ceylon and Brazil crops being to some extent confirmed, and the European stock being some 11,000 tons short, a very decided rise of say 3s. per cwt. was established. A shortness of 7,000 tons arrivals from the East Indies of course contributed to this result. Middling colory 69s. 6d. to 71s. per cwt. There were some fluctuations in September, but the general result was a slight advance on previous month's rates. In October the continued effect of unfavourable reports from Ceylon and Brazil, with the lowness of stock and largeness of export deliveries, caused a further advance of from 1s. to 2s. per cwt., and from the same causes a similar advance was established in November for middling qualities, and a still larger increase for common qualities. The market closed very firm in December, with prospect of further rise; good to fine middling 75s 6d. to 79s. 6d; middling colory

73s. to 75s.; low middling to middling greyish 70s. to 73s. per cwt. The total improvement for the year has been for middling qualities about 3s. and for common from 5s. to 8s. per cwt., while for triage, &c., 10s. to 12s. per cwt.; advance has been established.

CEYLON, NATIVE.—A good demand was experienced till about the beginning of March, at prices 3s. to 4s. above those at the commencement of the year, good ordinary 55s. 6d. to 56s. 6d. Throughout April and May the market was dull with a decline, as in the case of Plantation, to about 2s. below opening rates. In June there were large transactions in anticipation of increase in the French duty, and prices advanced, good ordinary 54s. 6d. to 55s. 6d. The actual increase of duty rendered the market dull in July, but in August there was an improved tone with a rise of about 1s. to 2s. per cwt. In September there were large transactions at a further increase of 1s. and in October a most active demand with an advance of 3s. to 4s. per cwt., owing principally to the deficiency in amount afloat from Java and in the quantity offered at the Dutch sale; ordinary and good ordinary native 60s. to 62s. There were slight fluctuations in November, but a good business was done at an increase of 2s. per cwt., and prices during December continued to rise, although until towards the end of the month there was comparatively little business done, good ordinary closing at 67s. to 68s. per cwt., showing an advance of about 15s. per cwt. on last years's rates.

MOCHA.—The imports have been very large this year (consisting chiefly of greenish sorts), being some 3,100 packages in excess of last year, and 5,844 packages in excess of 1869. Large supplies were offered in January and sold at easier rates, ordinary greenish short berry 84s. 6d. to 85s. 6d.; greenish 87s. 6d. to 89s. 6d. per cwt. In March long berry declined 5s. to 6s. per cwt. With the exception that in June and August there was a better demand, the market has been dull throughout the year with but slight fluctuations upon opening rates.

OTHER EAST INDIA.—Foreign as well as Plantation has followed the course of other kinds of coffee. In January Bonthyne was sold pale to good fine bold at 58s. 6d. to 63s. 6d., in May and June declined good pale 56s. to 60s., in September advanced to 65s. 6d. to 68s. 6d. per cwt. Manilla in June sold pale to good pale 55s. to 57s. per cwt. In October was quoted 60s. to 64s., and closed in the beginning of December at 65s. 6d. to 66s. 6d. per cwt.—*British Trade Journal.*

THE COFFEE-LEAF-DISEASE.

(From the Ceylon Observer.)

DEAR SIR,—Enclosed herewith I beg leave to send you a small portion of what was, when cut apparently, a young vigorous coffee branch, with a springing blossom, and leaves large and strong but well-marked with leaf-disease. This fragment has been split up lengthways through the centre, and if you examine it you will find, unless it has withered into general discoloration, that the pith is dotted with little slatey brown spots evident signs either of disease or decay. I have now split up a good many young branches diseased in leaf, and found that at least one in every three had these pith spots. These branches were either secondaries or tertiaries, and the younger portion of the wood usually had externally a slight tinge of yellow. The spots are mostly observable at or near the points from whence the diseased leaves spring, are sometimes single, sometimes in a series, and from say one to three-tenths of an inch in length. I have never been able to detect any of the red powder.

It will be interesting to ascertain whether any of your planting correspondents have detected these diseased pith spots, for the matter now seems to assume a most serious aspect. It is true that my estate, otherwise a good one, has been sadly ravaged by this new scourage, and that many branches having diseased leaves have still to all appearance a healthy pith, yet I fear we shall find that this so-called leaf-disease or its effects at any rate when severe, are much more deep-seated than many of us care to believe. As results of excessive leaf-disease I find that branches entirely deprived of their leaves from disease and wind, blacken, and die in from their extremities, and when partially denuded, that a good deal of the blossom, a higher percentage than usual, fails to come to anything. The trees exhibit little inclination to grow young wood, and even after a light pruning are so thin that the coming crop *must* be affected in quantity, and probably in quality. As a partial remedy I can only say that heavy pruning seems to stimulate a tree to throw off the disease more or less at least for a time. I think there is a general opinion, and such has been the experience in my district, that the parts of an estate, most exposed to the north-east monsoon, have been the first and the most to suffer. But I think where there is little or no wind to blow off the diseased leaves and afford room for new foliage, that the ultimate results to the coffee-tree itself may be very fatal. The spotted leaves hang on till every leaf becomes affected, and each leaf is not merely spotted, but assumes a yellowish red colour all over, and when vegetation acquires such a hue, we know that the leaves acting as lungs cannot properly perform their necessary functions. I am, yours truly,

ONE INTERESTED IN COFFEE.

THE COFFEE-BLOSSOMING TIME.

(From the Ceylon Observer.)

SIR,—The season this year from 1st January has been tolerably fine, but everyone who has been a resident for eight or ten years in Ceylon must feel that they cannot shut their eyes to the fact that it is a most unnatural one, and bids fair to compete successfully with its two disastrous predecessors. Where have the cold mornings and hot dry days of yore gone to? Now-a-days one fine day is enough to produce a sensation that it is going momentarily to rain in torrents, and instead of the old *dry grilling* heat we stalk about in an atmosphere natural only to a laundry-maid's department. I believe that some people have held the theory that a wet spring does not matter, provided the state is in strong condition, but the result of the two last wet seasons must have stumped that argument I should imagine. We all know now what the inevitable result, should this spring be a wet one, will be, and certainly the prospect is becoming desperate. At the present moment anything more* villainously and hideously unnatural than the appearance of the sky over the mountains near and far cannot well be. This year the atmospheric influences, which began their work of destruction last year in March, appear to have set in already. Under the circumstances would it not be a proper suggestion to make to the clergymen of the different churches that public prayers be offered up for seasonable weather, and that the impending ruin of the colony may be averted. You will smile perhaps at this serious view which I have taken of things, but how many people are there in Ceylon at this present moment who I am sure silently share in this gloomy view, and who lie awake at nights through a tormenting anxiety. We have had a most brilliant beginning this year and one which has raised peoples' hopes, as few can remember such an early quantity of bud as was to be seen;—but rain and stewing weather now having set in, latent blossom is being checked. Last year had the same magnificent prospects and early blossom shewing until March came, when a failure of this year's crop through a wet spring will convince people that it is not the fault or the age so much of the tree, but that it is consequent upon the change in the *spring* season of Ceylon that disaster has overtaken the coffee enterprise, and it will moreover convince those who will not be already done for, that the safest plan for them to adopt will be gradually to abandon and work out of coffee and an ungrateful land. Previous to two years ago such a thing as a wet spring never occurred to anyone's mind, but all this has now changed, and the spring seasons lack the qualities which they once possessed for forcing the formation of coffee blossom. I could shew you acres and acres of coffee *full* of rich wood, which is checked by growing weather, and to calculate the thousands of pounds which have been sunk in manure—the excellent wood produced thereby being rendered valueless—is tantalizing in the extreme. I remain,

DESPAIR.

P S. Mr. Buchanan's remarks on manuring are sound, but totally infensible. Most of us have long been aware of the fact that "bulk" is the proper thing for coffee, but *how* which we have yet to learn and which Mr B. by divulging will confer a boon, is, how a coffee estate is to be kept in existence by its pulp and cattle manure. Now-a days one-third of an estate requires to be manured yearly, and how is this to be done with pulp and cattle manure irrespective of the query about the transport of pulp and cattle manure from their respective depots to many places ranging from one to three miles. Some gentlemen are to be found who will inform on with the most perfect nonchalance that they manure 60, 80, or 100 acres a year with cattle manure and pulp. An acre of coffee *may* be smaller than I imagine it to be, but somehow, notwithstanding that I always have a good deal of pulp, and though I still feed a great many head of cattle all the year round, I can never succeed in making my manure go over more than half the ground which other gentleman say they do, although I may have more pulp and more cattle manure than they have.

[Our correspondent does not mention his district, but we observe that a Delotte correspondent bears him out so far as unfavourable weather experienced in the early part of last week is concerned. Every other report which has reached us is very hopeful of the prospects. Reliable authorities consider that the crisis which only arrived in March last year has been paralleled already during this season, and that a fair average crop over the coffee districts generally, may now be looked upon as secure. We trust it may be so, and that "Despair" will soon see occasion to change his tone. Prayers for seasonable weather during the coffee-blossoming period might well be offered in places of public worship in Ceylon, as well as for the safety of the grain harvests.—ED. C. O.]

LIQUID MANURE.

(From the Ceylon Observer.)

MY DEAR MR. EDITOR,—Nothing in my opinion requires more consideration on the part of the planter of the present day than manuring; much money has been spent in manure of late years, and that with such indifferent results, that it is quite time that cause and effect were looked to. Had we not seen the effects of frequent applications of artificial manures, so largely composed of minerals, the nature of these manures, and of the soil, and what we require from the soil, would teach us that these manures should not be applied at random, nor without due consideration. Soil and climate differ so much in different districts that no general rule can be applied, and I think a suggestion was made some two years ago, for the Planters' Association to appoint men in each district, to see the different kinds of manures most in use applied, and to report separately each month all particulars that might be useful or interesting, and that a committee of these gentlemen of two, three or four districts, might meet quarterly and report collectively, and these gentlemen might be

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DR. STRAUSS ON THE WAR.

THE letter addressed by Dr. Strauss to M. Renan on the subject of the war, which many of our readers have probably seen, is the most important contribution to its literature that has yet appeared. The letter is remarkable for the passion which it breathes, and for the disclosure which it makes of the stand-point from which the most cultivated men in Germany look upon the situation. The writer is chiefly known to the world for the misdirected acuteness and subtlety with which, some 35 years ago, he sought to establish in his life of Jesus (*Das Leben Jesu*) that the Evangelical history was simply a series of myths, concocted in the first and second centuries after Christ. Were Dr. Strauss a mere scholar however, we should attach little importance to the political manifesto he has issued in the somewhat sensational form of a letter to Ernest Renan. But Dr. Strauss is a forvid politician, as well as a scholar. As a Wurtembergian, moreover, and a Conservative, he can have no Prussian leanings or sympathies, and may therefore be fairly regarded as reflecting the views which animate the great body of the German people at this crisis of their history. Are these views correct? And is the national feeling which the war has evoked just and healthful? The answer we think must be, that while the feeling is in itself to be respected, it has been awakened by an essentially false estimate of the relations of Germany with the outside world. The letter is simply a long and impassioned indictment of the French people, as the authors of all the humiliations and sufferings endured by the Fatherland, in the wars of the last three centuries. We could not, we believe, state with more exactness what is the prevailing feeling throughout Germany at this moment. High and low, learned and unlearned, have persuaded themselves, that all the sufferings of Germany during these three centuries are to be traced to the door of those restless neighbours of theirs, the French. Instead of devoting themselves to the peaceful pursuits of industry, their vanity and restlessness have constantly impelled them across the Rhine, forcing the quiet, unaggressive German people, to take up arms in the too often unsuccessful effort to defend their homesteads from the invader. Now there is a half truth in this, while it has taken possession of the mind of Germany as though it were the whole. Like most half truths, it is in reality a dangerous falsehood The feeling which it has awakened is that of a passionate hatred of the French nation. "Certain of the righteousness of their cause" like the Prussian King, they are attributing to the French people, sufferings which have been the mere recompense of their own selfish violence against others, and their guilty ambitions at home That the French armies have repeatedly been the instrument of their punishment, is quite true, They are so at this moment, in the very midst of their reverses and we fear are yet destined to be so in the future. The fanatical belief of the hour, is that French vice has been the cause of German suffering. And yet how profound is the delusion. The Germans not an aggressive people! What means the pale, bloody outstretched form of Poland, with the German eagles over it! What the long, and cruel, and bloody oppression of Italy? What the spoliation of Denmark, and the still reeking smoke of its battle-fields! The Germans a peaceful people! What mean the long and cruel, the bitter and bloody wars between North and South, and their eager outbidding of each other for the now hated Frenchman's sword! *Why this very man Bismarck, whom Dr Strauss would have the world glorify, only four years ago would have brought the French armies, if he could, once more upon German soil* to desolate Wurtemberg and Bavaria with the sword, for no other purpose whatever than the aggrandizement of Prussia. This half truth—that French restlessness is the cause of Germany's sufferings, with which the German mind is filled, is a deadly delusion. Instead of turning their wrath upon the criminal who has lighted up this conflagration the end of which no man can foresee, they are falling down before him and worshipping him, for his success. With the yet undevoured prey of Denmark between their teeth, this non aggressive, peaceful nation is talking indignantly of the aggressions of France, and the love of military glory in the French nation Now if nations are to fight at all, it is better that they should fight for glory with the French, than for greed with the German—a fact which all men and Germans will have to discern before fightings come to a final end. The French *do* fight for glory. They fought for the glory of making Italy free from the German yoke; for the glory of rescuing the feeble Turk from the Russian oppressor at his gates. They fought against ourselves for American freedom; and they would have fought for the liberation of the Pole, and for the little kingdom of Denmark, against the non-aggressive peaceful countrymen of Dr. Strauss, if England had been but willing to help them in the unequal encounter. There is this broad, striking, impressive distinction between the French and German arms, that the one has ever been inspired, in so far as the people are concerned, by a national and instinctive hatred of oppression, by noble and chivalrous instincts; the other only by what has been ignoble, and selfish, and mercenary. The facts of history cannot be altered to suit the views of Dr. Strauss, whether he is engaged upon the history of Christianity, or the history of his own country. German suffering from French invasion, has been but the direct recompense of German crime. To this hour the nation shows

not the least symptom of relenting for its aggressive violence towards other lands, but merely a deadly hatred of the power upon its borders which has hitherto held that violence in constant check. National sorrow for plain national guilt is to be seen no where. There is not the slightest symptom of relenting in the German people either for their oppression of Poland, or Italy, or Denmark, while the infamous course of Bismarck is now declared by Dr. Strauss to be worthy of all honor and worship. The deadly selfishness of German aims received perhaps its most striking development in the alliance proposed by Bismarck so lately as 1864 to the Austrian Court, on the basis that Prussia should place her whole force at the disposal of Austria for holding Venice in captivity. This non aggressive, peaceful people we have seen conspiring in our own day to retain the sons of Italy in the bitter bondage, to subvert which Frenchmen had so freely shed their blood. And it is in this temper that the nation having armed itself to the teeth is directing its whole might against the power that has hitherto stood in its way. What is this but instinctively to take steps to secure for itself immunity in crime. All Europe is interested in its disappointment, and we venture yet to hope that it will be disappointed.

The Germany of Dr. Strauss is a romance. The Germany of history is a nation of men ever ready to do homage to successful violence, whether at home or abroad, a nation destitute of chivalry and generosity, and now full of the new-born sense of power to do what it will in Europe, if France can but be blotted out. Nothing but the most hopeless self-love could persuade the German mind that this war is the result of French aggression It is the direct result of the violence, ambition, bad faith and intrigue witnessed by all Europe with disgust from 1864 to 1866. The conduct of Germany towards Denmark has left a deep impression upon Europe. The perfidy and violence of every step from 1864 to 1866 admit neither of denial nor palliation, while the German conscience is seared and callous to reproaches The extent of this demoralization is fairly measured by the fact, that Dr. Strauss requires us to believe that the whole world, Germany and himself included, were wrong in the estimate they formed in 1866 of the conduct of the Prussian Court. He and Germany find the success of this perfidy and violence so complete and so profitable, that he would have us betray the cause of human progress by recognizing it all as statesmanship. As surely as God reigns over the world, it was *not* statesmanship. Though every German Professor of every German University in existence combine to condone these crimes, the truth will stand. Now the astounding acts of criminality committed in this course, begat the inevitable accompaniment of uneasiness as to their results, and this uneasiness the intrigue in Spain, to place a prince upon its throne, who, when the day of reckoning came, might help to avert the blow. If any doubt that the bad faith and violence of Prussia will yet meet their reward, we have nothing to say to such a one, because we believe that God and not the Devil reigns over the world. It was the great Prussian Frederick, we believe who made the discovery, that Providence is always on the side of strong battalions. Had he lived a few years longer, he would have seen his strong battalions scattered to the winds, and Prussia expiating, through long years of dreadful suffering and humiliation, the triumphs he had achieved therewith. Dr. Strauss could do better at this crisis of German history than help the delusion of his countrymen, that the vices of the *French* have been the cause of the sufferings of the Germans. The outside world sees plainly enough, that those sufferings have been the righteous recompense of their own crimes. There would be far more of hope for the future of the Fatherland, were the nation silent and uneasy at Bismarck's progress, than occupied in lauding his statesmanship, and challenging the world to worship this new avatar of successful wickedness.

THE PRUSSIAN KING.

The professions of piety with which the Prussian King interlards his addresses to his people, have we believe had a strong influence in persuading men's minds that what so good a man does *must* surely be right. And yet the judgment of sober reason upon these professions cannot be doubted. There is but one standard of right, one divine law, by which human actions stand or fall. If the conduct of the Prussian King shows manifest departure from this standard, plain violations of this law, are we to listen to the claim that he should be judged by another standard, and allowed an exemption from this law, on the strength of these painful professions of almost puritanic piety? We are disposed to believe in their *sincerity* in a qualified use of the word. It is the sincerity of the fanatic who has persuaded himself that as the favorite child of Heaven it is permitted *him* to do what other men may not do, or who believes that he is doing God service by his very crimes. It is not necessary to believe, it is revolting to believe, that King William is a vulgar hypocrite. He is not so. He is simply a dangerous fanatic who has persuaded himself that in *his* case, *success* in diplomacy and war, may safely be interpreted as the *stamp of the Divine sanction* upon what has been done. In his reply to the deputation of Hanoverians, who in 1866 prayed that the annexation of their country might not be accomplished, but that it might simply be made a part of the North German Confederation, the King made one of those peculiar harangues which have given superficial religious people so favorable an opinion of his character, but which, when carefully looked into, awakens the gravest apprehensions for the future of Europe:—

"When I entered on my present position!" said the King, "I "declared that my intentions relative to the safety of Prussia and "of Germany aimed at no other than moral conquest. People have "smiled at this language, and even have mocked greatly at it, "yet even now I give you my strong assurance, that my aims in "this respect have never gone beyond this, and that if now, at "the age of seventy, I proceed to forcible conquests, I do so only "from the force of circumstances, from the increasing hostility of "my pretended allies, and from my duty towards Prussia, the "guidance of which is entrusted to me. As to the justice of the "claims of Prussia in the late war, it seemed to me proved by "this, that without their accomplishment Prussia could not last "or have a prosperous development, and then I resolved with "my full heart on the decisive contest, leaving the issue of it in "the hands of God. The results, the greatness of which I had not "foreseen, and which have been rarely, and I may say never, "equalled in the history of a struggle between two powerful states "for their existence, and in so short a time, are due to the "visible interference of Providence, without which even the "most perfect army could not obtain such results. A very "serious examination, most painful by reason of my ties of rela"tionship with the house of Hanover, has made me adopt the "resolution of annexation as a duty—that of indemnifying my "Prussia for the heavy sacrifices which she has made, and of "thereby removing for the future, the probable return of the "dangers which might result from the hostile attitude of Han "over."

Now what does all this mean but simple fanaticism? God himself has entrusted to King William the task of making Prussia the chief power in Germany, and has given him a dispensation from the judgment of mankind, and the moral law itself, in his choice of means for the purpose, and has stamped a visible Divine sanction upon the violence, the falsehood, and duplicity of his course, by enabling him to win the battle of Sadowa. What is it all but fanaticism of the worst kind! Not hypocrisy, but that dangerous form of self-love and self-deception which so commonly developes itself in religious men, in persuading themselves that they are the chosen favorites of Heaven, and are thereby set free from obligation to the moral law! The student of mental phenomena knows how commonly deep religious feeling is found associated with unconscientiousness in the general life; how commonly, indeed, the former comes to be regarded as a sufficient substitute for the latter. The King of Prussia believes that his victory at Sadowa was the visible interference of Providence in his behalf, passing a plain sentence of Divine approval upon a course of diplomacy

which had called forth the abhorrence of Europe, and even excited his own people to come together in crowds, publicly, to wash their hands of all complicity in its guilt.

As plainly as language can convey his meaning, he tells us that God has set him and his course above the judgment of human opinion and the standard of the Divine law. He is not to be judged by either, for, in the execution of the task entrusted to him, he is above, and beyond both. Falsehood, bad faith and violence, are crimes no doubt ordinarily, and in others—in the French Emperor for example—but they are not crimes in Bismarck and himself. A dispensation has been given to them that deprives falsehood of its meanness, bad faith of its reproach, and violence of its pursuing Nemesis. The King found that "Prussia could not last or have a prosperous development" without his entering upon a course in which he had to trample upon honour, good faith, the rights of others, and the Divine law itself, and at last, to wade through the bloody battle-fields of Bohemia; and this course, so opposed to the consciences of men, but so completely in keeping with the whole history of Prussian development, has been stamped by a "visible Divine interference" that forbids all questioning of it on the part of men. Smith, Brown & Co., find that their firm can neither "last nor have a prosperous developement" without their imitating in a humble way the same course, but they find themselves under the gallows tree or in Norfolk Island, the stamp of "visible Divine interference" having been wanting in the case of their paltry villainy. Let no man believe in this Prussian piety. It is simply fanaticism of a very deadly kind, frequent enough in common life, as students of mental philosophy know. "The wisdom that is from above, (whether conferred upon Prince or peasant,) is first *pure*, then peaceable, gentle and easy to be entreated, full of mercy and good fruits, without partiality and without hypocrisy, and the fruit of righteousness is sown in peace of them that make peace."

If the wisdom to which the Prussian King lays claim, were "from above," it would bear *this* Divine stamp upon it, while the whole course of his relations with foreign powers, and with his own subjects, has been marked by dishonor, intrigue, and violence. The man is a profound self-deceiver, and is in the hands of a minister who uses his piety as a cloak to hide the real odiousness of their course from the German mind. The awakening from all this will be rude and terrible. All that is certain now, is, that Europe is launched upon a sea of troubles in which the Prussian dynasty, in common with every other, will not improbably be swallowed up.

The mind of Germany is so unhinged, that its people are unable to apply any just standard whatever to the conduct of the Prussian Court. Nor can we express surprise at the fact, when we know that almost the whole nation, under the excitement prevailing in the Jacobin assembly at Frankfort in 1848, embraced with all the vehemence of German popular feeling, that most unrighteous design for the seizing and incorporation of the Danish Duchies, out of which all these complications and these two terrible wars have arisen. Had Frederick William the Fourth been but true to those better instincts which moved him to repudiate as "abominable" and "dishonest" the counsels which he subsequently adopted, the unification of Germany would none the less surely have been accomplished, while humanity would have been spared the terrible wars into which Prussia has plunged the continent. It is *impossible* that other nations should forget the iniquitous course of aggression, the bad faith, and the open violence, which have marked every step of the process by which Prussian hegemony has been achieved; and the disposition to accept the success which has attended it, as an indication of the divine approval, must be resisted as a temptation and a blasphemy.

The period of awakening from these delusions will by and bye come, when the guilt of the course which has been followed, will be seen clearly, even in Germany itself. The success which has attended the policy of the Prussian Court in the last few years, and the powerful tendency of the popular mind to forgive everything thereto, make it the more necessary that the few who see clearly the guilt that has marked each step of its progress should throw themselves, as a breakwater across the tide of popular opinion. The law of God is immutable, and no professions of piety, be they ever so saintly, whether made by Prince or peasant, can be allowed to stand in the room of honesty and uprightness between men and between nations

Prussia is the one power of the civilized world that owns no allegiance to public law, and simply defies public opinion where it is not backed by the sword. The extent to which her late successes have debauched the public mind of Germany, is the most alarming feature in the present state of affairs in Europe. For prior to these successes, she was held in abhorrence throughout the German States, *and by Dr. Strauss himself*, for her bad faith towards the Confederation, her selfish violence, and open defiance of all law. The mind of Germany is now intoxicated with the sense of *power*, and everything is forgiven to the instrument by which the nation has been raised to the doubtful pre-eminence of the chief military power of the world. Germany is at this moment drunk with military glory. The means by which the nation has been welded into one, and made to forget the hateful character of the despotism which has brought about this revolution, has been by the steadfast direction of its eyes to the frontier, as the field in which the nation was to be regenerated in a baptism of French blood.

The policy has been successful, but its guilt is immeasurable. The unavoidable agitation of France in presence of the events of 1866, and the necessity imposed upon her of reorganizing her military establishments, have been steadily represented to the German mind, and to Europe, as evidence of a settled purpose of unprovoked hostility. Had Bismarck thought it desirable to allay the agitation which the events of 1866 had occasioned in Paris,—*and would have occasioned in London under similar circumstances*,—he could have done so with the greatest ease. An honorable man seeing the peculiar difficulties of the Emperor's position, and the weighty obligations under which he had laid the Prussian Court, would have produced cordiality at once between the two Cabinets and peoples by consenting to the trifling rectification of frontiers which the French Emperor required to allay the jealousy and irritation of the nation whom he ruled. It was fully, we say, within the power of this man, Bismarck, to have removed all sense of irritation from the French mind, without sacrificing German interests one jot. The simple fact is that this *war was necessary to the Prussian Minister* for the consolidation of the work of 1866—to convert Dr. Strauss indeed. The *Moscow Gazette* has stated the position with exactness:

"A war with France was absolutely necessary to Prussia for "the final unification of Germany. She felt this necessity "hanging over her for more than three years, and at last seized "the opportunity when it was ripe. The war was prepared "by the astute policy of Berlin, not only at home, but also in the "enemy's camp; and when all was ready, when France was "isolated abroad, and disorganized, and betrayed at home, and "consequently quite incapable of entering on a great war, *she was "goaded into fighting*, and in such a manner that it seemed as "if the provocation came from herself. The Prussian declara-"tion of war was put into the mouth of irritated France, who "knew not what she said."

This is nearly an exact statement of what has taken place. Bismarck took the utmost care to advertize to the German mind that France was seeking territory upon the Rhine, and to impress the world—as offensively to France as he could,—with the fact that the fortunes of the Fatherland were now in the keeping of a champion that laughed at French pretensions. The attitude was as base and dishonorable as it could be. For this man had toadied the Emperor with his whole might for years, while Germany owes her present position to his enlightened wishes for the welfare of her sons. The French Emperor had no private ends to serve in assisting Prussia in 1866. He believed her success to be desirable for Italy and for Germany alike, and he loyally forbore all interference with a development which they owe solely to his assistance or to his forbearance. The present temper of Germany towards the French people springs, from beginning to end, out of the dishonorable

conduct of the Prussian Court towards the French Emperor. For the real liberator of Germany—if it is liberated—as of Italy, *is he*, as the real author of this war, is Bismarck, to whom it simply presented itself as the readiest means of consolidating the work begun in 1866, of welding North and South Germany into close alliance

The cession of Luxembourg—which we say unhesitatingly ought to have been made to France,—would have dissipated all sense of irritation in Paris, as Bismarck knew perfectly well; but the only hope of general acquiescence in a Prussian domination of Germany, lay in his skilfully ministering to the pride of the nation to its new-born sense of power and importance It is upon this temper that he has been playing since 1866. He cared nothing for Luxembourg, but for the opportunity it gave him of placing Prussia before the world in the position of the champion of German unity He knew well that war with Germany, however popular with the French people, could only be dangerous and distasteful to the French Emperor. With consummate treachery, he allowed the Emperor to get well into the middle of disarmament, and then forced this war upon him, which Germans persuade themselves is a righteous and patriotic one. They are simply tools in this man Bismarck's hands—who cares nothing though a million of men perish in the war, if Prussian hegemony becomes an established and settled fact. He has been successful thus far beyond all human hope. It will be as well perhaps to wait a little longer, before we conclude with King William that the stamp of "a visible divine approval" is placed upon so sinister a policy.

It is a striking fact that you cannot place your finger upon a point in Prussian history, remote or modern, characterized by honorable adherence to engagements under temptation. It is a story of meanness, bad faith, and violence from beginning to end. The Danish difficulty began with the Jacobin assembly at Frankfort in 1848, when, without a shadow of right or law, Germany attempted to seize and incorporate by violence the Schleswig Holstein provinces of the Danish monarchy, upon the pretence that they were German. The heroic resolution of the King of Denmark and his people, defeated the attempt, but the war with some intermissions, lasted for four years, throughout which the conduct of Prussia was conspicuous for baseness, and for the bad faith with which she secretly violated the armistice which eventually led to the treaty of 1852 Si signed that treaty which restored the Duchies to the rightful possession of the Danes, *with the full intention of breaking it*; and in 1864 impudently repudiated it. Dragging unwilling Austria at her wheels, she invaded the Duchies in that year with an overwhelming force, professing to seize them at the instance of the German Confederation *on behalf of the Duke of Augustenberg*.

Upon King William of Prussia and Bismarck rest the wanton shedding of blood in that infamous campaign, undertaken without the slightest provocation, in cynical defiance of treaty rights, and for no object whatever but their own aggrandizment, as the event showed. The claim of the Duke of Augustenberg was a mere pretence. He was required to cede to Prussia the harbour of Kiel, the canal from the Baltic to the Elbe, and all the strongest points of the country, and when the prince rejected the base proposal, our pious Prussian King threatened to imprison him, and wound up by dividing the Duchies between himself and Austria. He dismembered the Danish Monarchy and then appropriated the spoil, while Europe looked on with amazement at the villainy of the proceeding. And this is the righteous King that has "put his trust in God from his youth up," and is now "certain of the righteousness of his cause." Now this act of spoliation, has launched Europe upon an era of complications and wars, the end of which no man can foresee. Hardly had the two powers divided the spoil, than Prussia, which intended from the first to seize the whole, offered Austria money, £12,000,000, for her share, and when that power refused to sell it, proceeded to take it by by force. The conduct of the Prussian King throughout these proceedings recalls the very worst times of the darkest ages of Europe. Can the reader wonder at our expressing abhorrence at the professions of piety with which this man scandalizes the world, while his "skirts are full of violence and blood." Had the Emperor Napoleon been guilty of one half the crime perpetrated by this man and the Minister of his guilty ambition, all Europe would have combined to overthrow him. Let no man believe in such piety. The King is under the awful delusion of the self-deceiver who has persuaded himself that God is "such a one as himself"—partial, unjust, and the companion of murderers. It is impossible for human language to measure the guilt of the conduct which has brought about the present position of affairs in Europe. Happy were it for Bismarck and his master, were they as little answerable for the blood that has been shed, through this Danish business, as the French Emperor whom they have overthrown and against whom they have endeavoured to rouse the indignation of Europe.

The Prussian King in the blindness of his self-love may persuade himself and Germany for a time into the belief that the French Emperor is the guilty author of all this bloodshed and suffering; but the judgment is written against himself, and may be read by him who runs: "THOU art the man"! The blood of his own subjects, of the Dane, the Bohemian, the German, and the Gaul will be found in no other skirts than his, when the great inquisition for it comes.

THE FRENCH EMPEROR.

A GREAT man has fallen in Europe, and "the asses are kicking the dead lion" with all the magnanimity of their breed. The liberation of Italy in 1859 and the commercial treaty between France and England, won even the pious Bunsen, we are told, "to look with favor and gratitude upon the French Emperor." It was reserved for Englishmen, who owe him a debt which they can never repay; for Englishmen, who, if ever nation condoned a political offence, condoned the *coup d' état* in the splendid hospitalities with which they received the Emperor in 1855; it was reserved for Englishmen to accompany his fall with shouts of insult and coarse vituperation. Truly, it was a flash of real genius lighting up the way to the very heart of the people, that declared us to be "a nation of shopkeepers." We are! A great man has fallen, and the grocers and bagmen of the country have been attempting to take his dimensions. They are about as able to do so, as to take the sun's altitude with their sugar scoops and tape yards. A ruler who has done more for the liberties of Europe, more for Italy, more for Germany, more for France, more for ourselves, more for the world than any sovereign who ever sat upon a foreign throne; and who has at last fallen under circumstances which move every generous mind to pity, is howled at as a "miscreant," "tyrant," "criminal," and "dastard," while the sufferings of his wife and child are thought capital subjects for the display of our bagmen's refined humour. Look abroad upon the world to-day, and recal the period of Louis Napoleon's accession to supreme rule in France, and measure the advance if you can. So wise a Sovereign has he been, that for years together, the world wondered whence he drew his inspiration and his insight; and only distrusts and contemns him now that the fortune of his early reign has been clouded by the disasters of later years. It is the old, old story of the dastard world worshipping success. The inspired poet of Israel discovered 3,000 years ago that "men will praise thee"—not when thou doest well *to others* but "when thou doest well unto *thyself*." Be successful; be powerful; and "men will praise thee," though thou be Bismarck, or the devil himself. Discarding this standard altogether, let us see what the French Emperor has done, what his real claims are upon the respect of the nations, and in particular upon ourselves.

Now, in the first place, we are struck with the fact that the friendships and the enmities of this man have alike been magnanimous. All the sympathies of this man have been great and noble, and it is a bad symptom of the age that there has been so little discernment of the fact. The Empire, emphatically, in the teeth of its detractors, has been—peace; cordial alliance with whatever was wise and generous in human rule, and war only against what was evil and oppressive. I

we look dispassionately at the Emperor's relations with foreign States, we find them marked throughout, by an instinctive and cordial recognition of whatever was noble, and enlightened, and a corresponding impatience of all that was ignoble and base. The failure of his critics, and of English publicists, to interpret his character, has been complete and full of dishonor. Upon reflection, can anything be more humiliating to us as a people than the representation of his friendship towards England, and his efforts to discredit the anti-English sentiment prevalent in France under the Bourbons, to selfish regard for himself? Instead of seeking so recondite and unworthy a motive for his friendship, is it not more honorable to ourselves as well as to him, to believe that he was drawn towards England by the fact that he recognized in her conduct towards other nations, the same generous, unselfish instincts that governed himself. The natural and the true interpretation of his leaning towards, and friendship for, the English people, of the sincerity of which he gave proof so complete, is to be found simply in a community of aims with them. There was a steady magnanimity in his conduct towards England which can be satisfactorily accounted for only in one way, and that, the most favorable both to himself and to us. This "atrocious criminal" as we call him, would have regarded it as a treason to humanity to have increased our embarrassments in 1857; but had our rule in India been oppressive, he would have brought it to an end in the mutiny. The sword of France was never drawn by this man knowingly on the side of evil, and it is impossible for the unprejudiced mind to recal the events of his reign, and the malignity with which he has been pursued, without deep indignation. The power that has overthrown him affected to be as deeply moved as France in 1854 at the overbearing tyranny of Russia towards the Porte; but mark how the two powers gave expression to their indignation. The Emperor engaged at once in a costly and bloody war with the oppressor; Prussia preferred to do a profitable stroke of business with him, supplying him with arms and ammunition throughout the campaign, although even Austria, the oppressor of Italy, threw *her* material weight, short of an absolute declaration of war, upon the right side, and the little kingdom of Sardinia instinctively placed all her resources in the Emperor's hands. The Empire has been peace—to everything but anarchy and tyranny. There has been complete consistency in its attitude towards foreign powers throughout. If the Empire declared war against Austria in 1859, it was because the cry of her tyranny had gone up to heaven. There was no unworthy jealousy of Austria in that war, but a generous indignation against her as a wrong doer, and a readiness to encounter suffering and sacrifice in opposing her. Here again Prussia affected to share the indignation of Europe against the Austrian domination of Italy; but while France watered the plains of Lombardy with her blood, and clothed her people in mourning, to procure its overthrow, Prussia at the last moment riveted the Austrian chains upon Venice for seven long years of suffering, *lest the French Emperor should become too powerful for her own peace!* But for the caprices of our own statesmen, Louis Napoleon would have drawn the sword to protect Denmark in 1864 from the open brigandage of this vile power, which dragged Austria with her into the shameful conflict, and professed to divide the spoil with her till the opportunity came to engross it all. The shame of the spoliation of Denmark is not the French Emperor's, for had we been but true to ourselves, we might have saved the little Kingdom from its spoilers and driven the buccaneers of Germany back at the point of the sword from their prey, teaching them that treaties are not to be broken with impunity for mere purposes of aggrandizement. It is vain to talk of the Danish spoliation as a thing accomplished. Such crimes refuse to be forgotten, and as Europe reaped half a century of bloody wars from the spoliation of Poland, so will the base and cowardly despoiling of Denmark yet avenge itself on Germany as surely as its people live.

Our own unworthy conduct made us all but partakers in the wrong, which we might have prevented, had we but cordially accepted the proffered alliance of—the "miscreant" Emperor of the French. It is the honorable peculiarity of this man's reign that he never struck the feeble, or helped the oppressor. The Empire was peace for all with whom humanity demanded it. Were the nation not so violently prejudiced as it is under the writings of English publicists, it would see this same distinguishing peculiarity in the occupation of Rome, and the expedition to Mexico, both proved to be political mistakes only by the logic of events. One would imagine from Protestant howlings upon the former subject, that the Garibaldians were a body of unoffending, peaceful men, whom the Emperor had sought out at Mentana, that he might try the effects of the chassepot upon them. All our sympathies are with the Italian cause, but what impartial man can find difficulty in occupying the stand-point of those who regard it with dread and abhorrence? The Garibaldians were seeking to subvert by violence the oldest temporal sovereignty in the world, a little kingdom which from its weakness, and its claims upon the consciences of men, appealed strongly to the pity and the passions of Christendom for protection. The Garibaldians represented at the best five or ten millions of men, while the desire that the temporal sovereignty of the Pope should be upheld, was shared more or less by the whole Roman Catholic world; at all events, by such part thereof as has any moral earnestness whatever. The occupation of Rome was, in other words, the protection of a feeble and aged Sovereign, who declared himself unable to comply with the demands of the revolutionary party in Italy; and if this protection were a crime in the eyes of advanced Liberals, let it be remembered, that it was one of the glories of the French Empire in the eyes, not only of the ultra Conservatives, but of the moderate party in Europe, we mean such men as Montalembert, Dupanloup, and multitudes of our own countrymen. At all events, it is the same story still—the sword drawn to protect the weak and helpless, not to strengthen the oppressor or to hold the captive in bonds. It is difficult to do justice to this honorable peculiarity of the fallen Emperor's career. Thus it is vulgarly affirmed that he countenanced the Prussian attack upon Austria in 1866 for the sake of some paltry rectification of the French Frontier upon the Rhine. Nothing but the grossest want of insight into history, could take up with such an interpretation of his course. The French Emperor is a truly enlightened man, and what he has earnestly and consistently desired throughout his career, has been the liberation of Europe from the retrograde and conservative influence of Austria therein. It was no love of Prussia for herself, still less a love of paltry intrigue, that led the Emperor to countenance and passively further Bismarck's ambitious programme in 1866. What he desired to see, was his own work in Italy accomplished without calling upon France for further sacrifices, and a blow dealt at Austrian supremacy in Germany for the evils with which it afflicted the people. The Emperor has been the enlightened, firm friend of the people everywhere. He has been by far the best friend to Germany that ever sat upon a foreign throne. No Holy Alliance could be proposed to this man. And the difference between the spirit which has animated his outlook upon the world and that of the sinister power which has overthrown him, receives a striking illustration in the fact that, at the very time when Prussia was intriguing to aggrandize herself in Germany at the expense of Austria, so purely selfish were her aims that she positively opened a negotiation with that power in 1864, the basis of which was that he should assist with her whole might to rivet the chains of Austria upon Venetia. Professing to be herself engaged in a struggle for the freedom of Germany, she deliberately proposed to attain it by making the bondage of the Italians perpetual! We are oppressed with the feeling that it is alike impossible to do justice to the despicable character of the one power, or to protest with just indignation against the malignant criticisms with which the other has ever been pursued.

So with the expedition to México. The dreadful state of anarchy in that country, led to a common agreement in Europe that armed interference was justifiable and necessary. The French Emperor conceived the striking idea of founding a Latin monarchy in the American hemisphere, peacefully to develope itself and run its course, side by side, with the great Protestant Republics of the North. The problem was one of deep interest

to the world. There was nothing little, nothing selfish about it; nothing sinister, or guilty. The experiment failed; and the Emperor met with the usual reward of failure. Every one had shared the error that lay at the foundation of the scheme, but as the *Saturday Review* said at the time, "Emperors cannot afford to make mistakes like Reviewers."

Louis Napoleon has labored throughout under two fatal disadvantages. Had he been but the *legitimate* ruler of France, he would have been made the arbiter of international disputes in Europe. So much wisdom, enlightenment, and generosity has he shewn, that he would have been emphatically, "the *great* King of France." Still more fatal has been the family name he bears. For if he owed his rising thereto at the first, it has also been his overthrow. The unthinking world associated war with the very name of Bonaparte, and when Louis Napoleon declared that the Empire was peace, the knowing ones, the bagmen and the grocers, put their tongue in their cheeks and winked to each other. Louis Napoleon is one of the great men whom the world has lost through cynic unbelief. The diplomatist was at fault when dealing with so courteous, so frank, so ingenuous, and yet so reticent, and so self-contained a sovereign. The very simplicity and directness of his course, so different from the tortuousness of diplomatic ways, instead of being appreciated, filled the courts of Europe with the belief that an illusion was being practised upon them, and that what seemed to be so transparent was really impenetrable.

Looking back upon Napoleon's foreign policy as a whole, it is impossible not to see how favorably it contrasts not merely with that of France under the rule of his predecessors, but with our own, and that of any other people of modern times. Could Europe, and Englishmen in particular, but have persuaded themselves that the Empire *was* peace, they would have done their best to strengthen the man who governed France, and who looked for his reward only in the promotion of the general welfare of mankind. He governed France with magnanimity and power; and while constantly exposed to the aim of the assassin seems never to have allowed considerations of personal safety to have moved him at any time from the course which a lofty wisdom dictated. In declaring this war against Prussia, he said truly, that it is not he who declares, but he who makes war necessary who incurs its guilt. But two alternatives were forced upon him by the intrigues of the Prussian Court—to declare war, or to abdicate. The war emphatically was *not* his, but a war of the two peoples made ungovernable by their passions, under the excitement of *the Press!* The time is not distant when France will recal with regret the rule of the Napoleon of peace. For ourselves, we regard its overthrow as a calamity for the world. All that a bitter, unscrupulous, and malignant press in England as well as in France, could do to make its continuance impossible, was systematically done. For twenty years, English publicists as well as French conspired to fill the path of the Empire with thorns and difficulties, and the relentings which the English press are now showing, come too late. Italy and Germany owe their freedom to the Emperor; England and the world what it would require a volume to deal with.

It would not be proper to close this article without noticing what certain hysterical gentlemen call the "crimes" of the French Emperor, meaning thereby the *coup d' etat* of December 1851. Now there is this peculiarity about these charges, that we seldom or never find the exact nature of the crime described, and the reason is that not one man out of a thousand who talks of the *coup d' etat* knows its real history. They remember *Punch's* weekly cartoons of the ugly villain who perpetrated it, and what the "leading journals" said about it. Of its real history they know nothing. It was not known even by the "leading journals" themselves until several years afterwards, and *Punch* had discovered in the Crimean war that the Emperor had a striking, if not, positively handsome face. The hang-dog conspirator of the cartoon of 1852 gave place to the somewhat handsome Emperor who is now our very cordial friend and ally. And *Punch* is one of the "leading journals" in whom our penny-a-liners and professors in these days put their trust. It is the fact, that not one Englishman out a thousand who speak and write of the *coup d' etat* as though they knew all about it, have any intelligible idea whatever of what it really was. One gentleman who has been writing to the Indian press about it, in very violent language, was in France at the time, and what he "remembers" is the yelling of the "legitimate faction" at Bordeaux at the time it occurred.

We are in this awkard position, that if what our Indian penny-a-liners and professors now say about the *coup d' etat* is true, it was just as true in 1855 when Englishmen were throwing up their caps in honor of this man, and the English Court and people were receiving him with splendid hospitality as their guest in the metropolis. What has been said by these writers is neither true nor justifiable, while the saying of it *now*, after the national reception of 1855, is calculated, we think, to provoke some feeling of ingenuous shame.

The truth is that the popular judgment of 1852 was worth just what such verdicts usually are. The judgment of history is not yet passed upon the event, but that it will be very different from the bagman's judgment, no man who knows the real story can doubt. The fiery declamations of Mazzini, the yellings at Bordeaux, *Punch's* cartoons, and the *Times* are not—history. The deliberate adhesion of a man like Montalembert to the *coup d' etat*, who justified it as a necessity, outweighs them all. His declaration that Louis Napoleon was "the legitimate, because the only possible 'chief' of France," carries with it the explanation of the act itself, and the proof of its necessity. Had it been possible for Napoleon to have separated his own personal interests from the event, the world would have applauded the firmness and the skill with which he cut a knot that no ingenuity could untie, and saved his country from the anarchy of a dozen contending and desperate factions in the Assembly. Had he been the legitimate Bourbon instead of the mere "elect of the people," the whole world would have declared the *coup d' etat* a wise and patriotic act.

It is impossible to give within the limits of this article even a sketch of the events which made the *coup d'etat* a necessity. It will be more useful perhaps simply to state the judgment passed upon it some years afterwards, in 1856, by the *Edinburgh Review*—the organ of English liberalism. "The liberal party in "England, and England generally, accepted the forcible change "of Government in France, though not without great reluctance; "they were not insensible to the grave culpability of the proceeding or the arbitrary violence of the blow, but they saw passions "and circumstances fast ripening for a civil war; they were grievously alarmed at the imminent prospect of a social convulsion, "exceeding in extent and horror all previous ones since 1792, and "they saw no other solution of the crisis than in an act of power "at once sudden, unconstitutional, and extreme. In short, they "believed, rightly or wrongly, that France had arrived at one of "those dreadful exigencies in which (to use the words of Mr. "Burke) 'morality is compelled to submit to the suspension of "her own rules in favor of her own principles.'"

Such was the judgment formed in 1856 upon this event, by the great body of well-informed Englishmen. In 1870 it has become a wanton act of bloodshed and violence committed by an "atrocious criminal," We leave our readers, each for himself, to constrast this judgment with the utterances upon the same subject of certain journals in the Indian Press. There is *one* misconception in the public mind concerning this *coup d'etat* which it is desirable to remove. It seems to be popularly believed that the act was attended with much bloodshed. Now the fact really is, that the revolution itself was entirely bloodless. The *coup d'etat* was made on the night of the 1st of December with complete success. On the morning of the 3rd., however, the Jacobins and Socialists who had filled Paris with such dreadful atrocities in June 1848, suddenly threw up barricades once more, and poured into the streets in arms. What was the President to do in these circumstances? Was he to imitate the weakness of Louis Philippe and yield Paris up to the dominion of a mob; or to rescue the city from their despotism, as Cavaignac had done in 1848? He overthrew the barricades. At the cost of 200 lives on the part of the sol-

diery and a somewhat larger number of the insurgents, he put the insurrection down, and for so doing, although he would have been covered with disgrace, if he had done any thing else, he has been styled "miscreant," "atrocious criminal" and "murderer." We can but recommend our readers to read history for themselves.

The second of these popular charges against the fallen Emperor takes the shape of vague declamation to the effect, that his personal rule of the Empire has demoralized the nation, and in a very special manner corrupted its literature. In the peculiar language of the Victor Hugo school, "a virile nation is once more about to take possession of itself." French society is to be regenerated under the elevating rule of Rochefort, Ledru Rollin, Jules Favre, and Thiers. The inordinate value attached by men to personal charms in women, the effrontery of the demi-monde, and the general laxity of morals in all classes, are evils, we are told, resulting from military government under which the hetaira rises into the ascendant and takes precedence of her more virtuous, but less amusing and attractive sister. "A coarse materialism has pervaded French society from its "summit to its basis, and virtue has everywhere been post-"poned to riches, and merit to courtly influence. Selfishness "and deception have pervaded every department. Under the "Napoleonic rule, birth being held of no account,—the only dis-"tinction that of riches, and consequently the pursuit of wealth "engrossed men's minds to the exclusion of all nobler aspirations. "Money prized not as a means unto great and generous purposes, "but as the all in all, the chief end and purport of existence."

Now this picture may be as true as it is sad, but the ascription of it to the "personal rule" of the Emperor is simply ridiculous. Some of us are old enough to remember that upon the establishment of the Republic of 1848—"that gigantic humbug of fifty conspirators, and a couple of thousand ruffians"—Louis Philippe and his family, all remarkable for their personal talents and virtues, were declared in the very same way to have completely demoralized the nation by a government "based on corruption and supported by venality." If, moreover, we are to attribute the materialism, and sensuality of modern society and literature in France to the deadly influences of "personal rule," to what are we to ascribe the development of the very same evils in our own country? If we are to charge the venality of the French departments, the gigantic peculations which are declared to have destroyed the army, upon the "personal rule" of the Emperor, to what are we to ascribe the astounding peculations revealed in the same departments in Republican America, during the crisis of the late war, in presence of which these French disclosures fade into insignificance? The charge is absurd. It is put forward by men without insight into the real causes of these phenomena, or by mere malignity. Neither the personal rule of the French Emperor, nor the constitutional rule of Louis Philippe, is answerable for the evils portrayed. An unprecedented growth of wealth and prosperity, a religion that has lost its hold upon the life of the nation, and *a press teeming with the productions of unhallowed genius*,—these are the real sources of national demoralization both in France, and in our own land.

It is permitted us to hope that the furnace of affliction through which the nation is now passing, is the appointed, as it is we fear the only, means of its regeneration. No change of Government ever yet renewed the character of any people upon earth. The only element of hope about this new Republic in France, is the fact that it comes ushered in by humiliation and suffering too deep for words. If any form of government could have delivered the French nation from *itself*, that government was to be found in the rule of the great man who has just fallen with so much dignity, as to betray even the most malignant of his critics into momentary forgetfulness of *themselves*.

A bitter opponent describes the French Emperor, as "a decrepid, sick man, prematurely old," and the *Times* which falsely charged upon him the whole guilt of the war, and declared it to have been planned without the knowledge of his ministry, volunteered at the same time the surance that "there was no possible return for him "therefrom except as a conqueror, and a conqueror on the scale "to which Austerlitz and Wagram had accustomed his uncle's "subjects." That this war was repugnant to the French Emperor personally is now admitted by the *Times* itself; and that everything he *could* do to avoid it he did, we entertain not the smallest doubt. Everything in his circumstances, and in his history, leads to the conclusion that he could *not* have desired this war, how clearly soever he may have foreseen it. The charge of having provoked it by a "brutal insult" to the Prussian King and upon a mere "pretext," was a malignant lie. History will do Louis Napoleon more justice than Englishmen have ever done.

It will be remembered, by and bye, that he alone of European Sovereigns, and while at the head of the chief Military Power in the world, was the anxious and consistent advocate of submitting international disputes to a Congress of the Nations. All that man could do was done by him in 1863 to bring about a settlement of the Italian and Danish difficulties by dignified and earnest appeals to the Courts of Europe. It is not he who has been the disturber of its peace, but the malignant spirit of tradition, cherished and embodied in such diplomacy as Bismarck's. The spirit which animated the *Parvenu* of the Tuileries was too noble and too far in advance of the times to be regarded as other than Utopian by the statesmen of tradition and legitimacy. History will recall with admiration and regret the *Parvenu's* efforts after peace, while a deep broad brand of infamy will it burn in upon the diplomacy of Bismarck and the pious King William.

THE REPUBLIC

If any thing has been made clear to the world by the events of the last five and twenty years in France, it is the fact that the Republicans of that country are numerically a mere fraction of the people. The great body of Frenchmen, educated and uneducated dread the very name of a Republic. The republican faction, for it is nothing else, consists simply of the *canaille* of Paris, the spawn of its Jacobin and Socialistic clubs, and of those secret societies of Europe which make the French capital the focus of their conspiracies against public order. This *canaille* of little better than wild beasts, have as their natural leaders, unclean spirits of the Rochefort, Ledru Rollin, and Proudhon type; while a knot of passionate ideologists of the Lamartine, Victor Hugo, and Jules Favre school, are committed to the attempt of setting up by means of this *canaille*, a form of government in the country which the mass of the people regard with horror and detestation. These leaders have nothing in common with the others, but the one object of subverting the existing order of things. The Jules Favre school will shoot down their following without hesitation or remorse when the right time comes. They count upon the necessity of doing so, as a part of their programme. They know that France dreads and abhors the institutions which they are setting up, but devoured by vanity, and full of the Utopian ideas which mark their school, they are forcing them upon the country in the hope that it will by and bye condone what has been done, and come to regard as national benefactors, the men in whom it now sees nothing but inordinate vanity, restless personal ambition, and misdirected abilities.

It is a deplorable spectacle that the world witnesses, in the momentary triumph of this faction, which France, from the exigency of the moment, must tolerate and suffer. General Trochu, we are told, stands aloof from the Provisional Government, and will have nothing to do with it, beyond accepting the position assigned to him of Commandant of Paris. It is permitted us to hope that Trochu may become the deliverer of his country, alike from the enemies upon its soil, and from the tyranny of the wretched *ideologues* whose powers are directed to making all government impossible in the country, which does not place Jules Favre, Victor Hugo, Louis Blanc, and the rest of the precious crew upon the throne in a body, side by side, in equality and fraternity with the Emperor.

It is these men and their determined abuse of the freedom of the Press, that make the outlook of France so gloomy. A le-

gislative assembly torn to pieces with ambitions and full of Utopian aspirations; and a press dragging every thing, that nations respect, down to the level of its own vileness, filling the minds and imagination of the people with obscenity and infidelity, and with defiance of all authority, human or divine. The revolutionary scum of Europe, and its passionate political dreamers are now gathered together in Paris as their focus, there seething as in a cauldron, shut in by the invader. The impression hangs over the mind, that the city is about to expiate its guilt in sufferings which the world has never seen since the fall of Jerusalem; suffering is the appointed means of purification in this world with nations as with individual men. A siege in winter, with a million of women and children shut up in the city, a vast army of soldiery, and the Jacobin scum of Europe seething within the walls—such a siege suggests possibilities from which the imagination shrinks. May God in the infinity of his mercy avert what we have so much reason to dread for the unhappy city! Meanwhile let none dream that the sufferings of Paris come from the *vices* of its rulers, as the Germans are idly persuading *themselves*, that their sufferings are the fruits of French crimes. The Government of the world is not carried on so; emphatically otherwise than so. Paris is about to expiate its own crimes, and not its rulers. A Paris regenerated by suffering, means perhaps the possibility of government and order in France. "Liberty, Equality and Fraternity," mean anarchy. Paris hitherto has made freedom impossible for France. Its captivity, may now possibly, make the nation free.

THE "LEADING JOURNALS."

We noticed in our last issue the unhappy influence which the Prussian successes in this war were exercising upon English opinion as reflected in the leading journals at home. Satisfactory relations between neighbouring peoples are no longer to be maintained by respect for public law, by the keeping of good faith, by an honourable adherence to engagements, and by the cultivation of a willingness to submit international disputes to the arbitrament of neutral powers. These things are delusions of the past. The right thing for nations to do, in particular for ourselves, is to imitate the example of Prussia and convert our whole male population into an armed force, drilled and organized to the highest pitch of efficiency, and kept ready to be hurled in masses, half a million strong, at a few hours notice upon the people we have outraged into foes. The readiness, with which some of our Indian contemporaries have accepted the "leading" of these journals is not very creditable to their discernment. They seem indeed to have made up their mind upon the subject, upon the strength of Reuter's telegrams. It is only right to say that our remarks have special reference to the Bombay papers, which, with the exception of the *Star of India*, a new journal conducted with remarkable ability, have shown the most discreditable prejudice throughout. The Spanish intrigue was not disclosed until the 4th of July; and the official papers upon the subject were not placed before Parliament until the 24th. Up to the date of their publication it was impossible to form any intelligent opinion upon the merits of the war, and yet, on the 7th of August, we had writers in the Bombay Press who had so completely made up their minds upon the subject as to tell us that, "the case was too clear to allow of equivocation, and that the guilt of the chief criminal admitted neither palliation nor disguise." (*Professor Wordsworth to Times of India*, 7th August.) The French Emperor and his ministry were denounced with the utmost violence as the authors of the war. We now know that the war was forced upon France by the intrigues of Bismarck—forced in this way that the French Emperor had but two alternatives left him, to declare war or to abdicate. The violence of the language applied to the Emperor by the Bombay journals and their correspondents, is fresh in every one's mind, as also the excuse for it—that "the leading journals" said so. Surely our Indian publicists ought to know that the leading journals as we call them (meaning thereby the *Times* and *Saturday Review*) are almost never right in their first deliverances upon public questions. And for this reason, that neither journal ever dreams of acting as a breakwater to public opinion. Instead of attempting to direct it to what is right and just in itself, both journals express the passing excitement of the hour. On what great public question, has either journal been right in the last ten years? The American War, Extension of the Suffrage, the Irish Church, the Irish Land, the Ballot, Mr. Bright and Mr. Gladstone, have been the great subjects of discussion during the decade. Have these so called leading journals been right in a single instance? Have they not been wrong in all, until the progress of outside opinion was such that they were obliged to *reflect* it? And these are the leaders whom we are to trust unhesitatingly in a case of so much delicacy as a Continental war in which our old traditional enemy is taking part We are sorry to see even the *London Economist* taking a somewhat disingenuous course upon the discovery now made, that France really was *not* prepared for this war, after all. They would have it, a starting, that the Emperor had made every preparation, and was eagerly watching for a pretext to begin hostilities. The *Economist* now learns that Denmark and Austria stood aloof from the French alliance from their knowledge that the Emperor was not prepared for the struggle. After producing what it believes to be proof of this curious fact, our contemporary remarks:—

"It is surely astonishing that with its dangerous situation "known to friendly foreign Powers, as well as to many of its "subjects, the French Government should either have received "no warning, or have been foolish enough to disregard it, if "given."

Would it not have been more honorable to express regret that Englishmen had so little insight into the true state of matters, as to have ascribed to the Emperor a war which he had no power to avert but by abdication? The French cabinet, was not dreaming of war when this Prussian intrigue in Spain disclosed itself. The leading English journals insisted that the French preparations were complete, and that the Emperor had only been waiting a pretext to show what his mitrailleurs and chassepots could do. Instead of frankly admitting that they were mistaken, the Emperor is now attacked for his recklessness in rushing *unprepared* into a war, which it requires but the least candour, to see was forced upon him by his position. Had he submitted to the treatment which the French Ambassador received at Ems, it was impossible for him to have maintained his rule for a day. He was at first "a miscreant" for having secretly planned the war, and seized upon a mere pretext for declaring it; now he is a madman for rushing into a war for which he was altogether unprepared. We looked for better leading than this from the London *Economist*.

THE STANDARD OF LIVING IN INDIA.

It is now many years since we first made an attempt to ascertain the pressure of the Land Revenue upon the soil by an approximate estimate of the whole agricultural produce of the country. In forming these estimates, we have always assumed the consumption of food grains in the country to average about a seer (2 lbs.) per head of population per day. This estimate is objected to as excessive. The *Pioneer* believes that "among the "mass of the population, the classes who get as much to eat as "they want and no more, the average daily consumption of "grain of an adult male is about three quarters of a seer, that "of an adult female, half a seer, that of children, a quarter of a "seer. The richer classes, no doubt, eat more than this in "quantity, but they do not eat much more grain." On the whole our contemporary believes the average he has given to be "near the mark."

The *Indian Daily Examiner* believes this estimate to be too low, and affirms that in the "part of the country with which "it is best acquainted, and it is a part in which the people are "rather badly off than otherwise, the common allowance of "rice and dall for an adult male is fourteen chittacks (28 ounces)

"per diem. We are also strongly inclined to think that the "three children may be fairly put down for at least a seer between them."

A private correspondent in the North West Provinces also expresses to us his belief that our estimate of 2 lbs. per head per day is too high, and says "it is generally held in the North West "that the average consumption of grain per head of population is "six maunds or 492 lbs. a year." On the other hand, earlier Indian writers confirm our estimate of 2 lbs. per head. Mr. Colebrook in his *Husbandry of Bengal* "reckons the annual consumption of grain for a man at nine maunds (720 lbs) a head besides cattle," (Galloway p. 247) and this if we remember rightly is Sir. Arthur Cotton's estimate. Mr. Maltby (Madras Board of Revenue 1854) quotes the Collector of Bellary as authority for the statement that "a seer of cholum, the food of the great body of the people in Bellary and the adjoining talooks," is the ordinary consumption of a man per day. The Madras Famine Report [1866] estimates the consumption of the rice-eating population of that presidency at 560 lbs. per head per year, while Mr. Fischer of the Shevagunga estate in the same presidency considers an allowance of 6 lbs. of grain per day as sufficient for a family of 5 persons. Upon the whole we are persuaded our estimate of 2 lbs. per head per day is the right one *for the purposes* of this enquiry, and we shall give our reasons for the belief in detail further on. In any attempt to define the standard of living in India it is necessary to remember that it differs in different parts of the country. Thus in the Central Provinces (Belaspore) we are told that "the ordinary practice "with all classes is to have three meals a day. Rice and dhal "at mid-day, rice and vegetables cooked with ghee in the evening, and rice gruel in the morning before commencing work. "This rice is called bhassee, being simply the remains of the "night repast, filled up with water and taken cold. Some men "are said to get through 3 lbs. of rice per day. The castes "who eat fish and flesh have, of course, a greater change of "diet. On the whole the great body of the people may be said "to live comfortably and well; and as regards quantity will probably never enjoy greater abundance" *Chisholm's* Reports 1866.

In Nagpore, "most of the Brahmans and the trading and artizan classes take two meals a day, one at about 8 o'clock in the morning, and the other in the evening. The field labourers, as in Belaspore, take three; one in the early morning, one at mid-day, and one at sunset. All classes except Brahmans Marwarrees and a few others eat animal food when they can get it. All the Mahratta tribes eat fowls and eggs -the food held in so much abhorrence by all the higher castes in Hindustan With the same exceptions, all the people use spirituous liquor distilled from the fruit of the Mohwa tree." (Ross's Report, 1869).

Where a rice diet, bulky and innutritious, is the staple food of the country as in Bengal and Madras, it is the practice of the people to take at the least two meals a day. In the North West Provinces on the other hand, where the staple food is wheat, "the rich bunnea and banker as well as the poor day labourer, content themselves with a little parched gram during the day, and one meal in the evening.

"From one year's end to another the diet is the same un- "leavened flour cakes, parched grain, and pulse, or the plain "wheaten cake is changed for cakes composed of wheat and "barley flour, or wheat and gram flour mixed; or these grains "roughly ground are mixed up with buttermilk; or when green "on the stalk, boiled into a mess of porridge. Several kinds of "vegetable, fruits and berries, too, come in their season to "relieve the sameness of their diet, and aid in preventing the "occurrence of dyspepsia and its attendant evils."

An analysis of the chief articles of Indian food shews the necessity of supplementing the diet where its staple is rice, with either meat or fish.

Proportion of Albuminous and other elements in 100 parts of each article of diet.

Articles of Diet.	Albuminous.	Starchy and oily matter &c., not albuminous	Water	Name of Analyst.
Wheat	11·67	71·65	13·68	
Indian corn	12·8	74·02	13·1	
Barley	12·6	72·8	14·0	
Field peas (*dhall*)	26·69	61·03	12·26	
Rice	6.18	80·25	13·26	Horsford
Vegetable, average of carrots, radishes, and turnips	5·83	17·23	16·89	
Meat (ox flesh)	19·25	3·1	77·20	Von Bibra
Fish whiting	17·05	0·38	82·95	Payne.
Bajra and jowar	Proportions almost identical with those found in Indian			Forbes. Watson.

In this table, Horsford's analysis of the "field pea" is made to do duty for an analysis of dhal and of *gram*, although the nutritive qualities of the latter are believed to be somewhat less than those of field peas. A highly nitrogenous diet composed of the most nutritious cereals, with a plentiful supply of vegetables enables the higher castes of India to dispense with meat altogether, but where rice is the staple food, meat, or fish, or a large admixture of *dhall* becomes indispensable to health. Rations are commonly given in *atta* (flour) instead of grain, and in these cases it is necessary to bear in mind that a pound of attah is equivalent to 21 or 22 ounces of grain. The rations of a Rajpoot soldier are 1½ lbs. of attah (about 2 lbs. of grain) and 2 ounces of dhall per diem (Tod's Rajasthan, p. 201). The same allowance is made to the troops in the Bhawalpore State according to the last Administration Report

So much care has been devoted of late years to the dietary scale of Indian gaols to make them as close a copy as possible of the food of the people, that they present, we have no doubt, a very close approximation to the general standard of living in the country. In Bengal the staple food of the people is rice, of which two crops are produced annually The first harvest is gathered about the end of August; the second and greater one in December. A variety of grain and pulse is also sown and the harvest reaped from February to April. Fish is so plentiful as to be at times within the reach of the poorest of the people, and there is a universal and vast consumption of vegetable oils. The dietary scale of the Bengal jails for laboring prisoners, is as follows:

Rice	140 oz	per week.
Dhall	28 "	
Vegetables	42 "	
Condiments ...	3½ "	
Meat (or fish)	16 (10 20)	
Oil (mustard, &c.)	14 "	
Salt	3½ "	
Firewood ...	10s.	

This scale represents we imagine with considerable accuracy the common diet of the labouring classes in Bengal. No provision is made therein for the luxuries of sugar, tobacco, betel, or pan Now this diet cost the jails of Bengal, we are told, upwards of 27 Rupees per head per annum in 1865. The people take two meals a day, and are in number about forty millions. Travelling upwards we come to the North West Provinces with 30 millions of people whose universal custom it is, whether rich or poor, to take but one meal a day in the evening, a small quantity of parched grain only being eaten about noon. Rice has here given place to *wheat* as the staple food, and the jail dietary is as follows:—

Attah	Wheat flour	10 oz.		
	Bajera flour	18 "		
	Jowaree flour	48 "		
	Indian corn flour	24 "	160	oz per week.
Dhall (cytisus cajan)			16	" "
Gram parched			28	" (morning)
Vegetables			21	
Ghee and Oil (mustard)			24	
Chillies (one or more daily)				
Salt (100 grains per day)			1½	"
Firewood			5¼	lbs

This scale was adopted in 1864, the improvement consisting chiefly in the variety introduced into the articles of which the *attah* is composed. It represents we imagine a somewhat meagre

type of the ordinary diet; and is marked by the absence of sugar, goor, tobacco and other small luxuries in general use in the country. Rice has here disappeared altogether from the common food of the people. The cost of this diet was Rs. 21 per year in 1865, but reached to Rs. 46 in 1869, from the rise in prices generally

Still travelling northwards, we come to the Punjab to find the dietary scale as follows:—

Attah	Wheat flour } Barley ,, }	140	oz per week.
Dhall ...		24	,, ,,
Vegetables		24	
Condiments	Garlic, Turmeric, Chillies, Coriander seed, Dhurnia	3½	,,
... ...		1½	,, ,,
Dhai (whey)		18	,, ,,
Meat.		5½	lbs. ,,
Firewood.		5¼	,, ,,

The cost of this dietary in 1865 was 22 rupees per year and is now about double that amount. It represents we imagine the common standard of living amongst the people of the Punjab, but without luxuries of any kind.

In the Sindh jails, the diet is a little more generous, and is as follows:

Rice	24	oz
Attah wheat	48	,,
Bajree	48	,,
Jawaree	48	,,
	168	oz per week.
Dhall (moong)	12	,,
Vegetables	48	,,
Condiments	3½	,,
Tamarind, or Kokum	1½	,,
Ghee	4¾	,,
Dhai (whey)	70	,,
Mutton	16	,,
Salt	3½	,,
Firewood	8	lbs

We have here a mixed diet of rice and dry grains, but neither sugar, tobacco, betel, or pan, the common luxuries of India are found in the scale, but it represents otherwise, we imagine, the full ordinary diet of an adult man throughout Sindh.

In the Bombay jails, (Ratnagherry) the scale is as follows.

Rice	72	oz.	
Attah Wheat	48	,,	
Bajree	48	,,	
	163	oz.	per week
Dhall (toor and chunna)	30	,,	,,
Vegetables	56	,,	,,
Condiments (chillies, garlic, &c.)	3½	,,	,,
Kokum	3½	,,	,,
Sweet oil	3½	,,	,,
Fish (many varieties)	13	,,	,,
Mutton, milk, or ghee	5	,,	,,
Salt	3½	,,	,,
Firewood	7	lbs.	,,

Although still marked by the same absence of small luxuries' we believe we have here a somewhat favorable representation of the ordinary food of the people. The cost of this diet in 1868 was Rs. 40·407 per head, the prices of all the necessaries of life being considerably higher in Western India than on this side. The jail statistics of the Central Provinces in respect of dietary are so slovenly as to be all but incomprehensible, and present a curious contrast to the general excellence of all official work reported therefrom. As far as we can make out, the dietary scale is as follows:

	Per Week.		
Atta. (wheat flour)	140 oz.	or 168 oz.	Bajree
		,, 168 ,,	Jowar.
		,, 140 ,,	Rice.
Dhall	16	,,	
Vegetables	24	,,	
Gram (parched)	4	,,	
Oil and Ghee	3	,,	Returns uncertain
Chillies, Condiments	0	,,	
Salt	0	,,	
Firewood	0	,,	

We doubt if this dietary represents the ordinary standing of living in the Central Provinces. We imagine it is some what below that standard generally.

The statistics of Madras are complete, and leave nothing to be desired. The scale is as follows:—

	Per week.		
Rice.....	182 ounces	or 154 oz.	Veragoo (warree)
		or 168 ,,	Raggee (natchnee)
		or 168 ,,	Cholum (jowaree)
		or 175 ,,	Cumboo (bajera)
Dhall ...	20		
Vegetables	18		
Tamarind	3½		(or Mango pickle)
Onions ...	3½		
*Curry powder	3½		
Garlic ..	½		
Ghee (or oil)	3½		or 14 oz. cocoanut
Butter milk	40		or tyre
Mutton or fish	15		or 7½ oz. salt fish
Salt	7	,,	
Firewood	14	lbs.	

In looking over these returns it is not the variety, but the sameness of the food which is the prominent fact in so vast a continent, comprising nationalities so distinct, and so far apart in all other respects. The food of the Punjabee is subtantially the same as that of the Bengallee and the Madrassee. The cooking no doubt differs widely, but the food both in quantity and nature is the same. If we add to these scales the simple luxuries of goor, tobacco, and pan soparee, we embrace almost everything in so far as the masses are concerned. The garden cultivation of India belongs chiefly to the well-to-do classes and the rich

These dietary scales of the various jails of India show the consumption of cereals to be as follows:

N. W. Provinces	Attah	160	ounces per week
	Gram and Dhall	44	,,
Central Provs	Attah	140	,,
	Gram and Dhall	20	,,
Madras	Rice	182	,,
	Dhall	20	,,
Punjab	Attah	140	,,
	Dhall	24	,,
Sindh	Attah	168	,,
	Dhall	35	,,
Bengal	Attah	70	,,
	Rice	84	,,
	Dhall	14	,,

This table contains the consumption of *grain* alone, and if we estimate 12 ounces of attah to be equivalent to a pound of grain, we shall find the average consumption to be very nearly 2 lbs. per prisoner per day, independently altogether of the allowance of vegetables, meat, butter-milk, condiments, &c. The allowance for European prisoners in Bengal is: —

Bread	168 oz.	per week.
Meat	112 ,,	,,
Vegetables	112 ,,	,,

Or 3½ lbs of solid food per day without taking account of milk, ea, sugar, &c. Large as the allowance seems it is considerably below the dietary scale of other English jails.

In Tasmania the allowance of a prisoner is 19½ lbs. of flour, and 10½ lbs. of meat per week, or more than 4½ lbs. per day. In the *Statistical Reporter* which accompanies this issue, we have given a record of interesting experiments made in Bengal some years ago, as to the quantity of food the people will consume when they can do so without thought of its cost. The spare diet of the Belgian miners has been remarked upon, and yet we are told they eat 2 lbs. of *bread* a day and 1½ lbs. of vegetables, besides other food.

In estimating the average consumption of food grains in India aot 2 lbs. per head per day, and basing our calculations thereon for testing the accuracy of the agricultural returns of thee Provinces, it must be remembered that we made no allowance for the consumption of grain by cattle, nor for the surplus food which in every ordinary year the harvest must be supposed to yield to replenish the food stores of the country, and provide for the loss which takes place from the constant destruction of large quantities through mildew and other causes. Our statement was as follows:

* *Official Recipe.*

		oz.	dr.
Jail curry powder	Chillies	3	6
	Black popper	1	4
	Coriander seeds	0	8
	Turmeric	1	1
	Cummin seed	0	6
	Mustard seed	0	6
	Vendeum	0	

The Central Provinces not only grow all the food consumed by their own population, but contrive to export about 1,000,000 maunds of food in ordinary seasons. The population of the Provinces is 9,000,000, and the average consumption of food grain per head will not be less than 2 lbs. per day. A very simple calculation, therefore, suffices to shew that the harvest *must* at all events reach 8,000,000,000 lbs. of food—thus:—

People		*lbs.*		*days.*		
9,000,000	×	2	×	365	=	6,570,000,000
Add 1/4th for seed corn replaced					=	1,640,000,000
Add 1,000,000 maunds export					=	82,500,000
The Harvest must be						8,292 000,000

without any allowance for the consumption of cattle. Now the total acreage under cultivation with food grains in 1867-69 was, we are told:

	Acres.		*Produce.*		*Harvest.*
Rice	2,532,321	×	579	=	1,466,136,180
Wheat	3,313,677	×	405	=	1,342,039,055
Other grains	4,197,561	×	440	=	1,846,907,040
					Lbs. 4,655,082,305

The acreage under grain was well ascertained, and if the produce of 1867-68 was no more than what is recorded, whence did the Provinces get their surplus 3,600,000,000 lbs. of food from?

We are unable, upon the most careful review of this passage to modify it in the least. If it errs at all, we are persuaded that it does so on the side of moderation. Making every allowance for children, we are still of the opinion that unless the harvest of the Central Provinces amount to 2 lbs. per head of population with a surplus for seed corn and export, the food reserves would be drawn upon steadily every year. In a country where grain is plentiful, the cattle are largely fed thereon. There is probably no province of India, in which milch kine are not so fed. The goat will not give its milk without muth, or orrid, and if we were to draw out the estimate in detail, it would be easy to shew that our rough calculation of 2 lbs. per head per day is reasonable in the extreme. We have no desire for a controversial victory; but it is plainly important to apply a simple and efficient test to the returns of our settlement officers.

These jail returns throw considerable light upon the cost of food in India of late years. The *Pioneer* thinks that *eight* rupees per head may be assumed to be the cost of the annual food of the population; and upon this assumption estimates the gross annual value of the grain crop of the North West Provinces at about £25,000,000 sterling. The *Indian Daily Examiner* thinks this too low, and believes "the value of the food consumed annually by each member of the population to be ten rather "than eight rupees"

That both estimates are too low is shewn conclusively by the jail returns of the country. Our prisons are supplied with food in immense quantities under contract, and it is only reasonable to believe that the actual cost per head in these circumstances is below that of the private consumer, the profits of the retail dealer being engrossed by the gaol. But what do these accounts shew? Instead of 8 rupees or 10 rupees per head, they shew the cost, at a period long antecedent to the late rise in prices through successive years of drought, to have been as follows:

Cost of food per head per Annum.

Punjab Jails	1865	Rs.	21	15	2
N. W. Provinces			21	1	6
Bengal			27	1	4
Bombay			40	4	7
Madras	1868		49	2	4

The *Pioneer* bases its calculations upon a repudiation of "prices now current as abnormal" and assumes that "20 seers per rupee may be taken as fair. This would give something over eight rupees as the value of the annual food of the population per head." What has our contemporary to say to the fact that with wheat at 33 seers, instead of 20, per rupee, the cost in the Punjab jails was 22 rupees per head in 1865? The contract prices paid in the Punjab in that year and the quantities supplied were:

	Quantity supplied.			Rate per Rupee.		
	Mds.	s.		Mds.	s.	c.
Wheat, 2nd quality ...	54,236	28	12	33	8	
Dhall	9,297	24	14	23	3	
Meat, free of bone and fat	9,297	29	0	7	0	
Parched gram	3,168	26	2	25	12	
Ghee	605	34	3¼		4	
Salt	1,413	26	7¾	20	9¾	
Condiments, (one Rupee for 448 prisoners)						
Firewood	33,927	35	10	4	20	5
Vegetables (supplied from jail gardon						

Now at these rates—which have since been nearly doubled—the cost per head was Rs. 22-0-0.

The average nett cost of each prisoner in the jails of the North West Provinces during the year 1868, after deducting a considerable profit made by their labour was:

	Rs.	a.	p.	
In the Central Jails ...	48	1	9	per head.
,, Divisional Jails ...	56	10	0	,,
,, District Jail ...	54	13	6	,,

And the average contract prices of the food supplied throughout the year was:

Wheat flour ...	15½	seers per rupee.
Dhall ...	11¼	,, ,,
Parched Gram ...	16½	,, ,,

In view of these statistics taken at the *Pioneer*'s own doors what becomes of its estimate of 8 rupees per head per year? It must plainly be trebled.

Our contemporary must now, we think, see how greatly mistaken was its estimate of 4th June last of the annual harvest of N. W Provinces. "Our calculation," it says "stands thus:

Food of 30,000,000 people ...	£25,000,000
Clothing of Ditto	,, 1,000,000
Forage crops, Garden Stuff, and Exports ...	,, 3,000,000
Seed for the next crop	,, 2,500,000
	£31,500,000"

Upon this really absurd estimate, the land revenue of the Provinces was declared to amount to one-seventh of the gross produce of the land The cost per head of population in the North West Province for the last two years cannot have been less than 25 to 30 rupees. Less than that would not have kept soul and body together, while there has simultaneously been an export of produce many millions in excess of our contemporary's estimate. Let the *Pioneer* substitute the following figures for its own estimates, and it will be nearer the mark a good deal:

Food 30,000,000 of people @ 20 Rs. ...	£60,000,000
Seed corn 1-7th of total crop of £70,000,000 ...	,, 10,000,000
Clothing 2 Rs. per head of population ...	,, 6,000,000
Forage, Pasture and Garden ...	,, 8,000,000
Indigo, Sugar, Cotton & other Exports ...	,, 8,000,000
	£92,000,000

We have estimated the clothing here at a low figure for a temperate climate like the N. W. Provinces. Instead of the land revenue of the Provinces being *one-seventh* of the gross produce of the soil, we are reasonably convinced that it is not one-twentieth, as we have repeatedly affirmed.

We have assumed the exports of the N. W. Provinces to amount to £8,000,000, a surplus industry of about 2½ rupees per head of population. We should think they must be more, but have no means of ascertaining the fact. All the statistical returns of these Provinces that we have seen are slovenly in the extreme. Travancore exports are 6 rupees per head. The average of all India 2½.

A HINT TO OUDH.

THE wrong done to the rest of India by the Land Settlement of the Central Provinces, receives a curious illustration in the trade statistics of the Provinces, as summarized at page 95 of the Administration Report (1869-70) just published Under a

normal condition of things, a nation's imports will always exceed its exports, and the reason is too manifest to be dwelt upon. Now the statistics of the trade of India shew this general order of things to be reversed. Instead of our imports exceeding our exports, they fall short of them by many millions sterling a year, the deficit being occasioned by the tribute which the country pays as the cost of foreign rule. Now this deficit should fall upon every province of the country in proportion to its resources and its population. But the Central Provinces contribute nothing to it. The preposterous terms upon which the land has been let therein for 30 years to come, have given these Provinces an immunity from all contribution to the Home charges and to the expenses of the Imperial Government. The trade statistics of the Provinces place the fact in a very striking light. Thus while the imports of every other province fall short of their exports, we have here the normal condition of things undisturbed.

Imports.....	1869-70..... £	4,086,222
Exports.....	,, ...	3,058,243
Profit.....	... £	1,027,979

While every other province of India has to part with more than it gets back, the Central Provinces, contributing nothing to the charges of the Imperial or Home Government, engross the whole fruits of their industry to themselves. Thus *all* the revenue raised in the Central Provinces is spent within them, and a considerable amount of the taxes contributed by other provinces. The injustice is overwhelming, and to remedy it we should send Sir Richard Temple back to the Provinces to raise another million of revenue therefrom in the best way he can devise. We may illustrate the wrong that has been done in another way. The total amount of the revenues raised in the Central Provinces from 1861-62 down to 1868-1869 was as follows :

Total Revenue Central Provinces.

1861-62	£	891,210
1862-63	,,	843,822
1863-64	,,	864,085
1864-65	,,	952,400
1865-66	,,	991,002
1866-67	,,	1,052,257
1867-68	,,	965,362
1868-69	,,	1,074,515 £7,141,654

The total amount spent within the Province, during the same period for civil charges and public works was

1861-62	£	349,776
1862-63	,,	627,333
1863-64	,,	732,078
1864-65	,,	843,027
1865-66	,,	913,129
1866-67	,,	857,717
1867-68	,,	1,044,175
1868-69	,,	1,185,656 £6,523,458

Thus all the taxes raised within the Provinces in the last eight years have been spent within them upon public works (not including railways) and civil charges alone, while they have been enriched by a very considerable military expenditure therein out of taxes raised in other provinces, and have contributed nothing whatever either to the liabilities of the Imperial Government or the Home treasury. And the working of this injustice is shewn clearly in the Trade statistics of the Provinces, the imports exceeding the exports by a million sterling a year.

Now we ask whether this is to last for the next 30 years? While every other province of India is bleeding freely for the Imperial and Home charges, the Central Provinces enjoy complete exemption from all contributions thereto. Without the slightest idea of what he was really doing in settleng the land revenue at a quit-rent, Sir Richard Temple has contrived thereby to impose upon the rest of India the share of the tribute they should yield to the Imperial Treasury and the Home Government. The great reproach of all this is that it is done unintelligently, without insight. There was no intentional injustice in the matter, but complete blindness to the effect of what was being done. Turn now to Oudh, the land of which was under settlement at the very same time, and observe the contrast it presents :

Total Revenues.—Oudh.

1861-62	£	1,263,946
1862-63	,,	1,223,517
1863-64	,,	1,184,666
1864-65	,,	1,237,763
1865-66	,,	1,313,097
1866-67	,,	1,213,956
1867-68	,,	1,426,502
1868-69	,,	1,476,183 £10,329,630

Now of this revenue the amount spent within the Province for civil charges and public works was but as follows :

1861-62	£	710,649
1862-63	,,	732,759
1863-64	,,	694,454
1864-65	,,	596,647
1865-66	,,	607,916
1866-67	,,	677,619
1867-68	,,	740,921
1868-69	,,	773,151 £5,534,116

Thus while the Central Provinces are keeping within their own borders all the revenues (taxes) raised therein, Oudh is retaining barely half the amount of its taxes, and is contributing 70 lacks a year of the fruits of its industry to the Imperial Treasury. The Province has been drained of £5,000,000 sterling for this purpose within the last eight years. The injustice is so glaring and so manifest when once pointed out, that a remedy ought to be found for it instantly. Where is the justice of exacting from the people of Oudh this heavy tribute, while the Central Provinces contribute nothing! The truth is that our finance is all a chaos at present. The facts we point out are simply disclosures which evidence how absolute is the necessity of close study of the economic facts of every province by itself separately.

Conceive the excitement which a disclosure of this order would make in a representative assembly where deputies from Oudh were sitting side by side with others from the Central Provinces. We look in vain in the "Budget" statements of Indian finance for any breadth of view, or evidence of insight into the true state matters. The general Income Tax which the country groans under, ought plainly to have been clapped as a special local blister in some shape or other upon the Central Provinces, because it is there that the deficit arises. This fact is as clear as the noon-day sun. But who can expect Sir Richard Temple to undo his own work in this cruel way! And yet undone it will have to be, for everything unjust in this world, must take the fate which God has appointed it. The truth is that there ought to be an economic Committee or Council, always sitting in Calcutta at the Viceroy's elbow, whose duty it would be to do what we are imperfectly attempting, to make the State aware of the conditions of Indian finance and the numerous problems it presents. We trust that the hint we have given in this article to the Government of Oudh will not be thrown away. It is surely its business to insist upon this state of matters being known and terminated.

SIGNING BILLS OF LADING IN ADVANCE.

THE sentence of "three years' rigorous imprisonment" passed by the High Court of Bombay at the last Criminal Sessions upon one of the Native Justices of that island, for obtaining money from Messrs Finlay, Scott and Co., upon the hypothecation of documents professing to represent Cotton that was really not in existence, is open, we think, to objection from the peculiar circumstances of the case. Had Mr Kursondass Madhavadass, the native gentleman in question, been a mere swindler, or his offence an intentional act of fraud, the sentence would have been just and proper. But Mr. Kursondass, within the knowledge of every man in the island, within the knowledge of the Judge himself who passed sentence upon him, is *not* a swindler. Although comparatively young, he has been one of the most influential men in the native community for some years, and has

been so conspicuous for disinterestedness, purity, and modesty and so earnest and self-forgetful in his efforts to promote every thing that is good and to discredit every thing that is evil in the community, that the ignoring of it all on the part of the Court lays we think its judgment open to remark. The line taken by the Counsel for the defence, moreover, in refusing to plead anything in mitigation of what Mr. Kursondass had done, and the total silence maintained as to the facts of his past life, surely imposed upon the Court the duty of reviewing what Counsel had left to make its own silent appeal thereto. The judge was unequal to the occasion; and lost one of those opportunities which now and again occur to our judges of throwing a breakwater across the tide of unhallowed custom, and of awakening the consciences of mercantile men to the fact, that much that is done and allowed in business, even by respectable firms, crosses the narrow border line of uprightness. The judge had before him a man greatly and deservedly respected, a Fellow of the Univerity, one of Her Majesty's Justices of the Peace, and this man disgraced and ruined by having availed himself *when in difficulties*, of an evil practice that prevails, we are assured, in every port of the world, a practice that commercial men resort to without the remotest intention of fraud, and which is so convenient in itself and so firmly seated in usage, that it is certain to die hard—if ever it die at all. The testimony of shipmasters is uniform as to the prevalence of this custom of signing Bills of Lading, before the goods they profess to represent are on board. They tell us that the utmost pressure is put upon them in every port of the world to sign such bills. The practice is not confined to Bombay, but is universal: and the shipmaster who refused under all circumstances to sign such bills, would simply find himself without a ship to command. Whenever there is difficulty in getting freight, the master is required to be as complaisant as the agent thinks necessary, and if fraudulent intention is to be inferred from the simple fact of getting a shipmaster to sign such bills, then half the mercantile firms in a body would have to go to the bar. Mr. Kursondass's error was, that he was doing that in *difficulties*, which in such circumstances he ought never to have done at all. We do not suppose that any person in Bombay, not even the judge himself, believes that he *intended* to defraud Messrs. Finlay, Scott and Co. when he placed these bills of lading in their hands. He honestly intended to ship the cotton, but the disclosure of the *Aurora* frauds, and the incidental mention of his own name in connection with the cotton shipped in that vessel, destroyed his credit, and therewith the possibility of the *financing* upon which he was relying to make the shipment.

This practice of signing bills of lading in advance has been no doubt constantly resorted to for years as part of that loose system, which in modern mercantile phrase goes by the name of "financing."—Now *financing* is safe enough for the capitalist; but for a firm whose existence depends upon its credit, *financing* simply means walking upon a volcano. Mr Kursondass was engaged in the business of *financing*, and it, has betrayed him to disgrace and ruin. So common is the practice we are told of signing bills of lading in advance that the circumstances take the case, as it seems to us, altogether out of the category of fraud. There was fraud without any really fraudulent intent, and in view of this fact what ought the sentence to have been? Certainly not three years' imprisonment with labour. The only effect of such a sentence is to excite sympathy for its subject.

Had Mr. Justice Green availed himself of the opportunity to deal a heavy blow and discouragement at the evil practice which had betrayed the man, the really good man, before him into so dreadful a position, he would have done better for society—and *that* is the final purpose of all judgement—than by passing the exceptionally severe sentence he did upon Mr. Kursondas. We can hardly understand how the Court could pass a sentence of this weight upon an offence in mitigation of which so much was to be suggested. The jury had recommended the prisoner to mercy. They felt instinctively the difference between intentional dishonesty and the betrayal into crime of a man whose nature they knew it was to shrink therefrom in every form. Mr. Justice Green had a fair opportunity of bringing doubtful mercantile usages under review, and of strengthening the hands of honorable firms who only require to discern clearly what is right to make it their invariable rule of conduct. So important are the facilities which the practice of signing Bills of Lading in advance confers upon the merchant, that the community is greatly interested in ascertaining how far the practice is permissible, if at all. We may be very sure that the sentence upon Mr. Kursondass will not stop it. The most common form of it, we believe, is for the shipmaster to sign when the greater part of the goods are on board, or in course of shipment. Even in this case, it is easy to conceive of an accident preventing the completion of the shipment, while it would be monstrous to infer fraud when every material circumstance of the case is inconsistent with the supposition. The Court might have done the community great service, by pointing out authoritatively where the line was to be drawn between what was permissible, and what was not. It seems to us that in such cases the rule for observance, should be *the simplicity of truth*,—an open statement of what the facts really are. If the Captain sign for 1,000 bales when 800 bales only are on board, then let the Bill of Lading bear the fact upon its face, and say that the Captain has signed for a thousand bales under the guarantee of Messrs. Finlay, Scott & Co. that the shipment will be completed. The document will suit the Banks just as well in this shape as in the perfect form to be supplied afterwards. Were such a course adopted, the giving a clean Bill of Lading when the goods were not on board, might be very justly ruled to be fraud. We pity Mr. Kursondass and should be glad to see a petition for the reconsideration of the sentence. It seems to us that simple imprisonment for a year would under the circumstances of the case have met the requirements of justice fully.

THE PERMANENT SETTLEMENT—ONCE MORE.

We pointed out in our last issue with as much force as we could command, that there is absolutely no excuse for our tampering with the Land Revenue. When Lord Cornwallis made his unfortunate settlement, the distress of the country was so great that he was forced to do something; and it is this consideration that makes us deal leniently with his error. Bengal was relapsing into jungle, and the circumstances of the time were so emergent, that we are compelled to condone an error made under severe pressure from outside. But what excuse can be pleaded for the statesmen of *our* time, who are moved by a mere morbid desire to be doing something, when the prosperity of the land bids us be at rest and do nothing. We ask once more—Who wants a permanent settlement of the land revenue? Not the people certainly. The proposal comes from a knot of doctrinaires inside the machinery of the State itself. The permanent settlement mania is a purely official disease, confined in the main to the Bengal Civil Service. It is now generally admitted that had we adopted the original proposal of this school we should have committed ourselves to an irreparable error, but the malady still prevails, having assumed the milder form of a permanent settlement in *corn*. As surely as Lord Mayo lives, if he give effect to the counsels of this school, his administration will be fatal to the future well-being of the country. Other nations enter upon revolutionary courses only when nothing else is left to them. *We* are to subvert the very best and wisest fiscal system a nation can possess, not because the people have gone mad, but because official men around the Viceroy are so. The whole school should be sent out of the country on sick leave. For they really *are* sick. No really sound brain in the country can entertain the delusion of the Temple school, that we may settle once for all the amount we are to get as revenue from the land, "and safely trust to the increment of something else" for the growing expenses of the State. The revolution proposed to us simply means the abandonment of the very best fiscal system a people can possess, for some other system that at the best will not be half so good. A permanent settlement of the land revenue, whether in money

or in corn, means a total subversion of the fundamental principles of Indian Government adopted by the great statesmen who ruled India under the Company. "It is the sacrifice of the "one single opportunity left in the world of carrying out in practice the essential principle of political economy in the maintenance of a community with entire justice and without waste. "From the first hour when the philosophy of administration has "been understood, it has been admitted that the true source of "state revenue is the land, and the only sound policy is to preserve the land as the property of the State. The land is the one "species of property which necessarily and perdurably increases "in value by the mere growth of society, and which can therefore be charged with the support of the State, precluding all "burdens upon individuals, and precisely adapting itself to the "demands upon it. The misfortune of all the Western Kingdoms of the world has been, that this discovery was not clearly "made till the practical application of it had become impossible, "through the appropriation of the soil as private property; and "when India came into the hands of our fathers, they found "themselves in possession of the one opportunity left in the world "for carrying on government without taxation, and without the "necessity for ever instituting taxes."

ALIENATION OF WASTE LANDS.

THE Government of the Central Provinces has, we observe, stopped all further sales of Waste Land in the Provinces pending the result of a reference on the subject to the Government of India. The improvidence of these sales is at last beginning to be recognized. The Commissioner expresses himself upon the subject in the Administration Report for 1869-70 just issued, as follows: "That these waste lands are in many parts very "valuable can admit of no doubt, and year by year, as the country is opened up, and as the lines of railway create a large "demand for timber and fuel, the importance of the Government "wastes will increase. The large areas which exist contain "much valuable land which has never been surveyed, and but "cursorily visited by any officers, and the policy of alienating "for a trifling sum lands which may prove of immense value, "is so very questionable that it is in contemplation to place further restrictions on the selections for sale of what are termed "waste lands."

In these Provinces alone, the area of cultivable land still unappropriated, either by sale or grant on clearance leases, amounts to 9,330,206 acres Now this property was being alienated from the State by tens of thousands of acres for 3*s*-6*d*. per acre, with a pledge never to impose a land tax thereon. And yet nothing is clearer to the student of Indian finance than that it is to the State rights in these lands that we must look for meeting the future necessities of the treasury. The hot-bed process of forcing them into private hands, has fortunately been arrested before much mischief has been done. It does not seem to be generally known that this alienation of the Waste Lands of the country was being carried through in the teeth of a consensus of opinion in the Home Press. The State is at last happily beginning to perceive what has been clear enough to economists from the first We shall not weary our readers with a string of English authorities upon the subject, but think it desirable to reproduce what the *Daily News* wrote about it in 1862.

"There is no calculating the increase of the value of land in such a country [India], as population thickens and arts and industry advance; but what may be estimated is its ample sufficiency for the support of the State if it is retained, on almost any terms, as the property of the State. The more the country improves and the population increases, the less need there will be of taxes, if this property is not frittered away by absolute sale to individuals, who might prosper quite as well under wise arrangements of tenancy Under the fundamental theory of Indian Government, we have seen something of the process; and what we have witnessed should enlighten us as to what to expect from fidelity to principle. We have seen early mistakes made as to the rate of assessment of the land; and we have seen how the total land revenue increased as the assessments were lowered, so that the greatest moderation secured the largest revenue. We have witnessed also the mistakes of one and another executive, which parted with this or that portion of land, and cut off for ever so much of the revenue of the State, compelling some sort of impost to make up for the sacrifice. The wisest statesmen have remonstrated against such alienation, and have never ceased advising that the grants should be repurchased, while it is still possible. It may be a question for discussion how far those grants may be resumed on honourable terms; but it ought to be no question among statesmen, *and it can be none among sound political economists*, whether any more of this State property should be allowed to pass out of its hands for ever. For the last nine months it has been a great perplexity to qualified observers not only how Lord Canning could venture upon such a revolutionary measure as his ordinance for the absolute sale of waste lands, and the redemption of the land tax, but what inducement could be strong enough to occasion so vast an innovation? Mr. Laing at Glasgow offered an explanation; but its levity and insufficiency render it really incredible. He says that Lord Canning thought it would be a good thing to introduce some variety in the dispensation and management of property to the notice of the people of India. For such an object as this, and also, no doubt, to encourage an immediate settlement, by gratifying the new speculators and colonists, he surrendered so far the State revenue for all time to come, and laid England under the necessity of imposing taxes, at an ever-increasing rate, on a people more impracticable as tax-payers than any other in the British Empire."

THE IMPERIAL GUARANTEE.

WHATEVER view we may take of the Indian debt, whether we regard it as inequitably bound upon the shoulders of this country or as justly attached thereto, the economic error we are committing in withholding the Imperial guarantee therefrom is manifest. The *Financier*, an English journal conducted with great ability, states the case with precision and force:

"Nothing but timidity—a feeling originating in old-world ideas and traditions—has prevented the direct guarantee of the British Government from being impressed ere now upon the whole of the Indian Government debt. It is as though a man had two estates, managed by two different stewards. On the one estate, more immediately under his own eye, he raises money at 3½ per cent., while on the other he raises money at 5 per cent. By more explicitly pledging his own liability, he would certainly be able to borrow the entire sum required at 3½ per cent., and in that case he might, if he so chose, gradually pay off the entire amount of the mortgage on estate number two by means of the 1½ per cent. per annum interest which he would thus save. His present policy in the matter is the less intelligible, because everybody knows that his liability is really as completely and inextricably pledged in the one case as in the other. But he has a vague notion that, were he to adopt the course here pointed out, and were a pinch to arise, he would not find it as easy as he does now to raise money at 3½ per cent. upon the first estate, on which he sets the more store. But he underrates his own credit."

While the *Financier* thus boldly adopts all that we have written upon this subject, other English authorities by their nibbling at the question shew plainly their consciousness of the error, that is being made. Mr. Laing hesitates to propose an Imperial guarantee for "the national debt of India," but would have it extended at once to the Guaranteed Railway Capital of the country

"There is a special capital which stands on a different footing from the national debt of India, viz,—the guaranteed railway capital. 1. The amount is known to be limited. 2. It is held exclusively in England. 3. It is held exclusively to an object in which English commerce has a vital interest. 4. The liability is slight, for it only extends to guaranteeing a certain return in case the traffic should be insufficient to pay it.

"It is, I believe, probable, that these railways, when finished, will earn on the average 4 per cent. or upwards on their cost and am morally certain that they will not earn less than 2½ or 3 per cent. If, therefore, the capital were raised under a guarantee of 4 per cent. the liability under that guarantee could not well exceed 1,000,000 a year, and in all probability, would be much less.

"Now the risk to England of endorsing the guarantee of the Indian Government to this extent would be practically nothing. The finances of India are on the soundest possible footing. With a gross revenue of 43,000,000*l*, which is rapidly increasing, the interest of the debt is not one seventh of the income, while that of England is two-fifths. England has no reserve, and barely meets the necessary expenses by the taxes of the year. India invests annually out of surplus revenue, at least 2,000 000*l*.

in reproductive public works. England has no cash balance beyond what is required to carry on current business; India has a reserve of at least 8,000,000*l.* in hard cash in her treasury. The risks, therefore, to England of endorsing a guarantee by the Indian Government to make up in case of deficient traffic a sum of, at the outside, not above 1,000,000*l.* a year to the subscribers of railway capital, who, be it recollected, are all English, is practically no risk at all."

Mr. Laing has never pronounced *against* extending the Imperial Guarantee to the whole debt, so far as we remember, while almost every line of this extract in favor of the Railway Debt applies *mutatis mutandis* to the National Debt. The *Economist*, which by some curious accident is almost never right in its views upon economic subjects connected with India, has opposed the guarantee ever since Mr. Wilson pronounced against it. In a recent issue, however, our contemporary when commenting upon Lord Granville's offer of the Imperial guarantee to a loan for New Zealand, let fall a sentence or two which seem to indicate a relenting mood upon the subject:

"Without attempting to lay down any general rule on the subject, we confess we do not see the force of the objections commonly urged against this policy [Imperial guarantee]. The risk in the case of any progressive colony— and all our colonies are progressive—is almost imaginary, and the value of the guarantee is very substantial. A Government which proposes to lend indefinite sums of money to Irish peasants of less than doubtful solvency, ought not to feel much difficulty in justifying a mere guarantee to the loan of a thoroughly solvent colony. It would be difficult to find an instance in which any such guarantee has done a particle of injury to either party, while the pecuniary benefit to a colony of borrowing at 3½ instead of 6 per cent. is tolerably obvious."

Now if such considerations as these are to influence the Government, they can be pleaded with ten-fold greater force in behalf of India than of New Zealand, for these reasons: (1). That the administration of Indian finance is completely in our own hands. (2). That no balance sheet in the world will bear a comparison in point of solvency, with that of India.

The objections to the guarantee have lately been restated by the *Daily News* (London) in reply to an article upon the subject that appeared in our first number. After complimenting the *Indian Economist* upon its ability, our contemporary proceeds as follows:

"When the matter is looked into the objections are overwhelming, the immediate effect would be to depreciate all English securities by a virtual increase of their quantity. When we come to borrow ourselves we should have to pay more, and might possibly feel the difference much in any great transaction, like the purchase of our own railways."

It is odd that the writer should have placed in the fore-front of his array, an objection, the very opposite of which was urged with great force a few years ago by financial authorities at home, *against* the system of improvident borrowing on Indian account. The high rate of interest paid by Indian Stock directly tends to depress Consols. It is easier to blind statesmen and legislators, to the interests of the country, than investors to their own. The most marked feature of the home money market throughout the Mutiny, when Indian loans were constantly being announced, was a steady decline of Consols. But a small portion of our eight hundred millions of national debt comes, or can come, into the stock market. The Indian stock, therefore, though comparatively trifling in amount as weighed against the whole of the national debt, bears a considerable proportion to the mobile part of the latter; and as capital naturally seeks the largest return, Indian securities were preferred. Sales of Consols had to be forced by those who wanted to realise, and the result was a steady decline in the price of the English funds. As permanent investments forsook Consols more and more, an increasing proportion of that stock was practically mobilised, and fell into the hands of temporary holders, who would throw it upon the market at the first momentary crisis.

If English statesmen had wished to depreciate Consols and to prevent any future Chancellor of the Exchequer from borrowing at 3 per cent., what more effectual method could they take than borrowing on account of India at 5 per cent., while giving to the lenders the same facilities for securing their dividends as those possessed by the holders of Consols, and virtually the very same guarantee!

The blunder was severely commented upon at the time by an English writer who said: "It would be a woful day to British "credit if our national rulers were ever to attempt to repudiate "these Indian loans, on the plea that the Indian revenue was "unable to pay the interest upon them; and if they are "perfectly safe, then our Financial Minister by giving them the "proper benefit of British credit, might have obtained the "money at or near 3 per cent. instead of 5, and by so doing *have* "*upheld the value of Consols*, and economised the national ex-"penditure."

The second of these "overwhelming objections" is stated as follows:

"Nor is it true that we give any sort of guarantee now. Even if we should have to do something for Indian creditors, on a disaster befalling the Government, we should clearly gain by making a grant then as a compromise, and not having to bear, in virtue of a distinct obligation, the whole burden of the debt."

The writer can hardly have reflected upon the position. Day by day the Indian stockholder is becoming more and more aware of the absolute guarantee which he holds. He perceives that every million added to the Indian debt, every million of English capital invested in India, is a material guarantee that India shall be retained, public claims met, and his own dividends ensured, by the whole power of England. He knows that to save the sacrifice of her children's property in India, and of their claims on the Indian revenue, England would, at a push, spend 500 millions on another war. He begins to see, in fine, that his own stock, by whatever name it may be called, is secured by the same guarantee as Consols,—*the national existence of England*. This explains how it is that successive additions to the Indian debt have not impaired the value of Indian securities. Ten millions of English capital might be abandoned by the English Government; with one hundred millions this becomes difficult; with five hundred millions impossible.

So *real* is England's responsibility for the debt, that she is prepared to spend its amount ten times over, rather than relinquish the sovereignty of the country; and it is impossible to conceive a contingency in which that debt will be abandoned that does not involve the bankruptcy and overthrow of England herself. In this position the imperial credit is already as *substantially* pledged to the payment of the Indian debt as to the debt of England.

The position, then, is this, that England is ignorantly incurring a debt which she calls Indian, but for which she herself is liable, at 1½ to 2 per cent. higher interest than she need pay. It is true that she looks to the Indian treasury to meet this interest annually, but, ultimately liable for every rupee thereof, she is as much interested as we are in reducing that interest to a minimum. The whole of the Railway debt of India and five-sixths of the national debt, are owing to English capitalists, the guarantee therefore would simply spread the risk of its eventual loss over the general English public. Let the reflective say, whether in the event of the insolvency of this country, or of its being wrested from our dominion, it would not be better for the loss to be spread over the general community at home than for ruin to overtake the small class of creditors. It is clear that the *national* loss of wealth would be the same in both cases, but it would be intensified in the one by an enormous amount of individual suffering. Can the opponents of the guarantee furnish any answer to this statement?

The third and final one of these "overwhelming" objections is stated as follows:

"But most of all we should oppose the guarantee as unnecessary, and possibly injurious, to India. The Indian Government would at once obtain the present of a handsome sum, and like most people with easily found money, would probably proceed to squander it. The lavish waste, instead of being checked, would rather be increased: the stimulus to improve the Government estate and study scientific taxation would be lost; England would be burdened, but Indian finance very shortly would be as hopeless as before."

By reducing the interest upon the total Indian debt by £2,000,000 a year, we should place the Indian exchequer in circumtances to borrow £70,000,000 sterling from the capitalist for investment in public works upon the scale on which they are required, and this operation we are to understand should be very "injurious" to India! The great want of the times is a clear and courageous exposition in Parliament of our true position, and of the financial relations which subsist between the two countries. In refusing the Imperial guarantee, and repudiating the necessity of borrowing, English

statesmen have shewn themselves profoundly ignorant of the real circumstances of this country; its progress depends upon the explosion and overthrow of both dogmas. Their maintenance will effectually arrest all rapid development of the country's resources, if they do not prevent it wholly.

MUNICIPAL LOANS.

THE Municipal Commissioner of Bombay is not a man to let the grass grow under his feet. In his Budget estimate of ways and means for the coming year, he holds the island community already committed to his proposal that certain works of local improvement, during the year, should be constructed out of loans, by reminding them that they have expressly demanded the adoption of this policy in Imperial matters in their recent protest against the Income tax:

"A community that has, so recently, and so very ably represented the objections to the Income Tax, and among other important measures recommended, with reference to imperial finance, *that all permanent works should be charged to capital instead of the cost being defrayed from current revenue*, will surely acquiesce in a similar scheme for local improvements, a scheme which while it gives present tax-payers the immediate benefit of proposed improvements, yet makes a future generation—not themselves alone bear the cost."

The Bombay community are, peculiarly fortunate in their Commissioner and the Justices will, we trust, continue to give him hearty support, instead of listening to the twaddlers in the press, who would have driven him from office two years ago, had they been allowed to do so. At present, Bombay cannot with propriety be said to be in debt at all. Every one we suppose, can see the difference between a debt of £500,000 incurred in war, and a debt of the same amount arising from the construction of the Vehar Water Works. The works are simply capital in a new form yielding a large income, and with these works at the credit side of the Municipal balance sheet it is misleading to talk of the island being in debt. We look to the Bombay community to shew the other Municipalities of India the right way to make our cities abodes of health and cleanliness, where they are now foul with dirt, disease, and death. Wherever want exists and the right way of meeting it is discerned, it is a reproach for any people idly to fold their hands and acquiesce in the want. The great cities of the world are beginning to understand that if it is lawful for men to borrow money for purposes of war, a *fortiori*, must it be so for purposes of peace. The twaddlers do not discern it; and never will. Our own statesmen at home shew discreditable slowness in apprehending this truth, but are at last waking up to its discernment. Bombay has a population of 800,000 persons, and is the entrepôt of a trade that for the last ten years has averaged £50,000,000 sterling a year. The city wants almost, everything, while the credit of its Municipality is almost as good as that of London; and yet the people have been persuaded that they cannot afford themselves even a proper supply of water! If they would make Mr. Crawford Dictator for five years, to do what ought to be done for their city, he would make it the fit capital of Asia, and hand the city back to them with its material resources doubled in value. Works of improvement upon any great scale are only possible upon *credit*. All that is necessary is that the works should be carefully considered, and their cost viewed in the light of the advantages which they are to secure. The fact that *debt* must be incurred in the prosecution of the work, is not worth a moment's thought. If the work should be done at all, the sooner it is done, that the people may get the advantage of it, the better.

The repugnance which the twaddlers express to this policy is blind and unreasoning, and while it lasts will stereotype the poverty of the people dominated thereby. Few persons in India have any idea of the extent to which this policy is being acted upon in Europe. In a few of the chief towns of France alone, the following loans were taken up by the Municipalities from 1851 to 1866, for works of public improvement:

Marseilles	108,750,000	*Francs.*	260,916	*Population.*
Lyons	34,204,000	,,	318,803	,,
Lille	24,100,000	,,	154,749	,,
Bordeaux	21,800,000	,,	162,750	,,
Rouen	9,655,000	,,	100,000	,,
Havre	8,800,000	,,	74,336	,,
Toulon	7,639,000	,,	84,987	,,
Toulouse	7,500,000	,,	113,229	,,
St. Etienne	7,055,000	,,	41,534	,,
Metz	5,846,000	,,	56,383	,,
Brest	5,500 000	,,	67,933	,,
Angers	4,850,000	,,	51,797	,,
Nantes	4,485,000	,,	113,625	,,
Avignon	4,360,000	,,	38,081	,,
Roubaix	4,247,500	,,	49,274	,,
Troyes	3,528,907	,,	34,613	,,
Versailles	3,170 000	,,		
Francs.	265,490,407		1,723,010	

The population of all these cities together is but about twice that of Bombay, while their trade is certainly not double. And yet they had boldly spent nearly £11,000,000 sterling of borrowed capital upon works of Municipal improvement, in the fifteen years from 1851 to 1866 alone. What the expenditure has been since we do not know. The progress of France in material wealth was altogether unprecedented in the 20 years preceding this war.

THE EAST INDIA STOCK.

As considerable interest seems to have been awakened on this subject by our letter to the Duke of Argyll, we think it desirable to state once more, as briefly as we can, the exact nature of our complaint. When Parliament in 1832 determined to put an end to the monopoly of the China trade in the hands of the Company, out of deference to the strong representations and remonstrances made against it by the merchants of London, Liverpool, Bristol, Manchester, and other great towns of the Kingdom, it was of course necessary to recoup the Company their capital of £6,000,000. For 40 years before the monopoly was abolished, they had been empowered by Act of Parliament (1792) to appropriate to themselves an annual dividend of 10½ per cent. upon that sum, or £630,000 a year. The trade with *India* had been thrown open in 1814, and the monopoly against which the merchants of England rose in 1832 was the monopoly of the trade with China. The company declared that the monopoly was a source of great profit to them, and that the Government of India could not be carried on without it. Parliament determined, however, that the experiment should be tried, and the East India Company, *as a trading Corporation*, was accordingly abolished. The Statute 3 and 4 W. VI., c. 85, s. 4, required "the Company to close their commercial business, and sell the effects distinguished in their books as commercial assets and to discontinue and abstain from all commercial business which was not incident to the closing of their actual concerns, and to the conversions into money of their so called commercial assets." So complete was the demise of the Company as a trading body, that a doubt arose as to the legality of the Company's continuing to engage in the manufacture and sale of opium, and was even submitted to Counsel many years afterwards in 1857. The East India Company virtually died in 1834; and was succeeded by a new corporation altogether, to which the administration of India was confided in trust for the English Crown. The remuneration of the new Corporation was no longer a *money* one, but the vast patronage which the administration of India left in their hands. When the old Company however was required to die and get out of the way, the proprietors of its stock—some 3,000 of the gentry, clergy, bankers, and merchants of England—wanted to know where their usual dividend of 10½ per cent. upon the £6,000,000 of paid up capital was to come from. Now although Parliament had empowered the Company to divide this dividend of the revenues of India if need be, it had never given any pledge that those dividends should be perpetual. On the contrary, the Company was well aware that the trade from which these dividends were supposed to spring, was under sentence of death from the determination of the country to bring it to an end. Had Parliament guaranteed the perpetuity of the dividends,

the Stock would have been quoted at 300 instead of 200. But the Company was immensely powerful in the old unreformed Parliament, and died hard. To get it to die at all, Parliament had to promise the holders of the stock an annuity for 40 years (virtually 55 years) of £630,000 per annum, and upon the expiry of this annuity, payment in cash of the amount of their paid up capital *twice over, i. e.* £12,000, 000 instead of £6,000,000. It had further to promise compensation annuities to the whole commercial staff of the Company at home, and in China, St. Helena, and elsewhere. These annuities amounted to £150,000 a year, and were we suppose of a capitalized value of 3,000,000 sterling. The question then arose—Who was to find the money? Who was to pay the Company and their staff this £780,000 a year for 40 or 50 years, and the £12,000,000 at the close.

The case was equitably to be met only by a compromise. The capital of £6,000,000 had disappeared over and over again in wars and trade. The loss of this capital was part of the price paid for the Empire, and in strict fairness it was inequitable to make the people of India refund any part of the amount. But what are we to say to an arrangement that saddled the already sore back of this country, with all these heavy liabilities in a lump, Parliament refusing to touch them even with its little finger? To obtain the privilege of an open trade with China for the merchants of London, Liverpool, and Bristol, the revenues of India were put under a contribution of £780,000 a year for 55 years, at the end of which period the people were to be allowed to redeem the liability by paying down £12,000,000 in cash. And they were required to give security for duly fulfilling the engagement thus made for them by at once paying down £2,000,000 sterling for investment in Consols, to accumulate as a guarantee fund, or security, for the eventual redemption of the liability. Who will venture to defend such an arrangement in these days? It is now nearly 40 years since the last trade venture of the Company was made, and yet all through this immense interval of time, India has been paying an annuity of from £630,000 to £780,000 a year to the holders of the stock for foregoing the trade. The guarantee fund amounts to-day to £6,500,000 or thereabouts, and we must go on paying £630,000 a year until the year 1887 if we are to wait for this fund to extinguish it. Is it *un*-English then to point out the wrong that has been done, and to appeal to a purer Parliament than that of 1832 to redress it? The least measure of redress, it seems to us, that could be given would be for England to take the guaranteed fund as it stands to release India from all further payments and herself to settle with the holders of the stock upon the best terms she can. This relief ought to have been given long since. Let it be given now, and the Income Tax may be repealed to-morrow.

Had common consideration for India been shown in 1832, the burden would never have been imposed at all in its present shape. An equitable arrangement would perhaps have been, the division of the liability between the two countries; but under any circumstances the annuity to the proprietors of the stock ought to have been refused. Parliament, we suppose, was crowded with holders of the stock, or so gross an abuse of power had been impossible. Again, had the guarantee fund of £2,000,000 been invested in the Company's own stock, instead of Consols, the liability would have expired in the present year. Or again, why should not the holders of the stocks have been paid their £12,000,000 down at the time in four per cent. paper—a course which would have saved the people of India not less than 20 to 30 millions sterling. Our excuse for calling attention to these matters is the fact that almost no one else has ever done so. Not only our publicists, but our very statesmen themselves, are ignorant of the real history of the so-called Indian debt. In equity, that debt is not an *Indian* debt at all but an English one, twice over. And yet we have men amongst us who clamour against the mere proposal that England should lessen the weight of the burden by an imperial guarantee to its holders—although on purely selfish grounds, it is manifestly to her interest to do so.

AXIOMS OF INDIAN FINANCE.—1870

I. That India should not be allowed to borrow for her Public Works, because the State owns the rental of the soil.

II. That if we do borrow at all, it is better for us to borrow in India where capital is scarce and dear, than in London where it is plentiful and cheap.

III. That whatever other devices we may resort to for increase of revevenue—let them be as inexpedient, unsound, and odious as they may—they are all to be preferred to an increase of the land revenue, because the people would pay this increase cheerfully and without thought of grievance, and because economic authorities declare with one voice, that this impost is the very best a nation can levy, being in fact a tax upon the industry of no man.

IV. That it is good policy for the State to lower its claim upon the cultivator to the point of abandonment, and at the same time to create a race of middlemen, to wring from him what the State has foreborne to take, because we may hope in this way to improve the circumstances of the man.

V. That it is necessary to maintain a tariff of export duties which has destroyed one important branch of our trade altogether and threatens to kill another, because by repealing this tariff and levying in its room merely a general registration fee of one per cent upon all exports indiscriminately, we should double the revenue and make the whole export trade of the county free

VI. That it is necessary to maintain an import tariff of six hundred enumerated articles, because 590 of them yield no revenue whatever, and never can yield any.

VII. That the Custom House will, by and bye, be the mainstay of our finance as it is at home, because we may reasonably expect the ryots to develope a taste for champagne and Long Acre carriages now that the fostering care of the malgoozar will succeed the rack-rent ing mercies of the Sirkar.

VIII. That our financial embarrassments arise from our extravagant outlay upon public works, because we have spent as much in the last ten years upon Railways in India as they have spent at home during the same time in the county of York

IX. That to substitute Notes for the metallic currency of the country it is necessary to make ten rupees the lowest denomination we issue since that sum is about three times the amount of the average monthly wages of the people, through payment of which in notes alone we shall accomplish our object.

X That to substitute gold for silver as the metallic basis of our currency, it is necessary to enact that silver alone shall be the legal tender, of country.

XI. That simply to stop the further coinage of silver, and simultaneously declare the English sovereign legal tender for ten rupees might effect what we want to do; but that in this country, the sun rises in the West and sets in the East and that it will never do to overlook this fact in our AXIOMS OF CURRENCY AND FINANCE.

EDITORIAL NOTES.

THE Index to the first volume of the *Indian Economist* and its supplements will be issued with the December number of the Journal.

THE *Englishman* assures its readers that—"The land re- "venue, wherever the Permanent Settlement does not extend, "already absorbs all that the land produces, beyond a pittance "for the cultivators" There is no excuse for writing of this order in these days. That the land revenue does not absorb one-twentieth of the produce of the soil, is demonstrable to the capacity of a child. The gross amount of it is but £21,000,000 sterling, while the exports of the country, in other words the *sur plus* produce, after feeding and clothing a hundred and fifty millions of people has averaged for many years past upwards of £50,000,000 sterling a year. Had the *Englishman* said that the land revenue was a '*pittance*' he would have been nearer the mark.

SOME of our contemporaries appear to think that the Permanent Settlement question belongs to history. We trust they are not mistaken. That there is not a Settlement officer throughout the North West Provinces in favour of such a settlement, is, we believe, the fact, but the question is still agitated, we

understand, in the Viceregal Council, Lord Mayo himself, if, we are not misinformed, being secretly inclined in favor of a settlement in corn as advocated in the last *Calcutta Review*. We can but express our conviction that the step is forbidden by every fact of our position.

THE season for Malwa opium has just closed. The passes granted during the year from 1st October 1869 to 30th September 1870, contrast as follows with the returns of the two years immediately preceding :—

Opium Season	1867-8	...	...	Chests 35,165
	1868-9	...	...	,, 33,184
	1869-70	...	...	,, 40,668

Of this number 19,843 were granted in the present financial year, i. e., from 31st March last. Should the drug come forward during the remaining six months of the year, as freely as it did last season, we shall have nearly 21,000 chests to add to this number, bringing total up to 41,000 and representing a yield at Rs. 600 per chest, of Rs. 2,46,00,000. Sir Richard Temple's estimate was for, £2,017,000, representing 33,000 chests only

THE *Englishman* upholds the Perpetual Settlement in Bengal on the ground that "men will not labour to produce wealth, "unless they have a reasonable prospect of enjoying the fruit of "their labour"; and affirms that "wealth has been amassed "under the beneficial influence of the Permament Settlement, "*i.e.*, under the feeling of security that the *toiler will enter into* "*the fruits of his labour.*" It is not the Bengal ryot, we are to understand that toils in the field, but the Bengal *Zemindar*. Those fruits of his industry, which in Provinces where the State is landlord are left to the cultivator—are in Bengal appropriated by the cultivator's master, the zemindar. Will the *Englishman* be good enough to tell us what toils and labours they are, the fruit of which the settlement secures to the zemindar? There is a good deal of toil and labour we suppose in wringing a rack-rent out of the blood and sweat of the ryot, but our contemporary will hardly uphold the settlement on behalf of such toils as these.

FEW men of our times have shewn a sounder judgment upon passing events than old John Marshman of the *Friend of India*. Though living in the midst of those extraordinary prejudices which this war seems to have awakened at home, Mr. Marshman reads its history without difficulty. He writes: "Prussia ever since "the battle of Sadowa has been preparing for the present struggle France was not prepared for the conflict, and to quote "the language of one of the most popular Russian papers, was "goaded into it by Count Bismarck, and his King—'so religious'—just as the Emperor of Austria was goaded into the "war which ended so disastrously for him. Some of the English papers appear to be in some degree relaxing in "their hostility to France, which from the first outbreak of "hostilities has been bitter and unceasing. France, it will be "remembered, when the feelings of the moment have subsided, "has, under the auspices of the Emperor been the firmest and "most useful ally of England for eighteen years, while Germany has done nothing for us but multiply the Royal Family." Few men of his generation have shewn a sounder judgment upon contemporaneous history than Mr. Marshman. It is to the credit of the Press of India, that, as a body, they have not endorsed the judgment of the English press upon this war. The leading English journals committed themselves at the outset to a false theory of its occasion, and will hold by it until a more just opinion becomes so wide-spread as to compel them to reflect it.

THE vast progress of France in material wealth under the Empire is largely attributable to the enlightened policy of the Emperor in committing the nation to an adequate expenditure upon Public Works. The Duc de Persigny, as Minister, gave vigorous expression to that policy some years ago, in half a dozen sentences, which embody convictions that we have ourselves been urging for many years past upon the Government of India. "It is necessary," he said, "that our entire system of "communications, railways, roads, cross-roads, and canals, our "whole machinery of agriculture, manufactures, and trade, "brought to perfection with a view to rapidity and cheapness "of transport, should be accomplished as soon as possible, no "matter at what cost. Let this work be completed quickly, "and neither ourselves nor our children will be embarrassed "about paying the cost. But, it will be said, how execute these "works? Where will you find the necessary funds? I feel "myself humiliated for my country when I hear these cries of "impotency. What! a people who came into the world yesterday, "the people of the United States of America, has been able to "raise in a few years, and during war, 15 milliards for the "purpose of destruction, and, we, a people of ancient origin, "wealth, glorious among all the peoples of the earth, should be "unable to find during peace capital for the purpose of production! This is a strange error. On condition, be it understood, of not employing it *except to produce instruments of* "*wealth*—that is to say, to create more capital. In a country "like France capital is inexhaustible. The more it is employed, "the more it reproduces itself; the more rapidly it is turned, "the more riches it engenders. In proportion as generations of "men succeed each other does the generation of capital add to "to the stock, and hence the rapidity with which it multiplies "among industrious people, when nothing intervenes to arrest "its development."

Now though this is elementary truth, you cannot get the twaddlers to discern it. According to these gentlemen, an outlay of two or three millions a year upon original works of improvement, over this continent of many nations has been "reckless expenditure," "a spendthrift outlay," and we know not what else. These twaddling gentlemen are not shocked in the least at the prospect of a war with China that will cost. £20,000,000 sterling a year, as long as it lasts, but to propose an outlay of the same order upon public works over this vast continent takes their breath away altogether.

THE Travancore Government, we are told, is covering the country with a net-work of roads in all directions, and in some of the most inaccessible parts of the country. The impulse thus given to trade and agriculture, will soon yield, says the *Bangalore Herald*, a fair return for the outlay, large as it is. "No sooner is a road opened than applications pour in for the rich virgin land on its sides. Commodities, such as cadjan, straw and firewood, which from their bulk, and the consequent expense of transit, were of no value in distant villages, now find their way to markets and realize good prices When the projected road system is completed, the Wurkullary junction canal cut, and the A. V. M. canal connected with that at Trevandrum, the prices of commodoties in the principal markets of the country, and a part, at least, of Sir Madava Row's dream of a happy land realized."

Travancore is perhaps at this moment the best governed province of India, but complaints are made in the Madras papers that its five per cent. export duty is unduly heavy:— "Why" say these writers, "should not Travancore adopt the "British export tariff as it stands, and by removing unfavourable rates of duty, give her ports the opportunity of becoming "the outlets for her produce, instead of forcing it through "jungle paths as at present? She would then have the plea of "uniformity to urge in asking the British Government to place "its tobacco import duties on a footing profitable to itself and "fair to its neighbours."

We are told it is impossible to raise a revenue from tobacco in India, and yet Travancore gets eight lakhs a year therefrom, with a population of not more than a million and a quarter.

A NATIVE newspaper in Bombay, the *Mitrodaya*, complains "that, "It is unfair to this country to contract loans on the "principle which has obtained hitherto, namely, to give the "preference of purchase to England, or as is usually done "to allot so many millions to England and so many to India. Were we all as well acquainted as we ought to be with the "difficulty of getting five per cent. for money in England, we "would see how it is that Indian loans are so greedily grabbed

"by the English capitalist. He finds he has a magnificent re-"turn for his outlay, and all we send him of the collected taxes "in payment of loans, enables him to speculate in stocks for the "benefit of his own country,—thus not a pie of this money "comes back to us."

Where did this writer learn that a "preference of purchase" is given to Englishmen, or that it is usual to allot, "so many millions" of every loan to England? The statement is utterly false, while the writer ought to know that it is in the interest of India itself that we go for what capital she wants to the cheapest market in the world. This patriotic goose would have the Government borrow capital in India of a people with whom it is so scarce, that they can make ten, fifteen, and fifty per cent. thereon in private enterprise, while the English capitalist is willing to lend as much as we want at four or five. Might not the *Bombay* papers occupy themselve with better advantage to public interests in setting their native contemporaries right in such matters than in carping at each others columns?

THAT the native press generally is marked by much moderation of tone, and in several instances by great capacity for the discussion of affairs, will hardly, we think, be denied by any one who has the opportunity of seeing these papers regularly. There are exceptions, however, to this general rule, and there is, we fear, a growing tendency in them to attribute *evil motives* to their rulers without any just cause.

The world has never yet seen a Government so single-minded, in its desire for the good of its subjects as the English Government of India. There is no Government like it upon the earth and if the privilege of free discussion is to be abused, its suppression is only a question of time. The attention of Government would seem to have been drawn to the matter from the introduction of the Bill to amend the Penal Code, which is now under the consideration of the Council. In introducing the Bill Mr. Stephens said,

"Nothing could be further from the wish of the Government of India than to check in the least degree, any criticism of their measures, however severe and hostile, nay, however disingenuous, unfair, and ill-informed it might be. So long as a writer or speaker neither directly nor indirectly suggested or intended to produce the use of force, he did not fall within the section. This, however, must be coupled with a warning. The question on trials under this section would always be as to the true intention of a speaker or writer, and this intention would have to be inferred from the circumstances of the case. The most bitter and unfair criticisms published by a newspaper in the common course of its business, might be perfectly compatible with the absence of any intention to advise resistance to lawful authority. Language, temperate in itself and justifiable as far as the express meaning of its terms went, might, if addressed to an excited mob, be the clearest proof of an intent to produce forcible resistance to authority. Whilst genuine criticism had nothing to fear from the proposed section, persons seditiously disposed must not suppose that they could evade its provisions by confining themselves to what, under other circumstances and in other persons, might be genuine criticism."

Attempts to excite disaffection to the Government by words or writing are now punishable only when they can be proved to amount to abetments of the offence of waging war against the Queen; and as this proof implies the actual existence of war, and must often be a matter of extreme difficulty, it seems desirable to the Government that some change should be made in the law. We confess that it seems desirable to us also. What do our readers think of such writing as the following?

God grant that Lord Mayo's blunders may not again inundate India, with blood. If injustice is done to the subjects, they cannot turn their faces from rebellion. Indians must have recourse to arms, if they are oppressed and compelled to hold their peace; consequently the subjects have no alternative but to either rise in arms against Government, or leave the country, or be destroyed with their whole families."

It is a mistake to suppose that any Government whatever, still less a Government so peculiarly situated as the Government of India, can safely tolerate such license as this. A section of the native press on both sides of India is marked by extreme hostility of tone towards the English rule. The privilege it is abusing will, if this continues, have to be withdrawn from it.

LETTERS TO THE EDITOR.

A CORRECTION.

To the Editor of the Indian Economist.

SIR,—I was somewhat astonished a few days ago to see a paragraph in page 352 of the *Indian Economist* in which you make me say that: "In very few cases have I gone beyond the rent rates fixed either before, or immediately after the settlement *of thirty years ago*."

The last four words which I have italicised, are no where to be found, either in my written Report or in the extracts printed in the Revenue Administration Report. The settlement referred to, is not the old settlement of 1841, but the last settlement which was concluded in 1864. You pleasantly assume that I am unaware of the causes which have brought about the rise in prices all over the country during the last fifteen years: but all that I wrote on this head in the Report dated October 1869, from which you quote is this—that I declined to enhance the rent of tenants because landlords could show that for some four years, prices had ruled exceptionally high. Further, I no where say that I expect "to see prices back at their old level of thirty years ago;" but that in commuting kind rents into fixed money rents, I have assumed that the price of wheat will fall to a rate, not much above the old average (as it stood after 1861) of 30 to 32 seers to the rupee. It is to be remembered that thirty years ago, harvest prices for wheat, averaged, during five years, higher than they have ever done since, during a similar period. And although I do not expect that prices will ever again fall as they did after the famine of 1838-39, I consider that it would be both unwise and unjust, to make the exceptional prices of the years 1866, 1869, the basis of commutation and enhancemennt. You appear to treat with contempt the supposition that the average harvest price of wheat will ever fall so low as 30 seers for the rupee, but as a matter of fact, it had never, when I wrote, reached so high a figure in this neighbourhood over an extended period.

You are certainly very wrong in thinking that thirty years ago a rate of 30 seer to the rupee was an average one for wheat in the Upper Doab.

Yours faithfullyf
9th August 1870. ALAN CADELL.

NOTE.—If Mr Cadell will refer to page 352 of the *Economist* again, he will find that we simply quoted the *Mofussilite*'s version of his Report. The Report itself we have never seen. If, therefore, an error has been made, we must ask the *Mofussilite* to be good enough to correct it. As to the prices of 30 years ago, we know no better authority than the papers laid before Parliament in 1858, according to which the price of wheat, in the Agra market, during the 30 years preceding the settlement, was as follows:—

		Average.
From	1812 to 1816	32 seers per rupee.
,,	1817 to 1821	21½ ,,
,,	1822 to 1826	26½ ,,
,,	1827 to 1831	31 ,,
,,	1832 to 1836	30 ,,

These returns bear Mr. Mansel's signature, and are dated 1841. The average of the Upper Doab for the 5 years preceding the settlement seems to have been somewhat lower (32½ to 39½ seers), but in the adjoining districts of Rohilcund much higher—25½ seers to 33¾, Bijnour alone excepted. That there has been a morbid dread in late years of over assessing the land on the part of our settlement officers generally, is undoubtedly the fact.—ED. *I. E.*

CONDITION OF THE COUNTRY.

RAJPOOTANA.

For the past month and a half we have had no rain whatever in Joudhpore, and the *bajree* consequently has been completely destroyed. Our tanks are fast drying up and the people already feel the scarcity of water. Heaven knows what will be the condition of Marwar again! With emigration, starvation, and death, we have lost above half the population of Marwar already. Many villages and homes have been completely deserted, and the wooden roofs and doors of huts and hamlets have been carried away by passers-by and others for fuel.—*Pioneer, October.*

OUDH.

The agricultural returns of Oudh for the week ending September 23, bear witness to the injurious rain which fell during that period. In Seetapore, where the rain-fall seems to have been heaviest, the khureef crops on the low-lying lands were almost entirely destroyed, and whole villages were swept away. Since the 23rd, the weather has been most favourable, and the provincial averages of prices remain steady.

The district returns for the week contain the following information.—*Lucknow.*—Prospects still favourable, except in low lands. *Oonao.*—The rain during this week has in

some places caused injury to some of the crops. *Barabunkee.*—The crops have suffered by the late heavy rains. *Seetapoor.*—The low ganjur lands on the banks of Chauka and Gogra have suffered seriously from inundation. *Hurdui.*—Owing to the incessant rains, the crop has not been so abundant as was expected. *Khuree.*—If there be fair weather the rest of the khurif crops will soon be fit to reap. At *Mohumdee* the khurif crops have suffered much, and those that have been spared are now being destroyed by excess of rain. *Fyzabad.*—The tehsildars from different quarters report that cultivators are now removing all sorts of khurif crops from their fields *Baraitch.*—Dhan ready, but the cultivating of the crops and ploughing for rabi are delayed on account of heavy rains. *Gondah.*—The season is favourable. *Roy Bareilly.*—All yesterday and to-day the rain has been falling as if it were the commencement of the rains, and the Sye has again risen. *Sultanpoor.*—There have been only light showers during the week, but even these have kept the ground too wet for ploughing. *Pertabury.*—Cutting of the rice crop had commenced, but the rain for the last three days has stopped this, and unless we have some fine weather some loss may be expected. Rain is favourable for the rabi cultivation.

ORISSA.

The fear of famine in Orissa seems to be now dispelled A report on the state of crops in that division, published as a supplement to the *Calcutta Gazette*, gives particulars of the late fall of rain which appear to have done much good and to have allayed the popular apprehensions of scarcity. A fair amount has fallen in Cuttack and Pooree, and enough in Balasore.

It is officialy reported on the 15th September that nearly the whole of the lands irrigable from the Taldundah, Machgong, and High Level Canals, and from the first five distributaries, Kendrapara Canal, have been leased This area is estimated as follows :

" Machgong and Taldundah	15,000 acres.
" High Level	25,000 "
" First five distributaries of Kendrapara .	30,000 "
Total...	70,000 acres.

Further reports have been received stating that more than all the above-mentioned areas on the Kendrapara and High Level Canals have been fully supplied with water, and that probably all the lands embraced by the Taldundah Canal as above stated, would likewise be abundantly irrigated. The area leased under the Kendrapara Canal is about one-third of the quantity of land commanded.

The Governor General expresses a hope that the people, now that they have seen the practical effect of a command of river water for their lands when the failure of the ordinary rains deprive their crops of all chance of coming to full maturity, will gradually come to appreciate the advantage which a moderate payment will secure to them, and will ere long be willing to pay for the water in proportion to the cost of the undertaking.

WESTERN INDIA.

Fortnight ending 31st August.

Kattywar.—Locusts in small numbers have appeared in the province, chiefly in the Northern Districts, but have committed little or no damage. Agricultural prospects promising, but for the timely showers of rain that fell during the middle of last month there would have been a failure.

Broach.—Little or no fall of rain through the collectorate. All the crops flourishing, with the exception of rice and bajree.

Ahmednuggur.—The fall of rain during the above fortnight was good. Preparations for the sowing of the rubbee crops commenced. The khurreef corps moderate.

Tanna.—Rain-fall, on the whole, favourable, and the crops thriving.

Sattara.—The fall scanty and partial, but the crops thriving.

Poona.—The fall good in the Mawul talooka and petta Moolsee, in the Joonere and Indapoor talookas, and slight in the remaining talookas. There was no rain at all in the Bheemthurry talooka. The khurreef crops generally good.

Fortnight ending 15th September.

Kaladghi.—Rain more or less in almost all the talookas of the collectorate.

Rutnagherry.—A sufficient fall of rain during the fortnight, The weeding is in progress. The crops were in a pretty good state

Dharwar.—The rainfall was good in almost all the talookas of the collectorate. Rice and jowaree crops in good condition ; other crops moderate.

Surat.—Crops good except rice and naglee, damaged for want of rain, during the fortnight.

Sholapore.—In some places the crops were doing well, in others, there has been an excessive rainfall. Sowing of rubbee crops was commenced.

SINDH.

Locusts have appeared in almost every talook of the province, but had done very little damage up to date of latest advice.

MYSORE.—*September.*

Bangalore District.—There were moderate showers of rain in the district.—The crops are in good condition, and the ryots are carrying on successfully their sowing operations.

Kolár District.—An average fall of 4 inches and 83 cents of rain throughout the district. The condition of rági crops is generally good, except in and about Kolár where they appear to be drooping from want of rain.

Toomkoor District.—The rains during the month were much heavier than in the preceding one. The dry and wet crops are in a promising condition, except in the Dodderi, and Midigesi sunmats of the Maddagiri Talook, and also in the Kunigallu Talook, in which parts the dry crops are reported to be withering for want of rain The crops harvested during the month were areca and cocoanut, green and black gram.

Mysore District.—The crops in the district are generally in a good condition.

Hassan District.—The seasonable showers of rain which fell throughout the country have proved very favouable to the growth of both wet and dry crops.

Chittuldroog District.—There has been a moderate fall of rain in all the talooks of the district. The crops sown during the month were, gram, nevane, &c., and those of the previous months that were fading for want of rain have revived, so that on the whole the crops are promising.

Coorg.—Transplanting paddy has been continued during the month, and is now nearly completed. The plants in many places are, however, not looking well, and fears are entertained that the crop will fail wherever the planting was late. The rági fields in the Nanjarájapatna and Yèlusávirasimé Talooks continue to thrive : kulthi or horse-gram has also been sown in small quantities.

MADRAS.—13-20th September.

Northern Section.—The rain-fall inadequate for the requirements of the season in Ganjam, Vizagapatam, and Nellore. In Godavery and in parts of the Kistna rain abundant, followed by heavy freshes in the rivers.

Ceded Districts.—The rain-fall general but not abundant in this section.

Cuddapah.—Standing crops were in excellent condition and *Indigo* harvested in a few parts of the district.

Bellary.—Ryots busily engaged in cultivation. No lack of pasture.

Kurnool.—The early crops suffering from blight in the Cumbum taluq to a small extent.

Cauvery.—Tanjore and the upland talugs of Trichinopoly had the benefit of a tolerably good rain-fall

Tanjore.—The Cauvery and other rivers in Tanjore rose, but there was not a full fresh.

Trichinopoly.—In Trichinopoly the usual heavy gales of the season set in, followed by freshes in the Cauvery and Coleroon.

Southern Section.—The South-west monsoon had commenced in Tinnevelly, and there was slight fall of rain in Madura.

The sowing of dry grains and second-crop cultivation in *Nunjah* commenced in Madura. *Cholum* in the northern taluqs of Tinnevelly harvested and yielded fairly. The moderate freshes received in the Tambrapurni river augmented the supplies in tanks and channels.

West Centre.—The rain-fall on the Neilgherries and in Salem general.

Coimbatore.—Rain in the Sattimangalum, Bhowany, Pollachy and Caroor, taluqs, but scarcely any elsewhere.

Pasturage in some places is scarce but forage is generally procurable. *Raggy* plants look well and *Cholum* is being harvested in garden lands. Wells are moderately supplied with water.

BENGAL.

22 *Sept.* 1870.

SONTHAL PERGHS.—*Nya Doomka.*—The rains which held off till the middle of June prevented the general sowing of jauerah, and then for a while there was continued light rain which did it some harm ; not being at the same time heavy enough for dhân cultivation. There was, however, good rain in August, and the prospects of both the Indian corn and dhân crops are now very fair indeed.

Godda.—The rains damaged the jauerah to the extent of about 10-16th, but fortunately the loss will not be felt, as this crop is not much cultivated. The dhân is very good indeed, and a more than average outturn is expected should the weather continue as favorable as hitherto.

Deoghur. The Janerah crop is more or less a failure this year throughout the district.—The following return is effected.—

Station Deoghur	4-16 of an average crop.
" Kurow }	10|16 of do
" Nulla }	

equal to a 6 anna average crop for the whole disttict. The maiwah and goudali will not yield more than 10 as. This crop however is only a partial crop, and its condition does not effect the general welfare of the sub-district.—Kodoo and Aous will yield a fair average return. As regards the anum dhan, the prospects are such as they have not been for the last 15 years, and there is therefore every reason to expect an unusually good season.

Rajmehal.—The bhadai crops have not been very successful this year owing to heavy rains and inundations. On the Dearal opposite Rajmehal and which stretches to Sahilgunge both paddy and jauera have been almost destroyed, there being only about 2 acres of it left. In the zemindaree portion stretching south from Rajmehal to Radhanugger, this crop is slightly better, but even then it will not be more than 4 or 6 annas. In the Dannin the bhadai crop will average 8 annas. This anticipated deficiency in the bhadai crop will not however produce any distress, and the people will more than make up for it by the very superior returns excepted from aughamy crop, which was never better than this year. A full 16 anna is almost certain, and this will be followed, the Assistant Commissioner believes, by a very good rubbee crop.

RESIDENCY DIVISION.—*Nuddea.*—The crops generally throughout this district are good. The recent inundation of the Jhellingh caused damage to the aous rice of some 29 villages in Mehorpore sub-division, and in about half of these the aous crop is not expected to exceed ¼. The inundation also affected in a small degree the neighbourhood of Kishnaghur, but the distress will be purely local and restricted.

Jessore.—The general prospects of this district are also very good, but a small tract of country between the rivers Nobogunga and Modhoomoti has suffered to the extent of about ½ or ¾ of the aous crop. This will not however very materially affect the food produce of the entire district, and a bumper crop of anum rice and miscellaneous staple is anticipated. Indigo has been fatally damaged in many places, but some factories will still have a very good outturn.

BURDWAN DIVISION.—*Midnapore.*—The aous and sugar cane crops in Pergh. Bogree have suffered to the estimated extent of of about 10 annas, but the anum prospects are encouraging, and a fair average crop is expected.

PATNA DIVISION.—*Tirhoot.*—The rice crop in the Mudhoobunnee sub-division has been damaged by recent inundations of the Kumla river, but this will in a measure be made up by the certain good to the land for the rubbee prospects.

The Commissioner does not anticipate that any great or lasting damage has been done and is sanguine that the next reports will clear away all causes for apprehension that there is likely to be distress of any kind.

BHAUGULPORE DIVISION.—*Bhaugulpore.*—Recent floods caused considerable damage to the bhadai crop in portions of this district. The rains commenced early, and the Ganges rose earlier and higher than usual. All the jauerah grown on the Dearah has been destroyed, but as yet the price of jauerah and rice has not risen in consequence. The heavy rains at the commencement of the season greatly injured the jauerah crops though it proved favorable to the paddy. One fourth of the lands in thannah Banka, ⅓ in Kutorah, and ⅛ in Umurpore, are grown with jauerah, and ⅛ the loss is estmated at ½ in each. There has not been any perceptible rise in the price of food in the Banka sub-division and the prospects of the coming rice harvest are good. The Collector does not think any distress need be anticipated from the damage done.

Monghyr.—The floods of the earlier part of August and the excessive rains which subsequently followed seriously damaged the bhadai crop, which is however only a small crop, and its loss, while it may pinch the poor somewhat, could not lead to extended distress. The loss is estimated at about 12 annas. The rains while injuring the bhadai crop may be expected to do immense good to future crops ; for as much as that the rain fall favors dhan crop, which is in excellent condition, and the floods which have desolated the higher lands have enriched them preparatory to the rubbee sowing.

The accounts received of the Jumooee sub-division are very satisfactory, and its prospects are at present very cheerful.

DACCA DIVISION.—*Furreedpore.*—Recent inundations considerably damaged the crops in this district, and it is estimated that only one anna aous crop and a four anna anum crop may escape. The commissioner is of opinion, however, that the partial loss of this latter crop will be nearly if not quite recouped by the very heavy crops which may be fairly expected from the higher lands which must have been benefitted by the floods. There is at present no immediate prospect of distress approaching to famine in many parts of the district. Prices of food are by no means high, and rice is selling at 20½ seers per rupee.

Dacca.—The anum is not much damaged ; wherever the rice was not totally destroyed the crops are excellent. The outturn for the whole district will be at least 10 annas. Teel, mustard and Inte have turned out excellently good this year. The chief damage occurred in the Manickgunge sub-division, but even there the prices of food have not risen.

Mymensing.—The only parts of this district which suffered from the floods are the lower lands situated in Atteah and Kishore gunge, but even the losses must be very partial as hitherto there has been no rise in the rates of food.

Cachar.—The injury caused by inundations to the crops in this district present and prospective threatens to be great The aous and asrat paddy has been completely destroyed, but this is not of much importance as sail [sail represents anum in Cachar, with this difference only that sail grows on high land] is the staple crop. The serious damage is caused by the destruction of great numbers of seedling beds in all the mouzahs near the river of the great bheels. This involves the loss of sail crop wherever it has occurred, for it is now too late to make fresh nurseries. Enquirjes are being instituted to ascertain the exact amount of damage done.

Sylhet.—With the exception of crops here and there along the banks of the Sumah which had been partially destroyed by inundation, the crops in this district are in a very thriving condition, and if nothing occurs to interfere with present prospects there is no ground for apprehending any general failure, however much the drought first and innundations afterwards may have combined to prevent the outturn.

RAJSHAYE DIVISION.—The accounts from this district are not so satisfactory as might be wished. In the Nattore sub-division about ⅓ of the anum and ½ of aous have been destroyed. In Tanore the aous crop would have been very plentiful had it not suffered from flood, but the loss will not, the Commissioner thinks, be so considerable here as in Nattore. The state of anum crop continues pretty good.

Maldah.—The bhadai crops have been almost totally destroyed, but this is not the staple crop of the district .The prospect of the anum and hemuuti dhan are fair, and the Collector is sanguine that there will be no distress among the people. The inundations have been higher than usual, but the rainfall has been less ; the people are always prepared for inundations which are common enough owing to the number of mountain streams running through the district.

Moorshedabad.—The crops in various portions of this district have been damaged more or less by recent inundations, but the Commissioner does not think that the distress caused will be very severely felt, if early and good cold weather crops can be secured.

Chota Nagpore.—The reports from all quarters of this division, except Singbhoom, are most favorable. In Lohardugga the weather has been very seasonable and an abundant harvest is confidently looked for. The whole of the agricultural community of Palmow are in spirits at the prospects before them. In Manbhoom a full crop of rice may be expected from half the district, and from the other half 11 to 14 annas. The early rice "ghora dhan" promises a full crop throughout, and in Govindpore all the crops are extremely promising. In Hazarebaugh, the state of the crops is very good, and there is every reason to look forward to a full harvest. The Indian corn was a little short in the southern sub-division owing to the incessant rain in July, but to the north of the grand trunk road a full crop of this cereal is being gathered. The accounts from the western tributary mehals, especially Sirgoojah, are also very favorable. The latest accounts from Singpore are up to the 15th August, when the Deputy Commissioner reported that the rainfall had been insufficient in Dhulbhoom, east of the Kapargadee range, but the markets are well supplied and the prices of grain are everywhere below the average.

ORISSA DIVISION.—*Cuttack.*—The reports from the interior are not favorable ; little rain has fallen, the crops are very backward, and in many parts it is supposed that even with a good rainfall there will be considerable loss.

Pooree.—The prospects of crops in this district are also unsatisfactory, On the 24th August the Assistant Collector of Khoordah reported, that the limit of time within which second ploughing among the growing rice would be attended with good effects had been reached ; on land not proviously ploughed there will be a total failure. Such land constitutes about ¼ of the cultivable area ; in 8 annas of the area ploughing was done early and in the low lands a full crop was expected ; on the remaining 4 annas present appearances promises a 12 annas crop. The average estimated out-turn is about 11-16th of a full crop. The most backward localities are pergunnahs Ranneshur and Doudemal.

Balasapore.—The only parts in this district that give any real cause for anxiety are Agarpara and Basudepore, both of which have been unfortunate owing to want rain. The sarud is very backward in the north of the latter Chakla, and it is feared that in Erun Bachada and some of the villages near the coast, there will be only an 8 anna crop. There has also been great and continued drought in the tributary state, Rampore, to the west of Khoordah, and in a late report from the Rajah of Nursingpore on the north bank of the Mahanuddy it was stated that the crops in his Estate were dried up. The Commissioner, under date 27th August reported—"We are now getting 'constant showers, and the weather here in Cuttack could not 'be more favorable for recovery of the growing crop."

MINERAL RESOURCES.

We are only just beginning to discover the extent of our mineral wealth. Lime-stone, copper and iron have been found along the Bhutan frontier and in Darjeeling. The Nepaulese have been particularly pressing for leave to work the ore. The Commissioner of Cooch Behar has been directed to divide the tract into sections, to let out the mineral privileges, by the year at present, to the highest bidder. If this prove a lucky find, we may yet see a railway to Daljeeling.—*Pioneer.*

The Coal in Bellary which we mentioned yesterday as having been found by Dr. Hunter promises, so we learn from a Madras contemporary, to turn out of first-rate quality. It is said to be very different in appearance to any other Indian coals, whether found in Chanda, Cochin, or Bengal. The mineral is gaseous, and would appear to be abundant in quantity as, on his first examination, Dr. Hunter found it in two different localities. The railway runs close to the spots, greatly enhancing thereby the intrinsic value of the discovery, whatever that may prove to be.—*Id*

PUBLIC WORKS—IRRIGATION.

The following facts relating to the projected Eastern Ganges Canal will be of interest to our readers :—

This canal will take its supply of water from the east side of the River Ganges, at a point seven miles below Hurdwar, or the headworks of the present Ganges Canal, and will water 3,000 square miles of Western Rohilkund.

The total length of the main lines will be 260 miles, and that of the minor channels and distributing branches nearly 900 miles.

For seven months in the year, or during the khurreef season the canal will carry a maximum supply of 4,560 cubic feet per second, and during the remainder of the year or the rubbee season, 1,250 cubic feet will be about the average quantity of water which will pass through the regulators at the head works.

No permanent weir will be required, as the water will be taken with the aid of a few spurs of fascine work, at a point, where nature has provided a basin, or just above a long rapid.

For the first 23 miles the work will be rather heavy, as five important drainage lines have to be crossed, either under or over and for about 14 miles of that portion the canal will be in cuttings of from 20 to 50 feet in depth.

The remaining part of the work will not present more than the ordinary engineering difficulties, which may always be expected in a canal which will traverse such a large extent of country.

At about the 23rd mile the water will command the country, and irrigation will begin.

The cost per foot of water delivered by this canal, calculated on the average discharge, will be Rs. 3,150.

The total amount of the estimate for the whole work completed is a little over £850,000.

The project was prepared under the superintendence of Mr. J. Parker, C. E., Superintending Engineer, 3rd Circle Irrigation Works ; by Mr. J. P. Roberts, C. E. Executive Engineer and his staff of assistants.

Both Mr. Parker and Mr. Roberts have received the thanks of the Lieutenant Governor, who has expressed his high approval of the efficient manner in which the weighty duty entrusted to these officers has been performed, and who has commended their services to the favourable notice of the Governor-General in Council.

Colonel Greathed, R. E., C. B., the Chief Engineer, in his official report on the project eulogises the laborious research and professional skill which the superintending and executive engineers have devoted to the subject, and he recommends to the favourable notice of Government the manner in which Mr. Roberts, with his small staff, carried out such a large survey and prepared the maps, estimates, designs, &c. in such a short space of time.

PUBLIC WORKS.—RAILWAY.

Some few weeks since we had occasion to call attention to a radical error about to be committed by the Indian Government in the introduction of narrow gauge railways on the new State Lines. We have just had the pleasure of reading a recent report on the same subject by Mr. Hawkshaw, Consulting Engineer to the Eastern Bengal and Madras Railways, which confirms our views entirely ; and we shall now endeavour to lay before our readers a summary of that gentleman's opinions. So far back as 1838, Mr. Hawkshaw was consulted on the subject of of the broad 7 feet gauge in England ; and he then pointed out the evils that would result from a break of gauge.

It was urged by those who supported the differential gauge, that the inconvenience would be measured by the time and expenses incurred in shifting goods from one waggon to another where the change of gauge occurred ; but experience has proved that this supposition was altogether illusory ; and the Great Western Railway Company has, in consequence, been compelled to lay down a narrow gauge railway on its broad gauge line. It is not asserted that the present Indian gauge of 5 feet 6 inches is the best that could have been *originally* designed ; but seeing that nearly 6,000 miles of trunk lines have been constructed to suit it, no sufficient reason exists for altering the existing gauge. In India requirements of war must ever take precedence of all other considerations ; and it behoves Government to take no step that would render its railways ineffective for the manipulation of an army.—In time of war the entire rolling stock of every railway in India may be required on some particular frontier, and should be constructed accordingly. A break of gauge at once nullifies this condition, and renders the transfer of rolling stock from one line to another impracticable. It is not enough to say that the men, that is, the soldiers, can walk from one train to another where the break of gauge occurs. It is of the last importance that the trains once loaded should pass on direct to their destination ; but break of gauge renders this impracticable, besides involving duplicate trains to carry the troops on the different lines. All these difficulties were fully brought to light in the enquiries made by the War Office on the practicability of bringing the whole available forces of Great Britain together at any given point. The task was shown to be practicably within a moderate space of time ; but had not nearly all the railways in England and Scotland been of the same gauge, the difficulties of the problem would have been immensely enhanced. Those who were engaged in the above enquiries (among whom was Mr. Hawkshaw himself) were fully impressed with the difficulties arising from the break of gauge. As respects guns, tumbrils, ammunition and baggage, the evils of the break of gauge are still greater than they are with the men ; in addition to which the small size of the vehicles on the narrow gauge of 3 feet 6 inches, renders them ill adapted for the transport of the material of war. On the Russian Railways, the ordinary waggon rolling stock (a great portion of which has been constructed by Mr. Hawkshaw) is specially fitted with movable appliances for the carriage of troops and horses ; a thing easily effected on their gauge of five feet. This cannot be so easily done with small vehicles ; and it will indeed be singular if at this time the Government of India should make a change that would almost set at nought the advantage of its railways for military purposes. So much for the *cheap* railways from a military point of view ; and now let us look at them from the commercial standpoint. Regarding the Festiniog Railway, about which there has been such a flourish of trumpets, Mr. Hawkshaw quietly observes that he has been favoured with a report from Mr. Juland Danvers, the Government Director of the Indian Railway Companies for the year 1869-70 ; and that he does not see anything in it to modify his statements. The report contains certain assertions put forward by Mr. Spooner, the Engineer and Manager of the Festiniog Railway, purporting to set forth advantages that would accrue from light and narrow gauge railways. Six out of the nine of Mr. Spooner's statements are in his opinion quite fallacious considered in their application to Indian Railways.

In Mr. Hawkshaw's opinion, the saving to be effected by the substitution of the narrow gauge of 3 feet 6 inches for the present one of 5 feet 6 inches amounts to the inconsiderable sum of £1,810 per mile, made up as follows :—

	per mile.
Earthwork	100
Bridges	300
Permanent way...	1,000
Engines	200
Carriages and waggons	nil.
Stations	nil.
Land	10
Saving by the introduction of sharper curves	200
Total saving in first cost, ...	1,810.

So that for this absurd reduction, amounting to but £16,000,000 sterling on all 9,000 miles of railways that are to be constructed in the next *thirty years*, Government is about to sacrifice the military efficiency of the entire system of railway communication in India ! ! ! It would be hard to believe that any such act of folly could be conceived.

TRADE BETWEEN CALCUTTA, DARJEELING, BHOOTAN, AND THIBET.

By Dr. A. Campbell.

Before reading my paper I shall allude to some circumstances which have an important bearing on the subject and which are not, I think, generally familiar to people in England.

A trade between India and Thibet always went through Nepaul and Bhootan, but after the present Goorkha dynasty conquered the valley of Nepaul, the trade which had been well carried on by the Newars, whom the Goorkhas displaced, became much reduced, and it then went chiefly through Bhootan. The Thibetans were always favourable to trade with India, and had a trading establishment near Calcutta. The Grand Lama was so desirous to improve this trade, that he asked the Governor-General of India to send an envoy to him for the purpose, and this led to Bogle's mission, in 1774, and to Turner's, in 1783. Shortly after this, however, the Chinese became paramount in Thibet, but their exclusive system and the normal misrule in Bhootan destroyed the trade, or nearly so.

In more recent times the trade again reverted to Nepaul and we have opened a way for it through Darjeeling. We have also, with other nations, opened trading ports in China itself; and the supremacy of China has been thrown off by the Panthays in the south-west, and by the Mahommedans in the extreme north-west of the empire. If the Thibetans follow suit—which is not unlikely—their tolerant usages will probaly resume their sway, and we may look for many trading facilities from them. In the meantime there is a good occasion for trying to induce the Chinese government at Pekin to relieve the trade with Thibet from all obstacles and restrictions in that country.

In venturing to bring this portion of our conference before you, I must at once announce that I have not the means of showing that an extensive or flourishing commerce is in existence in this direction, or that such can be easily or at an early date realised. My aim is to draw attention to the subject to indicate the state of things which obstruct the development of trade, and to point out how these may be most easily obviated. In doing so, I shall endeavour to give the information as concisely as possible, to meet the demands on our time this evening, and to furnish some details.

Our subjects are, trade with Central Asia, Thibet, and South-Western China. As the first is almost entirely carried on from the North-West Provinces of India, with Bombay as the seaport for English exports, it is quite distinct from the second which is carried on from Bengal with Calcutta as the seaport. It is not, however, so distinct from the third division of our subject, as trade with Thibet has the ultimate object of being trade with South-Western China also, although the routes from India lie through very different countries. Thus, goods reaching Lassa, the capital of Thibet, through Nepaul or Darjeeling, go on to Siling and Sechuen, Chinese marts; goods from Rangoon, through Upper Burmah, and Bhamoo, being destined, according to Mr. Cooper's recent account of his unsuccessful effort to reach India from the Yangz-te-kiang, to reach the province of Sechuen also, and thus the two streams of commerce will meet in China. Taking trade between India and Thibet in its fullest sense, then, it also means trade between the rich and populous countries of India and China by overland routes. Thibet must be considered, to some extent, as a medium of passing the commerce between these two great and populous countries. A trade with Thibet only would be, comparatively speaking, a restricted one, as silks, satins, fine woolen fabrics, &c., come from China. Although Thibet is a country of immense extent, and has very valuable products in gold, the finest wools, musk, borax, &c, its population is not dense, and Lassa itself, although a great entrepôt for trade, is not a great manufacturing city.

Looking at the map before you, then, you see the plains of Bengal on the south, and the country of Thibet on the north, with the great chain of the Himalayas lying between them. Taking Bengal geographically for my present purpose, it includes the provinces of Oude, Goruckpoor, Tirhoot, Purnea, Darjeeling, Rungpoor, and the valley of Assam. The corresponding portion of the Himalaya includes the independent state of Nepaul, the small protected territory of Sikhim, and the hill country of Bhootan.

Our frontier with Nepaul, from the Kali river on the west, to the Mechi river on the east, is 500 miles, with Sikhim and Bhootan about 250 more. The breadth of the chain is at least 100 miles. In no part of this long line of frontier—750 miles north of Nepaul, Sikhim, and Bhootan—have we any direct access into Thibet, nor have we any political relations whatever with the government of the country. It will, therefore, be readily admitted, after this outline of the relative positions of the two countries, India and Thibet, that there must be many obstacles to the carrying on of trade between them, and at present it is so. The obstacles are of two kinds, physical and political. The first lie in the character of the mountains, which, in the position indicated, form an aggregate of the highest peaks in the world, with innumerable lofty spurs and ranges, the whole embracing elevations from 29,000 feet downwards. The mean elevation of this extensive barrier, for such it may be called at present, is not easily computed, nor would it be of much importance to state it. The great facts, however, remain, that there is not one road through the Himalayas, except for carriage on men's backs, and that the passes leading into Thibet are all above 14,000 feet above the level of the sea, that these elevations involve the closing of the routes by snow for many months of the year, that the mean elevation of the route in Thibet is not under 14,000 feet, and that the lowest point on the road to Lassa, the terminus in Thibet, is 11,000 feet, which gives an inclement climate for many months of the year; added to this, the route in Thibet, although admitting of carriage on ponies and mules, and easy compared with the passage of the Himalaya passes over Kambala, and other ranges, the elevation of which involve heavy snow-falls and great cold.

The following are the elevations of the passes into Thibet from Nepaul:—The Kiroong I reckon to be 14,000 feet. I have not the exact elevation given by the pundit Numphal, who crossed it on his journey to Lassa, published last year, but the monastery of Tadum, close by, on the Thibetan plateau, is 14,200; Kooti, also a pass from Nepaul, say 14,000; Walloongchoong, from eastern Nepaul, measured by Dr. Hooker, is 16,764; from Sikhim, the Kangra Lama pass is 15,600; Donkia, 18,500; Tunkra, 16,000; and Chola, 14,000, all given by Dr. Hooker. Phari, the principal pass from the western parts of Bhootan, I reckon to be about 14,000 feet. Of the passes from Bhootan, east of Phari, I have no information.

The political obstacles arise from the character of the governments in the Himalaya and in Thibet itself. In Nepaul, through which the greater part of the trade runs at present, the government is very exclusive. No European, except those belonging to the political residency, is allowed to reside there, and the residency officers are not allowed to travel in the country more than a few miles from Catmandoo, the capital. There are many restrictions on free trade in the form of customs and transit duties, government and official monopolies, and the entire want of anything like a road from the British frontier to the capital, or beyond it to the Thibetan frontier, and this is after an alliance with Nepaul of more than 50 years. All natives of India, however, whether our immediate subjects or belonging to native states, have free access to Nepaul. This rather invidious distinction between natives of India and Europeans does not prevent the Nepaulese of all ranks and classes from deriving the fullest advantage from free resort into our provinces, where they are welcome to trade and settle without any restrictions.

The next obstacles of a political nature with which the trade to Thibet had long to contend, were in Sikhim. In consequence of a monopoly of the trade with Thibet being in the hands of the Dewan, an actual ruler of the country, who did not scruple to use his full power for his individual benefit, the trade through other hands was prevented, and it was almost annihilated in his own. After long continued and strenuous efforts, directed to their removal, and in the end the expulsion from Sikhim of the obnoxious individual, they are nearly or quite removed. All this has followed our settlement at Darjeeling, and it is from this place, as shall be presently shown, that we have it most in our power to diminish the obstacles, and that we must look for the greatest development of a trade with Thibet.

In Bhootan, ever since our first political relations with it in 1774, it has been altogether hopeless and impossible to make it the medium of a trade with Thibet. Turner's mission to the Grand Lama, 1783, failed to effect this object; so did Pemberton's mission to Bhootan, in 1838, and Eden's, in 1864. Since then, however, we have annexed the Dooars and lower hills of Bhootan, and although there is still a government, or, more correctly speaking, a system of the greatest mismanagement and lawlessness that ever existed anywhere, in possession of the portion of Bhootan giving access to Thibet, for the people's sake, it is to be hoped that our nearer contact with the Bhootanese, since the annexation of the Dooars, or some fortunate necessity for extending our frontier to the Thibet border may occur, to enable us to clear all political obstacles in this quarter.

I shall now proceed to give the most reliable information I have of the actual state and extent of the trade with Thibet.

For the Nepaul portion I am indebted to a paper by Mr. Brian Hodgson, who was long our distinguished Resident in that country. It was written in 1831, and is published in No. 27 of the "Selections by the Government of Bengal," for 1858. Mr. Hodgson invited the attention of the merchants of Calcutta and Bengal to the high profits then ruling in Nepaul, where 100 per cent. on prime cost in Calcutta or Benares was very common, and 30 to 40 per cent. was the ordinary rate of profits; and he gives tables, showing the imports and exports, rates of duties, profits and much other information on the trade with Thibet, and with Nepaul itself, from which the former is scarcely separable. The following is an abstract of this important paper:—

"Goods from India, whether the produce of Europe or India, pay about 12 annas, or 1s. 6d., per package of 96 lbs., as transit duty, and this franks them to the Thibet frontier.

"All goods into and through Nepaul are carried on men's backs.

"Imports from Thibet into Nepaul pay no duty, expect musk and gold.

"All the silver from Thibet must be taken to the Nepaul mint, where it is purchased.

"The trade with Thibet is carried on principally by Cashmerees, who have houses at Dacca, Patna, Catmandoo, and Lassa.

"Imports from India into Nepaul, in 1831, estimated prime cost, 17½ lacs of rupees, or £175,000; 157 articles enumerated. Of this amount, on 57 articles, it was estimated that about three lacs, or £30,000 worth, went on to Thibet.

"The exports of Nepaulese and Thibetan goods to the plains in 90 articles enumerated, estimated value 11 lacs, or £110,000, of which two-thirds, or £65,000, are on account of imports from Thibet into Nepaul. The trade with Nepaul is carried on principally by merchants of Benares, who have 10 kothees or firms at Catmandoo.

"Transit duties levied on goods from the Nepaul frontier to Catmandoo, about 7 rupees, or 14s. per bullock load of 380 lbs. or 3s. 6d. per man's load of 160 lbs.

"An *ad valorem* duty of 3½ per cent. is levied on arrival at Catmandoo. The valuation is made by government officers. If it is objected to by the merchant, the government requires a sale to itself at the merchant's valuation.

"An export duty of over 4½ per cent. is levied on articles whether of Nepaul, Thibet, or China."

The following is a list of the principal imports into Nepaul:—European broadcloths and other woollens of all sorts; European chintzes and other cotton of all sorts; European silks of all sorts; European linens of all sorts; Amritsir and Cashmere shawls, good Dacca muslins, and Jamdanees' sahans, &c.; Malda and Bhaugulpoor silk and mixed silk and cotton stuffs; Benares' kimkhabs, toftas, niushroos, shamlas, dopattahs, &c.; Mirzapoor and Caplee kharwas and garbas, mowsahans, andarsahs, &c.; Behar pagrees, khasas, &c.; Bareilly, Lucknow, and Tanda chintzes; European cutlery, as knives, scissors, &c.; European glass ware, as chandeliers, wall-shades, &c.; European mirrors, window glass, &c.; Indian kiranas, or groceries, drugs, dyes, and spicery of all sorts; peltry of Europe and India, as Dacca and other skins, goat ditto, &c.; quicksilver, vermilion, red and white lead, brimstone, jasta, ranga, camphor, indigo; precious stones, as diamond, emerald, pearls, coral; Indian laces, as kalábuttu, gotah, &c.

The following is a list of the principal exports from Nepaul:—Chours or yak tails; Thibetan, Himalayan, and Chinese woollens, as maleeda, toos, namda, chourpat, rahry, bhot, &c.; Chinese damasked and brocaded satins and silks; sohága or borax: Nepaulese, Bhootea, and Chinese drugs; rhubarb, mihargiyah, zaharmohara, momira, jatamangsie, hurtal, &c.; Bhootea and Nepaulese paper, musk pods, gold, silver, rupees of the plains, rupees of Nepaul, and copper pice of ditto, ponies, or tanghans, hardware, as iron phowrahs, &c., &c.

The chief exports to Thibet are European broad cloths (crimson, green, orange, liver, and brown are preferred), cutlery, pearls, coral, diamonds, emeralds, indigo, and opium.

The chief imports from Thibet are, chours or yak tails, white; ditto black; Chinese velvets, satins, silk thread, and raw silk; peltry of Mongolia and Bhote, as samoor, kakoon, chuah-khal, garbsooth, &c., borax, and furs; Chinese and Bhotea tea, drugs.

From Calcutta, Patna, and Benares the routes meet at Sugowlie, on the frontier of Champarun, whence it is ten stages to Catmandoo. There are two routes from Catmandoo, the capital of Nepaul, to the frontier of Thibet, one by Koote, the other by Kiroong. The former runs from the east end of the valley of Nepaul, the latter from the western. Both places are eight stages from Catmandoo. From these places it is about a month's journey to Lassa, and the hire of a pony or mule is about ten rupees, or £ 1.

From Mr. Hodgson's tables, I reckon the total annual trade between India and Nepaul, including Thibet, to amount to about £285,000. It has probably increased since his time, but of this I have no authentic information.

I now come to Darjeeling as the next route for trade with Thibet. This place being a British possession in the Himalaya, it differs in every respect from Nepaul, as holding out superior advantages for a greatly extended trade with Lassa. It is under 400 miles from Calcutta, of which 200 has a railway, and although a rail is much wanted for the remainder of the distance, it has, in the meantime, a good cart-road from the foot of the hills to the station, 30 miles; whereas Catmandoo is more than 600 miles distant from Calcutta, with no road at all in the hills. Darjeeling is the shortest route from Bengal to Lassa, the distance being say 500 miles, of which we have now the control of 70 miles through Sikhim to Choombi, and over which we can, under treaty with the Sikhim Rajah, make a road whenever we wish.

The present trade with Thibet through Darjeeling, as in Nepaul, cannot well be separated from the trade of Darjeeling itself. Of the present amount of this trade I have not correct information. In 1854, the imports into Darjeeling from the plains were estimated at three lacs of rupees, or £30,000; from Thibet, in 1861, at 70,000 rupees. The principal export from Darjeeling to the plains is tea, of which about 1,500,000 lbs. is expected this season, which may be valued at £100,000. The principal exports to Thibet are, English broadcloth (brown, purple, orange, green, and yellow the most preferred), cutlery, indigo, tobacco, sugar, rice, cotton sheetings, endy (or castor-oil), silk, crockery, &c. Wool is a very important product of Thibet, and may be looked to as a valuable export. In that country and the adjoining ones there are immense tracts of pasture land, on which flocks of sheep, in almost countless numbers, are maintained. Seven or eight thousand sheep is a common number for even ordinary graziers to possess.

The greater elevation and cold temperature of these countries, with the fine pasture, produce very heavy fleeces of the finest wool, and of a very long staple, quite as fine as the Australian wool, but more valuable for many fabrics, on account of its longer staple.

While at Darjeeling I procured some loads of this wool, and sent samples of it, with rate of cost, for trial and export to Calcutta and elsewere. It was highly spoken of; and the industrial school at Jubbulpore, in the Central Provinces of India, celebrated for its fine carpets, was so pleased with it, that the managers offered to send me a lac of rupees (£10,000), to be laid out in purchasing wool for them, at the rates I had quoted. I need scarcely say it was not procurable; but the wool is, in Thibet, in immense quantity.

Of the state of trade at this moment through Bhootan I cannot speak. It was, as regards English and Indian goods, at a complete stand-still all my time (from 1839 to 1861). Captain Pemberton, in his report (1838) says:—"There was every reason to believe that the trade which formerly existed between Bengal and Thibet was at one time carried on through Bhootan, and to its total cessation may, in a great degree, be attributed the marked deterioration of the latter country."

The following is a list of the principal articles imported from and exported to Bhootan. The former amounts to 7,375 rupees, or £737 only, the latter to 4,150 rupees, or £415. Imports:—Debang (China silks), cow-tails, hill ponies, wax, walnuts, musk, lac, madder or munjeet, blankets, silver. Exports:—Indigo, cloves, nutmeg, cardamom, nukher, camphor, sugar, copper, broad-cloth (castor-oil silk), coarse ditto, googool, sandal-wood, country gunpowder, dried fish, tobacco.

Of the city of Lassa, as the focus of all Thibetan trade, there is, as you are all aware, not much known as the result of European observation on the spot, nor can I give you positive information as to the profits to be made there on English and Indian goods. From all I have learned at Darjeeling, they are very large, and as goods in transit, loaded with a profit of 30 or 40 per cent. in Nepaul, are still profitable at Lassa, it is quite clear that goods going direct through Darjeeling to Lassa, without any custom or transit duties, as in Nepaul, and not having Nepaul profits added to the prime cost, must be very profitable indeed.

At Lassa, the trade arrangements are on a good footing, according to my information. It is resorted to by people of many different nations from every direction, and the merchants of each country appoint their own chief or consul, who is the medium of communication with the local government, and has the power of settling all disputes among his countrymen without reference to his own or the Thibetan government. The Newars of Nepaul, the Cashmerees of Patna and Dacca, the Bhootanese, the Ladakees, as well as the merchants of many countries lying between Thibet and China, have consuls of this description. The last account of trade at Lassa by a traveller, is by Numphal Pundit, of the Indian Trigonometrical Survey. He says "During the month of December, merchants from all parts bring their merchandize here from China, Tartary, Darchando, Chando, Khan, Tawang, Bhootan, Sikhim, Nepaul, Darjeeling, Patna, and Ladak. From China, silks of all varieties, carpets, and chinaware. From Jiling, in Tartary, is brought gold-lace, silks, precious gems, carpets of a superior manufacture, horse-saddles, and a very large kind of dumba, or large-tailed sheep, also valuable horses. From Darchando immense quantities of tea (Darchando is said to be situated north-east of Lassa, and to be distant two months' journey). From Chando city, in the Khan territory, an enormous quantity of the musk perfume is brought, which eventually finds its way to Europe, through Nepaul. Rice and other grain that is foreign to Lassa, is brought from Tawang, in Bhootan. From Sikhim, rice and tobacco; and from Nepaul, Darjeeling, and Patna, broad-cloth, silks, satins, saddles, and precious stones, coral, pearls, sugar, spices, and a variety of Indian commodities."

I have now to conclude with a few observations on the best means of improving and greatly extending this trade, and they are suggested by what has gone before. Our great aim should be to clear the way of all obstacles from our own to the Thibetan frontier, and it may be done in this way:—Firstly, we require a new commercial treaty with Nepaul, stipulating for the abolition of all transit and customs duties on European and Indian goods, whether for Nepaul or Thibet, and for the removal of all official interference with the trade between the British frontier and the frontier of Thibet. I have no hope that we can at present induce the government to make a road to Catmandoo and onwards to the passes, but it may be hoped for some day, and the treaty is

feasible. Secondly, we should take advantage of our present close connection with Bhootan, to remove all obstructions to trade between the Dooars and the Thibtan frontier. I am, however, one of those who think that it would have been the best thing possible for the people of that counry, if the British Government had annexed the whole of it instead of the Dooars only. This would have effectually cleared the way for trade to the north, and put a stop for the future to Bhootanese kidnapping of our subjects, and violent breaches of frontier, which the partial annexation will not effect. Thirdly and lastly, we should direct our best attention to the route by Darjeeling as the shortest and best to Thibet. There is not very much left to be done now to secure the benefits of the route, if the government would take it up in earnest. There are many other considerations connected with Darjeeling which could be fulfilled at the same time, and it would be wise and beneficent to attend to them. What is wanted is the extension of the railway to the foot of the hills, a road from Darjeeling for foot travellers and ponies, with rope or iron suspension bridges over the Runjeet and Teesta rivers to the Thibetan frontier at Chola, and the establishing of an annual fair or bazaar to continue for two months in the spring, at some place in Sikhim, near the frontier, to enable the Thibetans, who might not desire to go on to Darjeeling, to dispose of their goods, and provide themselves with return investments. After these arrangements are completed, I do not see why we should not go further a-head to develope our commerce with Thibet, and arrange to have a British consulate at Lassa. Russian goods are to be found in the bazaar at Lassa, and the Russians are fond of following their wares in this direction ; our English and Indian goods are in great request there, and we may as well follow them also. This, however, is a matter which, you will probably agree with me, requires much consideration and discussion.

INDUSTRIAL RESOURCES.

COAL AT KORBA IN THE BELASPORE DISTRICT OF THE CENTRAL PROVINCES

From T. OLDHAM, ESQ., LL. D., Superintendent, Geological Survey of India, to the Secretary to the Government of India, Home Department,—No. 727, dated Calcutta, the 17th May 1870.

I have now the honor to forward to you, in original, a report on the character and quantity of the coal exposed in the Belaspore District, near the village of Korba, drawn up by Mr. W. T. Blanford after his recent examination of the locality. The report was promised to be submitted before the end of May (my letter to your Office, No. 607, dated 28th December 1869). I have also appended the results of Assay of the various specimens of the coal seen by Mr. Blanford.

2. It will be seen that, after careful examination, Mr. Blanford has arrived at the conclusion that there are very favorable prospects of the coal field turning out productive of a large amount of workable coal of fair quality.

The coal field in which Korba is situated farther extends to the East as far as Rabkuk, the *Oodeypore* of the maps. There is abundance of coal in the Eastern portion, but the quality has not yet been examined. There is, however, not much reason to suppose that it will differ materially from that of the same coals to the West.

3. There is, therefore, as anticipated by myself long since, every probability of an extensive and useful supply of coal being available in these Districts, spread over a very considerable area (Oodeypore is some 50 miles from Korba, in a right line).

4. The occurrence of large plateaus of high ground, nearly flat on top, locally known as Pats (Main Pat, Juneera Pat, &c.,) in this vicinity, ought not to be forgotten, for these offer free selection of localities in every way adapted as retreats for Europeans during the hot whether, which, if a Railway be constructed here from Calcutta, would become readily accessible. The upper portion of all these plateaus is composed of trappean rocks overlaid by thick laterite, and for the most part they have an abundance of excellent water. The value of such a plateau, offering wide open space, dry, or well-drained soil, water abundant and good, and with an elevation of 4,000 feet above the sea, as sanatorial locations for either Troops or Civilians, cannot be too strongly insisted on.

5. In view of a Railway being constructed, it may be well also to draw attention to the present abundant supply of timber for sleepeers and other purposes, most of which will, in a few years more, if care be not taken, pass into the hands of speculators and contractors. It would, undoubtedly, be desirable to take some early steps towards the preservation of these forests.

Report on the Coal at Korba, in the Belaspore Districts.

1. *Locality and mode of outcrop.*—The village of Korba is situated in the Eastern part of the Belaspore District belonging to the Chatisgarh (Chutteesgurh) Division of the Central Provinces, and is the residence of a zemindar who owns a large portion of the surrounding country. It lies on the left or Eastern bank of the Hasdo River, a large tributary of the Mahanaddi. This stream has, in most places, a broad sandy bed, varying, however, from about 200 yards to above half a mile in breadth. The country around Korba, for many miles in all directions, is flat, or very gently undulating, and usually covered with clay.

Coal is exposed in two places close to the right (Western) bank of the river, just below Korba. The exposures are in the bed of the river, no section being seen in the bank itself, and, as will presently be shown, it is probable that both belong to the same seam of coal. A very slight rise in the river is sufficient to conceal both outcrops.

The lower outcrop, which is about half a mile below the village, is the best suited for examination, as both the top and bottom of the seam are exposed. A considerable proportion of the section is above water during the dry season, although there is always a great thickness concealed. The seam is remarkably thick, but, owing to its mode of occurrence, it is impossible to measure it exactly. It may, however, be computed sufficiently closely for all practical purposes. The dip varies in inclination from 13° to about 18° and in direction from N. 30° E. at the Northern extremity of the section to N. 16° E. at the Southern end. The horizontal breadth of the outcrop at the angles to the strike is 350 feet, and, taking the average dip at 15° the corresponding thickness is 90 feet. This, I believe, is rather below the truth than in excess of it.

Both above and below the coal, massive felspathic sandstones occur. Below the seam but a small thickness of these rocks is exposed, but above it, at least, 400 or 500 feet are seen in the river.

2. *Section of coal, seam and quality of coal.*—Of course the great thickness already mentioned does not consist throughout of workable coal. Bands of shale and of inferior coal are interspersed, as is more or less the case with most Indian coal seams. From the imperfect manner in which the seam is exposed, especially towards the base and from the surface as usually happens, in similar positions, being extensively decomposed, it is impossible to obtain a correct idea of the quality of the coal without cutting into it. I consequently had a series of small pits dug, 6 to 7 feet deep, and from these and the portions of the seam fairly seen in the river bed, I obtained a good section of the whole thickness with the exception of about 10 feet. To examine these few feet would have caused some delay with the means at my disposal ; and I had already fully ascertained the existence of a large proportion of good coal.

The section of the seam thus ascertained is the following. Of all the bands of coal to which letters are attached, specimens have been transmitted to Calcutta for analysis :—

	Feet.	Inches
Sandstone—		
Shale about	1	0
Coal of fair quality	1	0
Inferior coal	1	0
Shale and inferior coal	3	3
Good coal, an inch or two of inferior coal here and there	3	9*a*
Good coal	6	0*b*
Shale and coal mixed	1	6
Good coal	3	0*c*
Shale with bands of coal	3	6
Good coal	4	0*d*
Coal and shale mixed	2	0
Shale with bands of coal	2	0
Coal of fair quality	1	6
Inferior coal	0	6
Good coal	5	6*e*
Shale	0	6
Coal	0	3
Shale	2	0
Coal	1	0
Shale and inferior coal	2	0
Good coal	4	0*f*
Shale with bands of coal	3	0
Shale and coal, the latter good in part	3	0
Coal, rather inferior in parts but generally good	3	6
Shale	1	0
Good coal	1	0
Not examined about	3	0
Shale	1	0
Good coal	4	6*g*
Not examined about	3	0
Good coal	4	0*h*
Shale	0	4
Good coal containing one or two thin bands of shale	6	8*i*
Not examined about	0	0
Shale	0	4
Good coal	2	8*j*
Sandy shale / Sandstone	30	3

The above section shews a *minimum* thickness of 50 feet of good coal. The proportion is probably nearer two-thirds of the seam. The best bands appear to be those marked *b*, *g*, and *h*. Portions of these and especially the lower 2 feet of *h** appeared to me equal in quality to any coal found in the Raneegunge

* By a rough experiment, I obtained very fair coke from this part of the seam.

* In case of a railway bridge being necessary across the Hasdo Korba appears to be a more favorable spot than any other in the neighbourhood, as the breadth of the river is moderate, and a considerable portion of the channel rocky. For several miles above and below the breadth is very much greater and the bed a wide expanse of sand-

field. There is some iron pyrites here and there, but not throughout. The coal ignites readily and burns well with rather more flame than usual in Indian coal obtained from the surface. The ash left is large in quantity, and partly red, partly white.

Probable extent of seam.—Metamorphic rocks are seen in the Hasdo about three miles South of Korba, and also at about the same distance to the North: these mark the limits of the beds accompanying the coal in those directions. East and West, the coal-bearing beds extend to a great distance, and to the North-East they are apparently continuous with those forming the hills East of Churi and Sutringll, and these are probably part of one large field which has been found by Mr. Medlicott to extend beyond Sirguja. But, unfortunately, the surface of the country near Korba is so much covered with alluvial deposits that very few rocks are visible, and those seen are almost invariably coarse sandstones, the dip of which can rarely be determined accurately. West of the Hasdo the concealment is even greater than to the East, while in the latter direction, the whole country is an immense forest, rendering the relative position of the few outcrops met with very obscure.

But little information can be derived from the rocks seen in the Hasdo. The second outcrop of coal occurs about 300 yards higher up the river than that already described, and close to the same (right) bank. It is distinctly seem to be faulted against the sandstones which overlie the coal are exposed at the Southern outcrop. About 50 feet of coal exposed, neither the top nor the base of the seam being visible. The dip is very irregular and and twisted, owing to the fault close by; it averages about 12° to N. 10° W.

It appears more probable that this is the the same seam as that seen a little farther down the river, and that it is brought up again by the fault than that two seams of such unusual thickness should occur in the same beds. This, however, can only be positively decided by boring. The coal at the more Northern outcrop appears rather inferior to that seen to the South, but in the latter locality, the central portion of the seam contains more shale and inferior coal than the top and bottom, and it is the central portion of the seam which alone is exposed to the North. If the two outcrops belong to the same seam, the fault has a downthrow on its Eastern side of no amount, probably not much above 100 feet.

So far as any reliance can be placed upon the dips on the sandstones, the general direction appears to be North by East to North-East, for about a mile up the river, above the coal. Beyond this no rocks are seen. Just above the village of Korba, on the left bank, there is a reversed dip to the South-West, but it is probably local.

Belowed the Southern outcrop, rock is only seen in the river at distant intervals. The few sections observed appear to indicate that the direction of the dip changes to the Eastward. In this case the outcrop of the seam may pass for a long distance down the river, being concealed by the sand in the bed, which is here of great width. All the dips seen appear to be lower than those at the outcrop of the coal; and it is highly probable that the amount of inclination may be higher at this spot than it is else where, and the direction of the dip different in consequence of the fault close by. The circumstances already mentioned of the variation in both amount and direction of the dip at different parts of the outcrop in the coal seam itself, is in favor of this view.

So far as an opinion can be formed on these very imperfect data, it appears that the rocks associated with the coal cover a large tract of country, and it is improbable that so thick a seam should thin out within a short distance. It is, however, quite in accordance with our knowledge of similar seams in other parts of India that the exact thickness, the quality of the coal, and the proportion of good coal to inferior coal and shale should be highly variable.

If the coal seam be continous, it should be found west of the Hasdo throughout a tract from one to two miles broad, extending probably in a West North-Western direction from the river, the Southern boundary of this tract passing through the more more Northern of the two outcrops seen in the river. East of the stream the seam should underlie the village of Korba and the river bank for at least a mile below and probably one to two miles above the village, and it may extend for an indefinite distance to the Eastward, but it is possibly at a considerable depth below the surface throughout a large proportion of the area.

It is evident that before attempting to open a coal mine, boring must be resorted to in order to ascertain the extent of the seam, and its depth beneath the surface. The best places for boring will depend upon whether it is desirable that the coal should be extracted on the East or on the West side of the Hasdo.*

If to the West, as the strike of the rocks is somewhat uncertain, the first boring should be made about a quarter of a mile West North-West of the spot where the more Northern outcrop appears in the river. Although the strike at the outcrop is West by South, there can be but little doubt that the normal strike is North of West, and that the alteration is due to the fault. Should the coal not be found in the first boring, within a depth of 200 feet, two others,—one 300 yards further North, the other at the same distance to the South,—should be made. When the true direction of the outcrop is ascertained, it will be well to continue the borings along it at distances, not exceeding half a mile apart, as any slight change of direction coupled with the high dip (if the latter be constant) will take the coal below the depth to which borings can most conveniently be made. There is also a possibility of other faults occurring besides that seen in the river.

On the East of the Hasdo the question is simpler. The fault so frequently referred to must either pass through the village of Korba or just South-East of it. West of the fault, a boring behind the zemindar's residence would probably pass through the seam. East of the fault the best place for a boring is at a spot where sandstone occurs in the left bank of the river below Korba, due East of the more Southern outcrop on the right bank. Owing to the rather high dip, these borings should be made to a depth of about 400 feet, if coal be not found sooner. But, as I have already suggested, it is far from improbable that the high dip is local, and that on the left bank of the Hasdo the inclination is less, in which case the coal may be found at a moderate depth. Other borings, if the above are successful, may be made at intervals along the East bank of the seam below Korba. To the North of Korba the coal for some distance is probably at a considerable depth, but, if continous, it must again rise towards the surface between one and two miles North of Korba. It is, however, impossible to indicate with accuracy a good spot for boring in this direction. The best plan for examining the ground would be to put down a series along a line running North North-East from Korba at half mile intervals.

Facilities for mining.—The dip of the seam where seen in the river, although considerable, is by no means so high as to be any impediment to mining beyond its effect in rapidly increasing the depth of the seam below the surface. The sandstone above the coal is firm and massive, and will probably furnish a good roof. The coal appears compact, the joints or "barks" are rather irregular, but still sufficiently marked in general to facilitate mining. Some of the very best and brightest coal is, as usual, rather brittle,* but the greater portion of the seam bears carriage well.

In consequence of the absence of bands of shale in the overlying sandstone, the quantity of water may be rather larger than usual, but in the small pits dug in the bed of the river, the coal did not appear in general, to be porous.

In mining a seam of such thickness as this, especially where the proportion of good coal is larger, if the roof prove as sound as will probably be the case, it will be an important economic question whether some more advantageous method of mining cannot be adopted than that of removing a small section of the seam, not exceeding 12 feet in height, by "longwall," or still worse by "post stall," more epecially as it is highly improbable that the best bands of coal will be found for any distance on the same horizon,—a most serious drawback to mining on either of the two English systems mentioned. It would, however, be premature to enter into this subject at present, but the methods adopted for extracting the thick deposits of lignite or brown coal found in parts of Germany are deserving of attention.

Conclusion.—I have endeavoured to show my reasons for the opinion I have formed as to the Korba coal. My conclusions are briefly that both the quality and mode of occurrence are favorable. In thickness, in quality, and in the proportion of good coal to inferior coal and shale, the seam surpasses that near Chanda. The question of the extent over which the coal extends must be ascertained by boring.

Camp Korba,
The 18th April 1870.

W. T. BLANFORD,
Deputy Supt. Geological Survey of India.

The following Table gives the result of Assay of the Coals referred to in Mr. Blanford's Report just given:—

	Carbon.	Volatile.	Ash.
H	38·7	26·6	34·7
H lower 2 feet*	45·8	22·4	31·8
I	42·3	25·2	32·5
J	39·6	24·6	35·8
*	47·8	28·2	24·0
	32·8	21·4	45·8
	46·4	23·6	30·0
	57·5	25·2	17·3
	60·5	29·5	10·0
	46·5	22·2	31·3
	53·3	27·2	19·5

* Cakes slightly.

The 9th May 1870. A. TWEEN.

* This bright coal, as I have mentioned, makes a very fair coke, and in that state is far less brittle besides being much lighter and consequently costing less for carriage. The cost of cooking in ovens heated by waste coal would be very trifling.

PRICES OF FOOD THROUGHOUT INDIA.—LATEST OFFICIAL QUOTATIONS.

BENGAL.—WEEK ENDING 20TH AUGUST.

		Rice per rupee.	Wheat per rupee.
BURDWAN DIVISION.	Burdwan	20½ Seers.	14¾ Seers.
	Bauncoorab	21½ ,,	14 ,,
	Beerbhoom	23¼ ,,	14¼ ,,
	Hooghly	19 ,,	13 ,,
	Howrah	16 ,,	12 ,,
	Midnapore	23 ,,	10 ,,
ORISSA ,,	Balasore	32 ,,	9 ,,
	Cuttack	28 ,,	13 ,,
	Pooree	23⅔ ,,	10½ ,,
ASSAM ,,	Durrung	16 ,,	... ,,
	Goalparah	16 ,,	20 ,,
	Kamroop	20 ,,	13 ,,
	Lukimpore	11 ,,	7 ,,
	Nowgong	16 ,,	... ,,
	Sabsaugor	16 ,,	14 ,,
DACCA ,,	Dacca	21 ,,	11 ,,
	Backergunge	20 ,,	14½ ,,
	Furreedpor	21 ,,	14 ,,
	Mysmensing	21 ,,	7½ ,,
	Sylhet	24½ ,,	10 ,,
	Cachar	20 ,,	8½ ,,
PATNA ,,	Patna	18½ ,,	18¼ ,,
	Gya	17½ ,,	18 ,,
	Chumparum	21 ,,	20 ,,
	Sarun	20 ,,	18 ,,
	Shahabad	19 ,,	19 ,,
	Tirhoot	20 ,,	15 ,,
BHAUGALPORE ,,	Bhaugalpore	18 15/16 ,,	18 5/16 ,,
	Monghyr	20 ,,	17 ,,
	Purneah	21½ ,,	16 ,,
SONTHAL PERGHS.	Godda	20 ,,	10 ,,
	Nya Doonkah	20 ,,	12 ,,
	Rajmehal	18 ,,	16 ,,
	Deoghur	16 ,,	... ,,
	Calcutta	16 ,,	7 ,,
PRESIDENCY ,,	Nuddea	18 5-16 ,,	14 4-16 ,,
	Jessore	21 5-16 ,,	13¼ ,,
RAJSHAHYE ,,	24 Pergs	20 ,,	13 5-16 ,,
	Bagroah	22½ ,,	12 ,,
	Dinapore	27 ,,	13 ,,
	Maldah	20 ,,	16 ,,
	Moorshedabad	19 ,,	18¼ ,,
	Pubna	18 ,,	16 ,,
	Rungpore	25 ,,	15 ,,
CHOTA NAGPORE.	Hagareebagh	16 ,,	15 ,,
	Maunbhoom	27 ,,	12½ ,,

NORTH WESTERN PROVINCES.—30 SEPT. 1870.

		Wheat.	Rice.
MEERUT DIVISION.	Dehra Dhoon	16 8	12 0
,,	Saharunpore	19 6	15 1
,,	Moozuffernugger	21 6	15 7
,,	Meerut	19 4	16 0
,,	Boolunshuhur	21 4	11 0
KUMAON ,,	Kumaon	15 0	12 8
,,	Gurhwal	22 8	18 0
ROHILKUND ,,	Bijnour	20 13	11 13
,,	Moradabad	21 14	16 4
,,	Budaon	21 12	15 15
,,	Bareilly	20 15	15 0
,,	Shahjehanpore	22 8	12 0
,,	Terai Pergunnahs	20 10	16 15
AGRA ,,	Muttra	20 0	12 0
,,	Agra	20 0	12 8
,,	Furruckabad	...	17 0
,,	Mynpoorie	19 8	9 0
,,	Etawah	18 4	16 0
,,	Etah	21 0	12 0
THASSOO ,,	Jaolun	19 12	11 8
,,	Jhansie	16 6	10 12
ALLAHABAD ,,	Lullutpore	18 15	7 14
,,	Cawnpore	18 14	14 2
,,	Futtehpore	15 8	14 8
,,	Banda	15 0	...
,,	Allahabad	16 0	14 0
,,	Humeerpore	...	...
,,	Jounpore	17 0	15 6
BENARES ,,	Goruckpore	19 10	20 3
,,	Bustee	21 4	8 12
,,	Azimgurh	18 13	15 8
,,	Mirzapore	17 0	16 0
,,	Benares	14 13	12 13
,,	Ghazeepore	17 8	12 8
AJMERE ,,	Ajmero	10 6	6 8

OUDH.—FOURTH WEEK OF AUGUST 1870.

		Wheat.	Rice.
LUCKNOW DIVISION.	Lucknow	18 4	13 12
	Oonao	18 10	14 2
	Barabunkeee	18 0	14 0
SEETAPORE ,,	Seetapore	21 12	11 10
	Hurdui	21 1	12 9
	Kheree	23 6	11 6
FYZABAD ,,	Fyzabad	17 6	16 2
	Baraich	18 0	13 8
	Gondah	21 0	14 8
ROY BAREILLY	Roy Bareilly	17 8	14 12
	Sultanpoor	16 0	14 4
	Portabgurh	16 4	13 8

PUNJAB.—WEEK ENDING 18TH SEPT. 1870.

DELHI DIVISION.	Delhi	17 7	6 0
,,	Gurgaon	17 8	...
,,	Kurnal	17 0	8 0
HISSAR ,,	Hissar	16 0	9 0
,,	Rohtuk	16 0	10 0
,,	Sirsa	13 0	12 0
AMBALLA ,,	Amballa	20 0	12 0
,,	Ludianah	18 0	7 0
,,	Simla	13 0	7 0
JULLUNDHUR	Jullundhur	18 0	9 0
,,	Hoshiarpore	18 0	8 0
,,	Kangra	..	...
AMRITSAR ,,	Amritsar	...	...
,,	Syalkot	14 0	10 0
,,	Gurdaspore	17 8	7 0
LAHORE ,,	Lahore	15 8	9 8
,,	Fezrozepore	15 8	6 8
,,	Gujeranwalla	14 8	8 8
GUJERAT ,,	Rawul Pindi	17 12	5 to 10
,,	Jhelum	16 4	5 0
,,	Gujerat	...	...
,,	Shahpore	12 8	6 0
MOOLTAN ,,	Multan	11 8	5 12
,,	Jhung	12 0	8 0
,,	Montgomery	13 0	7 0
,,	Mozaffnuggur	12 14	6 8
DERA I. KHAN	Dera I. Khan	12 0	6 4
,,	Dera G Khan	...	...
,,	Bunnoo	15 0	5 0
PESHAWAR ,,	Peshawar	17 9	6 8
,,	Kohat	15 15	4 7
,,	Huzara	...	...

CENTRAL PROVINCES.—MONTH OF JULY 1870.

		Wheat.	Rice.
NAGPORE.	Nagpore	...	11 4
	Bhundara	14 0	15 0
	Chanda	10 0	10 8
	Wurdah	11 11	8 5
	Balaghat	15 0	18 0
JUBBULPORE.	Jubbulpore	14 10	8 0
	Saugor	14 9½	9 6
	Dumoh	12 5	11 0
	Mundla	15 0	15 0
	Seonee	17 0	10 0
NERBUDDA.	Baitool	12 12	6 8
	Hoshungabad	11 8	9 0
	Chindwara	12 8	10 0
	Nursingpore	13 8	10 0
	Nimar	11 12	9 14
CHUTTEESGURH.	Raepore	24 0	23 0
	Belaspore	24 0	24 0
	Sumbulpore	14 0	28 0
UPPER GODY.	Seroncha	10 0	8 0

MADRAS.—MAY 1870.

		2nd-Sort Rice. Fuzly 1278	1279.	Cholum. Fuzly 1278	1279.
		Rs.	Rs.	Rs.	Rs.
NORTHERN SECTION.	Ganjam	289	255	218	186
	Vizagapatam	380	305	222	165
	Godavery	284	240	165	127
	Kistna	350	340	148	203
	Nellore	363	350	155	182
CEDED DISTRICTS.	Cuddapah	407	419	174	199
	Bellary	356	377	124	178
	Kurnool	443	403	148	196
EAST CENTRE.	Madras	444	345	240	221
	North Arcot	395	331	201	193
	South Arcot	401	289	220	140
CAUVERY.	Tanjore	349	271	194	137
	Trichinopoly	369	293	159	135
SOUTHERN SECTION.	Madura	405	350	194	200
	Tinnevelly	391	384	...	163
WEST CENTRE.	Coimbatore	442	405	284	252
	Neilgherries	533	582	291	320
	Salem	375	335	203	173
WEST.	South Canara	350	367	...	...
	Malabar	441	412	..	...

BOMBAY PRESIDENCY.—SEPT. 1870.

	Atta per rupee.		Atta per rupee.
Colaba	6 Seers.	Rewa Kanta	.....
Tanna	6 ,,	Punch Mahals	11½ Seers.
Rutnagherry	5 ,,	Khandeish	7½ ,,
Dapoolie, D.	...	Ahmednuggur	6 ,,
Vingorla	9 ,,	Nassick	7½ ,,
Sawunt Waree	7½ ,,	Poona	6½ ,,
North Canara	4 ,,	Sholapoor	6½ ,,
Surat	8 ,,	Sattara	.....
Broach	8 ,,	Kolapore	4½ ,,
Ahmedabad	9 ,,	Kulladghee	5 ,,
Kaira	7 ,,	Belgaum	4 ,,
Cutch	...	Dharwar	4½ ,,
Gujerat	...		.....
Baroda, Residency	...		.....
Mahi Kantai	...		.....

THE PUBLIC REVENUE AND EXPENDITURE.

Revenue and Expenditure of the Government of India for the first two months of the year 1870-71, as compared with the corresponding period of 1869-70.

	Revenues and Receipts.	April to May 1869	April to May 1870	Increase	Decrease.		Expenditure.	April to May 1869	April to May 1870	In case	Decrease
		£	£	£	£			£	£	£	£
I	Land Revenue	3,717,938	3,841,003	123,065	..	1	Interest on Funded and Unfunded Debt	293,350	512,904	219,554	..
II	Tributes and Contributions from Native States	115,666	140,879	25,213		2	Interest on Service Funds and other Accounts	42,244	55,963	13,720	..
III	Forest	58,080	56,157	..	1,923		Refunds and Drawbacks	65,414	48,961	..	16,453
IV	Excise on Spirits and Drugs ..	350,791	379,168	28,377	..	3	Land Revenue	377,704	354,161	..	23,543
V	Assessed Taxes	47,004	148,231	100,627	..	4	Forest	44,673	43,754	..	919
VI	Customs	373,988	488,751	114,763	..	5	Excise on Spirits and Drugs ..	36,031	55,796	19,765	...
VII	Salt	978,959	1,066,208	87,249	..	6	Assessed Taxes	1,975	7,611	5,730	..
VIII	Opium	1,434,175	1,265,807	...	168,368	7	Customs	30,139	30,095	...	44
IX	Stamps	386,298	158,119	..	228,171	8	Salt	63,078	47,605	...	15,470
X	Mint	51,622	14,293	..	37,329	9	Opium	927,730	1,075,108	147,378	...
XI	Post Office	35,996	146,326	110,330	..	10	Stamps	17,866	9,629	..	8,237
XII	Telegraph	2,772	21,927	18,555	..	11	Mint	15,927	10,613	..	5,314
XIII	Law and Justice	142,382	361,882	219,500	..	12	Post Office	98,904	109,731	11,737	..
XIV	Police	45,639	59,357	...	4,282	13	Telegraph	46,262	46,244	...	18
XV	Marine	20,881	24,579	3,698	...	14	Administration	162,725	181,971	19,246	...
XVI	Education	13,805	10,703	..	3,102	15	Minor Departments	27,007	37,234	9,627	..
XVII	Interest	23,158	82,710	59,252	..	16	Law and Justice	438,300	446,521	8,221	...
XVIII	Miscellaneous	28,440	30,183	1,734	..	17	Police	491,305	371,101	...	30,204
						18	Marine	72,876	50,079	...	22,797
						19	Education	104,289	92,650	..	11,639
						20	Ecclesiastical	27,027	25,208	..	1,819
						21	Medical Services	74,009	75,264	1,255	...
						22	Stationary and Printing	39,796	34,768	..	5,028
						23	Political Agencies	66,634	38,217	...	28,417
						24	Allowances and Assignments under Treaties and Engagements	229,490	260,604	31,114	...
						25	Miscellaneous	81,935	135,704	53,769	..
						26	Superannuation, Retired, and Compassionate Allowances ..	100,264	108,526	8,262	..
						27					
	Total	7,826,475	8,275,663	892,363	443,175		Total	3,880,531	4,260,025	549,390	169,902
	Army Miscellaneous	132,277	124,290	..	7,987		Army	2,017,307	1,923,916	...	113,391
	Public Works Ordinary. Miscellaneous Receipts ..	24,267	22,274	..	1,993		Public Works Ordinary. Public Works ..	1,038,496	601,217	...	437,279
	Public Works Ordinary. Railway Exchange, Gain ..	21,102	...	...	21,102		Public Works Ordinary. Railways Guaranteed ..	8,092	9,454	1,362	..
	Public Works Ordinary. State Railways, Traffic Receipts	..	1,203	1,203	..		Public Works Ordinary. Railway Exchange, Loss ..	72,108	38,068	..	33,200
	Do. Extraordinary do.	..	1,615	1,615	..		Public Works Ordinary. State Railways ..	2,202	923	..	1,297
	Capital Amount	..	..	..	..		Irrigation, &c ..	105,387	132,713	27,326	..
							State Railways ..	77	30,147	30,070	..
	Total Revenue	8,004,121	8,425,045	895,181	474,257		Total Expenditure ..	7,144,269	6,997,369	608,154	755,051

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION, of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Retired by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
31st August 1870 ...	Calcutta	3,33,93,180	1,38,490	3,32,54,690	1,34,82,680	37,08,488	3,12,495	1,28,20,987	3,03,24,650
Ditto	Madras	87,03,710	98,470	86,05,240	54,84,856	.....	.....	17,28,404	72,13,260
Ditto	Bombay	3,77,21,240	45 950	3,76,75 290	2,12,18,530	26,16,000	.....	1,17,52,960	3,55,87,490
Ditto	Allahabad	51,25 050	18,85 950	32,39,100	39,07,769	.....	.....	11,03,291	50,11,060
Ditto	Lahore	34,33,350	11,64,270	22.69.080	26,93,443	.....	.....	7,00,037	33,93,480
Ditto	Calicut	9,87,040	1,91,410	7,92,630	8,58.301	.....	.....	1,00,059	9,58,360
Ditto	Trichinopoly	14,52,080	12,27,220	2.24,160	13,27,621	.....	.....	1,00,059	14,27,680
Ditto	Vizagapatam	3,79,460	72.310	3,07,150	2,38,111	.....	.....	1,00,059	3,38,170
Ditto	Nagpore	41,42,200	1,09,870	40,32,330	35,93,448	.....	.....	5.47,902	41,41,350
Ditto	Kurrachee	92,15,190	19,56,240	19,58,950	33,85 654	.....	.....	5,00,106	38,85,760
Ditto	Akola	22,54,240	80,940	21,73,300	22,50,660	.....	.....	.....	22,50,660
	TOTAL	10,15,06,740	69,74,820	9,45,31,920	5,84,41,073	63,24,488	3,12,495	2,94 53,846	9,45,31,920

Calcutta, Department of Issue of Paper Currency
6th September 1870.

H. HYDE, Lieut. Col.,
Head Commissioner.

SILVER RECEIVED AND COINED IN THE MINTS OF CALCUTTA, MADRAS, AND BOMBAY, 1869-70

	Calcutta.			Madras.			Bombay.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.	Bullion or Coin received during the month valued in Rs.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
March	1,58,444	5,29,702	17,19,083	...	...	...	1,22,684	8,95,338	23,99,295
April	6,517	12,28,916	5,59,260	...	192	...	...	30,86,611	21,99,388
May	691	8,04,000	22,18,732	...	10,906	...	2,48,438	7,24,594	23,99,310
June	1,148	24,650	10,38,778	...	14,509	..	18,577	14,07,061	22,11,376
July	1,201	2,722	9,30,351	...	3,594	...	88	1,03,558	26,51,675
August	66,565	2,020	...	...	644	...	...	43,631	11,23,536

THE BANK OF BENGAL.

Statement of Affairs.	11th Octr. 1870.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,76,011 7 0
General Treasury Balance at Head Office	46,21,237 10 11
Ditto ditto at Branches	1,25,23,465 12 4
Other Deposits at Head Office and Branches	2,66,85,969 12 2
Bank Post Bills, &c.	8,34,467 5 10
Sundries	6,08,098 7 8
Total...Rs.	6,88,49,250 7 11
Assets.	
Government Securities	96,39,424 2 0
Loans on Government Securities at Head Office and Branches	49,18,758 2 3
Accounts of Credit on ditto do do	36,43,772 6 10
Mercantile Bills discounted at do do	1,28,72,907 14 0
Dead Stock	11,35,531 14 6
Stamps	13,851 1 0
Balances with other Banks	11,49,393 10 1
Sundries	1,87,435 12 5
Cash and Currency Notes at Head Office	1,19,02,279 3 5
Cash and Currency Notes at Branches	2,33,85,896 5 5
Total...Rs.	6,88,49,250 7 11

THE BANK OF MADRAS.

Statement of Affairs.	1st Octr. 1870.
Liabilities.	Rs. A. P.
Capital	50,25,000 0 0
Public deposits at Head Office	1,26,43,795 12 3
Do. at Branches	25,55,401 4 2
Other deposits at Head Office and Branches	1,34,58,224 5 6
Cash Credits undrawn at do	3,07,353 0 6
Post Bills	1,39,738 5 2
Reserve Fund	5,62,500 0 0
Rest	1,13,332 15 1
Total...Rs.	3,54,05,343 10 8
Assets.	
Silver and Notes at Head Office	44,66,856 9 3
Silver and Notes at Branches	98,15,150 8 11
Government Securities	4,17,654 14 7
Government Reserve—Cash	1,01,43,793 12 3
Securities	.....
Loans at Head Office and Branches	18,66,213 10 6
Accounts of Credit at Head Office and Branches	6,35,540 0 0
Mercantile Bills discounted at Head Office and Branches	64,02,186 6 8
Dead Stock at Head Office and Branches	2,31,488 15 10
Bills of Exchange do	13,02,963 14 4
Due by other Banks	1,23,494 14 4
Total...Rs	3,54,05,343 10 8

THE NEW BANK OF BOMBAY.

Statement of Affairs.	
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance	34,09,674 0 0
Deposits at Head Office	1,78,52,827 0 0
Deposits at Branches	21 09,697 0 0
Bank Post Bills outstandings	8,54,470 0 0
Reserve	4,15,000 0 0
Undrawn Cash Credits	11,80,111 0 0
Total...Rs.	3,18,21,779 0 0

Statement of Affairs.	
Assets.	Rs. A. P.
Government Securities	24,12,681 0 0
Loans at Head Office & Branches on Govt. Sec. &c.	3,86,388 0 0
Credit Accounts do do on Govt. Securities.	27,58,700 0 0
Bills discounted and purchased at do do	36,61,799 0 0
Dead Stock and Loss written off	4,41,286 0 0
Stamps	6,650 0 0
Balance with Agents and Correspondents	17,61,576 0 0
Overdrafts	17,500 0 0
Government Reserve Cash	.....
Cash and Currency Notes at Head Office	1,43,03,855 0 0
Do. do. at Branches	47,62,350 0 0
Bullion at H. O and Branches	13,08,994 0 0
Total...Rs.	3,18,21,779 0 0

Cash Balances in the Government Treasuries in India, 1869-70 contrasted with previous years.

	Jan.	Feb.	March.	April.	May.	June.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	1,30,34,989	1,58,42989	2,07,94,308	1,62,44,972	1,11,67,665	1,13,96,105
Bengal	1,62,02,868	1,34,22,941	1,99,40 203	1,40,54,667	1,27,91,234	1,49,51,970
British Burmah	22,89,610	27,60,781	36,67,030	36,16,189	37,54,864	27,50,490
North-Western Provinces	2,14,02,495	1,99,27,391	1,57,56,570	1,39,47,004	2,05,84,544	2,41,33,186
Oudh	44,94,395	39,36,141	41,31,215	35,92,342	47,80,982	63,08,804
Punjaub	1,15,64,592	1,18,04,491	1,06,78,688	94,15,066	89,94,758	1,14,40,931
Bombay	2,13,88,959	2,98,13,815	3,50,28,704	3,67,57,721	3,72,42,836	3,39,55,116
Central Provinces	58,84,166	56,33,383	48,54,141	56,89,548	66,53,284	68,20,440
Madras	2,21,28,894	2,37,79,348	2,49,40,140	2,72,70,925	2,89,32,294	3,04,71,972
Total	11,83,90,968	12,69,21,285	13,98,20,999	13,05,88,334	13,63,02,461	14,22,29,014
1867-68	10,91,06,741	1,09,66,080	1,17,62,049	10,24,66,923	11,49,73,101	11,62,04,798
1868-69	8,87,68,635	8,69,65,712	1,03,60,599	10,45,09,269	11,73,38,501	11,81,90,260

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Div'd.	Quotations.
Banks.			
Agra Bank, Limited, A.	£10	2 p. c.	110 @ 112
Ditto, new contributory A.	£10	2 p. c.	108 a 110
Ditto Certificates B.	....	....	£ 45 a 47
Agra Savings' Bank	Rs 100	4 p. c.	120 a 130
Allahabad Bank, Limited	100	5 „	101 a 102
Bank of Bengal	1000	40 „	1440 a
Bank of Calcutta, Limited, A.	98	2 „	20 a
Ditto ditto B.	50	2 „	20 a
Bank of Upper India	50	6 p. c.	61 a 62
Delhi and London Bank, Limited	£250	2 p. c.	175 a 180
Mussoorie Savings' Bank	100	7 p. c.	135 a 137
National Bank of India	£12	3 „	127 a 128
Oudh and United Service, Limited	100	nil.	30 a 40
Punjaub Bank, Limited	100	4 p. c.	80 a 85
Simla Bank, Limited	50	6 „	562 a 570
Uncov. Ser. Bank (Agra)	100	4 „	90 a 95
Unitadenk (Simla)	100	5 „	95 a 95
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	nil.	420 a
Ditto ditto	200	nil.	84 a 86
Bengal Coal Co., Limited	1000	7 p. c.	1400 a 1135
Bonded Ware-house Asn	445	18 p. sh.	530 a 535
Brunton's Press Co., Limited	300	4 p. c.	170 a 175
Burdwan Stone Co., Limited	100	5 „	18 a 20
Calcutta Docking Co., Limited	700	nil.	50 a 270
Ditto New ½ Shares	350	nil.	125 a 135
Delhi Railway Co.	£20	2½ p. c.	225 a 230
Eastern Bengal Indigo Co.	100	nil.	30 a 35
Eastern Bengal Railway	£20	2½ p. c.	236 a 237
Eastern Steam Tug Co., Limited	250	nil.	100 a 120
East India Railway Co.	£20	2½ p. c.	147 a
Equitable Coal Co., Limited	250	5 „	217½ a 220
Goosery Cotton Millis Co.	200	6 „	10 a 212
Gourepore Co., Limited	1000	6 p. c.	1320 a 1325
Ditto ¼ Share	125	....	165 a 170
Great Eastern Hotel Co.,	250	6 „	165 a 167½
Howrah Docking Co., Limited	500	nil.	170 a 175
India General S. N. Co.	1000	2 p. c.	375 a 380
Ditto ditto, ½	500	2 „	195 a 205
Ditto ditto, ¼	250	2 „	97 a 102
Landing and Shipping Co.	100	3 „	34 a 36
Nasmyth's Pat. Press Co.	500	2½ p. c.	650 a 700
Oriental Gas Co.	£5	4½ „	70 a 75
Ditto (Contributory)	£1	1½ „	15 a 16
Oudh and Rohilcund Railway	£10	2½ „	105 a 107
Port Canning Land Co.	1400	nil.	295 a 297½
Punjab Railway Co.,	£20	2½ p. c.	228 a 230
R. Scott Thomon & Co.	500	4 „	35 a
Tirhoot Indigo Limited	200	nil.	35 a 40
Tea Companies.		*yearly.*	
Assam Tea Company	100	2½ p. c.	190 a 195
Bengal Tea Co., Limited	100	5 p. c	50 a 51
Ditto (Contributory)	60	5 p. c	18 a 20
Bishnauth Tea Co., Limited	200	nil.	96 a 97
Ditto (Contributory)	50	nil.	18 a 20
Central Cachar Tea Co.	200	nil.	60 a 62
Deling Tea Co., Limited	85	nil.	10 a 12
Dehra Doon Tea Co., Limited	100	nil.	5 a 6
Durrung Tea Co., Limited	100	nil.	29 a 30
Eastern Cachar Tea Co.	100	8 p. c.	100 a 102
East India Tea Co., Limited	100	nil.	23 a 25
Jellalpore Cachar Tea Co.	250	6 p. c.	60 a 270
Kunchunpore Tea Co. Limited	1000	nil.	nominal.
Ditto (Contributory)	800	nil.	.....
Kurseong and Darjeeling Tea Co.	250	2 p. ct.	62 a 63
Ditto (Contributory)	200	2 p. ct.	42 a 43
Kuttal Tea Co., Limited	....	....	.....
Lower Assam Tea Co., Limited	50	nil.	nominal.
Luckimpore Tea Plnt. Co.	200	nil.	65 a 70
Monacherra Tea Co., Limited	30	nil.	27 a 30
Moran Tea Co., Limited	65	nil.	nominal.
Muttuck Tea Co., Limited	125	nil.	40 a
New Golah Ghat Tea Co.	£10	..	100 a 105
New Mutual Tea Co.	30	15 p. c.	60 a
Punkabaree Tea Co., Limited	100	nil.	10 a 20
Soom Tea Co., Limited	100	nil.	35 a 40
Tuckvar Tea Co., Limited	200	nil.	nominal.
Upper Assam Tea Co., Limited	100	nil.	10 a 12
Victoria Tea Co., Limited	250	nil.	nominal.

BOMBAY SHARE LIST.

Banks.	Shares.	Nomi. Value. per. Sh.	Paid up.	Last Div'd.	Rate Share.
		Rs.	Rs.	per an.	Rs.
Agra Bank	100,000	100	all	4 pr. ct.	100
Bank of Bengal	22,000	1,000	all	9 pr. ct.	1,450
Bank of Bombay (New)	10,000	500	all	6 pr. ct.	5971
„ New Issue Do.	10,000	500	100	6 pr. ct.	165½
Bank of Madras	5,250	1,000	all	12 pr. ct.	1,500
Chartered of India and China	40,000	200	all	6 pr. ct.	275
Chartered Mercantile	30,000	250	all	6 pr. ct.	175
Delhi and London	45,999	500	250	6 pr. ct.	200
National Bank of India	37,006	250	125	6 pr. ct.	122
Oriental Bank	60,000	250	all	12 pr. ct.	400
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	....	£20	218-3-0	5 pr. ct.	235
Do. New £20 shares	....	£20	109-1-5	do.	113
Bombay, B. & C. I. R. Co.	....	£100	1,000	do.	1,100
Do, New shares	....	£18	100-5-1	5 pr. ct.	200
Land Companies.					
Elphinstone Land	10,800	1,000	all	30	1,040
Ditto New Issue	10,800	1,000	650	11-14	676
Frere Land	8,000	150	all	nil.	163
Mazagon Land and R	1,750	2,000	2,000	nil.	1,025
Port Canning	4,000	2,000	1,400	nil.	270
Colaba Company	4,000	3,000	all	70	1,535
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,850	250 p. s.	2,225
Albert Press Company, Kurrachee	200	2,000	1,100	100 do.	775
Alexandra Press Co.	250	3,000	850	60 do.	470
Apollo Press Co.	150	12,000	11,300	200 do.	8,000exd.
Bombay Press Co.	200	2,000	all	375 do.	2,225
Ditto (New)	200	500	all	93½ do.	555
Colaba Press Co,	500	1,880	all	800 do.	6,600
East India Press Co.	350	2,000	all	....	3,500
Fort Press Co.	150	8,500	all	1,000	9,300
Framjee Cowasjee Press	300	2,000	1,800	....	915
Hydraulic Press Co.	200	6,000	all	246 p. s.	2,350
Kurrachee Press Co.	1,000	5,000	2,000	120 „ „	850
Mofussil Press & G. Co.	2,000	400	350	20 „ „	330
Prince of Wales Press Co.	125	2,500	all	35 „ „	2,400
Victoria Press, Madras	220	2,000	750	350 „ „	1,100
Spinning & Weaving Cos.					
Albert Mills Company	400	2,000	1,700	50	1,250
Alliance Spinning Co.	500	2,500	all	125ps	2,250
Bombay	100	5,500	all	....	3,000
Bombay United	800	1,000	all	25	870exd.
Broach Mills	100	150	150	....	180
Do. New	800	150	50	....	180
Dhurumsey Spinning	800	5,000	all	....	2,000
Great Eastern	750	2,000	all	150 p. s.	1,485
Manockjee Petit's	2,500	1,500	all	80 „	890
Oriental	800	2,500	all	80 „	1,825
Royal	600	2,500	2,300	....	1,550
Shipping Company.					
Bombay Shipping Co	1,000	5,000	3,500	1,800	700
Miscellaneous.					
Mechanics' Building Co	4,000	50	all	5p.ct.	30
Kurrachee Landing and Shipping Co.	500	2,000	300	21	170
Treacher and Company	2,000	500	all	25	375

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation.	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs	Rs. exd
Bank of Bombay	Jan. '66	500	500	75	22
Bank of China	....	4,000	25	19½	1
Bombay Presidency Bank	Agu. '67	40,000	250	....	
Bombay T. and B. Association	Sept. '67	20,000	200	35	6
Brokers' Banking Co.	Sept. '67	20,000	200	40	15
Central Bank	Mar. '66	40,000	250	2	1
East India Bank	£	25,000	...	....	22
Indian Peninsula Bank	Feb. '67	25,000	200	10	6
Royal Bank of India	May '67	50,000	200	68½	5
Old Financial	Apr. '67	30,000	100	74	1½
Companies.					
Back Bay Reclamation Co.	Nov. '66	1,000	5,200	1,750	690
Bombay and Bengal S. S.		892	3,500	2,440	10
Victoria Spinning Co.	55	5,000	5,000	2,400	100

EXCHANGE ON LONDON.

	Calcutta. s.	d.
Bank Bills, at 6 months' sight	1	10⅛
Do. at 3 month's sight	....	
Do. on demand, ditto	1	10¼
Credit Bills (1st Class) at 6 months' sight	1	10 15-16
Documentary Bills at 6 months' sight	1	11¼

BANK RATES OF DISCOUNT.

	Per cent.
Discount on Private Bills and Notes	7 to 9
Ditto on Acceptance of Local Banks	7 to 9
Int. on Loans on Security of Govt. Papers	6

GOVERNMENT SECURITIES.

	Calcutta.		Bombay
Five-and-a-half per cent.	113¾	to	114⅛
Five per cent.	107	to	107⅞
Four & half per cent. (Public Works Loan)	103¼	to 103-10	106⅛
15 years' Debenture Loans	108	to	108
10 years' do. do.	107	to	106
5 years' do. do.	106¼	to	103
Six per cent. Municipal Loans	112½	to	113

THE FREIGHT MARKET.

CALCUTTA.

London	Cotton	£2 0s. 0d.	Nom.p.ton
	Cases	£2 0s. 0d. to £2 15s. 0d.	„
	Seeds	£1 10s. 0d.	
Liverpool	Iron Ships Cotton	£1 12s. 6d. to £1 17s. 6d.	
	Wooden Ships „	£1 12s. 6d. to £1 15s. 0d.	
	Myrabolns & Coir bdls	£0 10s. 0d. to £0 12s. 6d.	
	Seeds	£0 15s. 0d. to £1 0s. 0d.	
Havre	Cotton	£2 5s. 0d. to £2 10s.	Nominal
	Coffee	Nominal	
Overland	Steamers	£4 10s. 0d. to £5 0s. 0d.	
Liverpool via Suez Canal		£3 5s. 0d.	
China	Steamer Cotton	Rs. 6 per bale.	
	„ Opium	Rs. 25 to 30 per chest.	
	Sailing Ships	Nominal	
Calcutta	Salt	Rs. 3 0 0 to 4 0 0 per ton.	
Calcutta to Bombay		Rs. 13 to 14 and Calcutta Port charges	
Mauritius		8 annas per bag nominal.	

BOMBAY.

For Liverpool—
Iron ships, ...£1 0 0 to £1 2 6
Wooden ships £1

For London.—
Cotton £1 15
Seeds .. ..£1 5 0 @ 1 17 6

For Overland Route—
P. & O. Steamer.. .. ..£3 5 0 to 3 12 0
B. & B. Steamer.. .. ..£3 10 0 to 3 12 6

For China—
Cotton—Steamer .. ..Rs. 8 to Rs. 10 per bale.
Opium—Steamer Hong Kong .. .. ..Rs. 25 @ 30 per chest

INDIAN SECURITIES.—LONDON.

Share.	Paid.	INDIAN RAILWAYS.	Closing Prices Sept. 1.	Closing Prices Sept. 8.
st.	100	Bombay, Baroda, and Central India (gua. 5 per ct.)	105 to 106	104 to 106
20	all	Ditto Ext. do.iss. at12p.	20 to 21	20 to 21
20	100	E. Indian Stock (gua. 5 p. ct.)	110 to 111	100 to 111
st.	100	Eastern Bengal (gua. 5 p. ct.	105 to 106	105 to 106
st.	17½	Ditto, ditto, 5 ditto....	— —	— —
20	100	Gt. Ind. Peninsula (g. 5 p. ct.)	106 to 107	105 to 107
st.	32	Ditto, New (gua. 5 p. ct.)	1 to 1½ prem.	1 to 1½ prm.
st.	6	Ditto, New (gua. 5 p. ct.)	— —	— —
st.	50	Ditto, scrip, ditto, ditto	— —	— —
20	all	Ditto, scrip, ditto, ditto	— —	— —
20	all	Ditto, 4 per c. debenture..	90 to 92	90 to 92
st.	100	Gt. South. of India (g. 5 p. c.)	105 to 106	104 to 106
st.	100	Ditto (4½ per cent)	98 to 102	98 to 102
st.	100	Madras (guar. 5 per cent) ..	105 to 107	105 to 106
st.	100	Ditto, (4½ per cent.).....	93 to 102	98 to 102
st.	100	Ditto, (4½ per cent.).....	93 to 97	93 to 97
2	100	Ditto	— —	— —
st	100	Oude & Rohilkund (g. 5 p. ct.)	103½ to 104½	103½ to 104½
10	4	Ditto, shares (ditto)	par to ½ prem.	par to ½ prem.
80	4	Ditto ditto, ditto.....	prem.	prem.
st,	100	Ditto Nulhatee	— —	— —
st,	100	Scinde (guar. 5 per cent)	104 to 105	103 to 105
st.	100	Ditto, Delhi (gua. 5 p. c.)	104 to 105	103 to 105
20	5	Ditto, ditto (gua. 5 p. c.)	⅞ to 1⅛ prem.	⅞ to 1 prem.
st,	100	Ditto, Punjaub (g. 5 p. c.)	104 to 105	103 to 105
st.	100	Do. Ind. St. Flo. (g. 5 p. c.)	102	— —

INDIAN GOVT. SECURITIES.	Closing Prices, August 4.	Closing Prices, August 11.
Indian Stock, 10½ per cent ....April, 1874	— 205	204 to 206
Ditto. for Account.....	— —	— —
Ditto 5 per Cent .....July 1880	110 to 110½	110 to 110⅛
Ditto 4 per Cent .....Oct., 1888	101 to 101½	100 ex div.
Ditto 4 per Cent. Certificates	— 92	— 90½
India Enfaced Paper 4 per Cent.....	92	92
Ditto 5 per Cent..... ...Jan. 1872	— 100	99 to 101
Ditto 5½ per Cent.....May, 1879	101½	100 to 107½
Ditto 5 per Cent. Rupee Deben. 1874	90 to 92	90 to 92
Ditto ditto 1877	— 107	— 107
Ditto ditto 1882	— —	— —
India Debentures, 5 per Cent....Aug. 1875	101½	— 102¾
India Bonds, 4 per Cent £1,000	par	10s. prem.

Amt of Share.	Paid.	MISCELLANEOUS.	Closing Prices, August 4.	Closing Prices, August 11.
5	all	Bombay Gas (Limited)	5½ to 6	5½ to 6
5	4	Ditto, New	⅛ to 1 prem.	⅛ to 1 prem.
20	10	Ceylon Co Limited	5⅛ to 4½ dis.	5⅛ to 4½ dis.
20	5	Ditto, A Shares	3½ to 2½ dis.	3½ to 2½ dis.
50	7	East India Land Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis.
100	st.	Madras Irrigation & Canal (guar. 5 per cent. by the Indian Government) ..	99 to 102	95 to 99
1	6·6	Nerbudda Coal and Iron	par to ⅛ prem.	par to ⅛ prem.
5	all	Oriental Gas (Limited..) ..	8 to 8½	7½ to 8½
5	1½	Ditto, New	1 to 1½ prem.	1 to 1½ prem.
50	all	P and O. Steam Company ..	39 to 41	39 to 41
50	10	Ditto, New, 1867	5 to 3 dis	5 to 3 dis.

Amt of Share.	Paid.	JOINT STOCK BANKS.	Closing Prices, August 4	Closing Prices, August 11.
10	all	Agra Limited, A	8 to 9	8 to 9
10	—	Do., do. B.....	— —	— —
20	all	Char. of India, Aus. & China	15 to 16	15½ to 16½
25	all	Chartered Mer of India, London, and China.....	25 to 27	25 to 27
20	all	Eng Scot. and Aust. Chart.	17 to 18	16½ to 17½
20	4	Land Mortgage Bank of India	3⅜ to 3⅝ dis.	3½ to 3¼ dis.
100	all	Do., 5 per cent. Debentures, 1864 for 30 years	83 to 86	83 to 86
25	all	Oriental Bank Corporation..	37 to 39	37 to 39

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council.

Debenture Capital.	Rate	COMPANY.	Closing Prices, August 4.	Closing Prices, August 11.
£237,595	5	Bombay, Baroda, and Central India	103 to 105	103 to 105
881,700	5	Ditto ditto....	103 to 105	103 to 105
100,000	4½	Ditto ditto....	98 to 100	98 to 100
1,292,400	5	East Indian	109 to 112	108 to 111
1,806,300	5	Ditto	109 to 112	108 to 111
3,000,000	5	Ditto	99 to 101	99 to 101
1,000,000	4½	Ditto	99 to 101	99 to 100
440,000	4½	Ditto	98 to 100	98 to 100
—	5	Eastern Bengal.....	100 to 102	100 to 102
1,968,600	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto....	100 to 103	100 to 102
883,900	4½	Ditto	98 to 100	98 to 100
175,500	5	Great Southern of India	103 to 105	103 to 105
100,000	4½	Ditto	98 to 100	98 to 100
42,900	4½	Madras	— —	— —
916,600	5	Ditto	102 to 104	102 to 104
499,800	5	Ditto	103 to 105	103 to 105
20,000	5	Oude & Rohilkund (Lm)	102 to 104	102 to 104
180,800	5	Scinde (Indus Flotilla)	— —	— —
650,000	4½	Ditto	98 to 100	98 to 100

GOLD AND SILVER.	Per Ounce.
Foreign Gold in Bars	£3 17s. 9d.
Silver in Bars (Standard)	5s. 0⅛d.
Mexican Dollars....	4s. 11d.

THE EXCHANGES.

Banks Drawing rates on Calcutta	1s. 10¼d.
Madras	1s. 10¼d.
Ditto on Bombay	..1s. d·110

Advertisements.

TO MERCHANTS AND BANKERS.

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Do. MOSELLE,	do.	22	,,
Do. HOCK,	do.	20	,,
RUDESHEIM	do.	20	,,
CLARET—Chateau Pontet Canet (1865) in 3 doz. cases..		23	,,
SHERRY—Finest Pale No. 1	do.	24	,,
Do. do 2	do.	22	,,
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Do. do.	do. 6 ,, Pts.....	3	,,
Do. Machen's (Pelican Brand)	do. 6 ,, ,, ...	3	,,
ALE—Bass's Pale, (in 6 and 7 doz cases (Pints).....		3-7	,,

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PASSAGES TO SUEZ and EUROPE engaged, and Baggage received and shipped.

PAY and FUND ALLOWANCES realized.

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THE BOMBAY TRADING AND BANKING ASSOCIATION, LIMITED, (IN LIQUIDATION.)

AT a GENERAL MEETING of the Registered Shareholders of the Bombay Trading and Banking Association, Limited, in Liquidation, held at the office of the Association, No. 24, Victoria Buildings, Parsee Bazaar Street, Fort, on THURSDAY, the 1st day of September instant, at o'clock in the afternoon, 32 shareholders and the company's solicitors being present, the following resolutions were passed:—

"That Dinshaw Manockjee, Esquire, to take the chair."

"That the Report of the Liquidators, and the Final Statement of Accounts of the winding up, made up to 31st August 1870, now read, be adopted and passed."

"That the cash balance—Rs 699.8 0—be, and is hereby, presented to the Manager, Mr. Cooverjee Rustomjee Mody, for his valuable service, to the Association in the conduct of its affairs."

"That the affairs of the Bombay Trading and Banking Association, Limited, are fairly and fully wound up."

"That all Books, Vouchers, and Papers belonging to the Bombay Trading and Banking Association, Limited, be deposited with Messrs. Hearn, Cleveland and Peile, the company's solicitors, but that they be not responsible for any loss or damage they may sustain while in their custody."

"That the best thanks of the shareholders are due to the Liquidators and their Manager, Mr. Cooverjee Rustomjee Mody, for the able and satisfactory manner in which the Liquidation of the Association has been completed."

"That the best thanks of the Shareholders are due to the company's solicitors, for their valuable assistance and able advice rendered to the Association in the conduct of its affairs."

"That the best thanks of the meeting be given to the Chairman for his able conduct in the chair."

DINSHAW MANOCKJEE,
Chairman.

Bombay, 3rd September 1870.

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FROM THE CALCUTTA REVIEW, APRIL 1870.

THE "**MADRAS JURIST**" has reached its fifth volume, and has deservedly secured a large circulation in the sister Presidency. It is published punctually at the beginning of each month, and embraces a wide range of legal subjects, both Indian and English. Its principal value of course consists in the reports of Madras High Court Judgments, but all the more important Bengal and Bombay cases are also given. The leading articles are ably and carefully written, and furnish the younger legal practitioners and students with valuable *resumes* of the more important legal topics and principles, expressed in interesting intelligible language. The "Legal Echo from England" contain a readable summary of the latest events in home politics and legislation. By opening his columns to the discussion of legal points and difficulties, and answering the questions of correspondents, the Editor has supplied a much felt *desideratum*, for which young Judicial officers and pleaders ought to be, and no doubt are, duly grateful. The "Short Notes of English Cases" are specially compiled for the *Jurist*, and serve to keep the reader *au courant* with the decisions of the superior courts in England. The circular orders and letters of the Madras High Court are also given. We would call attention especially to a very useful and complete set of criminal procedure forms, issued by them last year, the adoption of which will save magisterial officers much time and trouble. Though not formally sanctioned by the Bengal and Bombay High Courts, they are, no doubt equally applicable to those Presidencies.

The *Jurist* is very neatly got up and printed, and the price is so moderate as to bring it within the reach of everybody interested in legal matters. We are sure that it only requires to be known in order to command the same success in Bengal that it has already deservedly attained in Madras and Bombay.

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* The P. C. Judgment, in the January "*Jurist*" 1870 was only one month old.

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THE Indian Economist,

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VOL. II.] CALCUTTA, TUESDAY 15TH NOVEMBER, 1870. No. 4.

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THIS COMPANY having a subscribed Capital of Two Millions and a Half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The Prospect of Bonus to the Participating Policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first Life Policy was issued in May 1862. On the 31st December 1869, the Life Premium Income, exclusive of Re-assured Risks, was about £52,000, and at the same date the Life Trust Funds *for the Premium security of Life Policies* exceeded £180,000, being upwards of sixty per cent. of the amount received upon whole Life Policies then in force. *This provides for all Special Policies, and for the Reversionary Bonuses declared upon existing Policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed £400,000, and the uncalled Capital of £2,250,000.

Four-fifths of the *entire* Profits of the Life Branch are divisible among the Participating Policy-holders.

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1. Annually.
2. Half-yearly, Quarterly, and Monthly.

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Age next Birthday.	Annual Premium.	Monthly Premium			Age next Birthday.	Half-yearly Premium.			Quarterly Premium.		
		Rs.	a.	p.		Rs.	a.	p.	Rs.	a.	p.
30	39	3	8	2	35	24	7	0	12	7	3
40	47	4	3	9	40	27	5	8	13	12	6
50	62	5	9	3	45	30	10	11	15	10	2

Examples of Without Profit Rates.

	CIVIL.				MILITARY.					
Age next Birthday	Annual Premium	Quarterly Premium.			Age Ne	Half-yearly Premium.			Monthly Premium.	
		Rs.	a.	p.		Rs.	a.	p.	Rs.	a.
35		10	1	1	35	20	12	10	3	0
40	42	11	2	1	40	24	7	0	4	3
45	48	12	11	6	50	31	2	8	5	6

Examples of Short Term Rates.

Age next Birthday.	Annual Premium.	Half-yearly Premium.			Age next Birthday	Quarterly Premium			Monthly Premium		
	Civil.					Military.					
		Rs.	a	p		Rs	a.	p.	Rs.	a	p
45	98	14	9	0	45	10	1	1	2	10	6
		15	1	3	50	11	6	4	3	6	9

BONUS.

Policy holders have the option, when their Policies are unencumbered, of selecting any of the following

Modes of receiving the Bonus declared.

1. By an increase of the sum assured.
2. By a payment in cash.
3. By a permanent reduction of future Premiums.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits*, 31st *December*, 1867.

Age at entry.	Sum Assured	Bonus Added.	Yearly Rate of Bonus per cent. on sum Assured.
	£ s. d.	£ s. d.	£ s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	108 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

Surrender Values.

Policies are purchased by this Company at an equitable value after payment of Premiums for three years.

Days of Grace.

Thirty days are allowed for the payment of Premiums, when they are payable yearly, or half-yearly, and fifteen when quarterly or monthly.

Forfeited Policies may be revived at any time within six months, if satisfactory medical evidence of the health of the life be produced (at the expense of the Assured) and a fine of one-half per cent. be paid on the sum assured.

Claims.

These are paid *one month* after proof (satisfactory to the Directors) of the decease of the Lives assured has been furnished to the Company, and the rate of Exchange will invariably be two shillings sterling per Rupee. Should death occur within the days of grace, the Policy will still be valid, and the sum assured paid after deduction of the Premium. The importance of this last regulation is obvious.

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Lives assured at Indian rates, who are not seafaring persons, are allowed to reside or travel without license, *in any part of the world* provided they do not proceed to any country which is at war.

General Regulations.

The English rate takes effect from the date of departure for Europe from Alexandria or Port Said, and the Indian rate from the date of arrival at either of those places outward bound.

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Bareilly	.. N. R. Burn, Esq.
Bombay	.. Messrs. G. W. Wheatley & Co.
Cawnpore	.. W. Neill, Esq., Bank of Bengal.
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Ditto	.. T. Lucas & Co.
Agra	.. James Begg, Esq.
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Tirhoot	.. E. Dalgleish, Esq.
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Ditto	.. Greetham & White.

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The first consideration in selecting an Office should be its ability to perform its engagements: in this respect the Commercial Union, by its very large subscribed and paid-up Capital, offers an undoubted guarantee.

The Fire Premium income of the Company, as at 31st December, 1869, exceeded £120,000.

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on Merchandize Warehouses, Screw-Houses, Mills, Dwelling-Houses, Shipping, &c.

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Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade from to { Warranted that no Jute or cotton in a loose state be deposited in the Buildings. }	10	7½	5	4	2½
	14	9	6	5	3
Bonded Warehouse, no Hazardous Goods	8	6	4	3½	2
Jute and Loose Cotton	16	12	8	7	4
Presses or Screw-Houses Cotton or Jute (warranted no artificial light used.)	20	15	10	8	5
Without such Warranty	24	18	12	9	6

The rates for Mofussil Risks may be ascertained from the Manager.
Agents at Simla—The Simla Bank Corporation.
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the Company together with Forms of Proposals and all further Information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,
No. 1, Hare Street, Calcutta, 7th November, 1870.
C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil Residents.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, TUESDAY 15TH NOVEMBER, 1870. No. 4.

The Indian Economist.

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THE WAR.

FORMATION OF PUBLIC OPINION.

THE course of public opinion in this war, has been so characteristic of the way in which it is formed nine times out of ten, that its history is a very instructive study. On the first of July, all Europe was in profound peace. So striking was the universal calm, so complete the seeming absence of all ground of strife, that publicists and statesmen were congratulating the world upon the prospect of a long and unbroken peace. The *Saturday Reviewers* were so impressed with the fact, that they made it the subject of a special notice. The premier of France was assuring the Legislative Assembly at the same moment, that all the cabinets of Europe were on the most friendly terms with each other, and that all causes of irritation had happily passed away. Now this fact is vital to the understanding of what follows. At the very moment when all seemed to be at rest, the spirit of intrigue to be dead, and the great powers of Europe bent upon cultivating peace for the blessings with which it is attended, *there was one power that was playing the rest of Europe false, and with the full consciousness of what it was doing*, was committed, but with every precaution of secrecy, to an intrigue which it knew well when disclosed, was certain to plunge Europe into war.

This statement should be carefully weighed. Bismarck and the Prussian King knew in June, *just as well as we know now* in November, that the moment the Spanish intrigue was disclosed, war would be declared by France. What they did not calculate upon was, that Prim would betray their own complicity in the matter. They wished to make the world believe that Spain had made its choice without their knowledge, and thus to throw upon the French Emperor the odium of declaring War upon a manifest pretext. They knew he was disarming, and therefore, unprepared; but War was a necessity to *them*, and could never arrive more oppportunely. They plainly did not foresee, however, the temper in which the other Cabinets would resent the intrigue, and when they found it so stern were obliged to withdraw the candidature. They made their puppet Hohenzollern do that himself, and having thus isolated the power against which the intrigue had been directed, professed to regard the just and moderate demands of that Power as an insult. Only 18 months before, they had pledged their honor to France that no such candidature would be sanctioned by them. With the utmost dishonor they had nevertheless attempted to carry it by a *coup de main*, and it was an insult it seems for France to ask the King, in the most temperate language, to pledge himself not to renew the intrigue. The demand was most natural, just, and reasonable. Had Napoleon been the guilty intriguer, what would English writers not have said about him? It is a misfortune for the journalist to be *betrayed* into error by the necessity of writing upon insufficient information: it is a crime for him to *persist* in error, when it has been pointed out.

The prejudices of Englishmen are so profound, and their sympathies so imperfect, that you look in vain for anything like *insight* into foreign affairs in the press. It is only when events have fully disclosed themselves that our publicists begin to understand what has happened. About the 7th of July, it began to be rumoured that serious difficulties had arisen between France and Prussia, in consequence of a Hohenzollern prince having been announced by Prim as the chosen candidate for the Spanish throne. Certainly it did seem that the Spanish people had a right to offer the vacant throne to whom they pleased, and that for France to interfere with their choice was but a new exhibition of its vanity and restlessness reflected in the rule of the Emperor. Had not Prim been seeking a candidate in all the courts of Europe? Why then should France take offence at his at last applying to Prussia for a prince to fill the vacant throne? With these views; in total ignorance of the secret history of the matter; and profoundly irritated at seeing the peace of the world broken up, upon so seemingly trivial a pretext, the English press began at once a chorus of denunciation of the Emperor, growing in fierceness day by day, as the situation became graver, until the country seems to have adopted almost as one man the conviction that the Hohenzollern candidature was a mere pretext for declaring war, and that the Emperor had secretly planned it without the knowledge of his ministry, for the purpose of bolstering those dynastic hopes which the course of events in France, and in particular the last plebiscitum had shewn to be precarious. This theory seems to have been adopted everywhere, and at once. The fact is England as a commercial country, is too deeply interested in the maintenance of peace, to be at any time the unmoved spectator of a war close to her own door. The terrible losses sustained within the first few days of July upon the Stock Exchange, were sufficient of themselves to lash the stock jobbers into fury; while the *Times* exposed to the full influence of "the city," and traditionally opposed to the Emperor, at once gave full voice to the passions of the English mob. Destitute of all exact knowledge as to how the quarrel had arisen, and therefore of its real merits, the country was written into a fury upon the subject, from the effects of which it is hardly yet beginning to recover. It is a humiliating fact that what is called public opinion is constantly formed in this way, and that without any intentional dishonesty on the part of our publicists. The Bom-

bay press gave a striking, indeed almost ludicrous, illustration of the violence with which popular delusions may be propagated on grave questions. Before the end of July, the Bombay papers had made up their mind, upon the strength apparently of Reuter's telegrams, and were rivalling in violence the denunciations of the London *Times*. The mischief of all this is, that journalists committed by this precipitancy into the expression of convictions that prove to be unsound, make it a point of honor never to withdraw what they have written. Who expects a frank avowal on the part of the London *Times* that it has misled its readers! As every one knows, such atonement to truth is never made by any chance whatever. The journal wriggles itself, as dexterously as it can, out of the false position it has got into, throwing a lot of dust in the eyes of the on-looker during the process, and is immediately afterwards seen firmly ensconced in a new position altogether, and not improbably denouncing with the utmost vehemence the very views and opinions of which but a few months before it was the impassioned leader.

Now, we say positively that if the papers laid before Parliament on the 24th July had been in the possession of the press from the commencement of the quarrel, the guilt of the war would have been laid down at the door of Bismarck and the Prussian King. Look at the facts which these papers disclose. They tell us that the proposal to place a Prussian prince upon the Spanish throne, had been debated in the cabinets of Europe 18 months before; that Prussia had pledged her honor to the French minister, that such a candidature was impossible, and that the French Court might dismiss all fear of it: that France had so dismissed all concern about the matter; that the French Emperor had repeatedly striven, through the mediation of Lord Clarendon, to bring about a disarmament of Europe, France and Prussia taking the lead therein: that Prussia had made excuse after excuse for evading the proposal, expressing at one time her fear of Austria, and at another of Russian aggression: that the French Emperor to shew the sincerity of his proposal had determined himself to set the example and that at the very time when this Spanish difficulty arose, so far from being prepared for war, he was in the midst of disbanding 90,000 men: that neither Mr. Gladstone nor Lord Granville, could believe that Prussia had really been intriguing to place a Hohenzollern upon the throne, when Mr. Layard first communicated the information; so serious did they know the offence to be, that they could not believe it possible that Prussia had really offered it. that the Russian and Austrian cabinets took it for granted that the Prussian king would give a clear and emphatic contradiction to the story; that even the Prussian ministry had been kept in ignorance of the intrigue; and that with such profound care and duplicity has it been managed, that the Prussian king thought it safe to make his ambassadors assure the Cabinets of London and Paris that he knew nothing whatever about it; that these ambassadors did so; and that it would seem to have been only the honesty of Prim that disconcerted them, and pilloried the Prussian king for his dishonor. Thus it came out that while all Europe was dreaming of peace, longing for peace, and counting upon peace these two men in Berlin with the most profound lying and hypocrisy had all but carried the throne of Spain by a *coup de main*, knowing well that the event would be certain to lead to war with France, the agitation of that country in view of the ascendancy Prussia had gained in 1866 having been quieted with the utmost difficulty by the Emperor. This pious Prussian king knew perfectly well that his intrigue would bring on a war; and to escape the odium of that war, he strove, up to the very last moment, to make the world believe that he had had nothing to do with it.

His honor had been pledged only eighteen months before that he would not sanction the candidature, while he knew that the Emperor was so sincerely bent upon peace that he was disbanding the French army by tens of thousands of men; but he also knew that a war with France was part of Bismarck's programme as necessary to the acceptance of Prussian hegemony by South Germany; and to make the issue sure, they determined to put a Hohenzollern upon the Spanish throne to place France between two fires.

The *Times*, in complete ignorance of these facts, threw the whole guilt of the war upon the French Emperor personally. He had made every preparation for it without the knowledge of his ministers, and had only waited a pretext for its declaration. Lest he might after all lose the opportunity of showing the superiority of the *chassepôt* and *mitrailleur* to the needle gun, he addressed an imperious summons to the Prussian king, such as no sovereign of spirit could submit to, and instructed Benedetti to offer him publicly a gross insult in the garden at Ems. The atrocious criminal gave the aged Prussian monarch a slap "in the face with the left hand," while his right "already grasped the hilt of the sword." The *Times* has now discovered that the Emperor "personally shrank from the war;" that "the inert mass" of the French nation had no desire for it whatever; and that it was forced upon the Emperor by the "men of political eminence and public energy" in the country, whoever they may be. The passage is too notable to be given in any shape but the original:—

> There is in France, as in all countries, a great inert mass which desires nothing but to work on through life from year to year, receiving in return sufficient means of subsistence, according to their traditional standard of comfort, and hailing the occasional fête days that vary the routine of their existence. These men enjoy the news of military successes abroad, but they have no active desire for war. If they are France, then France did not make war upon Germany; but if France means the men of political eminence and political energy, then the apology of the EMPEROR is true, that the opinion of France compelled him to enter upon a war from which personally he shrank.—*Times 23rd September.*

Thus after rousing the fiercest passions in the country against the Emperor, the journal now acquits him personally of the war, and lays the blame of it upon "the men of political eminence and political energy" in the country, whoever they may be. A year hence, the *Times* will have found out that the war was forced upon the Emperor by *Bismarck;* but the discovery will not have been made until the French nation has been outraged into lasting resentment. The aged Guizot in his retirement protests his grief and surprise at the [illegible] by the English Press in this war. The *Times*, which has made itself a mere organ of Bismarck throughout, is now affecting to regard with indignation the German demand for Alsace and Lorraine. A month ago, it was impudently insisting upon their cession by the provisional Government. The journal is unprincipled almost beyond belief, while from its position it exerts the most powerful influence upon opinion, nine-tenths of Englishmen being led by it by the nose from one year's end to another.

It is not three years since the *Edinburgh Review* assured its readers (April 1869) that "the bad faith of the Cabinet of Berlin, "and the iniquitous spirit of aggression by which the rights of "Denmark were assailed in the Duchies, had left an impression "on the English mind so deep and so unfavorable that it would "take a generation to efface it." English journalists can hardly have forgotten these events, while it is still more difficult to understand how they can have condoned them. The fact is becoming clear that our publicists have allowed themselves to be influenced by the purely selfish belief that it was better for ourselves that France should be stricken down in this conflict than Prussia. The Emperor was systematically avenging the fall of the first Napoleon upon his enemies. Russia and Austria had already been humiliated; Prussia's turn had now come; and the next would our own. Those who are able to form a dispassionate judgment upon the course of European politics can feel only scorn of such folly, and it is hard to understand how the leaders of a people should be led astray thereby. It is clear, however, that the statesmen and publicists of England have been influenced throughout by considerations of this nature. The London *Economist* blurts out the fact with an ingenuousness that is perfectly startling, altogether unconscious it would seem of the dishonour of the avowal:—

> Of course we all know that the instrument of attack which we have most feared for many years has been the French fleet. And one of the most certain consequences of this war is a great diminution in that

fleet. For many years France must be very poor. She will have to pay her own costs in the war and Germany's too—say at least 150,000,000*l.* or perhaps 200,000,000*l.* This will add from 10,000,000*l.* to 15,000,000*l.* to the annual charge of her debt.

At any rate, we shall gain by the war in this way, and to this extent, that it has transferred the military primacy of Europe from a country which has always hated us, which, so to say, hates us by tradition, to a country which has never hated us. Of course we ought to have a good and efficient land force, but we need not rush at new things in breathless haste. We are less likely to be attacked for some years to come, than we have been for some years past.

We do not know how our readers feel under such writing; for ourselves we are simply sick with humiliation. We have *feared* the French and therefore could not be just to them. Equally startling is the fashion with which the same journal and the *Saturday Review*, deal with the probabilities of Prussian aggressions in the future. The one says:—

Germany has, as yet, no fleet which we need fear, and we may deal with this danger when it comes. Just now Count Bismarck probably has other aims. Till he has reclaimed the German provinces which belong to Austria, perhaps those, too, which belong to Russia, Germany is not one, and Count Bismarck's work is incomplete. He is not a man to throw away millions to make a great navy in a non-seafaring nation, while he still has great schemes for that nation in its own line by land as a military nation.

Is our material prosperity destroying all that is noble and unselfish in the character of the nation? Is it no concern of ours, that Europe may look for a succession of bloody wars from the sinister programme of the scoundrel who has the manhood of Germany under arms to accomplish his purposes, so long as we ourselves are safe in our insular position from the scourge preparing for other nations? We are sick we say with humiliation and shame at such writings. They are not—they cannot be—the expression of the real sentiments of Englishmen. The grocers and bagmen of the country have got into the press, and are covering the name of Englishman with dishonour.

The *Saturday Review* is not so coarse as the other journal, but contrives to make it perfectly clear that it has one measure for French aggressions, and another altogether for those of Prussia. It says—

It may indeed be plausibly urged that Prussia has both in former times and in the present day been an aggressive Power, and that she has not only consolidated her supremacy in Germany, but conquered a district belonging by race and language, and by voluntary attachment, to Denmark. Posen is Prussian only as Alsace and Lorraine are French, in virtue of superior force exercised for purposes of territorial aggrandizement. It is not impossible that the ruler of united Germany may at some future time desire a further extension of frontier; but the army which has in a defensive war crushed the power of France would perhaps not be equally available for a war of conquest.

"It may be plausibly urged" that Prussia has been an aggressive power, and "it is not impossible" that she may desire "a further extension of frontier"! Where is the honest ring of just indignation in these sentences? The right tone of denouncing such crime as we have seen perpetrated within the past few years by the Prussian Court, is altogether absent. The writer is all but excusing the base and cowardly spoilation of the Danish Duchies, and all but justifying before hand the course of violence to which this power is committed. Have Englishmen lost all sense of right and wrong, except when their own interests are threatened, or their own shores in danger of being the scene of conflict? There has not been an attempt on the part of Englishmen in this war to hold the scales of justice even between the contending nations. French aggressions made *us* uneasy, and they were therefore atrocious crimes, although the French sword was drawn, not for greed, but for the deliverance of oppressed nationalities. Prussian aggressions though marked throughout by every circumstance of perfidy and dishonour, since they occasioned Englishmen no alarm may only "plausibly be urged" to have been crimes. Let the *Reviewers* turn back to their own columns of 1864, and they will find, we think, that they spoke in very different language then. We feel that the character of Englishmen has been dragged through the dirt by our publicists throughout this war, just as it was in the American war. It has been a crime in France that she was agitated and alarmed at the completion of German unity under the sinister power of Prussia. There was no crime, we suppose, in the desire of Englishmen in the American war, to see the United States broken up into three or four Republics. To understand French feeling in presence of the events of 1866, we need simply imagine what our own would be, were the Atlantic suddenly contracted to the dimensions of the English Channel, and the United States of America with their traditional disregard of international rights, suddenly made our immediate neighbours. We think Englishmen would be somewhat anxious to see them broken up into half a dozen powers, and ready to help in the work, if there was any reasonable hope of effecting it. A cowardly fear of France has prevented all justice towards her, and made all insight into the real cause of the war impossible, to the lasting disgrace of the nation.

Without in the least changing their cynical attitude upon the question, the *Saturday Reviewers* have, however, at last begun to correct popular misapprehension as to the causes of the strife. Let the reader note the following passage:—

For more than half a century France, in spite of habitual boastings about the Rhine, kept the peace with Germany, and as far as any desire for German territory is concerned, there is no sufficient evidence to show that she would ever have broken it. What alarmed the French nation was the changed position of Prussia in Germany; the absorption in part accomplished and in part threatened, of all the German States into a great and ambitious military monarchy. It was this that France desired to prevent; it was this that Germany asserted her right to effect. The first incidents of the conflict settled this question for ever. Whatever else Germany might have to fear, it was evident that the French by actually declaring war, had put it out of their power to prevent the virtual incorporation of the south into the Northern Confederation. They might have done something in this direction by intrigue and diplomacy; they could do nothing when once they had supplied the precise external pressure which was needed to overcome the particularist jealousies of the independent States.

Does any one suppose that the *Reviewers* understand this better than Bismarck? War with France is what this man has aimed at for years with these very views; while he had the skill in forcing it upon the Emperor to make him appear to be the aggressor. The French alarm was natural, justifiable, and inevitable. There was nothing guilty in the distress with which the French people regarded the sudden appearance of this great, unscrupulous power upon their borders. Englishmen would have felt precisely the same under similar circumstances, and would have bent all their efforts to prevent the extension of its power. The profound, hopeless selfishness which the nation has shown in this strife, excites our astonishment. There has been no sympathy for the one side, no denunciation of the wrong doing of the other. An unworthy fear of France on the one hand, and the losses of commercial men on the other, have been allowed to betray the nation into selfish and utter indifference to the merits of the quarrel, and a dogged determination to lay its guilt upon the Emperor. We feel deep sympathy for the French people, and nothing but indignation against the Prussian leaders, as the real authors of the war for the sinister interests to be promoted thereby. A very few years may suffice to open the eyes of the nation to the fact that the course into which it has been betrayed by its mingled selfishness and fear has not merely alienated the sympathies of France, but deprived us of the respect of Europe. Should misfortune overtake our own country, to what quarter in the world could we look for sympathy or assistance? We have chosen to shut ourselves up in our insular selfishness, and although we know the guilty course which the Prussian Court has followed, have found no fitting word of remonstrance to utter, but have made ourselves half partakers of her crimes by all but justifying them.

Within the last few years, Englishmen have had two striking illustrations of the ease with which a false direction is given to the public opinion of the nation, and of the extreme difficulty of any return therefrom. It is now all but universally allowed that the Crimean war was a profound mistake. But who forgets the angry impatience with which the nation treated the handful of men who saw this from the first? The late Mr. Cobden was laughed to scorn by

the press, and held up to the derison of the people. We now see that Mr. Cobden was simply 20 years in advance of his time. The very same thing occurred in the American war, when the national dislike of the Yankees, and at bottom much unworthy jealousy and fear of them, were allowed to blind the people to the real merits of that terrible strife. Statesmen and publicists alike ministered to the prejudices of the nation, and an unworthy desire to see the States broken up into half a dozen separate powers took full possession of the country. These striking aberrations of the public mind, instead of making the nation distrustful of the utterances of the press, seem to have no practical influence upon it at all. They were wrong before, no doubt, but unquestionably are right now, although it is as clear as the sun at noon day that their course was taken before the true history of the difficulty was known by them. That the sympathies of the country have been again directed to the wrong side is certain. French bombast disgusted the nation; distrust of the Emperor's ideas alarmed it; the unseemly and almost frantic delight of Paris at the prospect of war made it indignant: while the terrible losses sustained by commercial men gave point and fury to the expression of these feelings. The result is that nearly the whole press of England has taken up a false theory of the occasion of the war, while the men really guilty of it are covered with fulsome adulation. The national judgment by and bye will be reversed as surely as in the Crimean and American contests, in both of which there was the same unanimity on the wrong side in the periodical literature of the country. The guilt of this war belongs emphatically to Prussia. It was intentionally provoked by her, and carefully provided for. The disagreeable peculiarities of the French character were almost unconsciously contrasted with the undemonstrative phlegmatic German people, and the conclusion at once jumped at that it was not they, but the French, who were guilty of the occasion of the strife. It is neither a safe nor a pleasant thing for a journalist to be in advance of his time. We feel that we are so in this case, as we have been many times before, but it would be cowardly, and a treason to the right, were we not to state our convictions as strongly as we entertain them. The real authors of this terrible war—the intentional authors of it—were Bismarck and the Prussian king.

ENGLISH ADULATION OF PRUSSIAN INSTITUTION.

THE admiration which this war has begotten at home of everything German, is so blind, and the praise lavished upon it so fulsome, that we find it difficult to get through the columns of the English press at all. That Germany at this moment is under a military despotism such as France never knew, except when the First Napoleon was at the height of his power, and that the liberties of its people are absolutely lost, has received a striking illustration in the imprisonment of Dr. Jacoby for simply expressing his conviction that the annexation of Alsace and Lorraine was not to be desired by Germany. The leaders of opinion at home seem to be demented by the war, although receiving the most striking pictures of the unnatural state of matters set up under the hateful power that now rules Germany:

"The complete control of the people by the State" says Dr. Russell, in a letter from Berlin, "is most striking; "not only do they march off unmurmuringly from all men value "in this world, but they submit to the loss of their professional "prospects, and private careers of all kinds with a resignation "which the State they serve cannot afford to imitate. This "warlike submissive German is a creation or a manufacture of "the Government, carried on in Government factories by Go- "vernment officials, since the days of Scharnhost, and it is "not a natural product, for history shows that the German "was once a very self-asserting, rather turbulent, and indivi- "dualizing man, who gave great trouble to rulers, and rarely "acted with his fellows for a common object. Now his very "nature is changed, and he has given up his life and merged "his individuality in the great national current, which is directed "by the will of a few men, who can guide their forces as they "list."

The world has never seen a despotism like it before, and it may well make reflecting men pause. For confiding in her brute force, Prussia defies the opinions of mankind. By the treaty of Prague, she agreed to restore to the inhabitants of Schleswig the disposition of their own lot. She has refused to carry out the agreement, and who is to make her? By the same treaty, she engaged not to extend her teritory eastwards beyond the Maine. But turning the text of the stipulations with consummate fraud a few days after the treaty, she secretly signed conventions which placed in her hands all the military forces of the duchy of Baden, Wurtemberg, and Bavaria. She pledged her honor to France in 1869 that the candidature of a Hohenzollern Prince for the Crown of Spain was impossible. In 1870, she is found to have all but carried it by a secret *coup de main*. What is the world to do with a power like this in the midst of it? Utterly perfidious abroad, and at home a great military despotism.

THE imprisonment of Dr. Jacoby for stating in a temperate speech at Konigsberg, the reasons against the annexation of Alsace and Loraine, is justified on the curt, military plea that such meetings as Dr. Jacoby addressed, and such speeches as he made, are quite "inconsistent with a state of siege." But the normal condition of all Germany is "a state of siege." The Central Brunswick Committee of the German section of the International Workmen's Association issued a manifesto to the German working class, calling upon them to prevent the annexation of Alsace and Loraine, and to bring about an honorable peace with the French Republic. The manifesto, we are told, was seized, and all the members of the Committee, and even the printer, "were arrested, chained like felons, and sent to Lutzen in East Prussia."

There is perhaps no nation in Europe in which a more stern repression of all political freedom has been witnessed than in Prussia during the last ten years. An aristocracy, completely at the service of the Court, and the ready instrument of any violence whatever, represses all real freedom in the country. Had the French Emperor attempted to rule France, as Bismarck has ruled Prussia, he would have been hurled from the throne by a general uprising of all classes. Prussia is a century behind the French people in political ideas and civil freedom, while English publicists are making our nation ridiculous by their laudation of everything German to the skies. Civil freedom has yet to be won in Germany. At present the country is under the iron heel of purely military institutions, the success of which in this campaign has completed the intoxication of the people, while Englishmen are doing what they can to help their delusion.

Not one Englishman out of a hundred, seems to know the vital changes which Bismarck has made during the last ten years in the military system of Prussia. The Prussian army is no longer what the patriot statesman, Scharnhost, bequeathed it to his country, an enlightened system of merely national *defence*. It has become under the policy of the Prussian Court a deadly instrument of tyranny at home, and a menace to all Europe. If Prussia were a really constitutional State, her present military system would not be endured for a day. The grandeur of its success has simply debauched the conscience of Germany, and intoxicated the minds of its people with false notions of glory while Englishmen of all others are helping to maintain their delusions.

"During the war of independence, three-fourths of the officers were of citizen blood (brugesliche), but these have been now weeded and pensioned, and their places supplied by members of the impoverished nobility, the Junker. All officers of the highest rank are of noble blood. "No wonder," says a late writer, that the Liberals in the Prussian House of Representatives "strenuously opposed the extension of this service. * * A "politician with true insight into the essence of constitutional "government cannot do otherwise than regard a large standing "army in time of peace, and officered to boot, mainly and ex-

"clusively in the highest charges, by privileged classes—as inimi-
"cal to the development, if not, to the very existence of liberty.
"The prospect is not a cheering one, if we take into account the
"forces arrayed in an opposite direction, the powerful aristo-
"cratic, military bureaucratic organizations, culminating in the
"divine-right pretensions of the Prussian Monarch."

The Prussian army stands alone in its hateful peculiarities.

"From the working of her military system" says Colonel Chesney, "it has followed that not more than a twelfth part of the Prussian officers are of the middle orders. As a class they are composed too greatly of a needy noblesse, depending on the crown for all hope of advancement; separate from the people by birth, habits, and profession, and apt in their self-assertion to increase by offensive personal bearing the distance which in Prussia, more than in any other country, divides the man of arms from the civilian. *The endurance of such a military caste can only exist in modern society, with the necessity of having constantly in view the use of the army against foreign armies.* The contempt with which the aristocratic soldiers of fortune regard all civilian interference with their profession, will tend greatly to precipitate a collision between the crown and the people. Promotion from the ranks of the line in Prussia is a thing unknown. * * Provided with an army whose officers were utterly devoted to the crown, the power of discipline was relied on (in 1866) for carrying its mass as boldly forward, as though the whole nation had urged the war. The Landwehr could do but little by tacit disapproval; and in case of the field army's success, their military instincts would lead them to support their victorious brethern."

In reviewing the history of the war of 1866, and the growth of the great military power of Prussia the *Edinburgh Review* in October of that year, had the following pregnant passage:

"We have endeavoured to trace the growth of the military
"power of Prussia and to describe the present condition of the
"military institutions which have suddenly conferred upon her
"an indisputable supremacy in Germany, and we have done no
"injustice to the patriotism of her princes and the valour
"of her armies. But the triumphant success of a great military
"conspiracy against the existence of her own confederates and
"allies who were ill-prepared for so fierce a contest cannot
"efface the recollection of the scandalous duplicity and false-
"hood on the part of the Prussian Court which marked every
"stage of the late transaction. The unchecked success of
"Prussia in this enterprise has given an irreparable blow to
"political morality. It has shaken all trust in those public
"engagements on which the peace of the world depends. It has
"taught mankind once more the cruel lesson that strength alone,
"and not law, can give them security. It has placed all the
"smaller States of Europe at the mercy of three or four colossal
"empires, and it has compelled even these empires to augment
"their immense military establishments, and to press their
"whole adult male population into the ranks of their armies."

In these prophetic words, did the Reviewers in 1866 forecast the results of that most guilty war. As the immediate result of it, France was compelled to recast her military system at enormous cost, only to see it shattered and broken to pieces in this campaign, with the necessity of beginning the work afresh. All Europe will now have to remodel its military institutions, and to recast them more or less, for simple safety, upon the fashion of this perfidious power. The peace of the world no longer rests upon public law and the treaty engagements of honorable men. It can be secured only by all nations arming to the teeth. Even England, happy in its insular immunities, sees clearly the reign of brute force which this kingdom has set up, and meditates national armament in view of the altered condition of the times And in face of the fact, that this necessity is forced upon the world by the existence of one power therein which cynically defies all law but that of the strongest, the English journals in their hatred of the French Emperor have combined to hold him answerable for events which he earnestly strove to prevent, and are glorifying the Prussian Minister.

NOTES ON THE WAR.

ENGLISHMEN are full of indignation when they hear French politicians speak with ill-will of Italian and German unity; but do they think the unworthiness of such displays were less obvious to Frenchmen, when they saw Englishmen desiring and predicting the breaking up of the United States a few years ago, from precisely similar motives? The French Emperor risked his popularity and his throne to make Italy and Germany united, to maintain peace with England, and to effect the commercial treaty of 1861. He had a right to look for recognition of these services to the world. He has met with nothing but malignant criticism, and cynical reflections upon his motives, from beginning to end.

WE are told, that it is by no means an impossible result of the war, that the proprietorship of the Suez Canal should be transferred to England. Very shame should prevent the nation appropriating the fruits of an enterprise which it did its utmost to discourage, and by its influence upon foreign capitalists to make impossible. No. If our gallant and unhappy neighbours must part with the Suez Canal, let Europe—not England—take it as the great legacy to civilization left by the Emperor. Very shame, we say, should make it impossible for the English nation to become its owners under any circumstances. Let the nations buy it in common, if France must part with it. We trust she may yet retain it, and should be infinitely better pleased to hear of assistance being given her with that view, by the English ministry, than that they were negotiating for its proprietorship. We cannot—whoever else may—become proprietors of the Canal without dishonor.

IT is strange that English publicists treat so lightly the fact that the result of this war will be that other nations will have to recast their military institutions, if not upon the same model, upon the same scale, as those of Prussia. The guilt of the base conspiracy secretly framed by this power against public order, simply for her own aggrandizement, is, we believe, immeasurable. A great and successful example has been given to the world of organizing the whole adult force of an entire nation into an engine of war. Other nations can do the same, and now must do it, dragged at the heels of a power which has intrigued for years to bring about the temporary domination of Europe. Every nation around her will be compelled to adopt the same course. We had hoped—every wise and good man had hoped—that war was to cease, and the gigantic armaments of modern times to be disbanded. What hope is there now of this? And whose is the guilt of the new impetus given to the passions of mankind! With the strangest perversion of the teaching of facts, we are assured that this war will prove the knell of "standing armies." One would imagine from this, that the bulk of the German forces were Landwehr. The Landwehr are simply the reserves.

IT is a fact, that not one of the English journals, magazines, or reviewers, so far as they have yet come under our observation, has made an attempt to review the diplomatic correspondence which preceded the outbreak of this war, although it is in the light of that correspondence alone, that a solid judgment can be formed as to the merits of the quarrel. Long before it was possible to arrive at such a judgment, the leading journals had committed themselves to the most intemperate attacks upon the French Emperor, as the author of the war He had secretly planned it, without the knowledge of his ministry. Confident in the superiority of the chassepôt and mitrailleur over the Prussian arms, he had seized a mere pretext for plunging the two nations into war. A Napoleonic idea was being wrought out. Russia had been already accounted for in the Crimean war; Austria humiliated in 1859; and the turn of Prussia had now come. The next would be our own. It is impossible to express sufficient scorn of such "leading

journals." For the last three months, these "journals" have had full knowledge of the utter falsehood of the facts evolved by them in July "from the depths of their own consciousness," but not one word of honest, direct acknowledgment of their error has been made. The diplomatic correspondence is passed over in discreet silence; while the *Indian Economist* which has carefully reviewed it, is sneered at by the penny-a-liners who made up their minds upon the strength of Reuter's telegrams, for its paradoxical teachings: Alas! for leading journalism. It is, indeed, the blind leading the blind.

An Indian contemporary in expressing its surprise that Garibaldi should have joined the French ranks, says: "Garibaldi "must remember that to Prussia, directly and indirectly, Italy "owes all her 'clear gains' The acquisition of Lombardy had "to be paid for with Savoy and Nice, but Venice was an un-"alloyed gift This was due to the direct assistance of Prussia "in 1866." The writer expresses a very common, but a very erroneous belief. Italy owes *everything* to the French Emperor, *nothing* to Prussia. She would have been made free from the Alps to the Adriatic in 1859, but for an intimation from Prussia, after the battle of Solferino, that if the Allies attacked the Quadrilateral, she would march an army upon the Rhine.

The Italians know, moreover, that the liberation of Venice in 1866 was due to Louis Napoleon, not to Bismarck Anxious to see the work of 1859 completed, without calling upon France for further sacrifices, it was he who led Bismarck into the Italian alliance, against the King of Prussia's strongest inclinations. So selfish were the aims of Prussia throughout, that she had just previously proposed a settlement of her difficulties with Austria, upon the basis of an agreement to guarantee the Austrian possessions of Venice! Garibaldi does not forget this, and never will No Italian holds himself under obligation to Prussia, the purely selfish motives of the alliance in 1866 being perfectly understood everywhere but in England. *Indian Public Opinion* expressed a doubt a month or two ago, of the correctness of our statement that Prussia is isolated in Europe. Our contemporary may have observed since that the Prussian newspapers themselves are noticing the fact with irritation. There is not a nation in Europe but ourselves that does not regard the ascendancy of this power with alarm, because of its utter unscrupulousness, and the impossibility of binding it by treaties Englishmen alone seem blind to its character. Garibaldi and the Italians are a good deal better judges than Englishmen of the claims of France and Prussia respectively upon their gratitude

The *Times* would seem at last to have forsaken Bismarck, and to have taken a brief from "the criminal" at Wilhelmshöhe. We are now told by it that "whatever the faults of the Emperor, they "were not in the direction of parsimony and private self-seek-"ing. An enthusiast who believes in his name, his fortune, his "destiny, his overpowering will, his unerring judgment, is not "the man to square his expenditure by his income."

The criminal of July has become in September a mere enthusiast, whom no man can accuse of "private self-seeking." With an irony reflecting almost ludicrously upon itself, the journal proceeds to tell its readers, that "history is too often "tainted with the malignity of the hour," and that "the world "will do Napoleon III. this justice—that, though for so long a "period he distributed the favours of the most splendid State in "Europe, he left France in his old age with little of its wealth.

It is amazing that although Englishmen know how untrustworthy these "leading journals" are, they should still put their faith in them almost as implicitly as if they were inspired. Thus though Indian publicists know how wrong the "leading journals" were throughout the American war and in the Crimean war, they assured us confidently in August last that the "language of the leading papers was a *convincing proof* that the "case was too clear to allow of equivocation;" and that "the "guilt of the chief criminal admitted neither palliation nor dis-"grace; and that Napoleon III. and his tool the abject Ollivier "would stand out hereafter in the pages of history as two un-surpassed models of political wickedness and meanness." They have, perhaps, a right to complain that the *Times* is now assuring the world that the French Emperor "personally shrank from the war," and is writing almost eulogistically of him; but what are we to say of the readiness shown by them to follow such leading. They know as well as we, that these leading journals are wrong nine times out of ten; and yet they do not hesitate to follow them. The truth is their prejudices had prepared them to accept whatever the *Times* said as "convincing proof," that the Emperor had secretly planned the war, and had waited only a pretext to declare it. Both statements are now seen to be falsehoods;—the chief authority itself withdrawing the charge although, but in its usual disingenuous fashion.

It has often been remarked that a man's character is more easily determined by an observance of him in little things than in the greater. Bismarck will "leave the Parisians to cook in their own juice." The words throw a painful light upon the inside of this man. While the rest of the world is watching the city with pitying distress, there is one man able to make a joke about it. We have observed this man for years, and we believe there is but one Bismarck living. The statement that "*he had reason to believe*" that the French Emperor would invite him to turn their joint forces against Holland and Belgium but for his disclosure of the secret treaty, was a conception that could have entered no man's mind but his own. And now Paris in his eyes is a great cauldron in which we may see the interesting experiment of two millions of men, women, and children "cooking in their own juice," to promote German unity. He would just as readily watch the Berliners "cook" in the same way, as the Parisians. It is a reproach to the world that it can hear this man's name without abhorrence. But the public mind seems never to take vigorous hold of events until time has placed them in their true perspective. It takes *passionate* hold of prejudices fast enough, but has no grasp of what is near, and so worships to-day what it execrated yesterday, and will again execrate to-morrow.

Among the documents found in the Imperial archives by the Republican Government, an undated memorandum has been discovered which is now published in the *Journal Officiel* as evidence of the Emperor's complicity in "the secret treaty" disclosed by Bismarck in July last. The document is as follows:

"If France should place herself boldly upon the ground of nationality it will be proper from this time to show that there does not exist any Belgian nationality and to settle that essential point with Prussia. The Berlin Cabinet appearing to be disposed to enter into arrangements which it would suit France to accept, it will be necessary to negotiate a secret undertaking which shall bind both parties. Without pretending that such a document would be perfectly safe, it would possess the double advantage of compromising Prussia and of being to her a guarantee of the sincerity of the policy and the intentions of the Emperor. It is right we should not conceal from ourselves, when the characters of the King of Prussia and of his Prime Minister are known, that the latest diplomatic incidents and the present tendency of public opinion in France must have strengthened their conviction that we have not abandoned the idea of asserting our right to the frontier of the Rhine. In order to be certain to obtain a confidence which is necessary to the maintenance of an intimate understanding, we must devote our efforts to and dissipate apprehensions, which have been entertained in connexion with that eventuality—apprehensions which have again been excited by our latest communications, This result cannot be brought about by words. A document will be required, and one which would comprise the settlement of the future fate of Belgium in concert with Prussia, by proving at Berlin that the Emperor looks elsewhere than towards the Rhine for the extension that has become necessary to France, since the recent events in Germany will afford us, at least, a comparative certainty that the Prussian Government will oppose no obstacle to our aggrandisement."

The document certainly casts an important light upon the matter. A proposal had plainly been made to the French Government, that it should take its stand upon the principle of nationality. Did that proposal come from Berlin as the French Emperor declares; or did it arise in Paris, as Bismarck affirms? No candid person, well informed as to the history of the last few years, can be long in doubt. The Emperor notoriously wanted a trifling rectification of frontiers on the Rhine. As well known is it, that Bismarck while acknowledging the services

and claims of the Emperor, declared it to be impossible to cede a foot of German territory, the idea of nationality having taken too passionate a hold of the German mind. Now, in this position he plainly suggested that France should boldly take *her* stand also upon the principle of nationality; and instead of asking for German soil, take Belgium which was French, instead. Long before this war broke out, it was positively affirmed that Bismarck offered Belgium to France so far back as July 1864 in the interview which he had at Carlsbad with M. Rouher. We do not know on what authority the *Edinburgh Reviewers* made this statement, but they made it in the most positive form in their October number of 1869. The Prussian Minister would seem to have renewed the offer in 1866, suggesting that France should take its stand upon the ground of nationality. The document now becomes intelligible. If the reader will transpose the two first sentences, he will see the force of the disclosure.

The Berlin Government appearing to be disposed to enter into arrangements which it would suit France to accept [Bismarck's proposals. Ed. *I. E.*] it will be necessary to negotiate a secret undertaking which shall bind both parties. If France should place herself boldly upon the ground of nationality [Bismarck's suggestion. Ed. *I. E.*] it will be proper from this time to show that there does not exist any Belgian nationality, and to settle that essential point with Prussia.

The disclosure of this document ought, we think, to remove all doubt as to the real history of the secret treaty. Determined not to cede a foot of German territory to the Emperor, while compelled to allow the services he had rendered, and the promises by which he had been allured, the Machiavellian statesman insincerely suggested that he should take his stand upon "the principle of nationality and annex Belgium." That the Emperor entertained the idea hypothetically, if the document is genuine, seems to be certain. It is doubtful, whether either party was in earnest in its discussion. Certainly Bismarck was not, and the baseness of attempting to fasten the odium of his own suggestion upon the Emperor, was strikingly characteristic of the pious king William's right-hand man. King David said "I will not know a wicked person. He that telleth lies shall not tarry in my sight." Alas, for human consistency; the bloody son of Zeruiah was his minister to his dying day.

Is the continuance of Belgium, as an independent State, to be desired? The people are Roman Catholic, and their language and sympathies French. It is strange how readily men can shut their eyes to facts, when under the influence of prejudice. The seizure and annexation of the Schleswig-Holstein Duchies by Prussia, on the pretence that they were German, and her annexation of Hanover by so-called right of conquest, although as guilty proceedings as could be conceived, excite now almost no remark. Belgium is far more French than Schleswig is German, while the people themselves would undoubtedly vote for incorporation with France. But we have persuaded ourselves that the incorporation of Belgium with France would be dangerous to England; that the occupation of Antwerp in particular would be so. The belief, we are satisfied, is a delusion. Belgium gravitates towards France. Its institutions are French, its language French, its laws, its manners, its religion, and its sympathies. Instead of violently holding the two people apart, a wiser diplomacy would allow them to unite and to form one country. In view of the growth of Prussia, and the sinister character of her institutions, we believe the liberties of Europe require this rectification of frontiers: but the bare mention of it drives nine Englishmen out of ten into hysterics. The unprovoked annexation of Hanover by Prussia against the wishes of its people is nothing, while an attempt to unite Belgium with France would be an atrocious crime on the part of any French ruler.

It is impossible not to show some cynicism in dealing with prejudices so contemptible. Ten years ago, Italy in acknowledgement of the blood and treasure so freely shed by France in the campaign of 1859, surrendered Nice and Savoy to her, two outlying territories geographically French and speaking that language. The question of the transfer was submitted to the people who decided for it by a majority of votes. To this hour, however, the French Emperor is pursued with malignant criticism for having accepted this trifling rectification of frontiers. Although both Provinces belong geographically to France, and although the concession was made by Italy herself, in return for services which claim her undying gratitude, and although the people themselves approved the transfer, the annexation is on the tongue of almost every Englishman as one of the Emperor's crimes. Prejudice so deep makes one despair of one's country.

Not the slightest allowance has ever been made for the peculiarly difficult position of the ruler of a people so morbidly susceptible upon the point of honour, and so dominated by the idea of national glory. When Napoleon comes to be judged by history, the difficulties of his position to be weighed, his aims and purposes dispassionately dealt with, his failures viewed without bitterness, and his successes without envy, he will stand out as one of the great statesmen of his age—possibly as the greatest.

From the private Imperial correspondence in course of publication by the Republican Junto in Paris, we learn, that the Prefects of the French departments had informed the Emperor that the people throughout the country desire the maintenance of peace. Paris, that tumultuously throbbing heart of the nation was made for war. Paris alone. But unfortunately Paris in a very true sense, is France. In Germany, on the other hand, it is clear, that the nation shared to the full, the guilty eagerness of the French Capital for war. The hysteric, almost ape-like, vivacity of the Frenchman betrays him into antics so grotesque, and in presence of the terrible calamity of war so offensive to sober men, that Englishmen in their disgust of this spectacle seem altogether to have over looked the more guilty, because the more cold and deadly hatred of the German people generally. This war may be justly declared to be a war not between two nations, but between the French Capital and the whole German race. The quiet, self-contained German is moved at bottom by a feeling of deadly hatred against France. The French as a people do not reciprocate that feeling. A philosophic mind will make some allowance for the extravagant peculiarities of the Parisian, but what excuse can we make for the measured, deadly hatred of the German race against their neighbours! We are sick of the miserable *cant* of German unity. What is there we ask, in common between the Prussian and the Bavarian, but their present desire of military supremacy in Europe! Down to the war of 1866, Prussia was hated in South Germany; and justly hated for her traditional perfidy and overbearing violence. They have now made common cause - but what in? A great aggressive war, brought about by Prussian statesmen for the very purpose of making action between them possible! Let our readers hold their judgment in suspense for a while. In the meantime, it is strict justice that Paris should stand face to face with Germany in arms. The two really guilty forces are now engaged in the throes of a death struggle. The weaker will probably go down; but a Paris regenerated by suffering such as now looms before it, possibly means—a new France. We should shrink from the responsibility of advising Paris still to resist; but we have no regret at its determination to suffer any extremity rather than yield. "He that loses his life shall save it"—embodies a great principle of morals as well as religion. Paris may arise from her ashes, to exercise a nobler and purer influence upon the world than any other city has ever yet done. The conduct of the leading English journals in view of the French situation creates simply a feeling of loathing in our own mind, as we think it must in many others.

A PROTEST

MORE LIGHT.

In reply to an application which we made a few days ago to the Commissioner of the Central Provinces for a copy of the Settlement Report of the Mundlah district now under the consideration of the Supreme Government, we have received very courteous but decided refusal. Colonel Keatings

"personally would welcome the discussion of the questions "which settlement reports deal with, and regard it as bene- "ficial, but while the principles involved in them are still "under discussion;" he thinks that he is "bound by official etiquette" to refuse such reports to the Press. Now look at the position. An elaborate report of the resources and capabilities of an important district is in the hands of the Government, accompanied by a proposal that the land revenue, virtually the taxes, of the district shall be fixed for 20 or 30 years at certain rates, which the settlement officer recommends upon the grounds stated in his report. Now, instead of that report being printed and published, that it might undergo the ordeal of examination by every settlement officer, and every journalist in the country, so that Government might have the assistance of a body of independent assessors in determining as to the propriety or otherwise of the settlement proposed, the report is secretly printed in Nagpore, secretly recommended to the Supreme Government for sanction, and two or three months afterwards, as a matter almost of course, receives that sanction in the recesses of the Calcutta Secretariat. The report is *now* made public, when criticism is futile and merely provokes official hostility. This Mundlah Report which has been refused to us, was sent up to Government for sanction by the Commissioner so far back as April last. The Government excludes the public from its counsels altogether, while from the enormous amount of work which the Secretaries have to get through, the examination of such reports is necessarily nothing but a form, a fact sufficiently proved by the sanction that uniformly follows the recommendation of the local officials. The settlement thus becomes law, without undergoing any real criticism whatever. In the Upper Provinces, district after district is being settled for long periods of time, without the pretence of consulting the public, or submitting the leases to independent criticism. Now the effect of this is, that we sanction mistakes which are fatal to the welfare of the people, and which compromise the Government almost hopelessly. Look at the fact that Sir Richard Temple was allowed six or seven years ago in this secret and unwise manner to transfer to the village patels of the Central Provinces, the ownership of the soil, without the public receiving the least intimation of what was being done. The proprietorship of the land, which up to 1862 belonged to the State, has been transferred by a stroke of the pen, under these new settlements, to a body of native middlemen, who to this hour, are largely in ignorance of the fact, and cannot be made to understand it. Had the public been consulted, it would have forbidden the revolution with one voice. The whole thing was virtually done by Sir Richard Temple himself, his proceedings receiving the sanction of the Supreme Government as a matter of course. In the very same way the land revenue has been fixed for thirty years, at rates so absurd as almost to provoke mirth, were the interests compromised thereby not so grave as they unfortunately are. We appeal to Lord Mayo to give the *coup-de-grace* to this system so fraught with evil, so subversive of enlightened rule. What is the use of publishing the Mundlah report when, for good or for evil, its recommendations have passed out of the region of discussion? If the publication is to be of any use to Government; of any service to the country, it should be made *now*, when criticism may stop the settlement if it is unwise. We are almost ashamed to insist upon what is so manifestly the right course. Colonel Keatinge, as an able man, sees plainly how advantageous it would be to publish the report at once. He is not to blame for "the official etiquette" which hampers him. Let Lord Mayo cut through this traditional folly at a stroke, and take the public into the full confidence of the Government in such matters.

We take advantage of the general question involved in the case to urge upon Lord Mayo another most important reform in the same direction. We trust then, that when the next Budget estimate is laid before Council in March, it may be brought forward upon the sole responsibility of the Finance Minister himself. What can be more wrong, than for Government to profess to submit the Budget to the judgment of the Council, if a secret understanding has been arrived at beforehand, that it is to be voted as it stands? We appeal to Lord Mayo, to put a stop to this practice in one way or other, for the sake of the interests imperilled by the disingenuous course now followed. Whose budget is it, that is to be brought forward? The placing it upon the table, and inviting a debate upon its second reading becomes a mischievous and irritating sham, if the matter has been beforehand determined and settled in the Executive Council. If *this* is to be the course, far more dignified will it be simply to publish the financial statement in the *Official Gazette*, as a Government Resolution concerning the finance of the year. To invite discussion upon the measures proposed, when a secret understanding has been arrived at that no alteration of them will be allowed, is deliberately to provoke disaffection by the speeches of independent Members of the Council, and to fan it to a flame in the Press. Why submit the budget at all to an ordeal, which while a pure sham, serves only to excite disaffection amongst the people? We doubt if Lord Mayo knows the amount of harm that has been done within the last few months in the country, by the angry and excited declamations of the Press. Why deliberately provoke it, by appointing a field day in Council to commence the fray? If the budget is the result of the collective wisdom of the Executive Council, and it means to stand by it, then simply publish it in the *Gazette of India* as a settled thing. Far wiser than this course, however, would it be to submit it loyally to the criticism of the Council and the public, upon the responsibility of the Finance Minister alone. We do not say that Lord Mayo should refuse to give assistance to Sir Richard Temple; but we do say that he should come *unpledged* to the debate. Let the Finance Minister rely upon the merits of his budget for its acceptance, not upon the secretly promised support of a majority of the Council. The imitation of the forms of political liberty where the substance is intentionally withheld, is fraught with nothing but danger. The best way of all would be, for the Finance Minister to publish in the *Gazette of India* a month before the Budget meeting, an outline of what he proposes to do. He himself would then have the advantage of all the criticism that might be offered upon his measures, and if he thought that criticism sound, and to be deferred to, would have an opportunity of modifying them so as to bring them as far as possible into accord with the public wishes. Nothing could be more mischievous, more fatal indeed, than the alienation we have seen in these last few months, of all sympathy from the Government. A feeling of angry disaffection prevails throughout India, directly attributable to the sham forms of constitutional rule, with which the Government seeks to amuse the country, while shewing the most despotic disregard of its wishes. Do one of two things: honestly place yourselves *en rapport* with the people, or drop the irritating pretence of consulting them. The secrecy with which to this hour measures are determined upon in the Council Room, is part of the traditional system we have inherited from the bureaucratic instincts of the old East India Company. We appeal to Lord Mayo to give it the *coup-de-grace*. Let the Settlement Reports be published *before* their recommendations are sanctioned. Let the finance measures of the year be honestly submitted to public criticims, for the advantage of the State. We appeal to all India whether these demands are not reasonable, and just, and necessary?

THE STANDARD OF LIVING IN INDIA.

II.

We stated in our last issue, the grounds upon which we estimate that the total harvest of cereals in India must suffice to provide for at least 2 lbs. of grain per head of population per day, independently of the surplus produced for export, and a supply of seed corn for the next harvest. Within the last few days, we have received from Nagpore, Captain Forsyth's Report of the new land revenue settlement of British Nimar, and find that it contains an incidental corroboration of our estimate. Captain Forsyth states that "the main article of food in Nimar "is jowaree (millet) of which about 3 lbs. is the daily ration of

"an able bodied man," and that "an average of 2 lbs. of grain "per diem for each soul of the population will certainly not be "an excessive allowance."

As we made no allowance in our estimates for any consumption of grain by cattle, nor for losses in the food stores of the country by mildew and vermin, nor for surplus provision against years of famine, we are satisfied that if we err at all in assuring that the harvest amounts to 2 lbs per head per day, we err on the side of moderation. In a recent issue of the *Gazette of India* it is enacted that the daily allowance on board ship of each adult emigrant from India shall be as follows :

		lbs.	oz.	dr	
Grain	Rice	0	20	0	
	Flour	0	16	0	
	Dhal: For rice-eaters	0	6	0	Urhur dal=½ Gram =¼ Kalie =⅛ Moong =⅛ of the total quantity.
	Dhal: „ flour „	0	4	0	
Oil	Ghee: For rice-eaters	0	1	0	Half an ounce extra allowance of ghee to each adult for every day that dried fish is supplied.
	Ghee: „ flour „	0	1	8	
	Mustard oil	0	0	8	
Meats, &c.	Preserved mutton	0	2	8	In lieu of preserved mutton: To be supplied at scale rate—dried fish for two or three weeks, fresh mutton (sheep) one week.
Vegetables.	1 oz. pumpkins or yams... / 2 oz. Potatoes / 2 oz. Onions	0	5	0	In lieu of fresh potatoes, a sufficient quantity of preserved potatoes to allow two oz. twice a week to each adult, or about five weeks' supply at scale rate.
Curry stuffs &c.	Garlic	0	0	0½	
	Mustard seed	0	0	0½	
	Chillies	0	0	0½	
	Black pepper	0	0	1½	
	Coriander seed	0	0	2	
	Turmeric	0	0	4	
	Tamarind	0	0	8	
Narcotic.	Salt	0	0	8	
	Prepared Tobacco	0	0	7	
	Leaf	0	0	3	
	Firewood	2	0	0	Or in lieu of firewood, its equivalent in coal, for half the quantity.
	Water	One gallon.			

We have here, no doubt, a standard of living somewhat beyond the means of the masses in India, but we adduce it to show that the ration of cereals alone is 26 ounces per day. The dry provision, for bad weather when cooking is impossible, and people are reduced to living on grain alone—is as follows :

	lbs.	oz.	dr.	
Best coarse biscuit	36	0	0	
Choorah	4	8	0	
Gram	3	8	0	Is usually eaten with salt.
Sugar	2	0	0	Used with biscuit and choorah.

This allowance 46 lbs. is held to be sufficient for 18 days, a daily ration of 2½ lbs. of *flour*. In the last *Statistical Reporter*, we gave the result of some interesting experiments made about twenty years ago in Bengal, by Dr. Bedford, with a view to ascertain what the people will really eat, when food is provided for them without stint. According to these experiments, their consumption was found to be as follows :

	Ryots.		Coolies.	
	Hindoos.	Mussalmans.	Hindoos.	Mussalmans.
Rice	34½ oz.	36½ oz.	34½ oz.	36 oz.
Dhal	8 „	6½ „	8½ „	6½ „
Salt	½ „	¾ „	¾ „	¾ „
Fish	2 „	2 „	2 „	2 „
Meat	0 „	½ „	0 „	½ „
Spices	½ „	½ „	½ „	½ „
Vegetable	6½ „	6½ „	6½ „	6½ „
Milk	2 „	2 „	2 „	2 „
Oil	½ „	½ „	½ „	0 „

These experiments seem to be conclusive. They were made with great care by six darogahs in different stations, and the uniformity of the returns gives them a claim to be relied upon. In every case, we find the consumption of rice and dhall alone to have been nearly 43 ounces per day ! besides vegetables, fish, &c. Where, therefore, the people as in the Central Provinces, are living in the midst of coarse plenty, it is plainly impossible to estimate the consumption at less than 2 lbs. per head per day. We attach some importance to the establishment of this fact, because it supplies us with a test—rough it may be, but summary and decisive—as to the value of our Settlement Officers estimates of the annual harvests of the country. In the *Statistical Reporter* for December, we purpose to give some further details upon this subject of interest. We may remark here, that there is a general tendency, if we mistake not, to *under*estimate the quantity of food men will consume when free from all anxiety as to the means of procuring it. Mr. Macgregor, British Consul at Elsineur, tells us that the Danish farm labourer makes five meals a day, and that the following quantities of food are usually allowed to male farm servants per month ;

Bread	60 lbs.
Potatoes	½ „ bushel.
Groats	¼ „ „
Beans	10 „
Meat	4 „
Salt herrings	30 „
Salt fish	2 „
Beer	60 quarts.
Milk	*ad libitum*.

Such a consumption seems almost incredible, but Mr. Macgregor is declared to be an intelligent and careful observer. The diet amounts to about 5 lbs. of solid food per day, two quarts of beer, and milk *ad libitum* It is to be hoped, the peasantry of Schleswig-Holstein will be as comfortably provided for under the Prussian, as they were under Danish rule.

If now we estimate the population of British India at 150 millions—according to the latest statistics the estimate is 148,457,634—and the consumption of cereals at 2 lbs. per head per day ; and assume that the price of food throughout the country during the last two years had been *upon the average* as low as 20 seers per rupee, it is plain that the harvests must at least have been of the following value :

150,000,000 × 2 lbs. × 365 ÷ 40 lbs. =	Rs.	274,00,00,000
Add Exports	„	50,00,00,000
Seed corn one seventh	„	40,00,00,000
Vegetables, condiments spices &c.	„	
Crops of sugar cane, Tobacco	„	
Fodder for cattle	„	
Clothing of the people	„	

Now, although this calculation is very rough, and greatly *below*, as we are sure, the real value of the harvest—as for instance, who can calculate the value of the cocoa-nut harvest of India—it proves conclusively, which is all we want, that the land revenue is a mere pittance of the produce of the soil. We have repeatedly stated our conviction that it does not amount to one-thirtieth ! The margin that lies between our assessment of £21,000,000 a year, and the £500,000,000 of the harvest goes into the pockets of the agriculturists. The true rent of the land can hardly be less than £80,000,000 to £100,000,000 sterling, and it is to the State rights in this fund, that we must look for our future revenues.

THE PERMANENT SETTLEMENT—BENGAL.

V.

A CONTEMPORARY affirms that the chief exciting cause of the recent crusade against the zemindars of Bengal has undoubtedly been the discussions which preceded and accompanied the pass- "ing of the Irish Land Bill. It was found that the landlords of "Ireland must be restricted in the exercise of their rights, if not "cleared out altogether ; and puzzle-headed enthusiasts at once "began to look about for something similar to meddle with in "this country."

The only excuse for the entertainment of this belief is the fact that the writer is ignorant of the history of the question. The settlement of the question of tenant right in Ireland, has no doubt encouraged the friends of the ryot to hope for a settlement of the same question in Bengal, the more so as our adversaries were constantly adducing the *laissez faire* policy of the Home Government as conclusive proof of the propriety of the same policy in India. The *Friend of India* wound up a series of articles upon the relations of *Landlord and Tenant in India*, contributed to its columns, we believe, by Mr. Money the barrister, in 1863, with the following adjuration to the State :—

"Let the Indian Government, like the English, declare that Landlord and Tenant shall, in Bengal, as in Ireland, be as completely left alone as the seller and buyer of bread."

We have ever held this *laissez faire* doctrine in abhorrence. At bottom, it is simply an abdication by Government of its true functions, an admission that it is not competent to govern. We hail its abandonment in Ireland as a good augury for Bengal, but it reveals a total want of acquaintance with the discussions of the last ten years to attribute the "crusade against the zemindar" to the settlement of the question of tenant right in Ireland. The *Englishman* does an important service, however, when it proceeds to point out the peculiar difficulties with which the question is beset in these Provinces :-

What we say is that the proposed, or suggested, abrogation of the Permanent Settlement is a thing utterly beyond our power to accomplish The case is perfectly simple. If we raise the sudder jumma of the zemindars, the under-tenures on their estates must either be left as they are, or in some way modified. In the former case, our whole object will obviously be defeated, because the zemindars, being in fact mere recipients of a fixed rent charge, cannot possibly pay an increased revenue as the profit of their lands increase, whether we assess it or not; and in the other case, we should have to face the task which probably no one out of Bedlam would undertake, of so legislating as equitably to modify the status of nearly the whole population. Putnee and shokmee talookdars, gantidars, otmamdars, and a hundred other kinds of middlemen would have to be considered as well as ryots, with every degree of rights in their lands, and all these with the additional complication of half-a dozen different kinds of mortgages. The notion of attempting this is totally absurd, and even if we did succeed in the insane undertaking, it is evident that the whole population would be set by the ears amongst themselves, and it makes one dizzy even to think of the Civil Court which would be required to decide the resulting lawsuits.

This is good, vigorous, healthy writing though on the wrong side. Instead of the facts disclosed making us dizzy, they should simply nerve our resolution to deal with them, and reduce this terrible chaos to order. "Impossibility" applied to such a state of matters as this, is a word that should find no place in our vocabulary. If the business of Government is only to make a decent pretence of governing, while the people are left a hopeless prey to evils such as are here pourtrayed, then, of course, let us declare them remediless, and pass by on the other side. All governing, as we understand it, is "an infinitely difficult thing—a thing of battle, convulsion, and confusion." If the art of governing is simply that of suppressing all noise and disturbance; of making things pleasant in the city, while thirty or forty millions of people are mingling their bread with tears in the provinces; —away with such Government; for it is no Government at all. It has lost all right to the allegiance of the people, and has become an imposition and a curse. A Government that has shewn itself powerful enough to bring these evils upon the land by its own mistaken legislation, and then declares itself powerless to redress them, because of the mushroom interests it has created, is no Government at all. Suppose it is quite true "that since the time of the Permanent Settlement countless intermediate "tenures have grown up between the landlord and his "ryot, and that it generally matters little to the zemindar what "rent the ryot pays because his rights have in most cases been "handed over for a fixed yearly payment to middlemen, "who share with him and the ryots whatever profits Go-"vernment may have sacrificed by the Regulations of 93."—What then? Can we not deal with middlemen as well as zemindars, and ryots? The simple fact is we wait the advent of—a statesman. That the evils resulting from the Cornwallis Settlement, in so far as they affect the present and coming generations, admit of full redress we are satisfied. The measure that lies at the threshold, is a scientific and minute survey of the provinces at whatever cost, with a complete register of existing rights however created, or arising. Were such a survey and register in existence at this moment, they would be cheaply purchased by the State at the cost of half the Indian debt. In view of this fact of what are we to say to the apathy which makes no effort to obtain either, but wrings its hands over evils which will be half overcome the moment that this work is accomplished. Though it cost the State £10,000,000 sterling to obtain it, and though it were necessary to double the strength of the survey and settlement departments of all India, a statesman would never rest till the work was in the joyous swing of an advance towards completion. Settlement operations in Oudh and the Central Provinces are now, we believe, all but ended; and the Government has here set free to its land a body of men exactly fitted and ready for the work to be done in Bengal. The Settlement Officers of India, we are convinced, are the ablest administrative body of officials the world has ever seen. Set them at once at work upon Bengal. In the meanwhile we might declare by summary legislative procedure all transfers of, and dealings in land in the provinces, provisional only, pending the final adjustment of rights by the State. With energy proportionate to the task, a revolution might be successfully completed within twenty years, that would give new life and hope to the provinces for all time. Our business is to *govern*; and that means just now to undo the evils of the Cornwallis Settlement. Those evils we are persuaded admit of remedy without appreciable injustice to any interest. If we begin with the assumption that they admit of no remedy, we may of course as well fold our hands and go to sleep.

PUBLIC WORKS IN BENGAL.

We have frequently pointed out the impropriety of appropriating any part of the Imperial revenue to Public Works in this Presidency. That there is no part of India more urgently in want of them may be quite true, but with what propriety can they be made at the cost of the Imperial taxes? The commonwealth has lost all interest in the improvement of the soil of Bengal, the Permanent Settlement having transferred the ownership thereof to a race of private landlords. The *Englishman* has recently stated the case with perfect candour :—

In the Madras Presidency, the Government is the actual landlord of the soil, and derives direct and immediate advantage from any improvements which increase the value of the land. We need hardly say that this is not the case in Bengal. Here the Government is only indirectly interested in the improvement of the land. It cannot raise the rents of the cultivators, because it brings water to their doors. Like any ordinary Water Company, its profits depend upon the sale of the water. The value of the land may be increased ten-fold, but the Government will receive no additional revenue; the whole increase will go into the pockets of the agriculturists and landowners. In this lies the great difference between reproductive works in Bengal and Madras :—

Our contemporary should have said between "Bengal and *the rest of* India." The logical sequence of a permanent settlement, as we have often pointed out, is the abandonment of all idea of improving the land. For where is the money to come from? While the State remains owner of the soil, it is its duty to undertake all necessary works for improving its estate. On the other hand if it give up the landlordship, a Public Works Department becomes an absurdity and an impossibility. If you are really going to settle the Land Revenue in perpetuity, the cities of India will be justified in resisting by open force the imposition of taxes upon them for works to increase the value of the soil. The Egyptian darkness in which Indian Financiers grope their way, is one of the most curious phenomena of our times. Public Works upon the right scale in the country, can only be accomplished by loans, and the propriety of taking up such loans rests upon the fact that we own the rental of the soil, and look to be recouped our outlay from its increase. Is *that* so dark a saying, that an electric light is necessary for its discernment?

A VITAL DISTINCTION.

Imperfectly Understood.

The distinction between the contributions to the Revenue made by the Agricultural and by the Urban classes of India respectively, is vital; and at the same time little understood either by Indian statesmen, or Indian journalists. The matter is one of principle, and must be vigorously and clearly laid hold of, if we are to have an intelligent fiscal policy in the country. The case has been exceedingly well stated by Dr. Dallas of Bombay in a letter recently addressed by him to the *Bombay Gazette* and as the subject is of great importance, we make no apology for reproducing it here.

"The urban classes, the labourers, the artizans, and the traders toil, work, and trade that they may support themselves and their families, and lay up some provision for the future. They do not receive from the Government any assistance towards this end. No fund or capital is appropriated to their support, but on the contrary they pay Government; and by direct and indirect taxation contribute to the expenses incurred for securing life and property and for the administration of justice. They do not repudiate this obligation. So much as they receive from Government in the way of protection and security, they are ready to pay for. On the other hand, the agricultural classes receive from the Government a valuable property, the land,—the fund out of which they support themselves and their families. And for the use of this, they pay rent. It does not make any difference whether you call it a tax or rent. The fact is, they make a payment for something of value which *they* enjoy and which the urban class do not. Because the recipient of this rent happens to be the Government, the one relation is not merged in the other, but the agricultural classes are bound to contribute *further* to the expenses of the administration; and even then are not entitled to have the land in addition to rights of all other subjects by merely paying rent. Imagine the rackrented tenant farmers of England and Scotland—the men who at the close of a nineteen years' lease yield up all their improvements to the landlords—claiming an exemption from imperial taxation because they pay rent for their farms. The contention in behalf of the agricultural classes, that they are unduly burdened, that payment of rent is a full discharge of all their obligations to Government, is quite as reasonable as such a claim would be. If the Government advanced to the urban classes at a *reasonable* rate of interest the capital necessary for their various pursuits, the position of each class would be nearly identical; and then, and not until then, there might be some ground for a discussion about equalizing the burdens of the agricultural classes.

"The question is what does each class receive from the State? The urban classes receive, let us say, good government. The agricultural classes receive this same good government AND THE LAND, the means of subsistence. It is only just that they pay for both. The more they pay in the relation of tenant, the less they will have to pay in the relation of subject. They contribute fairly to taxation, as compared with the urban classes, when and so far as they pay more than the rent of their land. The use to which the Government applies this rent, the fact that it is expended for the same purposes as taxes, does not affect the question.

"A great deal of taxation "cheerfully paid" by the urban classes, is being spent for the benefit of the agricultural. All that has been expended on roads, railways, and canals, has been for the improvement of their land and for their immediate good. Hence they have obtained higher prices, and better markets, for the produce of their fields. The urban classes have suffered by the high prices which have enriched the agricultural classes.

"In all long settled countries, wherever land has value, a reasonable rent is paid for its use, but it is not supposed that the mere paymont of rent, if the Crown be the owner of the land, releases the tenant from the obligation of other payments to the State.

"Here in India the theory seems to prevail that the payment of rent to Government, creates some kind of solemn covenant between the tenant and the Government relieving the tenant from all other obligations?

"In estimating the relative positions of the two classes, an important question to be decided is, whether or not the State has unduly favoured the agricultural at the expense of the other classes—whether the rent paid the use of the public lands is a fair proportion of their produce."

So far Dr. Dallas. Let the reader now note the following facts in illustration of the subject. The Cotton Commissioner of Bombay is conducting experiments in the growth of Cotton in that presidency. To obtain land for these experiments he has had to rent it of the ryots. And at what rate does the reader suppose? In Sattara he has had to pay Rs. 15 the acre, the assessment upon the ryot being one fifth of that rate; in Khandeish Rs. 10; in Broach Rs. 30 the acre; in Ahmedabad Rs. 11; in Dharwar Rs. 10 to 12; and in Lower Sind 15 Rs. The average of the rates is 13 Rs. per acre. This is the rate the ryot is exacting from the State when it wants land for its Cotton experiments. The State meanwhile is charging the ryot but a fifth or sixth of this rental; and yet we have idiots amongst us who talk of the *Land bearing all the burdens of the State*, and would have us permanently settle the impost at a rupee or two an acre. Cannot even a child see that instead of taxing the ryot, the State has conferred upon him a vast property, at the expense of the urban classes? It is discouraging beyond measure to have to deal with such folly for ten years on end.

COTTON OR FOOD—WHICH?

We would direct the attention of the Bombay Government, to some very striking facts concerning the agriculture of the Southern Mahratta Country. We were told in the spring of the year, by the Cotton Commissioner of Bombay, that the following figures represented the area of land under Cotton in the S. M. Country in 1868-69, and 1869-70 respectively.

	Under Cotton.	
	1868-69.	1869-70.
Dharwar...	511,869 Acres.	647,241 Acres.
Belgaum	123,774 ,,	203,683 ,,
Kulladghee ...	393,493 ,,	393,493 ,,
S. M States ...	160,630 ,,	264,949 ,,
Total...	1,219,793 Acres.	1,688,125 Acres.

When these statistics first appeared, we expressed considerable doubt of their accuracy. The Cotton Commissioner, although assured of this extraordinary extension of the cultivation from 1,200,000 acres to nearly 1,700,000, could give no explanation of it. The acreage had suddenly risen from 28 per cent. of the cultivated land of the district, to nearly 40 per cent. Half a million of acres that had been under cultivation with food down to 1868-69, were now devoted to the produce of exports. The effect of this contraction upon the grain markets of the Mahratta Country, has been most striking. Hitherto, the price of food in these districts has been about one half the average price in other parts of the Presidency. It has now risen above them all! Look at the following figures:—

	Price of Attak.	
	Sept. 1869.	Sept. 1870.
Dharwar ...	17½ Seers.	4½ Seers.
Kalladghee	14 ,,	5¾ ,,
Western India	1 ,,	7½ ,,

The quotations for bajree and jowaree in the two years respectively are:—

	Bajree	Jowaree.
1868-69...	30 Seers.	34½ Seers.
1869-70...	18¾ ,,	19 ,,

The ryots of the Southern Mahratta Country as a class are independent of the Sowcar and must have had a year of the most extraordinary profits, while the Urban classes must be suffering proportionately for their enrichment. The Land Revenue or rental which the ryots pay is the same now as it was ten years ago, while the value of the harvest is trebled. The total average under cultivation in these districts in 1867-68, and amount of the Land Revenue were respectively as follows:—

	Acres Cultivated.	Revenue.
Dharwar ...	1,100,425	Rs. 18,68,770
Belgaum ...	701,126	,, 13,14,263
Kalladghee ...	1,938,808	,, 11,56,371
	3,740,359	43,39,404

Or an average rental of about Rs. 1-2-7 (2s. 3d.) per acre! Now, at the time when this rental was settled, and the present 30 years' leases were issued, wheat was selling in the bazar at Dhar-

war, retail profit included, at 4 lbs. to 5lbs. for a penny. The price to-day is Rs. 8-12-0 per maund, or 2¼d. per lb. wholesale! Observe:

1852	Wheat	1 farthing per lb.
1870	do.	2¼d. per lb.

The rent was *low* in 1852, what then is it now? Nothing is more certain than that if these prices last, cultivators of the Southern Mahratta Country will become enormously wealthy. If we knew with any certainty what the yield is per acre, what the precise character of the crops, and the acreage under each respectively, it would be easy to make an approximate estimate of the annual accumulation of capital in the district. The Bombay Government seems to regard such information as superfluous, as it appears to make no effort to obtain agricultural statistics from the territory which it rules. And yet how important is it in preparing for the re-settlement of these Mahratta districts, for the issue of new leases to the cultivators, that we should have some certain knowledge of the profits of agriculture in the district, and of the means of the cultivating classes. An annual rent of no more than £430,000 upon 3,750,000 acres of land under full cultivation, or 2*s.* 3*d.* per acre, with wheat at 96*s.* per quarter, and the common grains, bajree and jowaree, at 25*s.* That it is in *this* direction we must look for the future income of the State, we entertain not the smallest doubt whatever.

MUNICIPAL LOANS AND NATIONAL CREDIT.

"We believe that it is only by permitting terminable loans, "repayable in comparatively short periods, that the necessity of "our great cities and towns with respect to drainage, water sup-"ply, or communications, as the case may be, can be adequately "provided for." This decided expression of opinion on the part of the Committee appointed by the Bombay Government in July last, to prepare the draft of a new Municipal Bill for the Mofussil of that Presidency is most welcome. When the Government of India once awakes to the fact that it is to a courageous use of the national *Credit*, we must look for the means of constructing the great works of improvement that wait execution in our midst, a new era will have dawned upon the country altogether. We shall have discovered the secret of the vast progress of other lands, notably of the United States. It will not do to take English statesmen as our guides in this matter, for the national conceit of Englishmen and the vast material wealth of English capitalists, make them look askance at the gigantic power of *Credit* to equalize the resources of nations. Poor as India is, by a right use of her credit, she has the means of supplying all her material wants as readily as the wealthiest nation upon earth. She may borrow as much capital as she pleases at four or five per cent. for works the reproductive power of which in creating new wealth will simply be incalculable. The Governments and Press of India are still full of the idea that these investments are of the nature of a Joint Stock enterprize, the sole end of which is the profit of its promoters. The position is totally different. The net income which a railway or canal will yield to its shareholders, is the final end of the enterprize so far as they are concerned. But how absurd is it to make such returns the measure of the advantage which the nation reaps therefrom. The four hundred millions sterling, sunk by private capitalists in the Railways of the United Kingdom, do not yield a profit of ten millions a year, but they have doubled the national wealth of the country. Had private capitalists been unwilling to do the work, the Government of England would have wisely undertaken it though the direct return had been *nothing*. The distinction is vital; but the Government of India does not yet grasp it. Five hundred millions sterling spent upon communications and canals, would more than double the material wealth of India. If we suppose that wealth to day to be five or six thousand millions sterling, a proper outlay upon communications and works of irrigation will double that amount within 20 years. Our case is not that of a Joint Stock Company, but that of the landlord of a vast and improveable estate. It matters nothing what *direct* income any given railway or canal may yield, so long as the works are adapted to the great end of multiplying the productive powers of the country. We can now travel from Calcutta to Bombay in 48 hours, where formerly it was a month's journey. Who can measure in these circumstances the nation's gain! All but a clear month of time is won for productive labour, by every man who has to make the journey! In Upper India we have spent two or three millions sterling upon canals. But when these canals are covering the land with a harvest worth millions annually, to regard the investment as wise or otherwise by a mere consideration of the annual profit upon the outlay, as shewn by the amount of the water rates, is monstrous. By the expenditure of these millions we have run the value of the whole Dooab up so largely as to defy estimate. Was it not wise to import two or three millions from abroad to double the material value of the whole country, whether the canals give a direct profit or not? In spite of the obstructives who have never yet mastered the alphabet of economic science, the State is making steady progress towards the light. For a nation to borrow money that it may expend it upon luxuries, or upon military establishments, is purely evil; to borrow it for works of material improvement is all but purely good.

A wise statesman will look upon the *credit* of the nation which he rules, as a talent to be turned to account as carefully as its accumulated resources. English statesmen themselves want discernment of the fact that in dealing with the distressing social problems of the mother country, there is a power lying unused in the nation's *credit* that should enable them to solve them all.

"England, says Carlyle," is full of wealth, of multifarious produce, supply for human want in every kind; yet England is dying of inanition. With unabated bounty the land of England blooms and grows; waving with yellow harvests; thick-studded with workshops, industrial implements, with fifteen millions of workers, understood to be the strongest, the cunningest, and the willingest our earth ever had; these men are here; the work they have done, the fruit they have realised is here, abundant, exuberant on every hand of us: and behold, some baleful fiat as of enchantment has gone forth saying: 'Touch it not, ye workers, ye master workers, ye master-idlers; none of you can touch it, no man of you shall be the better for it; this is enchanted fruit'! On the poor workers such fiat falls first, in its rudest shape; but on the rich master-workers, too, it falls; neither can the rich master-idlers, nor any richest or highest man escape, but all are like to be brought low with it, and made 'poor' enough, in the money sense or a far fataller one. Of these successful skilful workers, some two millions, it is counted, (1842) sit in Workhouses, Poor-law Prisons; or have 'out-door relief flung over the wall to them,—the workhouse Bastille being filled to bursting, and the strong Poor-law broken assunder by a stronger* They sit there, these many months now; their hope of deliverance as yet small. In workhouses, pleasantly so-named, because work cannot be done in them. Twelve hundred thousand workers in England alone, their cunning right-hand lamed, lying idle in their sorrowful bosom, their hopes, outlooks, share of this fair world shut in by narrow walls. They sit there, pent up, as in a kind of horrid enchantment: glad to be imprisoned and enchanted, that they may not perish starved. The picturesque tourist, in a sunny autumn day, through this bounteous realm of England, describes the union Workhouse on his path. 'Passing by the Workhouse of St. 'Ives, in Huntingdonshire, on a bright day last autumn,' says the picturesque Tourist, 'I saw sitting on wooden benches, in 'front of their Bastille, and within their ring-wall and its rail-'ings, some half-hundred or more of these men. Tall, robust 'figures, young mostly or of middle age; of honest countenance, 'many of them thoughtful and even intelligent looking men.

* The Return of Paupers for England and Wales, at Lady day 1842 is, 'Indoor 221,687, Out-door 1,207,402, Total 1,429,089.—(Official Report.)

'They sat there, near by one another; but in a kind of torpor, 'especially in a silence, which was very striking. In silence: 'for, alas what word was to be said? An Earth all lying round, 'crying, Come and till me, come and read me;—yet we here sit 'enchanted! In the eyes and brows of these men hung the 'gloomiest expression, not of anger, but of grief and shame and 'manifold inarticulate distress and weariness; they returned 'my glance with a glance that seemed to say. 'Do not look at 'us. We sit enchanted here, we know not why. The sun 'shines and the Earth calls; and, by the governing powers and 'Impotences of this England, we are forbidden to obey. It is 'impossible, they tell us.!'"

Two millions of idle men; a Government possessing in the national *credit*, capital enough to employ twenty millions profitably; and of the seventy-seven million acres that make up the surface of the United Kingdom, forty-six millions only under cultivation! England will do better than this by and bye. We imitate her to the letter in India upon every recurring famine. A million sterling spent in 1869 would have saved a million of workers alive in Rajpootana; but the Government could not find the money, although the capitalists of the world were holding it out with both hands to them. For works of improvement to be indefinitely postponed, and for men to die of hunger, in a land whose *credit* holds at command the capital of every other land, whatever else it may be, is neither economy nor statesmanship; a fact which all men will come to discern by and bye.

WHAT NOW GOVERNS THE PRICE OF COTTON?

THE price of cotton during the last few years would appear to have been governed not so much by the demand for fabrics as by the anxiety of spinners and manufacturers to keep working. The manufacturing power of Lancashire exceeds the supply of the raw material. The spindle power of England in 1860 was equal to the manufacture of 51,420 bales a week. In 1869 it had risen to 54,153 bales. The total consuming power of the world which in 1860 was 102,676 bales per week, had risen in 1869 to 109,639 bales, while the supply had fallen from 113,814 bales per week to 96,384. The spindle power is thus capable of working up nearly 110,000 bales of cotton per week; while the total estimated supply for the present year is but 96,000 bales. In these circumstances, the competition of the mills has kept the price of the staple higher than the rate which consumers are willing to pay for the manufactured fabric. No one likes to close his mill. Manufacturers will work at a loss rather than do that; and men with small capital or old machinery are thus ruined. The Vice-President of the Liverpool Chamber in a paper lately read by him before the British Association assembled in that city, has brought the fact out very clearly. We are indebted to this gentlemen for the following figures:

Consumptive power of the Mills—per week.

	1860		1870	
England	51,426	Bales	54,152	Bales.
Continent	34,500		37,584	
America	16,752	,,	18,096	,,
	102,678	Bales	109,833	Bales.

Total supply, per week.

	1860		1870	
From all quarters ...	113,814	Bales	96,384	Bales

These figures reveal at a glance the real position of affairs. Manufacturing enterprise has been persevered in, in the face of an inadequate supply of the raw material. The result is that even the newest and most improved machinery can be worked only at a loss, while old and inferior works are making heavy sacrifices to avoid closing altogether. A common agreement amongst manufacturers to work short time would seem to be the natural remedy for the evil, but we suppose such a combination is impossible. In these circumstances we can easily understand the anxiety of Lancashire to obtain larger supplies of cotton. The manufacturing power of the world requires 18,000 bales a week more than it now gets (700,000 bales a year) of which England alone requires nearly 8,000 bales. Let the American supply but rise from 3,250,000 bales—the estimate for the present year—to 4,000,000 and the mills will all be working full power; and cotton will fall to its right value as compared with the manufactured fabric. What that value will be, it is very difficult to say. Our conviction is that Indian cotton will be a safe speculation for some time to come, whenever it can be laid down in Liverpool at 7d. per lb. That limit has been the highest *safe* one since 1866. Indian Cotton laid down at higher rates than 7d. we have always believed to be a very risky speculation since that year.

Mr. Forwood tells us that "there is a general feeling in Liverpool that values must return to the low level of prices that were current prior to 1861" Perhaps they eventually will; but it is unreasonable to expect that they should do so, until the supply of the raw material as much exceeds the manufacturing power of the mills, as it did at that period. In 1860 the supply was 11,000 bales a week in excess of the manufacturing power of the world. To-day, it is 13,000 bales a week below it Now, nothing is more certain than that with the faintest return of manufacturing prosperity, the spinning power of the trade will be greatly augmented. We start with a lee-way to make up of 24,000 bales a week, while the increase of looms and spindles that will take place as the supply gains upon the manufacturing power, makes the period of their equilibrium indefinitely remote. We believe therefore that 7d. per lb. for Fair Dholera in the Liverpool market, will for many years to come be the ruling average price; and that the present supply of cotton must be increased by 30,000 to 40,000 bales per week—1,500,000 to 2,000,000 bales a year—before the return looked for in Liverpool to the level of the low prices prevailing there prior to 1861.

SALT.—No. I

AN IMPORTANT ECONOMIC SUGGESTION.

A MADRAS paper tells us that English salt is about to be imported regularly into that Presidency, and that the first cargo is expected to arrive there about the end of the present month. The import duty on the salt will be the usual Rs. 1-13 per maund. The Madras agents (Messrs. Garland & Co.) will warehouse the supply, above three hundred tons, in bond on its arrival, and remove supplies as they require them for sale. Duty will be paid to the Government quarterly, and Madras now expects to be in possession of the best description of salt to be obtained. The supplies sold in Madras at times, are declared to be of the worst quality, and if the price of the imported salt is reasonable, there is no doubt, we are told, of its meeting a ready sale

We direct attention to this notice, not from any novelty in the fact of Cheshire salt being imported into India, English salt having driven the native manufacture out of the market in these Provinces altogether; but from a doubt whether the importation of such salt would be possible, were the native manufacture conducted in a more enlightened and scientific way. Does it not, upon the face of it, seem absurd that with salt water all round us, and in a climate where evaporation takes place with extraordinary rapidity, that a nation distant from us half the surface of the globe, and in a latitude where evaporation in the open air is hopeless, should be able to compete with us at our own doors, for the supply of salt? Every pound of Cheshire salt is made from a saturated solution of brine, evaporated by artificial heat. The rock is loosened much in the same way as coal, by blasting and pick, and is then dissolved in water pumped into large cisterns where it is completely saturated with the salt. The brine is then passed into evaporating pans, large flat open vessels, with flues underneath. After manufacture in this costly way, the salt has to be conveyed to Liverpool, and then to make a journey of 12,000 or 13,000 miles to reach the Indian market. Now, is it not, upon the face of it, we say, preposterous that with salt water all round us, and a tropical climate in which evaporation in the open air takes place at the rate of half an inch a day, that salt manufactured in this costly way, at the distance of half

the globe from us, should completely beat us out of our own market? It is now many years, since Sir Arthur Cotton called attention to this subject in the following terms :—

"The native mode of manufacturing is open to the same objections as their other operations, viz. that of carrying it on upon too confined a scale, and without capital. They think it impossible to manufacture it, excepting in the very lowest lands, on account of the expense of conveying and raising the sea-water, and consequently they incur many far greater expenses, especially as they are always liable to have the whole harvest destroyed by floods. The following calculations will show in what enormous quantities salt may be manufactured, of the purest quality, and at the most trifling cost. Sea-water contains three per cent. of salt; or a cubic yard weighing 1,700 lbs yields 50 lbs. Fully saturated brine contains 30 per cent. or 500 lbs. in the cubic yard. A square mile of plain is equal to three million square yards, and consequently a square mile of area, one yard deep, will yield nearly 70,000 tons of salt, or we may allow 60,000. The evaporation in the Carnatic, during the months of March, April, and May, is nearly half an inch a day on an average, and probably in extensive and very shallow reservoirs it would be quite that. We may safely reckon therefore that a yard depth will be evaporated in less than three months If, therefore, a convenient plain, a mile square, from five to ten feet above the sea, were chosen, and enclosed by a bank a foot or two feet high, and if, adjoining to that, a second area were enclosed, of about one-tenth its extent, or 550 yards square, the sea-water might be raised into the first in such quantities as to keep it always near the point of saturation As fast as it reached that point it would be made to flow off into the smaller area, where it would be allowed to evaporate entirely, so that when the amount of evaporation amounted to one yard in depth, there would be 500 lbs. of salt on every square yard of ground. Care should be taken to obtain the water in the first instance as clear as possible, and while standing in the first reservoir it would deposit every remaining particle of silt, and flow off into the smaller one in a state of great purity

"The total quantity of water that must be raised to give this quantity of 60,000 tons of salt, would be three millions of cubic yards, or 5,000 million of pounds; and as a two horse-power engine will raise at least three million pounds one foot high per hour, it would only require one horse-power for 1,700 hours, or 140 days, to raise the whole quantity one foot, or 700 days to raise it five feet; or eight horse-power to do the same work in three months. The cost of working an eight horse engine in such situations would be about 400 rupees a month, allowing 20 per cent. for interest, and wear and tear, and charging the year's interest to the three months. This would give 1,200 rupees for the cost of raising to the height of five feet, water sufficient to yield 60,000 tons of salt, at a cost of 50 tons for a rupee, or four pies per ton If bullock power be used, we may take it at 800 cubic yards raised five feet for a rupee, or 4,000 rupees for 60,000 tons of salt, equal to about one anna per ton. This will show that the cost of raising the water is an insignificant item

"Again: to lead the water to a convenient place would be a very trifling expense To cut a channel one yard wide at the bottom, and two yards deep, would cost about 300 rupees a mile; so that if it even had to be cut several miles, and were used but one year, it would only amount to one or two pice a ton on a manufacture of that extent. The expenses of collecting, also, from a surface of something more than a quarter of a mile square, would be equally trifling If the site chosen for the manufacture were thus a few feet above the level of tide-water, it would not be liable to be submerged, and the only evil arising from untimely rains would be, that two or three inches of water would fall in the reservoirs, which would take a few days longer to evaporate There are vast plains suitable for such works along the coast. In Tanjore, especially near Port Calymere, there is a plain containing perhaps 50 square miles in which salt could be manufactured on a magnificent scale, and probably at three or four annas a ton. That tract also has the advantage of water from the Bay of Tondi, where, from its sheltered position, it is as clear as crystal. And the coast there is also peculiarly favourable for shipping the salt, as there is smooth water, and consequently no surf. The coast canal, when completed, will materially facilitate the manufacture also, because almost any point on the whole extent of coast may be taken, wherever the circumstances are most favourable, when the salt can be conveyed to any other point, at the rate of about a rupee a ton for 400 miles. The idea of Cheshire competing with India for this trade is most absurd, unless some advantage, direct or indirect, be granted to the former."

Has Government ever had its attention seriously directed to the subject? In particular has the Madras Government ever considered it? If it is really possible to manufacture salt for ourselves in the way Sir Arthur Cotton thus pointed out so many years ago, how strange is the apathy which takes no account of the fact, in a country so poor as this, where it is of so much importance that its resources should be nursed with the utmost care, and developed with the utmost skill. If we can supply ourselves with pure salt at 2s. or 3s. a ton, while Cheshire costs us 15s. or 20s. or more—we have at once a great annual saving at our command for public works. Salt is still made in enormous quantities in Western India by evaporating the water in shallow mud baths along the shore. Is there no private enterprise in Bombay equal to such an experiment as Colonel Cotton suggests? Success means a fortune for the pioneers engaged in it, while a new branch of industry for the country means a nett gain thereto of probably £1,000,000 sterling a year.

SALT No. II

Our Natural Supply.

(By Mr. Dalzell, 8th January, 1868.)

There exist in Sind immense natural deposits of the purest Salt, accessible by water, and according to the late Captain Burke of the Bombay Engineers, who surveyed them many years ago, capable, "of supplying the whole world with Salt for a hundred years."!

When Collector of Customs at Kurrachee I proposed to the Government of Bengal to send a few ship loads of Sind Salt to Calcutta on Government account; my offer was accepted, but instead of allowing me to engage ships at Kurrachee as opportunity offered, I was at once informed that three ships had been chartered at Calcutta to proceed thence to Kurrachee to load. These vessels, two of them above 1,000 tons each, I loaded within three weeks, the Salt being brought in native boats from Seergunda, after the arrival of the vessels, distant 150 miles from Kurrachee. The Salt cost, put on board, including all charges of digging out and transport by camels, &c., 2½ annas a maund or Rs. 4-6-0 a ton. The price realised in Calcutta was I believe Rs. 70 or 75 a 100 maunds, or about Rs. 20 a ton. Had I been permitted to charter the vessels at Kurrachee as opportunities offered Government would have gained by the adventure; as it was, I fear there was a loss.

These Natural Salt deposits in Sind lie about 50 miles up the Seergunda creek, the most eastern arm of the Indus, up which boats of 50 tons burthen can at all times ascend; were a tramway of 4 or 5 miles laid down from the creek to the more distant deposits, this Salt might be imported into Bombay at the same rate at which I imported it into Kurrachee; viz. 2½ annas a maund, or Rs. 4-6-0 a ton.

Why this great natural and inexhaustible source of supply, of the purest description of Salt, only 400 miles distant from Bombay should not be utilised, in preference to manufacturing an impure and inferior Salt, at a heavy cost to Government, as I have endeavoured to show, is indeed remarkable.

The price paid at the Bombay works for a maund of Salt containing, from 7 to 10 per cent. impurity, of dirt in fact, is 2 annas, that is, 5 pice for the Salt, and three pice ground rent, both of which fall upon the purchaser. Adopting the higher rate of impurity, 10 per cent., which I believe to be correct, the price per maund of manufactured Salt comes to 5 annas and 3 pies while pure Sind Salt which often sells in Calcutta at from 10 to 12 annas a maund, might be laid down in Bombay at 2½ annas, or say 3 annas a maund, that is, Rs. 5 and 3 pies a ton.

Let us see what would be the probable gain to Government by importing Sind Salt instead of manufacturing it.

In 1866-67 the quantity of Salt sold in this Division (Northern) paying full duty, was 7,01,495 maunds. Ten per cent. of this quantity at which I have estimated the loss to Government by theft and peculation, gives 70,145 maunds which at Rs. 1-8-0 a maund, the duty, is equivalent to Rs. 1,05,217; add cost of establishments Rs. 1,35,599, and we have a sum of Rs. 2,36,816 as the cost to Government of producing 7,01,495 maunds of Salt; this gives a rate of 5 annas 5 pies a maund, equivalent to nearly 23 per cent. of the revenue, and about double the cost at which Government might import Sind Salt on its own account, saving the difference.

Applying the above estimate of cost, viz. 5 annas and 5 pies, to the total quantity of manufactured salt sold throughout the Presidency, which in 1865-66 amounted to 49,04,618 maunds,

the result shows an annual loss to Government of no less than nearly 17 lakhs.

Calcutta has shown wisdom in her Salt arrangements. She repudiates local manufacture as costly, and encourages foreign importations. From Bombay she receives on an average four lakhs of maunds annually, which, at the above cost of 5 annas and 5 pies a maund, amounts to upwards of a lakh and a half of Rupees, which the Bombay Government has to pay. Calcutta takes the kernel, the full duty, and leaves the shell to her less fortunate sister.

But why any sacrifice on the part of Government, while natural Salt of the purest description is available at our very door without cost! why incur expense in manufacturing an impure and inferior article? The exports from Bombay to Calcutta, simply involve a large expenditure, uncompensated by any return. Manufacturing Salt for export is a dead loss to Government. Let Calcutta find her supplies in the natural and inexhaustible produce of the country. Sind Salt is highly esteemed in Calcutta, and would no doubt soon find equal favour in Bombay.

Were Government to erect in Bombay capacious and convenient storehouses for Salt, as has been done in Calcutta, they would be soon filled with imported Salt, the duty being levied on its removal from store. That foreign Salt has not been hitherto imported into Bombay, may be attributed to the want of accommodation for storing it, as well as to the fact of the population having had no opportunity of imbibing a taste for pure salt. Give them the opportunity, and a preference would soon be manifested for it, as in Calcutta.

Sind Salt has other advantages than purity over manufactured Salt, being in large crystals, less deliquescent, and therefore less liable to waste, and better capable of bearing transport without loss, than the manufactured Salt of small grain.

PUBLIC WORKS.

(By Sir Arthur Cotton, 1851)

"The essential fundamental principles that, in my opinion should be kept in view in the matter of public works for India are,—

1st. That on no account whatever should any money be spent upon them which is taken from the current revenue; it being contrary to every principle of reason and justice, to make the present generation pay the principal for works of which they have only a life use.

2nd. That the account of all expenditure on public works should be kept entirely distinct from the general revenue accounts of the country.

"Till these two principles are acknowledged and acted upon I can see no hope for India. The current revenue never can produce the public works, and nothing but the public works can produce increase of revenue. But how wonderful it seems, to have to put such things as this on paper. Is there a man in England, that does not know that if they had waited *there* till the revenue had provided money for the public works, they would have waited till now? Out of the hundreds of millions that have been expended on roads, canals, and railroads; on lighting, and paving, and sewers; on docks and harbours; on lighthouses, and on a hundred other things, what per centage has been paid by the generation who executed them? Is not ninety-nine hundredths of all the capital expended on those works, a debt to this day? And is it a burthen to the country? It is a burthen which adds 50 lbs., to the weight the country carriers and 5,000 lbs., to its strength. It is like the load that a traveller carries away when he stops at an inn, and eats a pound or two of dinner; it does not hinder him much I think from carrying any other burthen he may have. In fact John's public works enable him to carry a national debt which would break the back of any one of his friends on the continent who have not got so much in their stomach. Ask Tanjore how she would like the bargain to be obliged to carry her own debt for public works, together with their profit, and to pay four per cent., on the 20 lacs a year of additional revenue they have produced, and see if she would account it laying an additional burthen upon her. Call upon Rajahmundry to pay only her old revenue, but at the same time to pay the interest of the cost of her works. What can be the reason that principles which no man ever dreams of applying to England should be applied to India by all sorts of people."

"For the second of the above two principles, as long as the salary of the Governor-General and the cost of a bridge or a canal are added together, what can there be but utter confusion? How can any body tell what they are doing, while such absurdities are committed! A bridge or a canal is just as much *bonâ fide* property as the rupees that paid for it; indeed more so; for the latter, while they are hoarded (as at present such millions are in the treasuries), are of no use to any living being. Imagine a man saying: "I was very rich once, I had "10,000*l.* in a box in my house, but now I am a begger; I spent "it all on this estate which yields me 1,000*l.* a year." The Governor-General's salary is money paid for advantages already consumed, and which yield no permanent income to the State; at least the same sum must continue to be paid every year. To treat the public works executed by Government as no longer property, because not in the form of rupees, is preposterous

There should be a Department of Public Works, which should keep a complete and distinct set of accounts of its own. Everything spent by it should be divided under two heads. (1.) Current expenditure on superintendence and necessary repairs; and this should be afterwards entered in the general accounts of the State as part of its current expenditure; and new works including improvements. (2) A dead stock account should be kept to balance against capital sunk, and means should be taken to obtain a tolerable estimate of the actual total returns of all new works, so far as they could be ascertained and stated. And if, at the end of five years, it appeared from those accounts that 20 millions had been spent, and that there were 20 millions worth of public works on hand, yielding in various ways, upon a reasonable estimate, 10 millions a year, we must not conclude that we were 20 millions poorer than we were, and weary ourselves to discover a way how we could get rid of this 20 millions of debt, but comfort ourselves with the thought that we were paying with one hand 800,000*l.* a year, and receiving with the other 10 millions I am afraid people will say: "We don't require a book to tell us such things as these; they are not discoveries."

But what is to be done! These things which everybody knows, never appear either in the minds or deeds of the Government of India, and there seems no alternative but to bring them forward again and again. Against the debt, there is to be set something considerable even now, notwithstanding the general neglect of public works, in the shape of property yielding abundant returns. Perhaps in the Tanjore and Rajahmundry, and other new irrigation works in Madras, in the Madras western road, in the grand trunk road, in the north-west canals and other works, a dead stock account to the amount of two millions or more, might be made out All this is *bonâ fide* property, as much as the rupees that were spent on them, or rather much more. Perhaps on an average, these two millions yield two millions annual profit to the community, and if so, they are equal in value to 50 millions of rupees, or nearly equal to the whole Indian debt If these things are taken into consideration, as most undoubtedly they ought to be, they will give a totally new aspect to our views of Indian finance. But we shall in vain hope for earnest action in this matter, until we shake off a peculiar disease, which is apt to take a deadly hold of us old Indians. We are apt to dwell with intense interest upon trifles, and to betray symptoms of disquiet if questions on which the lives and interests of millions are obtruded upon us. A question arises, who is to be made to pay for a few panes of glass broken in a barrack? And, for the settlement of it, a special committee, the Military Board, the Chief Engineer, the Governor in Council, the Court of Directors, the Board of Control—are all put in motion, and a mountain of correspondence is the result, which costs five hundred times as much money as the repair of the broken panes, and time appreciable."

(Written and published nearly 20 years

EDITORIAL NOTES.

SEVERAL numbers of the *Indian Economist* being out of print, should any of our subscribers not care to file the journal, and be able to supply us with the following numbers, we shall be glad if they will return them to us taking credit in account for the same, at the rate of 2½ Rupees per number.

No. 1.—Half a dozen Copies wanted; and a dozen *Planters' Gazette*.
No. 4.—Dozen *Planters' Gazette* wanted.
No. 6.—The whole number required.
No. 9.— Do. do.
No. 10.—*Planter's Gazette* wanted.

THE *Statistical Reporter* which accompanies our present issue is a double number. We were anxious to bring under one view the Cotton Reports of last season [1869-70] *for all India*. The Bombay Report is accompanied with statistical tables shewing the course of its cotton trade during the last two years. We are indebted for these tables to Mr De Quadros (Ritchie Steuart and Co.) of Bombay. We have added to the Reports, extracts from an exceedingly valuable paper, concerning the present consumption of cotton, lately read before the British Association, by the Vice-President of the Liverpool Chamber of Commerce. The fasciculus of papers thus presented in the accompanying *Reporter*, will, we believe, prove valuable to persons interested in the Indian staple. We have struck off a few extra copies of the number, to supply any casual want that may be expressed for them.

THE prices realized at the last Opium Sales, 7th instant, were as follows :—

	Chests.	Highest.	Lowest.	Average.	Proceeds
Behar.....	2,150	1,210	1,200	1,204-0-8	25,88,825
Benares.....	1,850	1,160	1,145	1,153-7-9½	21,33,950

These rates are a slight improvement upon those of the previous month. The estimates for the year were based upon the expectation of Rs. 975 per chest only.

IT is now nearly twenty years, since Sir Arthur Cotton pointed out that Agra being only 500 feet above the level of the sea, we might connect it with Calcutta by a canal, which would give us perfect steam navigation with still water for eight months of the year, at a cost of not more than Rs. 7,500 a mile, in addition to 40 anicuts, or weirs, costing on the average about three lakhs each. Now, if this be a fact, if we really may connect Agra with Calcutta by a canal, capable of steam navigation for a million and a half, or £2,000,000 of money—how deadly is the sleep into which we are fallen. We do not say such a word *can* be constructed; but that *if* it can, and Government knows the fact, the deliberate shelving of it is simply insane. Has the reader any idea of what it means; of the wealth such a work would confer upon both Lower and Upper India? In a country like this, the whole export trade hangs upon the cost of bringing produce from the interior. High speed railways cannot do the work; only water communication can. Of what use is it, that rice may be selling at 30 seers per rupee in Cuttack, and at 10 in Agra, if it costs 20 seers per rupee to carry it from one place to the other?

A DISPUTE has arisen between the *Hindoo Patriot* and an English contemporary as to the ethics of international policy. "We suppose," says the latter, "it is a necessary consequence of "the spread of education that Bengalees should have ideas of "their own on foreign politics; and we could hardly expect a "people who have never yet possessed the status of a nation to "entertain just views upon questions of international policy. "The mistake into which they would be most likely to fall, "would be that of thinking that international ethics are "governed by the same rules as social ethics."

That international relations *ought* to be so governed, is a great truth which the world, however slow to receive, must learn, and will, we believe learn, before it is very many years older. Diplomacy,—or the art of lying,—belongs to the past, and will have to go to its own place, the limbo of all lies whether between men or nations, and the journalist merely does us a service whether he be Native or European who reminds us of the fact.

LORD MAYO'S address to the Chiefs and Princes of Rajpootana at the Durbar in Ajmere on the 22nd ultimo was, we think, exceptionally good. The right tone was hit upon. We make room for a passage or two :

"I, as the Representative of the Queen, have come here to tell you, as you have often been told before, that the desire of Her Majesty's Government is to secure to you, and to your successors, the full enjoyment of your ancient rights and the exercise of all lawful customs, and to assist you in upholding the dignity and maintaining the authority, which you and your fathers have for conturies exercised in this land.

"But in order to enable us fully to carry into effect this our fixed resolve, we must receive from you hearty and cordial assistance. If we respect your rights and privileges, you should also respect the rights and regard the privileges of those who are placed beneath your care. If we support you in your power, we expect in return good government. We demand that everywhere throughout the length and breadth of Rajpootana, justice and order should prevail, that every man's property should be secure; that the traveller should come and go in safety; that the cultivator should enjoy the fruits of his labor, and the trader the produce of his commerce; that you should make roads and undertake the construction of those works of irrigation which will improve the condition of the people, and swell the revenue of your states; that you should encourage education and provide for the relief of the sick.

There is the assertion of righteous power in these statements, and it will be felt throughout the country. The conscience of every man says Yea to this! What Lord Mayo demands in the name of the Queen and of the people, we must have. We trust the Viceroy will see every province of India before he quits office. Every word of an address of this nature will sink into the soil, and bear a harvest of good in the future.

THE Kurrachee Chamber of Commerce would do a service to the country if it would follow up the enquiry it began a year or two ago as to the trade carried on across the land frontiers of Sindh with Beloochistan, and by the Bolan Pass. The traffic from Central Asia, which paid transit dues at Quetta and crossed the British frontier at Jacobabad between May and December 1867, was as follows :

	Candahar, Herat, Cabool, & Bokhara *via Khelat.*	*via the Bolan Pass.*	Persia *via Mekran.*	Tul Chotiala *via Bagh.*
Camels	6,323	3,208	4,000 (about)	500 (about)
Asses	631	1,480		
Horses	400	317		
Ponies	.....	91		

The Traffic which crossed the Frontier at Jacobabad from Afghanistan and Central Asia from September 1867 to January 8th, 1868, was as follows :

Laden Camels.	*Laden Asses & Ponies.*	*Horses.*	*Duty.*
500	1826	300	8 annas
With wool, muncet, fruit, &c., each camel load is about lbs. 480.	With woollen apparel, raisins, fruit of sorts, Persian carpets, &c., &c., each load is about lbs. 220.	Some are bought up for the use of the Cavalry at Jacobabad, others proceed to Bombay and Madras.	per maund charged by the Khan of Khelat by Treaty.

Five annas are charged upon each horse. Horses in general go by the Khelat Road to Kurrachee.

OUR contemporaries seem to be unanimous in supporting the demand for a Royal Commission of Enquiry into Indian grievances; and they are right. A Parliamentary Committee is a mere device for indefinitely hanging up a disagreeable question. We confess, however, that we have very little hope of a Commission being granted, since its appointment would be understood to commit the Government to the support of its recommendations. If there is no hope of a Commission, then and only then, should the East India Association move for a Committee. It is necessary, however, to say a word of warning upon the subject of this agitation. That any Government will appoint a Commission to go over such a field of enquiry as is opened out by several of our contempararies is hopeless. The proposal is made in forgetfulness of what is possible. The grievance of the period is emphatically one of *Finance*; and to

this subject must the enquiry be narrowed. It is extensive enough in all conscience. To call for an enquiry into the thousand and one grievances told off in a string by some journals, would simply invite, and merit indeed, a snub.

THE average price of Wheat in England during the present century has been as follows :

		s.	d.	
1800 to 1815 (war)...		84	9	per quarter.
1816 to 1820 ...		78	4	,,
1821 to 1830 ..		58	3	,,
1831 to 1840 ...		57	0	,,
1841 to 1850 ...		56	0	,,
1851 to 1860		56	0	,,
1870	(October)	40 to 48		

The average prices of wheat in September throughout India were :

		s.	d.	
Bengal ...	... 14 seers ...	35	0	per quarter.
N. W. Provinces	... 19 ,, ...	25	6	,,
Oudh ...	... 19 ,, ...	25	6	,,
Punjab ...	.. 15½ ,, ...	31	0	,,
Central Provinces	... 14½ ,,	33	0	,,
Western India	.. 6½ lbs. attah (flour)			

The staple food in these Lower Provinces is rice, the average price of which calculated upon the returns of some 46 stations was about 20 seers the rupee last month. Food is thus dearer in Bengal this year than in any of the surrounding provinces.

THE following seem to be the normal rates at which food is selling in Western India :

Rice	14 to 16 lbs. per Rupee.
Bajeree ..	24 to 28
Jowaree..	32
Wheat	14 to 16
Gram	14
Muth	32
Oreed	24
Ghee	2 to 2½
Jagree	9 to 10
Sugar	5
Sweet Oil	5½

In any other part of India these would be famine rates of unbearable severity. Wheat at 15 lbs. per rupee is 64*s.* a quarter ; a high price even for our own land. The staple food of the poor is jowaree which is selling at 32 lbs. per rupee. It may help our readers to understand how vast a revolution has taken place in Western India of late years, if we point out the average prices of food therein 20 or 30 years ago :

Average Prices of Jowaree.

1837-41...	64 lbs. per Rupee.
1840-42...	72 ,, ,,
1846-49...	84 ,, ,,
1850-52...	60 ,, ,,

The lowest point of agricultural depression (low priced food in other food) was about the year 1847. From that time until now, the rise has been steady and continuous :

1850-52...	60 lbs. per Rupee.	
1856-58...	58 ,, ,,	
1862-63...	29 ,, ,,	(The height of the war.)
1870 ...	32 ,, ,,	

How immediate is the connection between the growth of exports, and the price of food receives a very striking illustration in the fact that the extension of the acreage under Cotton in the Southern Mahratta Country last season has run the price of attah (flour) there up from 32 lbs. to 8 lbs. the rupee :

	Under Cotton.	*Price of Attah.*
1868-69...	1,029,163 acres	32 lbs. per Rupee.
1869-70...	1,448,719 ,,	8 ,, ,,

The price at this moment is 8 lbs. per rupee. Manchester disavows all intention of distressing the people of India by its impatient demand for *more* cotton ; but we see very plainly in these figures what the inevitable result is of increasing our acreage under growth of exports. Communications with Dharwar, there may be said to be none ; and so the people starve, while the ryot grows rich upon his cotton produce. Government has been obliged, we see, to allow the native troops *batta* of 5 rupees per month in these districts ; but who is to find *batta* for the urban and labouring poor ? The distress must be very great amongst these classes.

CONDITION OF THE COUNTRY.

BENGAL.

Abstracts of Reports on Crop Prospects.

ORISSA DIVISION.

Cuttack.—The accounts from this district up to the 28th September were on the whole good, the weather had been favorable for ripening bealee crop which was then being reaped. The Deputy Collector of Jajepore does not now anticipate a greater average loss than 4 annas in his sub-division. The sarud or heavy rice is said to be thriving generally throughout the district ; in Kuinka, Aul, and those parts bumper crops may be expected, and with late rain the harvest ought to be a fair one. Locusts or a large species of grasshopper have been destructive in places, and their presence is reported in all parts of Cuttack. On the 5th instant, the Collector reported, "No change in the condition of the crops, all reports being favorable, the damage done by locusts was partial."

The Commissioner is of opinion, that the low lands are all safe, the yield on intermediate lands where irrigation water is not available, will very materially depend on the rain-fall during the current month.

Pooree.—The general average is not so good as in Cuttack, but with continued rain there will be a fair average crop. It is expected that the out-turn of the several thannas named below will be as specified opposite each :

Koorloo	8 as. crop.
Kodar	10 ,,
Domarkhund	13 ,,
Rohong	10 ,,
Satparrah	11 ,,
Chowhuscood	11 ,,
Manikpatam	10 ,,

In Banchap, Outhrode and Atthois, transplanting and weeding are still going on, and in Oldhar cultivation is progressing. Locusts are also destructive in certain parts of Poorce. The latest accounts from Khoordah are up to the 22nd September, and to the following effect. In Neez, Khoordah and Punchghur the original estimate was ½ crop, but good rain has since fallen and lands that were late in being weeded and from which nothing was expected are now improving. From those lands which got rain early and were weeded in time a full crop is expected, and from those weeded later an 8 annas crop ; the general average will be about 12 annas if rain falls in the end of October. Some villages in Khoorda must sustain considerable loss, which may be diminished but not prevented by exceptionably late rain.

Balasore.—With the exception of a little damage caused by locusts, everything has gone well, the rain has been sufficiently abundant and in some places heavy ; the bealee has been reaped and the sarud prospects continue to be good. The Commissioner, judging from reports and other sources is of opinion that this district may be relied on as generally safe. In all the districts of this division the present prospects may be materially affected by absence of rain during this month. A heavy shower fell in Cuttack on the 4th instant, and the weather generally during the 10 preceding days was not unfavorable for the growing rice crops, and particularly favorable for the bealee harvest, and for rubbee cultivation.

BURDWAN DIVISION.

The accounts from the several districts of this division on the prospects of the rice harvest are not so promising as could be desired.

Midnapore.—Up to the 11th instant, complaints of scarcity of rain were heard more or less from every part of this district. It is apprehended that the crops will suffer seriously if it does not rain within a week or so ; as yet, however, the crops look healthy.

Bancoorah—On the 4th instant, the Collector wrote "that the unseasonable want of rain has considerably modified the favorable prospects which had hitherto existed. Fears are now entertained that if rain does not fall copiously within the next ten days, the out-turn will be reduced perhaps by as much as one-half. This is more especially the case in the Suddur and Boodbood divisions. In Gurbetta, rain has fallen."

Beerbhoom.—Complaints are received from the district of the want of rain ; from which if it continues the crops will suffer.

Hooghly.—The aous crop has been cut and gathered in Serampore and Jehanabad. In the latter sub-division it is considered a 12 annas crop. Up to the 30th September the aous crop has been gathered in two of the Thannahs of the Suddur subdivision. The winter crop is reported as doing well.

BHAUGULPORE DIVISION.

Bhaugulpore.—Mudhepoora sub-division Pertabgunge district. Bhadai excellent full crop. Aghui rice and other crop are only expected to be about an 1 anna crop. Should fall there will be a much better crop.

Bongong—Bhadai crop is only a 7 or 8 annas crop. Aghui is decidedly good.

Kisengunge.—Crops ruined where inundated by the Koooy river, elsewhere very good.

Bankal Cawnpore.—Bhadai about annas, Aghui very good.

Kutharah—14 annas crop expected.

Lokenampore.—Almost the entire Bhadai crop has been lost, a common occurrence in this part. No rice is grown to speak of Other crops are being now sown.

Colgong.—A 3/8th Bhadai crop is anticipated, but the Aghui crops are splendid.

The Collector thinks the out-turn has been underated rather than overated.

PATNA DIVISION

Tirhoot.—The recent floods in Mudhoobunny have caused no danger worth mentioning, and agricultural prospects generally have improved. The Bhadai crops along the Kumla valley in Durhunga have suffered considerably from inundations, but even there, there is a good rubbee crop almost certain from the thorough moisture of the ground. Everywhere throughout this estate a very prosperous harvest is anticipated, in many places better than there has been for years—rich rice crops are promised, and no distress apprehended.

The prices of rice and wheat prevailing in each district of the several divisions of the Lower Provinces of Bengal for the week ending the 15th instant are annexed

FEVER IN BURDWAN,

A correspondent of the *Daily Examiner* writes: The epidemic, which has for the last ten years been devastating some of the fairest places of Bengal, has made its second appearance in Burdwan and its vicinity. Numberless people are groaning under the fell disease—and men are dying by tens and hundreds. The suburbs of Burdwan, and especially places like Bhorchat, Jikorhat and Lacoodi are suffering more severely than those in the interior of the district. Most of the Europeans of the station including the public functionaries are not free from the malady—and the Magistrate has already been obliged to depart on sick leave. In the interior, fever is raging; at Kamarpara, near the Kanoo junction Station, also in Adra, Kythara, Bakta Mullickpore and other places on this side the Damooda, in the Sub Division Boodd-Bood. In the interior there is not a single Doctor to look after the sick and dying—and the native Kabirajes who especially use snake poison as medicine are hastening the work of death, the scene which some of those rural villages presents is heart-rending There is not a drop of medicine to be found in the interior.

ORISSA.

The serious fears entertained for the crops in Orissa, owing to the continued dry weather, have now been somewhat dispelled by the accounts lately received. These indicate a steady improvement crowned by the last, dated October 28th, which states that abundance of rain has fallen in Poorce, that price had lowered, and that the portion of the rice crop not actually destroyed would be saved. In the district of Khoordah the locusts had seriously added to the injury done by the drought, and the collector was of opinion that it would be advisable to import rice, although no serious want was apprehended.—*Pioneer.*

BURMAH.

The *Rangoon Times* has an article of a very hopeful kind on the state of the crops in Burmah. "On both sides of the Irrawaddy" it says, "the fields look truly beautiful. As far as the eye can reach on both sides the paddy plains stretch away in magnificent sheets of the richest verdure and the plants appear firm and strong and promise an abundant harvest." And so in many other cases throughout Burmah. We are very glad indeed to read so good an account of the one thing where human energy is at nought We may push over commerce to the Shan States and beyond them, but the harvest is beyond us, and these "sheets of verdure" will make all the difference between comfort and misery to thousands of people in Burmah.—*Pioneer.*

MADRAS.

Northern Section.—The rain-fall tolerably good in Ganjam, Vizagapatam, Kistna, and, Nellore, and in the two former districts was more plentiful than in the preceding month. In Godavery, however, the rain-fall was both scanty and partial.

Malabar.—Rain copious, steady, and seasonable in south Canara where the crops are in good condition. Harvesting commenced in Malabar. Prices stationary.

Southern Section.—The rain-fall scanty in Tinnevelly. In Madura more abundant, but unequally distributed.

Prices declined in Madura and remained stationary in Tinnevelly.

West Centre.—The rain-fall good on the Neilgherries and over the greater part of the Coimbatore and Salem Districts. Dry lands in Coimbatore, which had lain waste up to the preceding month, were brought under cultivation. The crops already sown, including garden products, were in good condition.

Ceded Districts.—The rain-fall general, and in parts of the Kurnool district excessively heavy.

MADRAS.

The rainfall throughout the Madras Presidency has this last season been very unequally distributed, judging from the official reports published in the Fort St. George *Gazette.* We read of overflowing tanks, bursting canals, swollen torrents, and tracts of land entirely under water in some parts; whereas in many other districts considerable damage appears to have been done to the crops by the extreme scarcity of rain. Upon the whole, however, the agricultural prospects seem fair; the paddy, indigo, and cotton crops being reported in a thriving condition. —*Pioneer,* 9 *Nov.*

COORG.

Wet Land.—September 1870.—Transplanting has been finished and the fields are on the whole looking well, except in some parts of the Yelusavirasime Talook where they have suffered for want of rain. The ryots are occupied in weeding, and nurseries are being formed for the Vysakha crops in the Nanjarajapatna talook. The fears regarding the rice crops, that were caused by the agricultural operations being delayed from the monsoon setting in so late, have been to a great extent removed by the rain keeping on beyond the usual time; there are still, however several places where the paddy is very backward.

Dry Land.—Reaping of the ragi crop has been commenced partially in the Nanjarajapatna talook. Kulthi or horse-gram, which was sown during the past month, is reported to be thriving.

Coffee.—The annual weeding of native coffee gardens has been taken in hand preparatory to gathering the berries. In the large plantations weeding, cleaning, &c., are still going on, and the prospects of the season are generally very good where the "borer" has not appeared.

Cardamoms.—Cardamoms are still being picked and the work is likely to be continued for some time. It has been hindered a little by some of the coolies from below the ghâts having run away, it its said, in consequence of a panic caused by a report that they were about to be pressed for service in the European war. The crop is expected to be much better than that of last year.

LOSS OF THE INDIGO CROP—JOUNPORE,

A correspondent, writing from Jounpore informs us that the indigo planters complain of another bad season. "Factories," we are told, "that in a good year turn out from 90 to 70 maunds from their new sowings, have only made 6 and 7 maunds.—*Pioneer,* 9 *Nov.*

UNSEASONABLE RAIN IN OUDH

The unseasonable rain experienced in parts of Oudh has, it is said, done considerable damage. The seed sown will of course have been washed away, but the Financial Commissioner is of opinion that, it is even now hardly too late to re-sow where this has happened. In those parts of the province, where the rain was not unusually heavy, reports speak favourably of the rubbee prospects.—*Id.*

DROUGHT IN MARWAR AGAIN.

Although the accounts of a favourable monsoon, and its almost necessary consequence, a good harvest, are very general, there are yet localities not participating in these blessings. As is often the case during recent years, in the tracts about to be named, the monsoon has been a failure, and the people again speak of the season as one of *khal,* or famine. We allude to the extensive range of country comprising Mullanne, Marwar, and the regions bordering on the desert about Ketree and Shekawutty. In a more southerly direction, the Serohee principality, but to a lesser extent, has again suffered from want of rain. And in the north, had it not been for late and local showers, the British Provinces of Ajmere and Mhairwarrah must have been a second time famine-stricken. We are credibly informed that some 300 persons have been daily passing as emigrants from Marwar *via* Pallee towards Meywar and Malwa. Others take a southerly direction, towards Guzerat, and not a few pass westerly to the Scinde frontier. But in contrast to what occurred in 1868, those now leaving the famine-stricken tract are generally persons in good, or at least not pauperised, circumstances. The latter class have indeed all, or nearly all, *disappeared* long since.—*Times of India in October.*

THE FAMINE TRACT.

It is not long since we informed our readers of the general aspect of affairs in Marwar and Mhairwarra, but now a second wail seems to us to come up from these two (what under existing circumstances can only be termed) unfortunate districts. We learn that by far the greater portion of the *khureef* crop, sown under such auspicious circumstances by the ryots, has failed owing to want of rain, and another famine may therefore be said to have commenced. Our Jodhpore correspondent also makes mention of this in his letter published in our issue of the 29th ultimo. On the night of the 4th instant a very slight shower passed over the Beawur commencing about 11½ P. M. and lasting but half an hour; this rain is in no way beneficial to the ryots now, as their crops with some few exceptions are all dry. In Marwar the people are deserting their villages, and

crowds of men, women and children, may be seen almost daily on their way to Malwa. As Lord Mayo will shortly visit these districts, it is certainly to be hoped that he will take minute observations of all around him and be thereby able to judge of the dreadful ordeal, in the late three years' famine, these districts have already passed through, and (if rain does not fall very shortly so as to save the rubbee sowings) may probably have to go through again.—*Pioneer.*

It is both a bad grain and a bad grass year throughout the whole of Western Rajpootana. Neither men, horses nor elephants, can exist without a due supply of necessaries. And doubtless through the exertions of the local authorities sufficient stores will be gathered together. But by what means, is quite another matter. We are quite sure from what we know and hear of the locality, that the material necessary to feed the hosts of men and animals, even for one day, is not obtainable at a less sacrifice than denuding the districts of the required articles. There are no large holders of grass, grain or other supplies, in the neighbourhood. These essentials must be painfully collected from distant parts, and must be sold altogether unwillingly by the owners. For the sale at this time of scarcity, means want and distress to the sellers. Rupees are useless to men unable to procure grain or for cattle dying from want of grass. It is of course very right and proper for the Viceroy to visit Rajpootana, and especially the British possessions situated in the centre of that Province. It is perhaps as well that he should see for himself the barren nakedness of the land.—*Id.*

The latest accounts from Darjeeling continue to send us bad reports of the cattle disease in the hills. As yet there appear to be no symptoms of improvement, and considerable anxiety is caused about the carriage of the tea crop to the plains. Numbers of bullocks working on the road have, we are told, already died, and others brought to replace them have in many instances been immediately stricken by the plague. The tea will therefore reach Calcutta unusually later. In the plains applications used to have, in the majority of cases, been made with success, but every remedy has hitherto been ineffectual in the hills. The *pest* in the neighbourhood of Darjeeling is apparently of more virulent type, and will have to be treated accordingly.—*Bengal Paper.*

TEA PROSPECTS.

It may be a matter of regret, but cannot be one of surprise, to learn that scarcely a single estate in either Sylhet or Cachar will realise the quantity of tea estimated at the beginning of the season, now drawing to a close; and already many who predicted the downfall of the tea enterprise during the disastrous year of 1866 are again giving vent to their gloomy prophecies. Very little reflection, however, will show them that although it is now impossible to remedy the evils that have caused the short out-turn of the present year, science supplies means of guarding against such heavy losses in the future - losses such as no concern, whether the property of a public company or private individual, can afford to have repeated.

Tea cultivation, judiciously conducted, is as profitable as any other agricultural investment in India, though returns from it will be considerably curtailed if future manufacturing seasons are to consist of six instead of nine month In ordinary years plucking commences toward the 15th of February, and continue till the middle of November, though many planters manufacture as long as a leaf is to be had. But this season cannot be said to have really commenced before latter end of May, at which time few factories had produced one-third of the quantity of tea turned out up to the corresponding date of the previous year—a state of affairs caused solely by the want of rain. No steps appear to have been taken to supply the deficiency. The panters simply waited and waited, watching hopefully, but helplessly, for the usual showers.

The such an extraordinary dry season had never before occurred, is true; but it is by no means certain that it will not occur again. It is just possible that the tea districts are only now commencing to feel the effects of the extensive clearances of the forest jungle. That these clearances have existed for several years, may be brought forward by some as an argument to refute this theory, but atmospheric changes are seldom sudden and take years to develop themselves. Assuming this to be the case, it would be better for the well being of every plantation that all factories should be supplied with the means of artificially supplying the requisite amount of water, as soon as signs of drought become apparent. A gentleman practically acquainted with the subject states that portable hand engines, in every way admirably adapted for the purpose of irrigating tea gardens, whether laid out on teelahs or flat land, can be had of a Calcutta firm doing a large business as ironmongers. From a careful calculation made at the time, our informant came to the conclusion that one of these machines for every fifty acres would be quite sufficient for most plantation, though more powerful ones would be necessary for those concerns that possess large blocks of plantings not in the immediate vicinity of water. Such as are thus situated would do well to turn their attention to Norton's patent tube-wells, which may be easily sunk in central spots in gardens.

However novel the idea of irrigation may be in Cachar, it has been practised for years in the North-Western Provinces and the Punjab, with the most satisfactorily results. The cost of the engines would be about Rs. 240 landed on any factory in Cachar, but this is the Calcutta price, and there is emple time to import them direct from Europe, long before they are likely to be riquired, in which case the expense would be considerably less. With four men workin the handles, and one guiding the delivery hose, eigh acres could be thoroughly saturated per diem; and althogh water thus distributed may not have all the fertilising effects of natural rain, it would at least produce suffibient quantities of leaf to cover the original value of the engine ten times over, to say nothing of providing employment for a large manufacturing staff, that would otherwise remain comparatively idle for three months. | For, after the pruning is finished, there is nothing for the tea-house hands to do till the leaf comes, in and imported labourers must be provided with work when they present themselves at muster, whether remunerative employment is vailable or not. There are few skulkers, we believe, on a tea plantation during fine dry weather whatever there may be in wet. This subject of irrigation for tea property is of vital importance to all owners, and should at once be taken into serious consideration; in fact the loss of three months' produce in many instances may make all the difference between bankruptcy and ?lvency.—*Englishman.*

THE BENGALEE PEASANT.

The saddest sight probably to be seen in our Eastern empire is the Bengalee peasant. Planted on a soil of marvellous fertility —returning, under the rudest husbandry, three crops a year — he lives in a condition of chronic destitution and complete ignorance. He cultivates as a tenant some four or five acres of land. His capital consists of a thatched hut, which generally includes a domicile for his oxen. Of these he has a pair, sometimes two, and the value of his agricultural instruments amounts on the average to four rupees six annas. He lives generally, on coarse rice—fish (a mere drug in Bengal) is a rare luxury. His dress is a coarse bit of rag and a scanty sheet. As a rule, he has no money whatever; but in some villages the phenomenon may be seen of a ryot possessing one and even two rupees. When thus wealthy, he does business among his neighbours as a money-lender. To render his destitution complete, the ryot marries early. They never have any hesitation in doing this, regarding it in truth as essential to everlasting salvation. During the crisis of the famine, marriages were stayed for a brief period, but, writes a magistrate, "when the people got a little relief, just as much as would enable them to catch their breath, they broke out again into marriage in a curious way."

The Bengalee peasant is also bestridden by an old man of the sea, in the guise of the mahajun. The cultivation of the province, the very life of the peasant, is dependent upon this functionary. The mahajun advances either money or grain, principally the last. Grain advanced for seed is re-payable at harvest time, bearing one hundred per cent. interest; grain advanced for food carries only fifty per cent. interest, and is supposed to be repaid when the first crop is ripe. This is a tolerable heavy millstone to wear round one's neck habitually, but does not by any means represent the full weight of the pressure which crushes the Bengalee cultivator to the earth. The Permanent Settlement, as we all know, converted certain hereditary collectors of revenue into a landed aristocracy. It did them no good however. The terrible punctuality of the British Government in demanding revenue, speedily lodged the landed gentry in the various jails, and bit by bit their estates passed into the hands of astute speculators, mostly resident in Calcutta. The later effect of the settlement, however, was a wonderful extension of cultivation; tracts of lands which had become waste from the anarchy and disorder of the times, were gradually recovered; and population and cultivation penetrated into the Soonderbuns, which is composed of the alluvial deposits at the mouths of the Ganges. But the consequent rise of rents has not reached those who are under direct revenue engagements with the Government. The zemindar, to quote a passage from a minute of the Lieutenant-Governor, "has created perpetual tenures at fixed rents, which effectually deprive him of all further participation in any increase of profits from the estate. Nor does the alienation of profits end here. The holder of the tenure of the first degree has generally in the same way created subordinate tenures of the second degree; and the holders of the tenure of the second degree have created tenures of the third degree. The effect of every such transaction is to secure in perpetuity to the lessor of each degree a certain profit after deducting the rent which he has bound himself to pay in perpetuity for his tenure; and while freeing him from all risks and uncertainties, to debar him from all participation in future increase of profits." And, may we not add, that so long as this practice continues, there is absolutely no hope for the Bengalee peasant? The inevitable increase of population causes cultivation to extend, but can never leave to the cultivator more than the

bare means of subsistence; every thing beyond that being swallowed up by a repetition of the process of sub-letting. Perhaps all this is inevitable, and even right and proper according to the inexorable laws of Political Economy. The distress and complication certainly appear to us to have reached that point that nothing short of a second deluge, which swept away zemindars and peasants in one mass, could enable us to relieve the one or unravel the other. Not the less is there, to our minds, something unspeakably painful in the spectacle of these patient, silent millions, toiling on day after day, enduring cold, heat, nakedness and hunger, with no hope before them but that of death. This is certainly a case, if ever there was one, where Novalis' famous alternative of the universal act of suicide might be almost deemed justifiable.—*Pioneer.*

THE BENGAL SETTLEMENT.

The exact position of the zemindar will best be understood by a careful perusal of the precise terms of the Legislative enactment, which have made him what he is. We reproduce the particular provisions of Regulation 1. of 1793, which will serve to illustrate the foregoing remarks :—

"Section VII. Art. VI. * To discharge the revenues at the stipulated periods without delay or evasion, *and to conduct themselves with good faith and moderation towards their dependent talookdars and ryots*, are duties at all times indispensibly required from the proprietors of land; and a strict observance of those duties is now more than ever incumbent upon them, in return for the benefits which they will themselves derive from the orders now issued. The Governor General in Council, therefore, expects that the proprietors of land will not only act in this manner themselves towards their dependent talookdars and ryots, but also enjoin the strictest adherence to the same principles in the persons whom they may appoint to collect the rents from them.

"Section VIII., Art. VII.—To prevent any misconstruction of the foregoing articles, the Governor-General in Council thinks it necessary to make the following declarations to the zemindars, independent talookdars, and other actual proprietors of land :—

"*First.*—It being the duty of the ruling power to protect all classes of people, and more particularly those who, from their situation, are most helpless, *the Governor General in Council will, whenever he may deem it proper, enact such regulations as he may think necessary for the protection and welfare of the dependent talookdars, ryots and other cultivators of the soil; and no zemindars, independent talookdar or other actual proprietor of land, shall be entitled on this account to make any objection to the discharge of the fixed assessment which they have respectively agreed to pay.*

Second.—The Governor General in Council having, on the 28th June 1790, directed the *sayer* collections to be abolished, a full compensation was granted to proprietors of land for the loss of revenue—the word ought to be *rent*—sustained by them in consequence of this abolition; and he now declares that if he should hereafter think it proper to re-establish the sayer collections, or any other internal duties, and to appoint officers on the part of Government to collect them, no proprietor of land will be admitted to any participation thereof (therein ?). or be entitled to make any claim for remission of assessment on that account."

Now, to most persons who read these provisions of the permanent settlement dispassionately, and without any bias in favor of either landlord or tenant, it must, we apprehend, be perfectly clear that, from a moral point of view, the obligations imposed upon landholders were just as binding upon them, as the policy, to which the State stands committed, is binding upon the Government; and if it can fairly be shown, as we think it easily may, that the zemindars have wilfully ignored their obligations, it must follow that they have also morally forfeited their privileges. We are, of course, perfectly well aware that this is a view of the matter which will never recommend itself to, or be accepted in all its integrity by, practical statesmen, who attach more importance to the letter than to the spirit of a law; but we have disignedly appealed to abstract morality for the special purpose of pointing out that the time has arrived in the history of Bengal, when the popular sensitiveness in the matter of repudiation, and strict adherence of politicians to the mere letter of legal enactments, should be freely permitted to work out their legitimate results in *every* conceivable direction. If it be incumbent on our consciences to pursue precisely the same course in a different direction, because material benefits to the ryots are likely to reward our consistency, we should imagine, indeed, that the hopeless helplessness of the ryot would impart an additional zest to our consistency, when we found it enlisted on the side of the weak against the strong. On the one hand, we have a strictly legal engagement that the "revenue" shall not be enhanced on landed proprietors —*and* a moral claim upon them, that they shall comport themselves with justice and moderation towards their tenants. On the other hand, the ryot has a moral claim on our protection—and there are distinct legal provisions for the imposition of internal cesses, for the benefit of the ryot, if the landholder should fail in his duty. That the landholder has ignored his responsibilities, is a fact that has long since passed into history; and it is time to discover what internal duties we are now at liberty to impose on the landed proprietary, for the benefit of the ryots whom they have chosen to neglect.—*Indian Daily Examiner.*

PUBLIC WORKS BUDGET GRANT FOR 1871-72.

RESOLUTION BY THE GOVERNMENT OF INDIA, PUBLIC WORKS DEPARTMENT, DATED SIMLA, 19TH OCTOBER 1870.

THE Governor General in Council having had under consideration the question of the amount of the public Works Budget Grant for 1871 72, has decided to sanction an allotment from ordinary revenue equestion of the amount of the Public Works Budget grant for 1871 72, has decided to sanction an allotment from ordinary revnue equivalent to that allowed for the current year, viz., £0,928,400, distributed as follows, under the main divisions of the budget allotment—

Military	£1,127,400
Agricultural	497,300
Other Services	1,404,310
Establishment	969,390
Total ...	3,998,390

2. It having been represented that by the arrangement at present in force of including the provision for Establishment and Tools and Plant with that for Other Services, any increase found necessary to the charges in question, on account of Military and Agricultural Works, has to be met by a diminution of the allotment for Civil Buildings, Communications, and Miscellaneous Public Improvement, it has been considered desirable to prevent such diminution by providing for the outlay on Establishment and Tools and Plant under a distinct grant, to be augmented, if necessary, by transfer from such other heads of service as the circumstances of the case may require.

3. The grant for Extraordinary Irrigation Works, with its proportion of charges for establishment and tools and plant, is fixed at 1,767 000. In addition to this, there will be the charge for the construction of State Railways and such other objects as have been specially sanctioned by the Government of India as "Extraordinary," the allotments for which will be determined as usual on actual demands.

4. The total grant to be distributed in these orders amounts to 5, 765,400 as follows—

Ordinary	£3,998,400
Extraordinary Irrigation	1,767,000
Total ...	5,765,400

5. Governor General in council now proceeds to notify the distribution of the aggregate allotment among the several local Government and Administrations.

MILITARY.

6. Fore next year the total grant under this head, including value of stores from England, amounts to 1,127, 400, which is distributed as follows, as compared with the grant for the current year—

	Grant 1879-71.	Grant 1871-72.
Madras	£60,000	£50,000
Bombay	277.500	277,500
Bengal	140,000	180,000
North-West Provinces	134.500	135,000
Punjab	200,000	192,300
Central Provinces	70,600	60,600
British Burmah	35,000	35,000
Oudh	45,000	35,000
Hyderabad	26,800	96,800
Rajpootana	39,000	32,000
Central India	94,000	94,000
Coorg	...	...
Port Blair	5,000	2,000
Total	1,12,400	1,127,4000

7. The demands of the several Governments and Administrations under this head aggregate 62,720, 885, but the Governor General in Council considers that this is very much more than can be profitably spent during the year, and the demand is therefore reduced to 2,264 300, being 34,500 more than the grant for the current year, a large part of which it is now certain will not be required. The distribution of this grant, as compared with that for 1870-71, is as follows—

	Extraordinary.		Ordinary.		Total.	
	Grant 1870-71.	Grant 1871-72.	Grant 1870-71	Grant 1871-72	Grant 1870-71	Grant 1971-72
	£	£	£	£	£	£
Madras .	220,000	195,000	165,000	165,000	385,009	360,000
Bombay ...	257.500	157,000	90,000	90,000	327,500	347,000
Bengal ..	400,000	375,000	70,000	70,000	470,000	445,000
North-Western Provinces ...	300,000	350,000	60,900	61,000	360,900	411,000
Punjab ...	335,000	350,000	77,400	77,500	412,400	427,500
Central Provinces ...	69.000	75,000	5,000	2,500	65,000	77,500
British Burmah	...	...	18,500	23,300	18.500	23,400
Oudh ...	160,000	160,000	...	...	160,000	160,000
Rajpootana ...	...	5,000	10,000	7,500	10,000	12,500
Coorg ...	...	...	500	500	500	500
Total ...	1732,500	1,767,000	497,300	197,200	2,229,800	2,264,300

8. The grant for extraordinary irrigation works si intended to provide for all works sanctioned by the Government of India as debitable to loan under the operations of ublic Works Department Circular No. 94 of 1867 and inoludes a proper share of the cost of Establishment and Tools and Plant employed on such works. The Budget Estimate should be so prepared as to indicate clearly the exact manner in which the provition under these two heads has been arrived at, and should show in the form of Appendix A. of the appropriation account

the precise amount proposed to be charged to each work. The Controller of Public Works Account should be specially consulted in the preparation of this portion of the Budget Estimate, so as to ensure that the extraordinary grant is not debited with a larger share of the charges for Establishment and Tools and Plant than is allowed by the rules in force.

9. The grant under ordinary provides for all agricultural works debitable to revenue, including embankments in Bengal and British Burmah, and State outlay on guaranteed irrigation works in Madras, as also for the maintenance of agricultural works generally.

OTHER SERVICES.

10. The grant allowed under this head for the current year was 2, 373, 700, of which 969,399 was for Establishment and Tools and Plants, for which provisions is to be made for the future under a distinct head, so that the sum left for expenditure on Civil Buildings, Communication, and Miscellaneous public Improvement is 1, 404,310 which Amount is distributed as follows, as compared with the allotment for the current year—

	Grant, 1870-71. £	Grant, 1871-72. £
Madras	183,580	183,580
Bombay	262,500	262,500
Bengal	308,300	308,300
North-Western Provinces	164,800	164,800
Punjab..	126 000	126,000
Central Provinces	118,000	118,000
British Burmah	87,500	87,800
Oudh	53,400	53,400
Hyderabad	1,700	1,700
Rajpootana	23 000	23,000
Central India...	63,600	63,600
Coorg	7,030	7,030
Port Blair	4,600	4,600
Total	1,404,310	1,404,310

11. It is expected that the several Governments and Administrations will make suitable provision from this grant for the works connected with the postal and Telegraph Departments. Schedules of the of the sums to be so so provided will be circulated in due course.

ESTABLISHMENT, AND TOOLS AND PLANT.

12. To meet the demands under this head a sum of £969,390 is available, which is distributed as follows in accordance with the appropriation made for the purpose in the several provincial Budget Estimates of the current year—

	Establishment. £	Tools and Plant. £	Total. £
Madras	130,920	13 000	143,920
Bombay	150,000	12,500	162,500
Bengal	175,200	9,000	184,200
North-Western	141,400	6,500	147,900
Punjab	131,300	8,100	139,400
Central Provinces... ...	47,400	6,500	53,900
British Burmah	39 700	1 500	41,200
Oudh...	28,100	1,000	29 100
Hyderabad...	5,860	700	6,500
Rajpootana...	12,500	500	13,000
Central India	39,900	2 500	42,400
Coorg	2,370	100	2,470
Port Blair	2,700	200	2,900
Total ...	907,290	62,100	969,390

13. The estimate for Estoblishment should provide for the salaries of the Engineer Establishment at the consolidated rates of pay; and if, of the sum required for this purpose there should qe any portion which cannot be met frem the grant for Establishment and Tools and Tlant it should be provided for by transfer from the other hands of service concerned.

SUMMARY.

14. The tablh attached to this resolution shows the total grant asaigned to each province. The Budget Estimaqes should now be framed accordingly, the following conditions being observed -

I. That the amount assigued to each Province for Military Works mest be cousidered to be fixed so far, that it is onl availablo for increasing the grant for Establishment and tools and Plant to such extent as any increase required to that geant may be shown to be due to military works,

II. That in like manner the grant assigned for Ordinary Agricultural Works, as defined in paragraph 9 of this resolution, is only available for for such works; and also to supplement the allotment for Establishment andTools and plant to the extent of an increase rendered necessary in that grant by the expenditure no Ordinary Agricultural Works.

III. That the grant assigned for Agricultural Works classed under the heading Extraordinary is only appropriated to works specifically sanctioned by the Government of India to be defrayed from loan funds. On this point attention should be paid to Public Works Department Circular No. 90 of 1869.

IV. That the sum assigned for other services will be allotted by each. Government and Administration according to the requirements under Civil Buildings, Communication, and Miscellaneous Public Tmprovement; as also to repairs of work under these three heads.

V. That the grant for Establishment and Tools and Plant may be increased, if necessary, by transfer from the other three ordinary heads of the allotment. But in case transfers are made from the grant for Military and Agricultural Works, it will have to be clearly and fully shown, by reference to actual figures, that the sum transferred represents an increase to the charges for establishment caused by expenditure on Military and Agricultural Works.

VI. That any savings in the grant for Establishment and Tools and Plant may be applied at the discretion of Local Governments and Administrations to augment the allotment for the other heads of service.

VII. That the amount assigned for each of the main divisions of the allotment includes the value of stores from England so that the Budget Estimate should provide for probable payments on this account in the manner prescribed in chapter 16, section 1, paragraph 14 of the Code. A memorandum of the sum so provided, with explanation of the grounds on which the sum reserved for expenditure in England has been arrived at, should accompany the Budget Estimate.

VIII. That the grant for State Expenditure on guaranteed railways and on State railways will be in addition to the allotments now assigned, the estimate for each Government and Administration being framed as usual on the actual requirements of the year. Attention should be specially given to the several orders requiring that this part of the estimate may be considered carefully, and made as precise and definite as possible.

15. It should be understood that no entry should be made in the Budget Estimate of any works for which estimates have not been sanctioned by competent authority. On this point attention is requested to Public Works Department Circular No. 90 of 1869.

16. In the preparation of the Budget Estimates, care should be taken to keep in view the principle of concentrating expenditure particularly that on Military Works, not only upon the completion o buildings that are in progress, but also upon the completion of groups of buildings, station by station. Due consideration must of course be at the same time given to economy, by attention to the limits prescribed by the extent of local resources, and to the necessity of avoiding that increase of rates which is apt to accompany the too rapid pushing forward of work at any particular place. The principle which it is desired should be followed, will require establishments from station to station as the circumstances of the case may require.

17. Special attention should be paid to the preparation of that portion of the Budget Estimate relating to Public Works Revenue, so as to make it, as far as possible a reliable indication of the actual income of 1871-72.

Abstract of the Grants assigned from Imperial Funds for expenditure on Public Works in India during 1871-72 as compared with the Grant assigned for 1870-71, excluding State expenditure on Guaranteed Railways and expenditure on State Railways.

	Ordinary.						Extraordinary.		Grand Total.	
	Military.		Agricultural.		Other Services.	Establishment and Tools and Plant.	Total.	Agricultural.		
	1870-71.	1871-72.	1870-71.	1871-72.	1870-71. 1871-72.	1870-71. 1871-72.	1870-71. 1871-72.	1870-71.	1871-72.	1870-71. 1871-72.
	£	£	£	£	£ £	£ £	£ £	£	£	£ £
Madras	60,000	60,000	165,000	165,000	183,580 183,580	143,920 143,920	552,500 552,500	205,000	205,000	757,500 757,500
Bombay	277,500	277,500	90,000	90,000	262,500 262,500	162,500 162,500	792,500 792,500	257,500	257,500	1,050,000 1,050,000
Bengal	140,000	140,000	70,000	70,000	308,300 308,300	184,200 184,200	702,500 742,500	410,000	375,000	1,112,500 1,117,500
N. W. Provinces....	184,500	135,000	60,300	61,000	164,800 164,800	147,900 147,900	508,100 508,700	300,000	350,000	808,100 858,700
Punjab	200,000	182,500	77,500	77,500	126,000 126,000	139,400 139,400	542,900 534,900	334,000	330,000	877,500 864,900
Central Provinces....	70,600	60,000	4,000	2,50	118,000 118,000	53,900 53,900	246,500 235,900	61,000	75,000	307,500 310,000
British Burmah ...	35,000	25,000	18,500	28,500	87,500 87,500	41,200 41,200	182,500 187,200	...	...	182,500 187,200
Oudh	45,000	25,000	...	...	53,400 53,400	29,100 29,100	127,500 117,500	160,000	160,000	287,500 277,500
Hyderabad	26,800	25,000	...	...	1,700 1,700	6,500 6,500	35,000 35,000	...	...	35,000 35,000
Rajpootana	39,000	39,000	10,000	7,500	23,000 23,000	13,000 13,000	85,000 82,500	...	5,000	85,000 87,500
Central India	54,000	54,000	...	...	63,600 63,600	42,400 42,400	260,000 260,000	...	...	260,000 260,000
Coorg	...	...	500	500	7,030 7,030	2,470 2,470	10,000 10,000	...	...	10,000 10,000
Port Blair	5,000	2,500	...	...	4,600 4,600	2,900 2,900	12,500 10,000	...	...	12,500 10,000
	1,137,400	1,127,400	497,800	497,800	1,404,310 1,404,310	969,390 969,390	3,998,400 3,998,400	1,767,500	1,767,000	5,765,900 5,765,400

PRICES OF FOOD THROUGHOUT INDIA.—LATEST OFFICIAL QUOTATIONS.

BENGAL.—OCTOBER 1870.

		Rice per rupee.		Wheat per rupee.	
BURDWAN DIVISION.	Burdwan	22	Seers.	15	Seers.
	Bancoorah	22¼	,,	14	,,
	Beerbhoom	24¾	,,	13½	,,
	Hooghly	22	,,	14	,,
	Howrah	16	,,	15	,,
	Midnapore	26	,,	10	,,
ORISSA ,,	Balasore	31	,,	9	,,
	Cuttack	24	,,	12	,,
	Pooree	26¼	,,	11 13-16	,,
ASSAM ,,	Durrang	14	,,	6¾	,,
	Goalparah	0	,,	0	,,
	Kamroop	20	,,	20	,,
	Lukimpore	10	,,	9	,,
	Nowgong	16	,,	0	,,
	Seebsangor	16	,,	10	,,
DACCA ,,	Dacca	25	,,	11	,,
	Backergunge	20	,,	14	,,
	Furreedpore	23	,,	11	,,
	Mymensing	27½	,,	12	,,
	Sylhet	0	,,	0	,,
	Cachar	20	,,	8	,,
PATNA ,,	Patna	25	,,	20	,,
	Gya	21¾	,,	19½	,,
	Chumparum	20	,,	21	,,
	Sarun	22	,,	20	,,
	Shahabad	22	,,	20	,,
	Tirhoot	22	,,	17	,,
BHAUGALPORE ,,	Bhaugalpore	25¼	,,	24	,,
	Monghyr	20	,,	17	,,
	Purneah	20	,,	17	,,
SONTHAL PERGHS	Godda	26	,,	16	,,
	Nya Doonkah	21	,,	12	,,
	Rajmehal	0	,,	0	,,
	Deoghur	20	,,	14	,,
PRESIDENCY ,,	Calcutta	17	,,	16	,,
	Nuddea	23¼	,,	14 9-16	,,
	Jessore	23½	,,	13¼	,,
	24 Pergunnahs	20	,,	13¾	,,
RAJSHAHYE ,,	Rajshahye	21 9-16	,,	16	,,
	Pacroah	30	,,	13	,,
	Dinapore	27½	,,	12¾	,,
	Maldah	23	,,	17½	,,
	Moorshedabad	22¾	,,	15	,,
	Pubna	30	,,	15	,,
	Rungpore	21	,,	13	,,
CHOTA NAGPORE.	Lohardugga	36	,,	17	,,
	Hazareebagh	20	,,	18	,,
	Manbhoom	31	,,	11	,,
	Singbhoom	10	,,	18	,,

NORTH WESTERN PROVINCES.—OCTOBER 1870.

		Wheat		Rice.	
MEERUT DIVISION.	Dehra Dhoon	16	0	12	0
,,	Saharunpore	19	6	10	12
,,	Moozuffernugger	21	7	16	8
,,	Meerut	20	8	13	0
,, ,,	Boolundshuhur	22	0	15	0
KUMAON ,,	Kumaon	16	0	13	0
,,	Gurhwal	22	8	18	0
ROHILKUND ,,	Bijnour	0	0	0	0
,,	Moradabad	22	13	17	8
,,	Budaon	22	5½	20	1½
,,	Bareilly	22	8	17	8
,,	Shahjehanpore	22	12	21	0
,,	Terai Perunnahs	0	0	0	0
AGRA ,,	Muttra	20	0	14	0
,,	Agra	21	0	13	0
,,	Furruckabad			18	8
,,	Mynpoorie	20	0	11	0
,,	Etawah	15	11	15	12
,,	Etah	22	0	22	0
JHANSIE ,,	Jaloun	19	14	10	0
,,	Jhansee	15	12	11	0
,,	Lullutpore	17	11	8	0
ALLAHABAD ,,	Cawnpore	18	11	14	2
,,	Futtehpore	15	4	17	0
,,	Banda	0	0	0	0
,,	Allahabad	15	8	16	0
,,	Humeerpore	17	8	13	8
,,	Jounpore	18	4	16	13
BENARES ,,	Goruckpore	21	1	24	9
,,	Busteo	21	6	8	12
,,	Azimgurh	18	1	15	8
,,	Mirzapore	17	0	16	0
,,	Benares	15	12	15	0
,,	Ghazeepore	17	9	13	12
AJMERE ,,	Ajmere	9	12	6	0

OUDH.—OCTOBER 1870.

		Wheat.		Rice.	
LUCKNOW DIVISION.	Lucknow	19	0	16	13
	Oonao	18	14	17	4
	Barabunkee	19	0	17	0
SEETAPORE ,,	Seetapore	22	13	19	10
	Hurdui	21	9	16	1
	Kheree	23	4	20	13
FYZABAD ,,	Fyzabad	19	1	18	1
	Baraich	19	8	14	6
	Gondah	22	6	16	14
ROY BAREILLY	Roy Bareilly	18	0	20	6
	Sultanpoor	19	0	23	0
	Pertabgurh	17	0	19	8

PUNJAB.—WEEK ENDING 30TH OCT. 1870.

DELHI DIVISION.	Delhi	18	8	8	8
,,	Gurgaon	16	0	8	0
,,	Kurnal	19	0	8	0
HISSAR ,,	Hissar	15	0	8	0
,,	Rohtuk	16	0	12	8
,,	Sirsa	13	8	13	8
AMBALLA ,,	Amballa	22	0	13	0
,,	Ludianah	21	4	6	0
,,	Simla	13	0	8	0
JULLUNDHUR	Jullundhur	18	8	8	0
,,	Hoshiarpore	20	0	9	8
,,	Kangra				
UMRITSAR ,,	Amritsar				
,,	Syalkot	15	0	10	0
,,	Gurdaspore	18	0	7	0
LAHORE ,,	Lahore	17	3	12	0
,,	Fezrozepore	16	8	6	8
,,	Gujeranwalla	15	4	9	8
GUJERAT ,,	Rawul Pindi	17	12	5 to 10	
,,	Jhelum	16	8	6	0
,,	Gujerat	16	8	6	0
,,	Shahpore	13	0	7	0
MOOLTAN ,,	Multan	12	8	6	8
,,	Jhung	12	8	17	0
,,	Montgomery	13	4	7	6
,,	Mozaffnuggur	12	0	6	0
DERA I. KHAN	Dera I. Khan	12	8	6	4
,,	Dera G Khan	11	4	6	4
,,	Bunnoo	15	0	5	0
PESHAWAR ,,	Peshawar	16	9	6	8
,,	Kohat	14	5	4	7
,,	Huzara	17	0	4	0

CENTRAL PROVINCES.—OCTOBER 1870.

		Wheat. S.	C.	Rice. S.	C.
NAGPORE.	Nagpore			12	7
	Bhundara	15	0	16	4
	Chanda	10	15	12	0
	Wurdah	13	4	9	10
	Balaghat	16	0	22	0
JUBBULPORE.	Jubbulpore	14	12	8	12
	Saugor	16	3¼	10	1
	Dumoh	13	11	13	6
	Mundla	15	0	15	0
	Seonee	18	0	13	0
NERBUDDA.	Baitool	12	0	6	8
	Hoshungabad	11	0	8	0
	Chindwara	14	0	10	0
	Nursingpore	13	0	10	0
	Nimar	11	12	10	4
CHUTTEESGURH.	Raepore	27	4	26	12
	Belaspore	27	0	28	0
	Sumbulpore	13	12	31	8
UPPER GODY.	Seroncha	10	0	9	0

MADRAS.—OCTOBER 1870.

		2nd-Sort Rice. Fuzly 1869	1870.	Cholum. Fuzly 1869	1870.
		Rs.	Rs.	Rs.	Rs.
NORTHERN SECTION.	Ganjam	314	284	235	195
	Vizagapatam	409	315	224	178
	Godavery	290	236	162	128
	Kistna	363	332	184	208
	Nellore	364	326	154	197
CEDED DISTRICTS.	Cuddapah	421	419	181	210
	Bellary	363	377	121	170
	Kurnool	419	418	155	197
EAST CENTRE.	Madras	...	...	...	...
	North Arcot	...	...	...	...
	South Arcot	434	293	288	143
CAUVERY.	Tanjore	399	284	240	152
	Trichinopoly	418	309	204	154
SOUTHERN SECTION.	Madura	442	344	184	155
	Tinnevelly	448	432	234	240
WEST CENTRE.	Coimbatore	475	405	281	239
	Neilgherries	711	533	320	320
	Salom	406	330	212	160
WEST.	South Canara	433	372	...	...
	Malabar	453	393	...	...

BOMBAY PRESIDENCY.—OCTOBER 1870.

	Atta per rupee.			Atta per rupee	
Colaba	5½	Seers.	Rewa Kanta	11	Seers.
Tanna	6½	,,	Punch Mahals	11½	11
Rutnagherry	5½	,,	Khandeish	7	11
Dapoolie, D.	...		Ahmednuggur	6½	,,
Vingorla	9	,,	Nassick	7½	,,
Sewunt Waree	7½	,,	Poona	6	,,
North Canara	4	,,	Sholapoor	7	,,
Surat	8	,,	Sattara	6	,,
Broach	8	,,	Kolapore	4	,,
Ahmedabad	9	,,	Kulladghee	6	,,
Kaira	7	,,	Belgaum	4	,,
Cutch	...		Dharwar	4½	
Gujerat	...			.....	
Baroda, Residency	..			.....	
Mahi Kantai	...			.....	

THE PUBLIC REVENUE AND EXPENDITURE.

Revenue and Expenditure of the Government of India for the first four months of the year 1870-71, as compared with the corresponding period of 1869-70.

	Revenues and Receipts.	April to July 1869	April to July 1870	Increase	Decrease.
		£	£	£	£
I	Land Revenue	6,738,932	7,206,022	467,090	.
II	Tributes and Contributions from Native States	210 011	235,742	25,731	..
III	Forest	119,720	101,783	..	17,937
IV	Excise on Spirits and Drugs ..	722,571	784,749	62,178	..
V	Assessed Taxes	172,891	408,567	235,676	..
VI	Customs	746,641	884,488	137,847	..
VII	Salt	1,813,527	1,992,000	178,473	..
VII	Opium	2,818,783	2,553,899	...	264,884
IX	Stamps	817,477	339,027	.	478,850
IX	Mint	66,386	18,135	...	48,251
XI	Post Office	155,923	297,780	141,857	..
XII	Telegraph	24,374	62,174	37,800	..
XIII	Law and Justice	310,662	811,366	500,704	..
XIV	Police	84,903	79,952	...	4,951
XV	Marine	38,654	57,608	18,954	...
XVI	Education	25,817	22,980	..	2,867
XVII	Interest	79,065	125,128	46,063	..
XVIII	Miscellaneous	126,164	271,043	144,879	..
	Total	15,072,531	16,252,943	1,998,152	817,740
	Army Miscellaneous	259,871	257,894	.	1,977
	Public Works Ordinary. Miscellaneous Receipts ..	48,789	47,473	..	1,316
	Public Works Ordinary. Railway Exchange, Gain ..	108,408	...	.	108,408
	Public Works Ordinary. State Railways Traffic Receipts	..	2,412	2,412	..
	Do. Extraordinary do Capital Amount	..	1,782	1,782	..
	Total Revenue	15,489,599	16,562,504	2,002,346	929,441

	Expenditure.	April to July 1869	April to July 1870	Increase	Decrease
		£	£	£	£
1	Interest on Funded and Unfunded Debt	647,528	881,469	233,941	..
2	Interest on Service Funds and other Accounts	129,969	75,358	..	54,611
3	Refunds and Drawbacks	123,515	104,421	..	19,094
4	Land Revenue	802,394	783,952	..	18,442
5	Forest	92,187	112,639	20,452	..
6	Excise on Spirits and Drugs ..	77,147	1 0,822	33,675	...
7	Assessed Taxes	6,987	13,288	6,301	..
8	Customs	59,297	60,750	1,453	...
9	Salt	136,443	116,736	..	19,707
10	Opium	1,020, 12	1,176,052	155,940	...
11	Stamps	36,956	20,608	..	16,347
12	Mint	30,928	20,080	..	9,948
13	Post Office	100,985	210,663	10,678	..
14	Telegraph	98,037	93,983	...	4,650
15	Administration	374,002	373,147	...	855
16	Minor Departments	68,566	68,784	218	..
17	Law and Justice	890,308	941,919	51,611	...
18	Police	795,658	728,123	...	67,535
19	Marine	130,731	110,499	...	20,232
20	Education	208,063	193,552	..	14,511
21	Ecclesiastical	52,746	49,270	.	3,476
22	Medical Services	146,412	150,678	3,666	...
23	Stationary and Printing ..	89,000	70,194	..	3,406
24	Political Agencies	172,907	84,091	...	88,906
25	Allowances and Assignments under Treaties and Engagements	466,562	478,126	11,564	...
26	Miscellaneous	194,267	265,865	71,598	..
27	Superannuation, Retired, and Compassionate Allowances ..	171,723	190,228	18,505	..
	Total	7,211,325	7,494,997	633,392	350,720
	Army	4,098,129	3,957,080	...	141,049
	Public Works Ordinary. Railways Guaranteed ..	2,148,242	1,170,030	...	978,212
	Public Works Ordinary. Railway Exchange, Loss ..	22,343	31,756	9,413	..
	Public Works Ordinary. State Railways ..	135,124	62,820	..	72,304
	Public Works Ordinary. Irrigation, &c ..	6,085	2,256	..	3,829
	Public Works Ordinary. State Railways ..	240,082	253,420	17,338	..
		1,087	71,414	79,327	..
	Total Expenditure ..	13,858,416	13,042,773	730,470	1,546,113

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION, of the amount of COIN AND BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Retired by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
31st Oct. 1870 ..	Calcutta...	3,56,95,300	43,460	3,56,51,840	1,53,97,690	36,08,188	3,12,195	1,18,70,987	3,11,39,060
Ditto	Madras	93,81,680	2,11,450	91,70,230	55,88,936	.....	...	17,28,404	73,17,360
Ditto	Bombay	4,03,41 440	22 540	4,03,11 900	2,42,63,849	7,15,371	... ..	1,27,52,960	3,77,38,180
Ditto	Allahabad ..	69,14 650	30,67,770	38,46,880	57,80,799	. ..	... ..	11,03.291	68,84,090
Ditto	Lahore	44,43,930	14,67 220	29.76,710	37,17,423	. ..	. ..	7,00,037	44,17,460
Ditto	Calicut	13,15,300	4.95,380	8,19,920	11,10,841	.. ...	. ...	1,00,059	12,10,900
Ditto	Trichinopoly ...	17,49,060	14,82,040	2 67,020	16,10,531	.....	...	1,00,059	17.10,590
Ditto	Vizagapatam ..	4,74,140	2,05,690	3,68,450	3,00,551	.	. .	1.00,059	4,00,610
Ditto	Nagpore. . ..	43,11,060	1,02,020	42,09,040	37,62,728	.. ..	..	5,47,902	43,10,630
Ditto	Kurrachee	42,34,630	23,83,790	18,50.660	37,11 274	. . .	...	5,00,106	42,11,380
Ditto	Akola . ..	25,75,680	1,31,920	24.43,660	25,75,150	.....	.....	.....	25,76,450
	TOTAL ...	11,14 39,770	95,23,760	10,19,16,310	6,78,26,092	43,23,859	3.12,495	2,94 53,864	10,19,16,310

Calcutta, Department of Issue of Paper Currency
6th September 1870.

H. HYDE, Lieut. Col,
Head Commissioner

SILVER RECEIVED AND COINED IN THE MINTS OF CALCUTTA, MADRAS, AND BOMBAY, 1869-70

	Calcutta.			Madras.			Bombay.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.	Bullion or Coin received during the month valued in Rs.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
April	6,517	12,28,916	5,59,260	.	192		. .	30,86,611	21,99,388
May	091	8,04,000	22,18,782	..	10,906		2,48,438	7,24,594	23,99,310
June	1,148	24,650	10,38,778	...	14,509		18,577	14 07,087	22,11,376
July	1,201	2,722	9,30,351	...	3,594	.	88	1,03,558	26,51,675
August	66,565	2,020	...	...	641		..	4? 631	11,23,536
September	89,122	3,28,445	...	...	...	..	40,524	49,655	3,28,585

THE BANK OF BENGAL.

Statement of Affairs.	11th Octr. 1870.		
Liabilities	Rs.	A.	P.
Proprietors' Capital, paid up	2,20,00,000	0	0
Reserve Fund	15,46,011	7	0
General Treasury Balance at Head Office	93,12,475	11	0
Ditto ditto at Branches	1,20,09,188	5	9
Other Deposits at Head Office and Branches	3,19,02,174	7	1
Bank Post Bills, &c	14,71,911	7	2
Sundries	6,52,841	3	11
Total ... Rs	7,99,15,905	9	11
Assets.			
Government Securities	1,60,02,924	2	0
Loans on Government Securities at Head Office and Branches	50,75,847	3	9
Accounts of Credit on ditto do do	51,82,771	13	8
Mercantile Bills discounted at do do	1,26,21,382	6	1
Dead Stock	11,34,664	7	9
Stamps	15,234	13	0
Balances with other Banks	12,38,142	11	7
Sundries	1,95,192	10	2
Cash and Currency Notes at Head Office	3,54,16,170	4	0
Cash and Currency Notes at Branches	4,41,69,735	5	11
Total...Rs.	7,99,15,905	9	11

THE BANK OF MADRAS.

Statement of Affairs.	1st Octr. 1870.		
Liabilities.	Rs.	A.	P.
Capital	50,25,000	0	0
Public deposits at Head Office	1,28,43,793	12	3
Do. at Branches	25,55,401	4	2
Other deposits at Head Office and Branches	1,34,58,224	5	6
Cash Credits undrawn at do	3,07,353	0	6
Post Bills	1,39,738	5	2
Reserve Fund	5,62,500	0	0
Rest	1,13,332	15	1
Total ..Rs.	3,54,05,343	10	8
Assets			
Silver and Notes at Head Office	44,66,856	9	3
Silver and Notes at Branches	99,15,150	8	11
Government Securities	4,17,654	14	7
Government Reserve—Cash	1,01,48,793	12	3
Securities	.....		
Loans at Head Office and Branches	18,66,213	10	6
Accounts of Credit at Head Office and Branches	6,35,540	0	0
Mercantile Bills discounted at Head Office and Branches	61,02,186	6	8
Dead Stock at Head Office and Branches	2,31,488	15	10
Bills of Exchange do	13,02,963	14	4
Due by other Banks	1,23,494	14	4
Total...Rs	3,54,05,343	10	8

THE NEW BANK OF BOMBAY.

Statement of Affairs.	5th Nov. 1870.		
Liabilities.	Rs.	A.	P.
Proprietors' Capital, paid up	50,00,000	0	0
Subscriptions on account of new Capital	10,00,000	0	0
General Treasury Balance	42,26,336	0	0
Deposits at Head Office	1,76,91,304	0	0
Deposits at Branches	20,83,121	0	0
Bank Post Bills outstandings	8,51,756	0	0
Reserve	4,15,000	0	0
Undrawn Cash Credits	9,58,110	0	0
Total...Rs.	3,22,22,257	0	0

Statement of Affairs.	5th Nov. 1870.		
Assets.	Rs.	A.	P.
Government Securities	12,52,077	0	0
Loans at Head Office & Branches on Govt. Sec. &c.	3,49,560	0	0
Credit Accounts do do on Govt. Securities.	23,96,509	0	0
Bills discounted and purchased at do do	45,14,845	0	0
Dead Stock and Less written off	4,42,311	0	0
Stamps	6,672	0	0
Balance with Agents and Correspondents	19,52,222	0	0
Overdrafts	41,969	0	0
Government Reserve Cash	2,26,336	0	0
Cash and Currency Notes at Head Office	1,51,01,110	0	0
Do. do. at Branches	47,02,065	0	0
Bullion at H. O and Branches	12,40,552	0	0
...Rs.Total	3,22,26,227	0	0

Cash Balances in the Government Treasuries in India, 1869-70 contrasted with previous years.

	March.	April.	May.	June.	July.	August.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	2,07,94,308	1,62,14,872	1,11,67,665	1,13,96,105	1,52,43,515	1,36,15,865
Bengal	1,09,40,203	1,10,54,167	1,27,91,234	1,49,51,970	1,23,40,473	1,12,23,907
British Burmah	36,67,030	36,16,189	37,54,834	27,50,490	28,44,725	32,10,450
North-Western Provinces	1,57,83,570	1,39,17,004	2,05,84,544	2,41,33,186	2,39,69,426	2,14,9,8002
Oudh	11,31 215	35,92,342	47,80,982	63,08,804	62,19,612	53,76,649
Punjaub	1,06,78 688	94,15,066	89,94,758	1,14 40,931	1,17,81,232	1,08,05,965
Bombay	3,50,28,704	3,67,57,721	3,72,42,836	3,39,65,1 6	3,05,03,255	2,35,10,012
Central Provinces	48,51,111	56,89,548	66,53,284	68,20,440	63,53,106	61,53,053
Madras	2,49,10,140	2,72,70,925	2,89,32,294	3,04,71,972	3,07,95,345	2,75,09,862
Total...	13 98,20,999	13,05,88,334	13,63,02,461	14,22,29,014	14,00,50,689	12,79,02,765
1867-68	1,17,62,019	10,24,66,923	11,49,73,104	11,62,04,798	11,00,92,380	9,63,10,342
1868-69...	1,03.60,599	10,45,09,269	11,73,38,501	11,81,90,260	10,94,54,805	10,02,49,204

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Div'd.	Quotations.
Banks.			
Agra Bank, Limited, A.	£10	2 p. c.	105 @ 108
Ditto, new contributory A.	£10	2 p. c.	104 @ 105
Ditto B. Shares	....	....	£ 45 @ 47
Agra Savings' Bank	Rs. 100	4 p. c.	120 @ 122
Allahabad Bank, Limited	100	5 „	100 @ 101
Bank of Bengal	1000	45 „	1145 @ 1150
Bank of Calcutta, Limited, A.	50	2 „	22 @ 25
Ditto ditto B.	50	2 „	22 @ 25
Bank of Upper India	50	6 p. c.	61 @ 62
Delhi and London Bank, Limited	£25	2 p. c.	175 @ 180
Mussoorie Savings' Bank	100	7 p. c.	135 @ 137
National Bank of India	£12½	3 „	120 @ ....
Oudh and United Service, Limited	100	nil.	15 @ 20
Punjaub Bank, Limited	100	4 p. c.	80 @ 81
Simla Bank, Limited	500	6 „	560 @ 570
Uncov. Ser. Bank (Agra)	100	4 „	90 @ 95
United Bank of India	100	5 „	90 @ 95
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	nil.	425 @ 435
Ditto ditto	200	nil.	84 @ 86
Bengal Coal Co., Limited	1000	7 p. c.	1145 @ 1150
Bonded Ware-house	445	18 p. sh	530 @ 535
Brunton's Press Co., Limited	300	4 p. c.	165 @ 170
Burdwan Stone Co., Limited	100	5 „	10 @ 12
Calcutta Docking Co., Limited	700	nil.	250 @ 270
Ditto New ½ Shares	350	nil.	125 @ 135
Delhi Railway Co.	£20	2½ p. c.	225 @ 230
Eastern Bengal Indigo Co	100	nil.	30 @ 35
Eastern Bengal Railway	£20	2½ p. c.	236 @ 237
Eastern Steam Tug Co., Limited	250	nil.	100 @ 120
East India Railway Co.	£20	2½ p. c	246 @ 247
Equitable Coal Co., Limited	250	5 „	120 @ 122½
Goosery Cotton Mills Co.	200	6 „	204 @ 206
Gourepore Co., Limited	1000	6 p. c	1320 @ 1325
Ditto ¼ Share	125	....	165 @ 170
Great Eastern Hotel Co.	250	6 „	165 @ 167
Howrah Docking Co., Limited	500	nil.	190 @ 195
India General S. N. Co.	1000	2 p. c.	300 @ ....
Ditto ditto, ½	500	2 „	195 @ 205½
Ditto ditto, ¼	250	2 „	97 @ 102
Landing and Shipping Co.	100	3 „	39 @ 40
Nasmyth's Pat. Press Co.	500	2½ p. c.	650 @ 700
Oriental Gas Co.	£5	4¼ „	70 @ 75
Ditto (Contributory)	£1	1½ „	15 @ 16
Oudh and Rohilcund Railway	£10	2¼ „	105 @ 107
Port Canning Land Co.	1400	nil.	270 @ 280
Punjab Railway Co.	£100	2½ p. c.	1100 @ 1150
R. Scott Thomson & Co.	500	4 „	235 @ 240
Tirhoot Indigo Limited	200	nil.	50 @ 52
Tea Companies.		*yearly.*	
Assam Tea Company	200	2½ p. c.	191 @ 195
Bengal Tea Co., Limited	100	5 p. c	50 @ 51
Ditto (Contributory)	60	5 p. c	18 @ 20
Bisnauth Tea Co., Limited	200	nil.	95 @ 97
Ditto (Contributory)	50	nil.	21 @ 22
Central Cachar Tea Co.	200	nil.	60 @ ....
Dohing Tea Co., Limited	85	nil.	14 @ 15
Dehra Doon Tea Co., Limited	100	nil.	6½ @ 7
Durrung Tea Co., Limited	100	nil	27 @ 28
Eastern Cachar Tea Co.	00	8 p. c.	95 @ 100
East India Tea Co., Limited	100	nil.	24 @ 25
Jellalpore Cachar Tea Co.	250	6 p. c.	60 @ 270
Kunchumpore Tea Co. Limited	1000	nil.	nominal.
Ditto (Contributory)	800	nil.	.....
Kurseong and Darjeeling Tea Co.	250	2 p. ct.	62 @ 65
Ditto Contributory)	200	2 p. ct.	42 @ 43
Kuttal Tea Co., Limited	....	....	.....
Lower Assam Tea Co., Limited	£5	nil.	5 @ 10
Luckimpore Tea Plnt. Co.	200	nil.	65 @ 70
Monacherra Tea Co., Limited	90	nil.	15 @ 17
Moran Tea Co., Limited	65	nil.	nominal.
Muttuk Tea Co., Limited	125	nil.	3 @ 35
New Golah Ghat Tea Co.	£10	..	100 @ 105
New Mutual Tea Co.	30	15 p. c.	60 @ 65
Punkabaree Tea Co., Limited	100	nil.	20 @ 30
Soom Tea Co., Limited	100	nil.	35 @ 40
Tuckvar Tea Co., Limited	200	nil.	35 @ 40
Upper Assam Tea Co., Limited	100	nil.	nominal.
Victoria Tea Co., Limited	250	lin.	5 @ 10

BOMBAY SHARE LIST.

Banks.	Shares.	Nominal Value per Sh	Paid up.	Last Div'd.	Rate Share.
		Rs.	Rs.	per ann.	Rs.
Agra Bank	100,000	100	all	3 pr. ct.	100
Bank of Bengal	22,000	1,000	all	9 pr. ct.	1,450
Bank of Bombay (New)	10,000	500	all	6 pr. ct.	600
„ New Issue Do.	40,000	500	100	6 pr. ct.	1,66⅔
Bank of Madras	7,200	1,000	all	12 pr. ct.	1,850
Chartered of India and China	40,000	500	all	6 pr. ct.	150
Charter'd Mercantile	30,000	50	nil	6 pr. ct.	250
Delhi and London	15,000	100	2-0	6 pr. ct	200
National Bank of India	37,000	250	125	5 pr. ct	120
Oriental Bank	10,000	250	all	12 pr. ct.	425
Railway Companies					
G. I. P. R. Co, Consolidated Stock	....	£20	218-3-0	5 pr. ct.	137
Do. New £20 shares	....	£20	169-1-5	do.	118
Bombay, B. & C. I. R. Co	....	£100	1,000	do	1,100
Do, New Shares	....	£18	196-5-1	do.	200
Land Companies.					
Elphinstone Land	10,800	1,000	all	50	1,040
Ditto New Issue	10,800	1,000	600	11-14	670
Fiere Land	800	100	50		150
Mazagon Land and R.	1,600	2,000	2,000	nil.	1,020
Port Canning	400	2,000	1,400	nil.	270
Colaba Company	4,000	3,000	all	70	1,615
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,850	250 p. s.	2,300
Albert Press Company, Kurrachee	200	2,500	1,100	70 do.	980
Alexandria Press Co.	200	3,000	850	nil	480
Apollo Press Co.	150	12,000	11,000	200 do.	7,500
Bombay Press Co.	200	2,000	all	265 do	2,085
Ditto (New)	200	500	all	60¼ do.	515
Colaba Press Co,	500	1,880	all	80	6,500
East India Press Co.	350	2,000	all	....	3,000
Fort Press Co.	150	8,500	all	1,000	9,300
Framjee Cowasjee Press	300	2,000	1,800	....	910
Hydraulic Press Co.	200	6,000	all	240 p. s.	2,425
Kurrachee Press Co	1,000	5,000	2,000	120 „ „	850
Mofussil Press & G. Co.	2,000	400	350	35 „ „	370
Prince of Wales Press Co.	120	2,500	all	350 „ „	2,400
Victoria Press, Madras	220	2,000	750	200 „ „	1,075
Spinning & Weaving Cos					
Albert Mills Company	100	2,000	1,700	50	1,250
Alliance Spinning Co.	500	2,500	all	125ps	2,300
Bombay	100	5,500	all	....	3,000
Bombay United	800	1,000	all	25	945
Broach Mills	800	150	150	....	190
Do. New	800	150	50	....	100
Dharumsey Spinning	800	5,000	all	....	2,025
Great Eastern	700	2,000	all	150 p. s.	1,600
Manockjee Petit's	2,500	1,000	all	80 „	945
Oriental	800	2,500	all	80 „	1,595
Royal	600	2,500	2,300	....	1,475
Shipping Company.					
Bombay Shipping Co.	1,600	5,000	3,500	1,800	700
Miscellaneous					
ychanics' Building Co	1,000	50	all	5p. c.	30
arrachee Landing and Shipping Co.	500	2,000	300	81	170
rencher and Company	2,000	500	all	25	375

BANKS AND COMPANIES IN LIQUIDATION.

Banks	Date of Liquidation	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs.	Rs. and
Bank of Bombay	Jan. '66	500	500	75	25
Bank of China	.. .	1,000	25	10½	1
Bombay Presidency Bank	Augt. '67	40,000	250	....	
Bombay T and B. Association	Sept '67	20,000	200	14	6
Brokers' Banking Co.	Sept '67	20,000	200	10	15
Central Bank	Mar. '66	10,000	250	2	1
East India Bank	....	25,000	....	....	22
Indian Peninsula Bank	Feb '67	25,000	200	10	6
Royal Bank of India	May '67	50,000	200	68½	5
Old Financial	Apl. 67	30,000	140	71	1
Companies.					
Back Bay Reclamation Co.	Nov. '67	1,000	5,200	2,300	090
Bombay and Bengal S. S.	....	802	3,500	2,140	10
Victoria Spinning Co.	....	55	5,000	2,100	10

EXCHANGE ON LONDON.

	Calcutta. s.	d
Bank Bills, at 6 months' sight	1	10½ 5-16
Do. at 3 month's sight	....	
Do. on demand, ditto	1	10¼
Credit Bills (1st Class) at 6 months' sight	1	10 15-16
Documentary Bills at 6 months' sight	1	11

BANK RATES OF DISCOUNT.

	Per cent.
Discount on Private Bills and Notes	7 to 9
Ditto on Acceptance of Local Banks	7 to 9
Int. on Loans on Security of Govt. Papers	6

GOVERNMENT SECURITIES.

	Calcutta.		Bombay.
Five-and-a-half per cent.	113⅜	to	114
Five per cent.	107	to	107
Four & half per cent. (Public Works Loan)	103½	to 103-10	106½
15 years' Debenture Loans	108	to	108
10 years' do. do.	107	to	108
5 years' do. do.	106½	to	103
Six per cent. Municipal Loans	112½	to	113

THE FREIGHT MARKET.

CALCUTTA.

London	Cotton	£2 0s. 0d. Nom. p. ton
	Cases	£2 0s. 0d. to £2 15s. 0d. „
	Seeds	£1 10s. 0d
Liverpool	Iron Ships Cotton	£1 12s. 6d. to £1 17s. 6d.
	Wooden Ships „	£1 12s. 6d. to £1 15s 0d.
	Myrabolns & Cor bills	£0 10s. 0d. to £0 12s. 6d.
	Seeds	£0 15s. 0d. to £1 0s. 0d.
Havre	Cotton	£2 5s. 0d. to £2 10s. Nominal
	Coffee	Nominal
Overland Steamers		£1 10s. 0d. to £5 0s. 0d.
Liverpool via Suez Canal		£3 5s. 0d.
China	Steamer Cotton	Rs. 6 per bale.
	„ Opium	Rs. 25 to 30 per chest.
	Sailing Ships	Nominal
Calcutta	Salt	Rs. 3 0 0 to 4 0 0 per ton.
Calcutta to Bombay		Rs. 13 to 14 and Calcutta Port charges
Mauritius		8 annas per bag nominal.

BOMBAY.

For Liverpool —	
Iron ships	£1 0 0 to £1 2 6
Wooden ships	£1
For London.—	
Cotton	£1 15
Seeds	£1 5 0 @ 1 17 6
For Overland Route—	
P. & O. Steamer	£3 5 0 to 3 12 0
B. & B. Steamer	£3 10 0 to 3 12 6
For China—	
Cotton—Steamer	Rs. 8 to Rs 10 per
Opium—Steamer Hong Kong	Rs. 25 @ 30

INDIAN SECURITIES.—LONDON.

Share Paid	INDIAN RAILWAYS.	Closing Prices Oct. 1.	Closing Prices Oct. 8.
st. 100	Bombay, Baroda, and Central India (gua. 5 per ct.)	104½ to 105½	104½ to 105½
20 all	Ditto EXt. do ss. at 2p	20 to 21	20 to 21
20 100	E. Indian Stock (gua. 5 p. c.)	109¾ to 110¼	109¾ to 110¼
st. 100	Eastern Bengal (gua. 5 p. ct.	104¼ to 105¾	105 to 106
st 17½	Ditto, ditto, 5 ditto	— —	— —
20 100	Gt. Ind. Peninsula (g. 5 p. ct.)	105¾ to 106¼	105¾ to 106¼
st. 12	Ditto, New (gua. 5 p. ct.)	¼ to 1¾ prem	¼ to 1¾ prm.
st. 6	Ditto, New (gua. 5 p. ct.)	¼ to 1¾	¾ to 1¼ prm.
st. 50	Ditto, scrip, ditto, ditto	— —	— —
20 all	Ditto, scrip, ditto, ditto	— —	— —
20 all	Ditto, 4 per c. debenture..	89 to 91	89 to 91
st. 100	Gt. South of India (g. 5 p. c.)	105 to 106	105 to 106
st. 100	Ditto (1¾ per cent)	98 to 102	98 to 102
st. 100	Madras (guar. 5 per cent) ..	104½ to 105½	105 to 106
st. 100	Ditto, (4¾ per cent.)	98 to 102	98 to 102
st. 100	Ditto, (4½ per cent)	96 to 97	98 to 97
2 100	Ditto	— —	— —
st. 100	Oude & Rohilkund (g. 5 p. ct.)	103½ to 104½	103½ to 104½
10 4	Ditto, shares (ditto)	par to ⅛ prem.	par to ⅛ prem.
st. 4	Ditto ditto, ditto.....	prem.	prem.
st. 100	Ditto Nuliatee	— —	— —
st. 100	Scinde (guar. 5 per cent.) ..	102 to 104	103 to 105
st. 100	Ditto, Delhi (gua. 5 p. c.)	104 to 105	103 to 105
20 5	Ditto, ditto (gua. 5 p. c.)	⅞ to 1⅛ prem.	⅞ to 1 prem.
st. 100	Ditto, Punjaub (g. 5 p. c.)	104 to 105	103 to 105
st. 100	Do. Ind. St. Flo (g. 5 p. c.)	102	

INDIAN GOVT. SECURITIES.	Closing Prices, August 4.	Closing Prices, August 11.
Indian Stock, 10½ per cent ....April, 1874	— 207	207
Ditto. for Account.....	— —	— —
Ditto 5 per Cent .....July 1880	110¼ to 110⅝	110⅛
Ditto 4 per Cent .....Oct., 1888	100⅝ to 100⅞	100⅝
India Enfaced Paper 4 per Cent.....	91 to 92	91⅝
Ditto 5 per Cent .....Jan. 1874	99⅝ 100¼	100¼
Ditto 5½ per Cent.....May, 1879	107 to 107½	107½
Ditto 5 per Cent. Rupee Deben. 1872	90 to 92	90 to 92
Ditto ditto 1877	— 107	— 107
India Debentures, 5 per Cent....Aug. 1873	103¼	103½ to 103¾
India Bonds, 4 per Cent £1,000	19s. prem.	19s. prm.

Amt of Share.	Paid.	MISCELLANEOUS.	Closing Prices, August 4.	Closing Prices, August 11.
5	all	Bombay Gas (Limited)	6 to 6⅛	6 to 6⅛
5	4	Ditto, New	1 to 1⅛ prem.	1 to 1⅛ prem.
20	10	Ceylon Co Limited	4⅛ to 3⅛ dis.	4⅛ to 3⅛ dis.
20	5	Ditto, A Shares	3 to 2 dis.	3 to 2 dis
50	7	East India Land Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis.
100	st.	Madras Irrigation & Canal (guar. 5 per cent by the Indian Government) ..	100 to 102	100 to 102
1	6/6	Neebudda Coal and Iron	par to ⅛ prem.	par to ⅛ prem.
5	all	Oriental Gas (Limited..) ..	8 to 8⅛	8 to 8⅛
5	1½	Ditto, New	1 to 1⅛ prem.	1 to 1⅛ prem.
50	all	P. and O. Steam Company ..	47 to 49	49 to 51
50	10	Ditto, New, 1867	3 to 1 dis	2 dis to par

Amt of Share.	Paid.	JOINT STOCK BANKS.	Closing Prices, August 4	Closing Prices, August 11.
10	all	Agra Limited, A	8 to 9	8 to 9
10	—	Do., do B.....	—	—
20	all	Chart. of India, Aus. & China	11 to 11	11½ to 11¾
25	all	Chartered Mer. of India, London, and China.....	24½ to 25⅛	24½ to 25⅛
20	all	Eng. Scot and Aust. Chart.	16 to 17	16 to 17
20	4	Land Mortgage Bank of India	3⅝ to 3⅞ dis.	3⅝ to 3⅞ dis.
100	all	Do., 5 per cent Debentures, 1861 to 30 years	85 to 86	85 to 86
25	all	Oriental Bank Corporation..	11 to 13	11 to 12

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council.

Debenture Capital.	Rate	COMPANY	Closing Prices, August 4.	Closing Prices, August 11.
£287,595	5	Bombay, Baroda, and Central India	103 to 105	102 to 104
881,700	5	Ditto ditto....	103 to 105	102 to 104
100,000	4½	Ditto ditto....	98 to 100	98 to 100
1,292,400	5	East Indian	108 to 111	108 to 111
1,806,300	5	Ditto	108 to 111	108 to 111
3,000,000	5	Ditto	99 to 101	99 to 101
1,000,000	4½	Ditto	99 to 101	99 to 101
410,000	4½	Ditto	98 to 100	98 to 100
—	5	Eastern Bengal.....	100 to 102	100 to 102
1,968,600	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto....	100 to 102	102 to 104
883,900	4½	Ditto	98 to 100	98 to 100
175,500	5	Great Southern of India	103 to 105	103 to 105
100,000	4½	Ditto	98 to 100	98 to 100
42,900	4½	Madras	— —	— —
916,600	5	Ditto	103 to 105	103 to 105
499,800	5	Ditto	103 to 105	103 to 105
20,000	5	Oude & Rohilkund (Ltd)	102 to 104	102 to 104
180,800	5	Scinde (Indus Flotilla)	— —	— —
650,000	4½	Ditto	98 to 100	98 to 100

GOLD AND SILVER.

	Per Ounce.
Foreign Gold in Bars	£3 17s. 9d.
Silver in Bars (Standard)	5s. 0⅝d.
Mexican Dollars....	4s. 10½d. to 4s. 10⅝d.

THE EXCHANGES.

Banks Drawing rates on Calcutta .. .. .. at 60 days' sight.	1s. 10½d.
Ditto on Bombay	1s. 10⅝d.

Advertisements.

G. I. P. RAILWAY.

COTTON AND GRAIN RATES.

ON AND AFTER THE 1ST NOVEMBER, revised rates for the Carriage of Cotton to Bombay, will come into force.

Special reduced rates for the carriage of grain over the Great Indian Peninsula Railway, between Bombay and Jubbulpore, and the East Indian, and Scinde Punjaub and Delhi, Railway Stations, will also come into force on the 1st November.

Full information can be obtained from the undersigned.

HENRY CONDER,
General Traffic Manager.

Bombay, 31st October 1870.

TIMBER SALE IN NORTH CANARA.

NOTICE is hereby given, that the undermentioned quantity of Timber, the property of Government, will be sold by public auction in December 1870 and January 1871 at the Ports of Gungawally, Carwar, and Sedashigur :—

	Teak, best Southern.		Blackwood.		Junglewood.		Date of sale.
	Logs.	Candies	Logs.	Candies.	Logs.	Candies	
Gungawally..	202	327	33	29	5	5	19th Dec. 1870.
Carwar..	2,679	5,039	506	558	221	494	5th Jan. 1871.
Sedashighur..	223	210	409	215	1	9	Ditto.
Total ..	3,104	6,176	948	802	257	508	

1. The Timber is arranged in lots.
2. The bids will be by the lot, and not by the candy, except in the case of such lots as may, for special reasons, be sold by the candy.
3. Intending purchasers are at liberty to examine the lots, and will receive from the Storekeeper any information they may require as to the registered size of each log.
4. No bid will be invalid on account of any discrepancy or dispute as to the contents of any log or lot.
5. *Terms*.—Purchasers to pay down 15 per cent. of the sale price on the day of sale, and the balance on or before the 1st April 1871.
6. Interest will be charged at the rate of 12 annas per cent. per mensem on all purchase money not paid by the above date, viz. 1st April 1871.
7. No lot is to be removed till paid for in full.
8. All Timber to be paid for and removed from the Depot on or before the 1st April 1871, and each log not removed on that date will be charged Depot rent at the rates specified below.

TEAK AND BLACKWOOD.

1. For logs above 3 candies, 4 Annas per month per log.
2. For all logs below 3 candies, 2 Annas a month per log.
3. Junglewood of all scantlings, 1 Anna per log per mensem.

9. The Timber will at any time be liable to be removed by Government, at the risk and cost of the purchaser, the cost of removal, and the amount of Depot rent due being recovered, if necessary, by the attachment and sale of the Timber, or any portion thereof.

10. All Timber, the price of which is not paid by the 15th April 1871, will be liable to be taken possession of by Government and resold at the risk of the first purchaser, whose deposit money will be forfeited, and who will be liable for any loss from resale thereof.

11. Further particulars of sale and rules may be obtained at the office of the Superintendent of the Timber Depot, Carwar.

J. ELPHINSTONE,
Acting Collector, Canara.

Canara, Collector's Office, Carwar, 1st October 1870.

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Price per No. .. .. .. Rs. 5.
" " Annum .. .. " 20.

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1 Page	10	35
½ "	6	20

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OPINIONS OF THE PRESS.

No. C.

The Centenary number of the *Calcutta Review* which has just appeared, exhibits a marked improvement upon its predecessors for some time past. It has not only increased in bulk, but contains a large variety of really able articles on subjects of general interest, European as well as Asiatic.—*Englishman April*, 1870.

No. CI.

From our advertisement columns it will be seen that an event important to the history of the CALCUTTA REVIEW has lately occurred. For the first time since that serial was set on foot a second edition has been called for. No. CI. is the notable number, and we hope that every succeeding unit in the century will deserve the same popularity.—*Pioneer, September* 6, 1870.

Just Published.

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Fire Reserve Fund	£297,153	10 10	
Fire Premium Reserve	138,514	15 1	
		435,668	5 11
Total Accumulated Funds		2,838,118	18 11
Annual Income from Fire, Life and Investments	£801,801	12 9	

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Revenue.		*Invested Funds.*	
Fire Premiums	£ 836,816	Capital	£ 391,752
Life Premiums	„ 250,039	Life Reserve	„ 1,873,020
Interest	„ 162,680	Reserve Fund	„ 971,410
		Undivided Profit	„ 64,823
	£ 1,249,535	Accumulated Funds	£ 3,301,005

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Policies of Insurance against Fire upon Dwelling Houses and other Buildings, in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the Company.

The rate on pucka-built Bungalows situated out-side the Fort of Bombay or in any part of the Bombay Presidency, is now reduced to (6) six Annas per cent. per annum.

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A. C. BRICE & Co.,
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LOCAL BOARDS and AGENCIES in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where Premiums may be received and claims paid.

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PROFITS divided every five years.

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D. CLUNIE GREGOR,
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C. LAZARUS & Co. as Manufacturers, invite particular attention to their large stock of full-sized Billiard Tables, the cushions of which are constructed on an entirely new principle similar to those supplied be C. L. and Co. and now in use at the Bengal Club and in most of the Clubs and Messes of the three Presidencies.

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THE Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, THURSDAY 15TH DECEMBER, 1870. No. 5.

Advertisements.

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MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.



THE COMPANY INTENDS TO DESPATCH EVERY MONTH a Steamer from TRIESTE to BOMBAY, and *vice versâ*.

The Passenger Steamer "THETIS" will leave Bombay for Trieste about the 20th January. Early application for passages should be made to prevent disappointment.

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	Cabin.	Deck	without food.
To Aden	£ 16	....	£ 6 -15
To Suez	„ 28	....	„ 11-15
To Port Said	„ 30	....	„ 12-10
To Trieste	„ 40	....	„ 16-10

Cargo taken for Trieste, Venice, Constantinople, Odessa, Aden Egypt England, and the Continent generally

There is also a weekly service by MAIL STEAMERS between Alexandria and and *vice versâ*, in conjunction with the P. & O. Co.'s Mail Steamer to and from Suez. The Austrian Lloyd's Mail Steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 209 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the Port of Trieste. The passage occupies only 4½ to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers to Southampton, at a charge of 10s. per cwt., to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned Agents grant also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria.

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS .....£11 | SECOND CLASS £9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLASS, £7-10 per head

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In conjunction with the Austrian Lloyd, Cargo for Trieste and Venice can be booked through from Bombay by the P. & O. Co, and the Bombay and Bengal Steam Ship Co., and via Bombay from the various ports touched at by the steamers of the British India Steam Navigation Company.

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GOODS for Trieste, Venice, Odessa, and Ports on the Syrian, Turkish and Greek Coasts, shipped by Steamers under any Flag whatever from Japanese, Chinese, and Indian Ports bound to Mediterranean or British Ports VIA SUEZ CANAL are received and transhipped by the Austrian Lloyd's Agent at Port Said, and forwarded to their destination by the Company's regular lines of steamers.

For further particulars, and for freight and passage apply to
A. C. GUMPERT & Co.,
Bombay, 2 Ash Lane. Agents for the Austrian Lloyd

STEAM COMMUNICATION WITH KURRACHEE.



THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to KURRACHEE every Monday at noon,

Bombay, 1870. W. NICOL & Co., Agents.

AUSTRIAN LLOYD'S STEAM NAVIGATION COMPANY.



IN ADDITION TO THE MONTHLY-LINE of Steamers between BOMBAY and TRIESTE, the Company have resolved upon establishing a transhipment service at Port Said for goods shipped for Trieste by steamers sailing under any flag whatever, from the JAPANESE, CHINESE, and INDIAN Ports to MEDITERRANEAN or BRITISH Ports via Suez Canal.

Merchants and Shippers, who avail themselves of this mode of conveyance, are respectfully requested to address such goods to the Austrian Lloyd's Agency at Port Said, which will care for their transhipment upon and forwarding by the Company's weekly steamers running between that port and Trieste, via ALEXANDRIA, charging the following rates of freight:—

Cotton, Wool, Skins, Tea.. .... 24 shillings per ton of 40 Eng. c. ft.
Indigo, Silk ..... 60 „ „ 20 cwt.
Gum, Incense, Coffee, Pepper, Oil-Seeds, Ginger, Rice, Oils, &c. ..... 10 „ „ 20 cwt.

inclusive of transhipment expenses, as also of eventual charges for disembarkment, storing and re-embarkment. On these rates a reduction of 8s. per ton of 20 cwt. is allowed when goods are received and embarked at Port Said by any other medium than that of the Lloyd's Agency

The Company undertake, at Merchants' request, the Insurance against War risks the following premium per cent List:—

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10 „ 1st of Oct. to 31st March.

Goods for Odessa and ports of the Syrian, Turkish and Greek Coast touched at by the Company's steamers, will also be received and forwarded at the above rates of freight

By order of the Board of Directors,
Trieste, 15th February 1870. A. C. GUMPERT & Co.,
Bombay, 2nd March 1870. Agents of the Austrian Lloyd's S. N. Co

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.



MESSRS. R. RUBATTINO & Co.'s ITALIAN MAIL STEAMERS are running between GENOA & BOMBAY, calling at LEGHORN, NAPLES, MESSINA (occasionally ALEXANDRIA), PORT SAID, SUEZ, ADEN, and *vice versâ*.

The next Steamers of the above Company leaving this port will be the newly English-built Steam-ship "INDIA," 2,500 tons burden, Captain DEBARO, with superior accommodation for 1st, 2nd, and 3rd Class Passengers. She is expected to arrive by the end of January, and will consequently be despatched within the 2nd or 3rd week of February 1871

More precise information regarding her departure will be given on her arrival.

PASSENGER RATES.

Inclusive of all transit fees through the Suez Canal.

	1st Class	2nd Class.	3rd Class.	
To Aden	£22	£15	£4	Including Wines.
„ Suez	36	22	8	
„ Port Said	48	24	9	
„ Alexandria	39	25	9-10	
„ Messina	45	32	12	
„ Naples	47	33	13	
„ Leghorn	50	34	14	
„ Genoa	50	34	14	
„ Marseilles (than shipment at Genoa)	52	35	14-10	Without Wines.

Children under 3 years, free of charge Children not above 10 years half fare

Passengers are allowed to *break the voyage at any of the above named Mediterranean ports*, and are free to resume it by any of the Company's Steamers to the port of destination marked on their Tickets.

Passengers returning within six months of their departure from Bombay by the steamers of the Company, are entitled to a reduction of 20 per cent. on the return fare.

Berths may be secured in advance by depositing half the Passage Money.

For prospectus, rates of freight, and further particulars, apply to
VOLKART BROTHERS,
Bombay, 19th December 1870. Agents, Rubattino Steam Navigation Company.

STEAM COMMUNICATION WITH THE PERSIAN GULF, VIA KURRACHEE.

Interchanging Cargo and Passengers at Bussora, to and from Baghdad, with the Euphrates and Tigris Steam Navigation Company



THE British India Steam Navigation Company, (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, will despatch a steamer every 14 days to the PERSIAN GULF, touching at KURRACHEE, GUADUR, MUSCAT, BUNDER ABBAS, LINGA, BUSHIRE, FAO, MAHOOREAH, and BUSSORAH.

Bombay, January 1870. W. NICOL & Co. Agents.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.



THE British India Steam Navigation Company, (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days

This route is the most expeditious and economical for passengers for the Neilgherries via Beypore, Bangalore and Madras, where rail is found at Calicut for Beypore, and proceed from thence by rail

Passengers for Calcutta can take the same route, picking up the steamer at Madras

Bombay, January 1870 W. NICOL & Co., Agents.

COMMERCIAL UNION ASSURANCE COMPANY.

HEAD OFFICE: 19 & 20, CORNHILL, LONDON.

Capital fully subscribed.....£2,500,000.
Amount paid up £250,000

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The Oriental Bank Corporation.
The Chartered Mercantile Bank of India, London and China.

SOLICITORS.

Messrs. Barners, Sanderson, and Upton.

LIFE DEPARTMENT.

THIS COMPANY having a subscribed Capital of Two Millions and a Half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The Prospect of Bonus to the Participating Policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first Life Policy was issued in May 1862. On the 31st December 1869, the Life Premium Income, exclusive of Re-assured Risks, was about £2,000, and at the same date the Life Trust Funds *on the Premium security of Life Policies* exceeded £189,000, being upwards of sixty per cent. of the amount received upon whole Life Policies then in force. *After providing for all Special Policies, and for the Reversionary Bonuses declared upon existing Policies*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed £500,000, and the uncalled Capital of £2,250,000.

Four-fifths of the *entire* Profits of the Life Branch are divisible among the Participating Policy-holders.

Rates of Premium.

These are generally lower than the rates of other Offices.
Premiums are received-
1. Annually
2. Half-yearly, Quarterly, and Monthly.

Examples of With Profit Rates.

For the Assurance of Rs. 1 000 for the whole Term of Life.

Age next Birthday.	CIVIL. Annual Premium.	CIVIL. Monthly Premium	Age next Birthday.	MILITARY. Half-yearly Premium.	MILITARY. Quarterly Premium
		Rs. a. p.		Rs. a. p.	Rs. a. p.
30	39	3 8 2	35	24 7 0	12 7 3
40	47	4 3 9	40	27 0 8	13 12 6
50	62	5 9 3	45	30 10 11	15 10 2

Examples of Without Profit Rates.

Age next Birthday.	CIVIL. Annual Premium.	CIVIL. Quarterly Premium.	Age next Birthday.	MILITARY. Half-yearly Premium.	MILITARY. Monthly Premium.
		Rs. a. p.		Rs. a. p.	Rs. a. p.
35	38	10 1 1	30	20 12 10	3 9 7
40	42	11 2 1	40	21 7 0	1 3 8
45	48	12 11 6	50	31 2 3	5 6 5

Examples of Short Term Rates.

Age next Birthday.	Annual Premium	Half-yearly Premium.	Age next Birthday	Quarterly Premium	Monthly Premium.
	Civil.			Military.	
		Rs. a. p.		Rs. a. p.	Rs. a. p.
35	28	14 9 0	40	10 1 1	2 15 6
40	20	15 1 3	50	11 6 4	3 6 9

BONUS

Policy-holders have the option, when their Policies are unencumbered, of selecting any of the following. :—

Modes of receiving the Bonus declared.

1. By an increase of the sum assured.
2. By a payment in cash
3. By a permanent reduction of future Premiums.

Examples of Bonus declared on Policies effected in 1863, at the Division of Profits, 31st December, 1867.

Age at entry	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on sum Assured.
	£ s. d.	£ s. d.	£ s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

Surrender Values.

Policies are purchased by this Company at an equitable value after payment of Premiums for three years.

Days of Grace.

Thirty days are allowed for the payment of Premiums, when they are payable yearly, or half-yearly, and fifteen when quarterly or monthly.

Forfeited Policies may be revived at any time within six months, if satisfactory medical evidence of the health of the life be produced (at the expense of the Assured) and a fine of one-half per cent. be paid on the sum assured.

Claims.

These are paid *one month* after proof (satisfactory to the Directors) of the decease of the Lives assured has been furnished to the Company, and the rate of Exchange will invariably be two shillings sterling per Rupee. Should death occur within the days of grace, the Policy will still be valid, and the sum assured paid after deduction of the Premium. The importance of this last regulation is obvious.

Limits as to Residence and Travelling.

Lives assured at Indian rates, who are not seafaring persons, are allowed to reside or travel without license, *in any part of the world* provided they do not proceed to any country which is at war.

General Regulations.

The English rate takes effect from the date of departure for Europe from Alexandria or Port Said, and the Indian rate from the date of arrival at either of those places outward bound.

Medical Fees and Stamp Duty are paid by the Company. No Entrance Fee or other payment at is required of the Assured beyond the Premium.

Assurances may be effected, when necessary, on the same day that Proposals are received.

The following Agents have been appointed to transact business with the Life Department.—

Agra	Uncovenanted Service Bank.
Allahabad	W. Frazer, Esq., Bank of Bengal.
Behar Districts	J. Ainsley, Esq.
Bareilly	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Campore	W. Neill, Esq., Bank of Bengal.
Delhi	Bank of Upper India
Ditto	T. Lucas & Co.
Champaran	James Begg, Esq.
Chumparan Districts	E. C. Lamb, Esq.
Dalhousie	Walter Adhard, Esq.
Delhi	Delhi Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal,
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Dhanso	Buzengee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank
Lucknow	W. Dickson, Esq., Bank of Bengal
Madras	Messrs. Arbuthnot & Co.
Jhan Meer	W. Adhard, Esq.
Meerut	Greetham & White.
Muzaffurpore	T. Lucas & Co.
Mungpoo	Thomas & Co
Nowgong	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq., Bank of Bengal.
Purneah	P. H. D. de Bombal, Esq.
Rampoor	Messrs. Bullock Brothers.
Rohilkund Districts	H. Costley, Esq.
Sylhet	E. G. Foley, Esq.
Saugor	J. A. Withall, Esq.
Simla	United Bank of India.
Tirhoot	E. Dalgleish, Esq.
Umballa	Ditto
Ditto	Greetham & White.

Fire Department.

The first consideration in selecting an Office should be its ability to perform its engagements: in this respect the Commercial Union, by its very large subscribed and paid-up Capital, offers an undoubted guarantee.

The Fire Premium income of the Company, as at 31st December, 1869, exceeded £120,000.

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on Merchandize Warehouses, Screw-Houses, Mills, Dwelling-Houses, Shipping, &c.

Rates for Fire Risks in Calcutta.

The buildings being Brick or Stone, built and tiled or roofed with Metal, Slate, or Chunam.	Per Rs. 100. 12 months.	6 months.	3 months.	2 months.	1 month.
Private Dwelling Houses	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade from to { Warranted that no jute or cotton in a loose state be deposited in the Buildings.	10	7½	5	4	2½
	14	9	6	5	3
Bonded Warehouse, no Hazardous Goods	8	6	4	3	2
Jute and Loose Cotton	16	12	8	7	4
Presses or Screw-Houses Cotton or Jute (warranted no artificial light used.)	20	15	10	8	
Without such Warranty	24	18	12	9	

The rates for Mofussil Risks may be ascertained from the Manager.
Agents at Simla—The Simla Bank Corporation.
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the Company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,
No. 1, Hare Street, } C. H. OGBOURNE,
Calcutta, 7th November, 1870. } Manager in India.

Applications for Agencies will be received from influential Mofussil Residents.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, THURSDAY 15TH DECEMBER, 1870. No. 5.

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THE RUSSIAN CIRCULAR.

THE whole gravamen of this difficulty lies in the proof which it affords that respect for treaty obligations is for the present lost in Europe. To illustrate our meaning, we point to the fact that although the Treaties of 1815 were framed, and necessarily framed, in a spirit of hostility to France, and were ever so regarded by her statesmen, no French Government ever dreamed of repudiating the obligations which they imposed upon the nation. French statesmen honorably recognized their binding character, and looked to time to modify such of their provisions as were obnoxious to them Treaty engagements between nations are what lawyers call "contracts of imperfect obligation," the only power capable of enforcing them resting upon the combined action of the surroundin nations. A State which assumes to itself the right o cancelling its treaty obligations is a public enemy, and in the future will come to be treated as such. On no other basis than some such general agreement amongst nations to punish the treaty breaker, will general peace and order ever be maintained. All question of the reasonableness or otherwise of the engagements under which the Russian Court came by the Treaty of Paris, is out of court under present circumstances. By repudiating that treaty, the Russian Court has placed itself outside the pale of law, and must be held to be a common enemy by all civilized powers. To narrow the quarrel to a duel between Russia and England, is a profound mistake. England may have a special interest in the maintenance of the treaty, but that interest is altogether subordinate to the interest which all Europe has in compelling its various members to respect their engagements. Lord Granville is therefore perfectly right in requiring Prince Gortschakoff to withdraw the Circular in which he repudiates the treaty, as a preliminary to all consent to the Conference. Whatever course Russia may now take, the English Ministry is quite right in refusing to review the treaty, until Prince Gortschakoff's Circular, which is a simple defiance of public law, is withdrawn.

Should Russia refuse to withdraw the Circular, England must absolutely decline the Conference. She is bound to do this in behalf of Europe. Should the Russian Minister attempt to give effect to his Circular, it will be the duty of *every civilized Cabinet* to resist and punish the treaty-breaker. It will be the duty of all alike to do so, of the American Cabinet as much as the European ones. As the most powerful of them all, and the State against which the offence was specially directed, England no doubt has peculiar responsibilities of her own in the matter That it would be her duty to engage single-handed in war against the offender is not however clear; but if other powers are prepared to follow her, she cannot rightly, we think, refuse to lead them. Unfortunately at the present moment owing to the ascendancy which Prussia has gained by a course of foreign policy described by Mr. Gladstone as "brutal" and "unscrupulous," no genuine alliance exists between any two nations in Europe. Each Cabinet is isolated from every other. That a secret treaty of some kind exists between Russia and Prussia seems to be undoubted, but the alliance whatever be its nature, is hollow and unscrupulous, and will not bear the light of day. Under the ascendancy of this sinister Power, the reign of public law in Europe has for the present been completely subverted and overthrown

Louis Napoleon strove to substitute an era of Congresses for the reign of Law, which he saw was crumbling away and disappearing. Europe is launched apparently upon a period of complete lawlessness. The repudiation of the Treaty of 1856 by Russia, is quite as justifiable as was the repudiation of the Treaty of 1852 by Prussia in 1864. Both Powers deserve to be treated as common enemies, and if England enters upon a great war, not in maintenance of the Treaty of 1856—for which we care little—but in vindication of public law and public morality, she will deserve and will, we trust, receive the assistance of other Powers. Treaties cannot be too carefully or too equitably framed, nor their deliberate breach afterwards too severely punished. Prussia is at this moment forcing an inequitable and impossible treaty upon the French people, calculating upon their breaking it the moment they are powerful enough to do so. She is the great demoralizer, and the great disturber of Europe, and is the real instigator of this Russian outbreak against public law.

THE "PRESS" AND THE WAR.

IT is a popular, perhaps a true belief, that "notwithstanding a great deal of fustian and bad taste therein, with many other things as little to be commended, the Press must, in its nature, be an instrument of good; and that it is as much as can be hoped from any human institution that the good shall greatly exceed the evil of it." Restraints upon it, serve we are assured, but to enthral the judgment and conscience of the nation; to bind it over in slavery to the party for the time in power, and to involve the people in hopeless ignorance and error. The liberty of the press and the liberties of the country, we are told, stand or fall together, and the Press itself becomes respectable in proportion as it becomes free. In spite of the platitudes with which the world is

plied upon this subject, it is difficult to decide whether upon the whole society is the better, or the worse, for that peculiar institution of modern times which we call with some felicity—the fourth estate. Look at the tyranny which a man in the position of the editor of the *Times*, exercises upon opinion. At bottom the editor of that paper is a snob. He has no reverence in his nature for merely personal greatness or capacity. Corrupt in the vulgar sense of the word he is not; corrupt in a very true sense he is. Lord Palmerston had only to open his drawing room to this gentleman and button hole him for three or four minutes in the presence of society, to secure his support from one session to another. The earnestness of Mr. Gladstone has simply excited his enmity and provoked his sneers. The Statesman with the straw in his mouth and a wink in his eye, was exactly to his mind. The age has at last become more serious, and so of course has the *Times*. While Louis Napoleon, with the earnestness of a man full of a great idea, was urging the making of the Suez Canal upon capitalists of Europe, Lord Palmerston and the *Times* were declaring that it could could not be made, and that it was not intended to be made; and that the project was simply a device for placing a French army in possession of Egypt.

Had Louis Napoleon remained Emperor, he would have bridged or tunnelled the English Channel as surely as he made the Suez Canal, to make of two nations one people, emulating each other only in the arts of industry, and by their united might holding the brigandage of the world in check What hope is there of bridge, or tunnel, or effectual check now? Your Delanes could see in the proposal only the means of an insidious invasion for the overthrow of our island liberties. All that the leading journals of England and France could do to thwart the rule of the French Emperor and to make its continuance impossible at home and suspected abroad, they systematically did. The conduct of the *Times* towards the French Emperor has been full of dishonor. As in the American war the whole force of the journal was prostituted to bolster the most dangerous conspiracy ever organized against human liberty; so in this present war, it has ignored the whole course of Prussian history and thrown upon the French Emperor the guilt of events that were made inevitable by the intrigues of the Prussian Court. Had Louis Napoleon been born in the purple, the *Times* which "reverences a Lord," but has no reverence for personal capacity, would have bidden the world see in him the great King of France. As it is, he was only the adventurer of Leicester Square, the Parvenu of the Tuilleries.

If we owed the Exhibition of 1851 to the late Prince Consort, it was Napoleon who seized the idea, and who made these *Expositions* so powerful an incentive to the arts and sciences. Who but this man would have conceived the idea of bringing peacefully together in one city, as he did only three years ago at the Exposition of Paris, the sovereigns of Russia and Turkey, Prussia and Austria, and a host of the minor potentates of the Continent. The crowned heads of Europe have had a real respect for this man; the flunkey *Times*—none. The Prussian King in spite of himself is shewing that respect even now It is your scribblers in the Press that have none.

The prejudices amongst Englishmen which this war has brought to light are almost incredible Ask the next man you meet, what he *means* when he says the French Emperor was "a tyrant." In every corner of France, men have been at liberty to do and say everything that men may rightly do or say in any part of the world. Even the ruffian Rochefort was allowed to publish the *Lanterne* in Paris, week after week, until men wondered to what lengths the Imperial forbearance would go. France, under Napoleon, had complete religious freedom for the first time in her history; full civil and political freedom; and but for the ignorance and opposition of the people, would have had full commercial freedom also. Frenchmen were free to do and say anything and everything they pleased, so long as they did not conspire against the Government. They were allowed, however, the utmost license, and as we think, unwisely, to attack that Government in the press. Practically, France has been in the enjoyment of liberty as complete as could be conferred upon a people. Invidious distinctions of rank were unknown, and perfect equality before the law established between all classes.

On the other hand, Prussia has been under the most iron despotism. Its Parliament has met year after year, only to be treated with contempt. Its standing army has been increased in the teeth of a united popular opposition; its taxes levied without the pretence of consulting the people; its press published under stern restrictions, and its foreign affairs conducted by Bismarck without the knowledge even of the so called Cabinet itself. When therefore hysterical gentlemen like the younger Trevelyan, or Professor Wordsworth, exclaim so violently against "the personal rule" of the Emperor, we naturally ask what they mean? We truly do not know. If the French Emperor's foreign policy was guided by himself personally, as no doubt it was, the foreign policy of Prussia has been openly defiant of its parliament and people too. We are not upholding "personal rule" It is a grave and fatal mistake. But nothing but the most hopeless prejudice can condemn so bitterly the "personal rule" of the Emperor, while keeping profound silence as to the personal rule of Bismarck. When we remember, moreover, that "the personal rule" of the one was generous in its aims, while that of the other has been marked by nothing but ambition and greed, we stand amazed in the presence of prejudice so profound. The vices and failings of the French national character are all charged upon the French Emperor personally, while Bismarck and the Prussian King are credited with the solid, if neither very generous nor amiable, qualities of the German people. The hatefulness and guilt of the Prussian course are held, after some unaccountable fashion, to disappear in the presence of the respectable and quiet character of the people. A consideration which but aggravates the guilt of these men, is held to absolve them from guilt altogether. The war of 1866, in the emphatic language of the people themselves, was, *"the one man's war."* So deep was the indignation of the Landwehr at that war, that Bismarck did not dare to show himself in its ranks for fear of being shot. Its success simply debauched the public mind, and now Englishmen are bowing down before the idol then set up to the demoralizing of the worshippers. Upon the French Emperor, meanwhile, is heaped all the odium of Parisian vices and excesses. He who strove to prevent the war and would fain have disarmed Europe, is the great criminal of all! English journalism throughout the war, has been simply below contempt. Personal rule in perfection is the Prussian rule, as everyone knows who knows modern history; but the character of the Germans themselves being good, masks the odiousness, while it increases the guilt, of that rule. In France, the rule of the Emperor was in advance of the character of the people—notably so in the commercial treaty and in its attitude towards this war—while it has to bear all the odium of the nation's sins and failings.

A very fair illustration of the licence which English journalists are accustomed to allow themselves, when speaking of the French Emperor, was recently furnished by a local contemporary. Speaking of Louis Napoleon's presidentship, it says:—"It "rested on a huge lie. He swore faith to the Republic; he "designedly and at once set himself to break his oath. In "common life one likes to deal with the man who never keeps "things on the background to be turned up at inconvenient "times, as the secret treaty was turned up by Bismarck. There "is something hateful in that; and *that* Napoleon did. He "never intended to remain President either for ten years or for "life. He intended to be Emperor, and he stepped to the "throne over an awful crime; a crime so base that it has af-"fected the whole tone of human society from that day to this, "and will affect it for centuries. All the waters of the ocean "will not wash from Napoleon's name that great crime."

The writer who indulges in this passionate language, gives clear proof in the manner of his doing so that he is merely reflecting what he has heard others say, or seen others write upon the subject. It is impossible that anyone who has studied for himself the history of the Revolution of 1848 down to the *coup d' etat*, should write in these terms about it. We hold no

brief for the fallen Emperor, but feel deeply the debt which Englishmen owe to him, and are indignant at the appearance of such attacks in the columns of English journals. Look at the statement that Louis Napoleon "designedly and at once set himself to break his oath." We are not so much surprised at the fact which is professed to be disclosed, as curious to know by what means the writer ascertained it. How does he know that Louis Napoleon designed to break his oath from the first? The charge is a very heavy one, and it is a grave impropriety to prefer it, if the writer has no better ground for it than his belief that Louis Napoleon *must* have done so. We are satisfied from a study of the period that Louis Napoleon was loyal to the Republic; but at the same time quite ready to play the rôle of Emperor, if the people wished it. And nothing but hopeless prejudice can doubt that the French people, in voting him President, did so with a full intention of re-establishing the Empire. Was there any guilt in Louis Napoleon accepting the Empire when it was all but thrust upon him? There is dishonor, in these national attacks upon the fallen Emperor, after the complete condonation of the *coup d' etat* by the English nation and its Government. Can we forget that the Queen of England was the open guest of this man only four years after what the writer hysterically describes as a "crime so awful and so base, that it will affect human society for centuries?" You prove too much when you speak thus. Be good enough to remember that your Queen and the venerated Prince Consort honored this "great criminal" with their presence in his own Capital and Palace, and paid court to him upon that very throne to which you say "he stepped by an awful crime." We were nearer to these events at that time than we are now, and the long and tried friendship of this man towards us, should have softened and not embittered their memory, at all events in the eyes of Englishmen. The terms in which it has become the fashion to speak of the *coup d'etat* are not even true, while they are impossible to us, when we remember how weighty are the obligations under which the nation lies to this man personally. Englishmen really seem to be making an effort to forget the nation's debt to the Emperor by covering him with odium and putting him out of the pale of society lest his presence should be a perpetual reminder of their shame

It is easy to make light of the fact, but assuredly the historian will not do so, that this man was made Emperor by the votes of five, six, and seven millions of Frenchmen. The statement that the votes were obtained by the influence of the Prefects and the Maires, can impose upon none but those who are the dupes of their own prejudices. Louis Napoleon had no possible means of influencing the elections of 1848, and yet he polled 5,534,226 votes in that contest against Cavaignac's 1,448,107, although all the influence of the Government had been used in the most unsparing and unblushing way in behalf of the latter. What are Englishmen —who are they—that they should dictate to other nations whom they shall choose to be their rulers? If one thing is unequivocally certain in our days, it is that Louis Napoleon was made President, and became Emperor, by the choice of the great mass of the French people. And English men resent the fact, and ever have resented it, because he is a *parvenu* and not the legitimate Bourbon. Had the Duc d' Aumale been elected, we should have approved it heartily, while the election of one of the ablest men in Europe, offended the instinct that "loves a lord" beyond forgiveness. When the French people made Louis Napolion President, not for *ten* years as the writer under review in his misty forgetfulness of facts asserts, but for four, —they intended to make him Emperor and wished him to be Emperor. The factions of the Assembly knew this perfectly well, and Legitimists, Orleanists, Republicans, and Socialists conspired to thwart what they saw to be the national wish. They brought matters to such a pass that France was on the very brink of civil war, when the leaders of the army took the matter out of their hands altogether, and quietly carried the *coup d' etat*. Without any prepossessions in favor of Louis Napoleon or prejudices against him, upon simply a candid review of the history of the period, our judgment revolts against the terms in which the revolution of December 1851 is commonly denounced. With Montalembert and our own *Edinburg Reviewers* of 1855, we doubt much whether the act was not an absolute political necessity. Of one thing we are sure, that the world would have called it a wise and patriotic act, but for the fact that it promoted Louis Napoleon's own personal interest. Make the worst of that you can, the fact remains that the *coup d' etat* to this hour seems to have been the only possible solution of the crisis at which everything had arrived. The knot could not be untied, it could only be cut, and because the cutting of it was to the advantage of the man who cut it, he is "an atrocious criminal." We at all events, for the sake of the English character, protest that we dissent from such a judgment. No one has ever yet ventured, as far as we know, to point out what Louis Napoleon *ought* to have done, instead of the *coup d' etat*. The position was—the *coup d' etat* or anarchy. It would be worth our readers' while to contrast the history of the event in *Blackwood's* last number (*November* 1870) with the wild language commonly applied to it by English journalists now that the Emperor has fallen.

NOTES ON THE WAR.

METZ, it seems, is required to protect Berlin from the French, although a string of fortresses lies between them, while Paris is completely open to an assault from Metz. Europe is mad to allow the transfer. It simply means reducing France to a second-rate power, since a German army at Metz, lying close to the very heart of France must paralyze the nation, and leave Bismarck at liberty to do what he pleases.

THE English *Spectator* has suddenly discovered, upon the appearance of an article from the pen of Mr Ludlow in the *Contemporary Review*, that "Prussia has crowded into her "brief existence as a kingdom, more cynically flagrant "outrages against right than could be found in any other "period of history" "Can we forget," says the writer, "how "she bargained to take Hanover as the price for joining "Napoleon?" But how is it that the *Spectator* discovers this only now? The truth appears to be that English journalists are extremely ill-read in modern history. We find it difficult to make any other excuse for their writings during this war.

ALL Germany, says Mr. Carlyle, "may now look forward to "happier days in a political sense than it has seen since the Em- "peror Barbarossa left it. My individual satisfaction in all this "is great; and all England, I can say all the intelligent in "England, heartily wish good fortune to brave old Germany, in "what it has accomplished." Unfortunately for Mr. Carlyle he and "all the intelligent in England" with him were "heartily wishing good fortune" in the very same way for President Davis and the Southern States only a few years ago. Mr. Carlyle is a simple worshipper of "*successful* force," and too little careful of the real character of his heroes. He could see nothing but heroism in the leaders of the great conspiracy against human freedom in 1864. Mr. CARLYLE recommends German conquest from the sentiment which has made him always the worshipper of strength. "The apologist of despotism everywhere," as the *Daily News* calls him, "Mr Carlyle hates free government and personal independence. He believes in slavery, white and black. The absence of the properly political virtues in the German people is to him their highest virtue. That pusillanimity which makes them acquiesce in invasions of civil right, and as obedient in political as in military affairs to their drill-sergeants and captains recommends them to him. When they pass out of this stage, he will like them less. In the meantime, it is well that men of calmer judgment should avoid allowing the simple question of the merits of the war to betray them into a quarrel of races. Mr. Carlyle's fierce philo-Germanism is as dangerous a sentiment as the blind philo-Gallicism against which he lifts up his voice."

We suppose that none of our readers forget his "Iliad in a nutshell." In *that* case, it is admitted that he began to worship what looked like success too early. It is not impossible perhaps that he is falling into the same error again.

The *Saturday Reviewers* in their issue of 29th October admit that "the French Government had most distinct warning in "1868 that Prussia was preparing for war with them, and was "looking to Alsace at least as the prize of conquest, and that "in the spring of that year General Von Moltke was engaged "in a minute examination of the fortresses and positions on the "line of the Moselle" being secretly followed by a French agent. We also learn that "behind the screen the conquest of Alsace "and Lorraine was the common talk of the inner circle of the "Prussian court, and had been so for years." It does not suit the *Reviewers* to admit as yet that the war was *forced* upon the Emperor, but they have got the length of discovering that "there is little to choose between the statesmen of both sides" in apportioning its guilt. We thought it was all engrossed by the Emperor! They told us so, not three months ago.

Much unreasonable remark has been made upon the slowness with which the departments of France have responded to the appeals made to their patriotism by the Republican Government. From the tone of the English press it would really seem to have looked for a literal rising of the people *en masse*. Whatever else characterises our age, thoughtfulness and reflection seem to be lost. We believe the age *reads* too much, while it thinks too little. There never was probably a more superficial generation than our own. Everybody knows everything, but you may tell off upon the fingers of one hand the men of your acquaintance who ponder and weigh what they read. The rising of a people literally *en masse* is a very rare occurrence, and is ever preceded by long preparation for such a movement. France is still half bewildered by the weight of her calamities, but she is answering well to the appeals made to her patriotism

We shall probably very much astonish some persons when we say that instead of expressing suprise at the want of discipline shown by the French troops under their reverses, it would be more just to express astonishment that they held together so well as they did, under generalship so manifestly incompetent, and against odds so overwhelming. The French army never was a disciplined force, even under the first Napoleon. If he had relied upon the *discipline* of his armies for his successes' they would never have been achieved The French army in modern times, while full of soldierly instincts and of military dash, has ever been badly organised and imperfectly disciplined Dé Fézénsac's *Recollections of the Grand Army* ought to have ong since dispelled all belief in the discipline of the forces of the old Empire. A disciplined and well organised French army has not been seen in modern times. General Trochu holds out to France for the first time, the hope of such a force being organised.

We quote the *Indian Daily News* :—"However powerful and "highly organised the Prussian army may be, the nation is "neither intoxicated with victory nor maddened with an am-"bitious lust for conquest beyond the borders of German-"speaking countries It seems to us to be clear that the en-"thusiasm of Germany must inevitably fall away from its pre-"sent leaders, if this powerful element of success, which has "been invoked in the support of German altars, is diverted—"or if any effort is made to divert it—to the propping up of "a reckless military despotism, fired by pride of race under the "flimsy disguise of national ambition. We have seen what "Germany can do in a war which her people believe to be just "and holy ;—it remains to be seen what they will do, if they "can be persuaded to do anything at all, in an unprincipled "and unjustifiable contest."

Has the writer been asleep all these years, or does he simply forget the war of 1866? So "unprincipled and so unjustifiable" was that war in the eyes of the Prussian people themselves, that they assembled throughout the country in crowds to protest against its prosecution. They called it "The one Man's War," and its author did not dare shew himself amongst the Landwehr, for fear of being shot. But splendid success "by the evident favor of God" crowned it; and now the nation worships the man whom it then execrated. It was with great difficulty that the King's own scruples in that war were overcome, for he knew well the baseness of the course by which Bismarck had forced matters to the *ultima ratio*. The *Indian Daily News* forgets the history of its own days.

Carl Vogt, "the well known philosopher," as the *Pall Mall Gazette* calls him, has published an honest letter upon the subject of the war in the *Frankfort Gazette*. He declares the war to have been "the necessary consequence of the campaign of 1866," and lays the guilt of it upon Berlin as much as upon Paris. "Both in Paris and at Berlin the Government has, "since 1866, been endeavouring to excite the people, not to appease them. In the west this was done with much show and "noise ; in the east quietly, but no less earnestly. . . . . "Count Bismark has performed a master-stroke in shifting the "responsibility of the war on France." The *Moscow Gazette* says that "the war was prepared by the astute policy of Bismarck not only at Berlin *but in the enemy's camp*." Bismarck took the utmost care to advertize to the German mind that France was seeking territory upon the Rhine, and to impress Europe, as offensively to France as he could, with the fact that the fortunes of the Fatherland were now in the keeping of a champion that laughed at her pretensions. The attitude was as base and dishonorable as it could be considering the services of the Emperor. He knew perfectly well that the cession of Luxembourg would have dissipated all irritation in Paris ; but the only hope of a general acquiescence in the Prussian domination of Germany lay in his ministering to the pride of the nation, to its new-born sense of power and importance. It was upon this temper that he was ever playing after 1866. He cared nothing for Luxembourg, but for the opportunity it gave him of placing Prussia before the world in the position of the championof Germany. He knew well the difficult position of the French Emperor, and at last left him no resource but war, by all but carrying the Spanish throne by a secret *coup de main*. He knew that the temper of Paris was such that this new aggression would compel the Emperor to declare war.

THE LAND.

At Home and in India.

As an evidence of the growing tendency to agitate the question of the land in England, and as a sign of the direction of opinion, we append the following programme of an association lately framed in London under the presidency of Mr. J. S. Mill. for the prosecution of reform in the land tenure system of England. The society takes the name of the Land Tenure Reform Association and its objects are declared as follows:

Land tenure reform association.—The new programme.

I.—To remove all legal and fiscal impediments to the transfer of land.

II. To secure the abolition of the law of primogeniture.

III.—To restrict within the narrowest limits the power of tying up land.

IV.—To claim for the benefit of the State, the interception by taxation, of the future unearned increase of the rent of land (so far as the same can be ascertained) or a great part of that increase, which is continually taking place, without any effort or outlay by the proprietors, merely through the growth of population, and wealth, reserving to owners the option of relinquishing their property to the State, at the market value which it may have acquired at the time, when this principle may be adopted by the legislature.

V.—To promote a policy of encouragement to co-operative agriculture, through the purchase by the State, from time to time, of estates which are in the market, and the letting of them under proper regulations, to such co operative associations, as afford sufficient evidence of spontaneity, and promise of efficiency.

VI.—To promote the acquisition of land in a similar manner, to be let to small cultivators, on conditions which, while providing for the proper cultivation of the land, shall secure to the cultivator a durable interest in it.

VII.—Lands belonging to the crown, or to public bodies, or charitable and other endowments, to be made available for the same purposes, as well as for the improvement of the dwellings of the working classes, and no such lands to be suffered (unless in pursuance of the above mentioned ends, or for peculiar, and exceptional reasons) to pass into private hands.

VIII.—All lands now waste or requiring an Act of Parliament to authorise their enclosure, to be retained for national uses, compensation being made for manorial rights, and rights of common.

IX.—That, while it is expedient to bring a large portion of the present waste lands under cultivation for the purposes, and on the principles laid down in the preceding articles, it is desirable that the less fertile portions, especially those which are within reach of populous districts, should be retained in a state of wild natural beauty, for the general enjoyment of the community, and encouragement in all classes of healthful rural tastes, and of the higher order of pleasures also in order to leave to future generations the decision of their ultimate uses.

X.—To obtain for the State the power to take possession (with a view to their preservation) of all natural objects or artificial constructions attached to the soil which are of historical, scientific, or artistic interest, together with so much of the surrounding land as may be thought necessary, the owners being compensated for the value of the land so taken.

JOHN STUART MILL, Chairman.
PETER ALFRED TAYLOR, Treasurer.
ANDREW REID, Secretary.

Land Tenure Reform Association, 9, Buckingham Street, Strand.
London, W. C., July 8th 1870.

We owe it, we suppose, to the war that the establishment of this Association has escaped observation in the Home Press. Its existence is made known to us for the first time by an incidental reference thereto in Dr Hodgson's recently published lectures upon *Turgot's Life, Times and Opinions*

It is impossible to exaggerate the importance of this programme. The injurious effects upon the nation of the present state of the English law with respect to property in land are far from being generally understood, or even suspected by English statesmen. A reform of the land tenure system of the mother country, lies at the root of all effectual dealing with the social problems that so perplex and distress humane minds. In view of this programme, expressing, as it does, the latest convictions of the scientific world upon this great subject, what are we to say to the open defiance of them shewn in our own recent land settlement proceedings in the Central Provinces, in which expression has been given to a policy radically opposed to the teachings of economic science, subversive of the law and constitution of the country, and destructive of the immemorial rights of the State on the one hand, and of the cultivator on the other. We are most sorry to be perpetually dragging this subject forward, wearing, as it does, the aspect of constantly attacking Sir Richard Temple But what can we do? We see plainly what others do not yet see, that he has *destroyed the provinces* by his folly In the very infancy of the wrong, we point it out, and call earnestly upon the State to review what has been done, and to reverse it We have no hostility, not the very least, to Sir Richard Temple; but we see plainly that his restlessness and vanity have found expression in proceedings which involve the ruin of the Provinces. While the whole body of economists at home are directing all their energies to remedy evils which a mistaken policy towards the land has entailed upon the country, Sir Richard Temple has been allowed deliberately to introduce the very same policy into India, in subversion of old and immemorial institutions which it was the peculiar happiness of the people to have inherited from the past. We have striven with our whole might, ever since we became acquainted with the facts, to induce the State to review what has been done. We are persuaded that nine-tenths of our official men are convinced that we are right, but some decision is wanted. The giving away of the waste lands of the Provinces has happily been stopped, and indications are not wanting that the Supreme Government is at last awake to the absurd character of the new assessments being imposed upon the land. The *third* error of the settlement, however—the fatal revolution introduced by transferring the proprietorship of the soil from the State to the malgoozar, or village patels,—is not yet recognized, or understood. Let us try once more to shew what has been done. When Sir Richard Temple began his settlement then, the Provinces were under cultivation by a body of about 800,000 tenants: "The settlement" says Mr Rivett Carnac "found all classes of cultivators in the position "of tenants. In the same way the landholders were but *farmers* "when the country was annexed (1854). The British Govern- "ment made these *farmers* proprietors of their estates. Enquiry "shewed that in nearly every estate there existed a class o "cultivators, then only tenants, who for particular reasons were "deserving of special consideration, who *quo ad* their fields or "holdings possessed as good a title to proprietary right as the "landholders (farmers). The cultivators were accordingly taken "out of the category of *tenants* altogether, and raised to the "rank of proprietors of their holdings." All the rest of the cultivators, were made tenants at will of these two classes,—the farmers (malgoozars) and superior cultivators. The State, in the wildest spirit of revolution, has conferred the absolute *landlordship* of the soil upon the malgoozar and superior cultivator. We take this popular account of the Settlemen from Mr. Rivett-Carnac's interesting report upon the Wurdah district (p. 104). The general result is, that the State no longer owns an acre of land in the Provinces—except certain wastes. The settlement has transferred we say the absolute proprietorship of the soil from the State to the malgoozars and superior cultivators of the provinces, and made all the rest of the cultivators their tenants at will. Out of a body of 830,000 cultivators, 175,000 are mere tenants at will either of the malgoozar, or of the superior cultivator endowed with rights of occupancy, while the malgoozars themselves are only about 80,000 in number. In tabulated form, the result is:—

At the Malgoozar's mercy.....	474,656	tenants at will
Cultivators with certain rights,...	298,000	"
The Malgoozars themselves	81,000	"

The State has made over the soil to these 81,000 men, and left the mass of the cultivators at their mercy; but thrown certain barricades around the 298,000 superior cultivators of the 2nd class. In other words, the settlement has repeated to the letter all the errors of the Cornwallis settlement in Bengal. The wrong that has been done is so unpardonable, that we feel at a loss to describe it in just terms of animadversion. As a landlord who receives no *rent* is, of course, an absurdity, it was necessary to make the malgoozar a real landlord; and so the settlement makes him a present of half the rental hitherto taken by the State. Indeed it ostentatiously *abandons the entire rental to this mushroom race*; for while fixing their contribution for 30 years at 2 annas 7 pies per acre it allows them, and encourages them, to screw out of the actual cultivator all they can get.

The superior cultivators (298,000) are supposed to have some protection against their exactions by the settlement rules; but the 475,000 tenants at will have none whatever, and are not designed to have any. Thus while the land is paying these malgoozars, whatever rental they may choose to exact, the State demand on the malgoozar is fixed for 30 years at 2 annas and pies per acre on the settlement area.

The State has made over the ownership of the 35,312,489 acres assessed under the settlement to these men for a gross payment of £ 500,000 a year, while they may take £ 5,000,000 out of the land if they can; and admittedly are taking upwards of £ 1,000,000 at the very outset of the settlement. When we enquire why this disastrous revolution has been made, the sole answer is that a school in Calcutta have got the notion into their muddled brains, that it is better for the landlord-ship of the soil to be in the hands of middlemen than of the State. The whole body of economists meanwhile, condemn them *with one voice*. The revolution is fraught with a thousand evils familiar enough to the student, and in India it simply means the stereotyping of the poverty and degradation of the people. We are clear of the guilt of these proceedings; their authors will be covered with shame for all time. If Sir Richard Temple were a statesman, he would himself seek permission to undo the evil he has done. A *little* man is of course incapable of such resolution. We have a better opinion of Sir Richard Temple's powers than the Indian press generally; and he should redeem his official career from the opprobrium of the one great blunder that has marked it, by getting permission to undo in its infancy the evil he has inaugurated so rashly.

THE COTTON COMMISSIONERS.

WE suggest to the Cotton Commissioner of Bombay and to

Mr. Rivett-Carnac, that they should require the officers in charge of the experimental Cotton Farms to keep their monthly reports of the season and the prospects of the crop distinct from the accounts they send us of what is being done upon the farms. The character of the season and the prospects of the out-turn are of special interest and importance to the merchant; but the work going on upon the farms is of far greater interest to the economist and the statesman. We should be glad to have a report once a month from every model farm in the country, for publication in the *Agricultural Gazette of India*.

We want to excite, and then sustain and keep alive an active interest in the improvement of our agriculture, and we know of no way in which we are so likely to do this, as by engaging the gentlemen in charge of these farms in a minute and regular account of their work. The reports now issued by Mr. Rivett-Carnac and Dr. Forbes, leave little to be desired in so far as the season and its prospects are concerned; but we want them to give us more information as to what is being done upon the model farms in course of establishment. The Administration Report of the Cotton Department in Bombay for the last season is a very unsatisfactory affair, in so far as it deals with the experimental cultivation going on in Western India. The mistake has been made of jumbling together in one report an account of the cotton trade of the season, with a mass of half digested, incomplete statistics concerning the experiments for improving the cultivation now in course of progress in that Presidency It is time, moreover that Dr Forbes supplemented his account of these experiments with exact information as to their results. It is a mistake altogether, however, for the Commissioners to jumble together their supervision of the trade in Cotton, with reports of the agricultural experiments they are conducting. If they will give us every month separate and distinct reports for the trade on the one hand, and for the economist on the other, we shall be greatly obliged to them.

The prospects of the and all matters affecting the course of trade, would find their legitimate place in this part of our journal; while the work going on upon the farms woul appear every month in our Agricultural Supplements.

THE NORTH WEST PROVINCES.

THEIR GRO[illegible] PRODUCE.

WE have received the followin[illegible]ible and interesting critique upon our late estimate of the Harvest of the North Western Provinces:—

SIR,—I have read your two articles on the "Standard of Living," in your October and November numbers, with great attention and interest. They contain a valuable collection of facts, and deserve the careful consideration of all our Settlement Officers, and of all who are engaged in the financial administration of the country. I believe too that you have adopted the true method of calculation in such matters, and that there is less likelihood of error in treating the subject on a large scale, as you do, by arguing from the food to the produce, than in attacking it in detail, and estimating average produce acre by acre and grain by grain. But you seem to me to be mistaken in many of your facts, as far as the North West Provinces are concerned, and I venture to think that I can show grounds for asserting that the Land Revenue bears a much larger proportion to the gross produce than you maintain.

"Your estimates is as follows:—

	£
Food of 31 million of people at 20 Rs.	60 millions
Seed corn, 1-7 of the crop of 70 millions	10 ,,
Clothing at 2 Rs. per head of population	6 ,,
Forage, Pasture and Garden	8 ,,
Indigo, Sugar, Cotton and other exports	8 ,,
	92 millions.

"I will take up these items in detail. You assert and maintain with great wealth of argument, that the consumption of food is 2 lbs. per head, but the figures from which you draw this result are the figures that shew the actual consumption of jails and of emigrant ships, and an estimate of what people could consume if they eat their fill. But do you really consider these figures any basis for an estimate of *average* consumption? Consider a moment. The diet at jails is avowedly a large and generous diet, meant to resist the depressing effects of confinement; and it is obviously no criterion of general consumption. It is the food required by men engaged in hard labour; and all the population is not so engaged, and does not require as much sustenance. It is a diet which amply satisfies the hunger of the prisoners; and I do not hesitate to say that half our agricultural population never know from year's end to year's end what it is to have their hunger fully satisfied. Lastly, it is the food of adult males; and I need hardly observe that the average for the entire population would not be the same as the average for adult males.

"On the whole I think the *Pioneer's* estimate was much more accurate than yours. The ordinary phrase in these parts, when a man asks for employment is that he wants half a seer of flour; and a phrase so general must have some foundation. I believe that it has this much truth in it, that 1 lb. of flour is sufficient, though meagre sustenance for a non-labouring man. That a labouring adult can eat 2 lbs. I do not doubt, but he rarely, if ever, gets it. But take the ordinary population in a family of five, consisting of a father, mother, and 3 children. The father will, I would say, eat a little less than 2 lbs. The mother little more than 1 lb. The children about 3 lbs. between them. Altogether 7 lbs. to 5 people is the average which after much enquiry, I am inclined to adhere to. This would give a total consumption, for 30 millions, of 21 million seers of food a day, or 21×365 million seers a year.

"Again, you take 20 seers as the fair average price of food. This has not been an unfair rate for wheat of late years; but recollect that only about ¼ of our average is under wheat. The main articles of food are barley, bajree, jowar, and these grains sell much cheaper than wheat—generally ranging at about 30 seers or higher at harvest time, and falling to about 25 seers at other times. At 30 seers per Rupee, the cost of the year's food would be less than 26 millions sterling. But assuming a somewhat higher rate, it will probably be a fully large estimate to place the value of food at 30 millions sterling, or half your calculation.

"Next we come to seed corn. Here I agree with your estimate of the seed as 1/7 of the crop, in the case of wheat barley, and the heavier grains. But you forget that half our acreage is under the lighter autumn grains, bajree, jowar &c., in which the seed bears a quite infinitessimal proportion to the harvest, and hence your figures for the whole are erroneous. The *Pioneer's* estimate of seed corn as 1/10 of the crop errs I think on the side of excess. (I should put it at 1/14), but I will accept it and take the price at three million sterling. This will leave a margin for loss by mildew and bad storage Your estimate of the cost of clothing is undoubtedly too large. Two Rs. equals at the price cotton has fetched since 1862, about 5 lbs. of cotton which would require 150 million lbs. for the whole population, Now according to official records the production of cotton in the North West Provinces was 58 million lbs. in 1868, and 44 millions of lbs. in 1869. Our trade statistics are very deficient; but it seems to be the general opinion that the cotton exported to Bengal is pretty nearly balanced by that imported from the Punjab and Native States. In other words the North West Provinces consumes its own cotton which was, in a nominally good year, some 60 millions of lbs. or 2 lbs. a head. This agrees with the estimate lately made by an experienced Native gentleman, Deputy Collector of Boolundshuhr, who reckons the consumption to be 3 lbs. per head, of which one is English. The cost of clothing is therefore the price of 30 million seers of cotton, or less than two million pounds.

"You put the value of forage, pasturage and gardens at 8 millions, but you give no ground for this figure, and I cannot help thinking it is based on a mistaken idea as to the conditions that prevail here. We have almost no pasturage; as a rule the cattle are all stall-fed; and the straw and chaff they are fed on has hardly any marketable value. As to gardens, whatever they produce that affects the present argument, has already been taken

nder the head of food. I should certainly not reckon the *selling* value of the produce of pasturage, and of fodder, at any thing over two millions.

"Our exports again are almost a *terra incognita*. Indigo and sugar are the principal articles which we export in any considerable quantity. The highest estimate I have ever heard of the value of Indigo would not place it higher than 25 per cent of the Land Revenue of indigo-growing district, say half a million for the whole Province. Sugar however is a large and very important article of export; and on the whole I should think your estimate too low, and would place the value of exports at not less than ten million sterling.

"My estimate then of the gross produce of the North West Provinces stands thus:

Food	30 millions.
Seed corn	3
Clothing	2
Fodder and pasturage	2
Exports	10
	47 millions

"Against this, put a land revenue which at the close of the settlements now in progress will certainly amount to 4½ millions, and which, if part of the Provinces were not permanently settled would probably reach five millions. This would be a full tenth nearly a ninth, of the produce. I am confident that with our minutely divided properties, our immense and cramped population, and our grinding poverty, any attempt at heavier taxation than this would result in financial failure to the Government in widespread distress and ruin to the people.—I am, Sir, yours faithfully,

December, 6th 1870 C. A. ELLIOTT.

We are much indebted to Mr. Elliott for this contribution to the subject under investigation. We have now the advantage of three independent estimates of the harvest of the N. W. Provinces, and their divergence from each other is very striking. The *Pioneer's* estimate was as follows:

Food of 30,000,000 people	£25,000,000
Clothing of Ditto	,, 1,000,000
Forage crops, Garden Stuff, and Exports	,, 3,000,000
Seed for the next crop	,, 25,00,000
	£31,500,000

These figures were not put down at random, but were the result no doubt of observation and reflection. Mr Elliott thinks the estimate too low, and raises it, as we have seen, from £31,500,000 to 47,000,000. Our own statement was as follows:—

The cost of food per head of population in the North West Provinces for the last two years cannot have been less than 25 to 30 Rupees. Less than that would not have kept soul and body together, while there has simultaneously been an export of produce many millions in excess of our contemporary's estimate. Let the *Pioneer* substitute the following figures for its own estimates, and it will be nearer the mark a good deal.—

Food 30,000,000 of people at 20 Rs.	£60,000,000
Seed corn 1-7th of total crop of £70,000,000	,, 10,000,000
Clothing 2 Rs. per head of population	,, 6,000,000
Forage, Pasture and Garden	,, 8,000,000
Indigo, Sugar, Cotton & other Exports	,, 8,000,000
	£92,000,000

We have estimated the clothing here at a low figure for a temperate climate like the N. W. Provinces. Instead of the land revenue of the Provinces being one-*seventh* of the gross produce of the soil, we are reasonably convinced that it is not one-twentieth, as we have repeatedly affirmed.

We have assumed the exports of the N. W. Provinces to amount to £8,000,000 a surplus industry of about 2½ rupees per head of population. We should think they must be more, but have no means of ascertaining the fact.

It is not without some diffidence that we venture to stand by our estimates, *upon the whole*, in face of Mr. Elliott's criticisms. For the settlement records of the country of the last few years teem with evidence of his mastery of the land question and of the numerous problems connected therewith. There is probably no one in India more justly entitled to be regarded as an authority upon matters bearing upon the produce of the land. "After much enquiry," Mr. Elliott declares his conviction to be that the consumption of grain by the people is about 7 lbs. per day for every five persons of the population, and not 10 lbs. as we suppose it to be. On the other hand Captain Forsyth declares that where "the main article of food is jowaree," as in Nimar, the daily ration of an able-bodied man is 3 lbs., and that "an average of 2 lbs. per diem for each soul of the population will certainly not be an excessive allowance." The dietary scale in Indian prisons and Dr. Bedford's experiments in Bengal cannot be allowed, we are told, to determine the question, as in each case we adduce a standard of living beyond the reach of the masses, concerning whom it may be affirmed that they seldom or never get their bellies really filled.

According to this view of the case, therefore, in estimating the gross annual production of food in the country, we must take our stand upon a "hard and fast line" of 7 lbs. of grain per day, for every five persons of the population. We think Mr Elliott will find upon reflection that this is drawing the line too fine. In our estimate of 2 lbs., we never intended to affirm that every man, woman, and child of the population consumed on the average that full quantity of grain day by day. We made no allowance, for instance, for the consumption of grain by cattle, nor for the provision of reserve stores of food for years of famine, nor for the destruction of grain by mildew and other accidents There is "almost no pasturage," Mr. Elliott tells us in the North West "As a rule the cattle are all stall-fed; and the straw and chaff they are fed on has hardly any marketable value." We are persuaded that Mr. Elliott is in error, and that the market value of the fodder is very much greater than he supposes. From the absence of all statistics concerning the agriculture of the provinces, it is impossible for us to speak with certainty upon the point, but fodder is as valuable, we presume, in British territory as in native. When the principality of Sirdhana lapsed to the State by the death of the Begum Sombre, some 30 years ago, the average return per acre of cultivation in the jaghir was found to be very exactly recorded. We have now before us a record of the income in three different mouzahs, from which we make the following abstract:—

Southeree, Purgunnah of Boosharr, computed from Price Currents of 1st November 1836.

	Produce.	Value per Acre. Fodder.
Cotton, irrigated	Rs. 28 0 0	Rs. 2 0 0
Wheat	,, 15 0 0	,, 4 0 0
Churree	,,	,, 10 0 0
Jowaree	,, 4 0 0	,, 8 0 0
Wisseera	,, 4 0 0	,, 2 0 0
Wheat (not irrigated)	,, 11 0 0	,, 3 8 0
Wheat and Barley	,, 10 0 0	,, 3 0 0
Gram	,, 11 0 0	,, 3 0 0
Goor	,, 6 0 0	,, 6 0 0
	0	Rs 41 8 0

The fodder is here nearly half the value of the grain. In going through our modern Land Settlement Reports, we have been repeatedly struck by the fact that so little account is made of the provision which the land yields for the Agricultural Stock of the country. There can hardly be less than 25,000,000 head of stock in the North West besides poultry, in addition to the 30,000,000 of people. Now of this stock, the milch-kine, goats, horses, poultry, must all be consumers of grain. As the produce of this stock is required for human food, we assume the average consumption per head of population to be 2lbs. of grain per head per day. If we drew out our estimate in detail upon Mr. Elliott's basis, it would stand thus:—

1.	Grain eaten by the people themselves	7 lbs per 5 persons per day.
2.	Grain for milch kine, goats, poultry, horses &c.	,, ,,
3.	Grain for reserve food stores	,, ,,
4.	Provision for loss by mildew, vermin, &c.	,, ,,
		10 lbs. for 5 persons per day

We feel compelled to say that *for the purposes of this enquiry*, we cannot safely assume the requirement to be less than 2 lbs. per head per day. It may be that this is a fraction too high, but we think it more likely to be a fraction too low. So as to the price of food, Mr. Elliott seems to think that 10 Rs. per head of population per annum is a sufficient allowance.

Our statement was that "for the last two years less than 25 to 30 Rs. would not have kept soul and body together," and we based our estimate of the present value of the harvests in the North West upon a scale of 20 Rs. a year. Can it really be that 10 Rs per year (13 annas four pies per month) has covered the cost of food per head of population in the Provinces, during any one of the last five years?

We certainly were under the impression that wheat was the staple food of the Provinces, but Mr. Elliott points out that the cheaper grains of barley, bajree, and jowaree enter largely into consumption But on the other hand, the large consumption of the far higher priced grains of rice and dhall must be taken into account. Our estimate of 20 Rs. per year assumes an average rate of 18 seers (36 lbs.) per rupee all round. This may be somewhat high, but assuredly Mr. Eliott's rate is too low. It must be remembered that we are concerned with an *average* rate, not the very lowest any more than the highest. The North West Provinces, moreover, where living certainly seems to be cheaper than in other parts of India, has been drawn into this controversy, only by the accident of the *Pioneer* taking up the question. Our argument originally had special reference to the Central Provinces, concerning which we have the advantage of valuable though imperfect statistics. It seems to be a fact that food *is* cheaper in the N. W. Provinces than in other parts of India, if we may trust the jail returns of the country, and they ought to be unimpeachable. But instead of the cost of food averaging only 10 Rupees per head, the actual cost in the jails throughout India in the last three years, has been as follows:—

		Food.	*Clothing.*
Bombay	1867	Rs. 41 14 1	8
	1868	38 7 0	5 11
Bengal	1868	28 3 1	5 1 6
,,	1869	31 4 7	3 15 10
C. Provinces	1868	23 7 1	4 9 8
,,	1869	31 8 8	4 11 5
Madras	1867	49 2 7	3 15 9
	1868	40 2 1	4 5 2
Punjab	1867	22 0 0	6
	1868	29 3 8	4 12 5
,,	1869	36 5 4	4 7 10
N. W. Provinces	1867	17 7 9	2 15 9
,,	1868	18 12 2	3 7 2
(*Estimate*)	1869	32 0 0	4 0 0
(*Average*)..		Rs. 31 15 0	Rs. 4 4 0

These figures represent the *actual cost* of rations, and clothing, for prisoners of all ages and both sexes throughout India. To adopt therefore 10 Rupees as the average cost of food per head of population in the North West, and but 12 annas as the average cost of clothing, seems impossible. We are persuaded that were it possible to make an exact enquiry throughout the country into the produce of the land, the general truth of our statement would be borne out, that the land revenue does not absorb one-twentieth part of it. It is possible that our estimate of ninety millions for the North West Provinces is somewhat too high, but it seems clear to us that Mr. Elliott's as well as the *Pioneer's* is far too low. Our estimate of the seed corn is plainly open to the correction supplied by Mr. Elliott, and we might perhaps lower the estimate for clothing. On the other hand, we doubt very much whether the estimate for fodder, pasture, and garden produce for the wealthier classes, would not require to be increased. Has the fruit crop of the Provinces no value, nor its tobacco, betel, pan, condiments, and spices? We gather up all these under the head of garden produce, which we do not include in the estimate of food consumed by the people.

The great item after all however is the food, and in estimating the harvest it is impossible to do as Mr. Eliott has done, confine it by a hard and fast line to 7 lbs of grain per day for every 5 persons. Are we to understand that all the milk, buttermilk, ghee, mutton, eggs, poultry, oil, firewood, consumed by the 30,000,000 of people in the Provinces are worth nothing? They are all farm produce, be it remembered, and in the absence of all exact information upon the subject we assume a margin for all in our allowance of 2lbs. per head per day of grain, into the consumption of which they are all reducible. We are persuaded the margin is not too high. As to the great item of *fodder*, we are also satisfied that our estimate must be upheld. If Jowaree (millett) be the grain chiefly consumed by the people, as Mr. Elliott intimates, the fact, upon the whole, will but corroborate the accuracy of our estimates, as to the quantity of grain eaten and the value of the fodder which jowaree yields. For Captain Forsyth points out in his report upon Nimar just published, that "jowaree being much lighter than wheat "and extremely digestible, a good deal greater weight of "it than of wheat forms the average ration of a working "man." He elsewhere declares the *average* ration of jowaree for a labouring man to be 3 lbs. a day, and points out further that the stalks (*Kurbee*) yielded by jowaree, being a valuable cattle fodder, fetch 4 to 5 Rs. per acre. Now if anything like the same proportion of land (45 per cent.) is under jowaree in the North West as in Nimar, the fodder yielded by this crop alone will be of the value of eight or nine millions sterling a year. What does it cost to keep a horse, or a cow, in the North West? Does it cost nothing? Are the enormous quantities of hay, straw, &c., consumed in the cities and cantonments of the North West, worth nothing? Does the cultivator make the dweller in the towns a present of all such produce of the land? We feel compelled to say that we are satisfied our estimate of the total value of the harvest of the Provinces cannot err materially on the side of excess. Let Mr. Elliott tell us what it costs *him* to feed his horses in Allahabad; what it costs the dairymen of the North West cities to feed their cows; and what the brinjarrees to feed their countless strings of bullocks. This discussion will do great good, if it but stimulate the Government, as the landlord of our Indian farms, to make close and exact enquiry into the value of the produce of the land. We have a very strong conviction that upon the whole our estimates of that produce are much nearer the mark than official ones.

There is moreover the item of fuel and firewood, of which we have taken no account, but a large sum for which reaches, we imagine, the landowners of the Provinces. Mr. Elliott will be able to tell better than ourselves the probable annual return from this source to the agricultural classes. The cooking of 30,000,000 of people will consume a vast quantity of fuel. The Commissariate demand alone for the small body of troops in the Central Provinces is 14,00,000 lbs. a year. The *Jubbulpore Chronicle* estimates the cost of fuel in those Provinces per head of population at 1 pice per day. At this rate, the cost to the 30,000,000 of people in the N. W. Provinces would be 7,500,000 annas Rs. 4,70,000 a day, or £17,000,000 sterling a year!

		Pice		*Days*	
30,000,000	×	1	×	365 =	Rs. 17,15,50,000

The same journal tells us incidentally that the cost of "the average daily consumption of food" by the laborer in the Central Provinces is as follows:—

	As.	
Flour.. ..	1	per day.
Dhall or Vegetable	0	
Salt	0	
Wood ...	0	
Tobacco ...	0	¼
	Annas. 2	0¼ per day.

Upon this scale, the 30,000,000 of the North West would consume upwards of £500,000 worth of food per day, or £190,000,000 a year; about three times the amount of our estimate.

		annas.		
30,000,000	×	2-0¼	× 365 =	Rs. 188,19,40,000

In estimating the total cost of food in the North West at £60,000,000 a year, we assume that its population is fed at at average cost of 320 annas per head per year, or 3½ pice per day, Mr. Elliott affirms that the average cost is only half that amount, 1¾ pice per day, Reduced to this shape, he will himself perhaps see that his estimate needs correction.

Lastly: he has himself officially recorded (Letter 1113, Nynee Tal, 10th August 1870,) that throughout the relief ope-

rations of 1869-70 in Rajpootana, the scanty food furnished the people in Beawur and Todgurh, cost the State from 15¾ pies to 15¾ pies per head per day, although they consisted principally of women and children.

The diet was simply of "*dulleah, kichree,* and *chapaties* given on alternate days with a small allowance of parched gram morning and evening," the quantities being :

For men and women	20	oz. per day
„ Youth	12	„
„ Children	4	„

The average allowance per head per day did not therefore exceed 8 or 10 ounces of food of the poorest order, and yet this diet cost on the average 15¾ pies per head. Thirty millions of people fed upon the same miserable scale would cost Rs. 24,22,000 per day, or about £90,000,000 sterling a year :

Pies Days
30,000,000 × 15¾ × 365 = Rs : 88,40,30,000

In view of these figures, we think Mr. Elliott must perforce abandon his estimate of £30,000,000 as the harvest of the North West, in favor of our own, when we remember that the *many* indulge in simple luxuries of some kind or other, and that in these estimates we must take the average style of living, *urban* as well as agricultural, rich as well as poor. We are satisfied that our figures do not admit of such modification as Mr. Elliott thinks. It is the official estimates that are wrong—not ours.

A late number of the *Edinburgh Courant* contains an estimate of the annual consumption of food in our own country, the population being estimated at 30,000,000. In a general way it is calculated that 200 lbs. of butchers' meat at 9d. per lb. and 500 lbs. of bread and other stuffs at 2d. per lb ; or 700 lbs. solid dry food in all, may be regarded as the annual consumption of every able bodied man in the country. The actual value of the food annually consumed is declared to be as follows :

Bread stuffs, home grown . ..	£ 77,000,000
Butcher's meat, &c.	130,000,000
Imported Agricultural commodities...	42,000,000
Total. . . £	249,000,000

At this rate, the annual cost of the main articles of food alone averages upwards of £ 8 per head of population, while the whole expenditure is estimated at from £ 22 to £ 30.

There is no doubt a very wide difference between the English and the Indian standard of living, but no such difference as these figures would indicate. Taking into account not merely the grain consumed, but what we call at home the dairy produce of the land, the garden produce, and the simple but universal luxuries of the people, we do not think it possible to lower our estimate of £60,000,000. The question is one of great importance from its bearing upon the land revenue.

NIMAR.

Report on the Land Revenue Settlement of British Nimar. Effected by Captain J. Forsyth, Bengal Staff Corps. 1870

As we are going to attack Captain Forsyth, we shall begin by expressing the unqualified admiration which his Report has excited in our minds. The volume of 356 pages before us, is a monument of the administrative skill of our officers. There is no insincerity in the expression of our admiration of Captain Forsyth's work. He belongs to a class of men to be found nowhere else, we believe, in the world. Their position is peculiar, their education highly technical, their opportunity unique, and their work simply magnificent. We feel indignant at a work like this Nimar Settlement Report being consigned to the recesses of our Secretariates almost as soon as recorded. Full of interest, almost as fascinating as a romance, and crowded with facts the teaching of which all the world requires to learn, this report is the latest contribution furnished by the Central Provinces to the rich store of technical literature which the Government of India already possesses upon the great question of the soil and its produce. That the Settlement Officers of India constitute at this moment the ablest administrative body of men the world has ever seen, we entertain no doubt whatever: and we repeat the suggestion made in our last issue, that Government should concentrate the energies and skill of these gentlemen, as they become available for the purpose, upon the task of undoing the evils of the Cornwallis Settlement in these Lower Provinces.

In approaching this Nimar Report, we feel the difficulty of doing justice to Captain Forsyth's striking merits, and at the same time of insisting in sufficiently strong terms upon the necessity of disallowing his recommendations. Captain Forsyth has done his work so well, has given us so complete a statistical memoir of Nimar, that he has made it impossible for us to accept his conclusions. The Settlement which he proposes for our sanction, affords a new and striking proof of the paralysis which has laid hold of our Settlement Officers upon one side of their work. A dread of over-assessing the land so completely occupies their minds, that there seems to be no room left therein for any regard to the necessities of the State, the requirements of the public service. We take up the volume, and hold it out before us, and look at it, and admire the labour, and power, and skill of which it is an embodiment, and then remember that its final meaning is that the State should commute all claim upon British Nimar, a province containing nearly 200,000 people in circumstances of almost unparalleled prosperity, for 20 years to come, to an annual payment of £17,000 or £18,000 a year ! Now this payment of £18,000 a year includes the rental of 290,000 acres of land in cultivation under peculiarly favorable conditions (one-fourth of the people only being engaged in agriculture) and virtually all the taxes of the province !

It is the impotence of the conclusion that we are compelled to fasten attention upon. In the midst of such straits for revenue that we are almost provoking rebellion by the devices we are resorting to for money, a proposal is made to us to let off these 200,000 people in the valley of Nimar for 20 years upon a payment of £17,000 or £18,000 a year, less than 2s. per head, which payment is to include the rent of 290,000 acres of land being cultivated under a peculiarly favorable condition of things. A sum of £18,000 represents simply the farmer's rental of about 9,000 acres of average land throughout England and Wales. *Here* the same amount is to include the *rental* of 290,000 acres of land, and the *taxes* of about 200,000 people ! Captain Forsyth has persuaded himself that he has shewn good reason for proposing this Settlement, and Mr. Morris, the Commissioner, regarding it "as one "well calculated to secure the best interests both of the Govern- "ment and the people, confidently recommends its confirmation." We feel as though a nightmare were upon us. Let Lord Mayo hold his hand. Captain Forsyth and Mr. Morris are both wrong.

IN the first place, let us see what Captain Forsyth himself deems to be the annual value of the Nimar harvest. He makes it out thus :—

Estimate of gross agricultural produce of Nimar District.

Name of crop.	Number of acres in year of measurement.	Average produce per acre in lbs.	Total produce in maunds of 82 lbs.	Value at rates obtainable by cultivators.
				Rs.
Wheat	8,862	640	69,167	1,89,056
Gram	5,815	500	35,457	72,684
Pulses	1,963	400	9,575	24,470
Jowar	142,463	85	6,08,073	10,17,594
Toor	37,446	300	1,36,997	3,86,192
Bajree	17,009	170	35,250	72,288
Rice	7,384	1,000	90,048	3,46,126
Other edible grains ...	30,558	150	55,886	93,106
Total food grains.	251,500		1,040,453	22,01,585
Fibres. Cotton ..	31,952	fibre 40	15,587	3,03,544
Fibres. Hemp	800	seed 120	46,761	20,000
Oil-seeds Tillee	20,007	500	4,878	1,50,000
Oil-seeds Linseed ..	1,476	200	48,797	29,059
Sugar-cane	421	800	5,400	16,800
Opium	278	400	2,048	16,000
Tobacco	525	12	40	16,000
Ganja	491	240	1,536	15,750
Vegetables and Spices.	996	250	1,497	4,662
Dye stuffs All	837	Rs. 200 per acre		3,99,200
Dye stuffs Indigo	20	„ 600 „		1,67,400
Fruit trees	64	„ 200 „		4,000
		„ 150 „		9,600
Total ...	58,866		Total	10,90,770
Total cultivated area.	310,366		Total	32,92,355
Add for second crop on gutta land.	9,036	500	55,097	1,37,742
Total .	319,402		Total	34,30,097

Thus Captain Forsyth himself estimates the value of th harvest to be £343,000 a year, yielded by a gross area o 319,402 acres of land. The total assessment which he proposes to levy upon this produce is Rs. 1,81,180 (para. 471 or in round figures about 1-20th of the produce. When we come to look closely however into the matter, we find the rea value of the harvest to be greatly in excess of the estimate The most casual reader can hardly fail to be struck with the fact that no account whatever is taken of the *fodder* raised by the land. The harvest, according to Captain Forsyth consists simply of the food required for the consumption of man, and of certain exports raised in the province.

And yet he himself has told us (para. 320) that "45 per cent. of the whole cultivated area is devoted to jowaree" and that the stalks (*Kurbee*) of this jowaree "form a valuable cattle fodder fetching when sold about 4 to 5 Rs. an acre." Now, as the land under jowaree according to the above table comprises 142,463 acres, the value of this fodder alone is Rs. 560,000 to Rs. 700,000 a year. Captain Forsyth says "the fodder is rarely sold;" but what has that to do with its value? If the cultivator prefers to raise stock thereon (para. 361) his profit is just as sure in the one case as in the other. But it is not jowaree alone that yields fodder. All the food grains yield it. In this single item of *fodder* alone, it is necessary to add Rs. 10,00,000 to Captain Forsyth's estimate, bringing the gross value at once up to Rs. 44,60,000. Again, thinking it "unsafe to assume anything like a continuance of the present money prices during a period of 20 years" (para. 444), and that the whole price of the seven years subsequent to the Cotton famine must be looked on as an accident (para. 147). Captain Forsyth seems to have calculated the value of the harvest upon what he regards as *a safe scale of prices.*

He admits (para 443) that during the seven years 1862 to 1868, "though the rainfall and harvests were better than usual," that the average price of jowaree was nearly three times what it was 20 years ago, and we know that in the last 2 years 1869 and 1870, it has been higher than ever And yet in resettling the districts, we are to ignore the prices prevailing these last ten years, and are to assume that the present and prospective value of the harvests *for all purposes of assessment* is to be calculated upon the prices of 10 years ago. During the last 12 months, the prices prevailing in Nimar have been as follows :—

Wheat ...	22½ lbs. per Rupee
Rice	20 lbs.
Jowaree	41 lbs.

Now at these rates the advantage of which has been already reaped by the ryot, the value of the last harvest in Nimar cannot have been less than Rs. 60,00,000 while the total gross assessment which Captain Forsyth proposes to levy during the whole of the next 20 years, is but Rs. 36,00,000.

Proposed assessment

1,81,800 × 20 = Rs. 36,36,000.

Thus a single harvest is to pay the whole 20 years' assessment with Rs. 24,00,000 to spare. It is these wild measures regarding the land that occasion all our embarrassment.

Look at the matter in another light. Only 25 per cent. of the population in Nimar consists of agriculturists, the district forming in this respect a striking contrast to the state of India generally. Of the gross population of 190,440 souls, one-fourth only belong to the cultivating classes. As Captain Forsyth himself estimates the consumption of grain per head of population at 2 lbs. per day, the proportion of the harvest consumed by the growers of it, will be

lb.	Maunds.
190,000 ÷ 4 × 2 × 365	423,000

According to Captain Forsyth himself the cultivating class, including farm labourers, will consume but 423,000 maunds out of their total production of 1,040,453 maunds, the remaining 617,000 maunds being surplus produce in their hands for sale. Thus the ryot after paying for his own maintenance and the cost of cultivating his fields, has for disposal

617,000 maunds of food ..... Rs.	12,34,000
Add Fibres, Oil seeds, &c. according to Capt. Forsyth's estimates ..... Rs.	10,90,000
Surplus produce .. .. Rs.	23,24,000

And the State, according to Captain Forsyth's own showing, is to abandon to the cultivator, this Rs. 23,24,000 a year, taking from him in full liquidation of the claim of the commonwealth but Rs. 1,80,000 of this surplus. How is it possible to carry on the Government upon such principles? The proposal to settle Nimar upon such terms is a farce in the circumstances of the country, and is made without 10 minutes broad and comprehensive regard to the issues involved in the question. Instead of £18,000 a year—the settlement ought to be £100,000, and everything in Captain Forsyth's report goes to prove that the people could pay the one amount as easily as the other.

Once more as to fodder The Nimar cattle are of a fine breed, and Captain Forsyth estimates (para 382) that there are altogether 41,206 cows in the district and 42,377 bullocks "actually belonging to residents in the settled villages." Most cultivators of land, he tells us, (para 361) "add to their regular profits from agriculture by keeping cattle," each cultivator possessing "an average of two head besides his plough bullocks. These are usually grazed on the village waste and are liberally fed with the *kurbee* of jowar, *bhoosa* of wheat and rice and straw of other crops, besides often with cotton seed, oil cakes and green *mathee*, teara, &c, grown on purpose for them." This forest cattle sell for Rs 150 to Rs. 300 the pair, while inary breeds range from Rs 60 to 200. Sheep are not bred, we are told, in the districts, but large herds of goats are kept, and common fowls are tolerably abundant.

There is perhaps no other district in India the circumstances of which are so favourable to the cultivator. Only one-fourth of the population being agricultural, the local production of food is inadequate to the demand, and 39 per cent. of the quantity consumed in the district has to be imported. The district has the further advantage of an enormous traffic passing through it. The through traffic alone, independently of the local traffic, is estimated at 60,000 tons a year, while there are supposed to be 18,000 persons "always in the district as travellers" (para 391.) In the cold season, "it is the great highway for the march of troops, and nothing goes out of the district, in lieu of all the money thus brought into it." So large a part of the agriculture of the district being confined to the autumn crops, a vast number of carts are set free for hire during the open season, and "the cultivators add not a little to their gains in this manner," the supply of carriage being below the demand, and the cost of carriage extremely high, two bullock carts getting from 4 to 6 annas a coss (3d. to 4½d. a mile) according to the class of persons who hire them (para 396.)

Now the outcome of all this, is an exceptionally high range of prices for the agricultural produce of the district. Captain Forsyth himself says, "in point of fact wheat sells regularly about 70 per cent. higher here than in Hoshungabad, and every other imported grain in proportion. This dearness of food is of course highly favourable to the agricultural part of the community." (para 392.) We have here then *every* condition for a high assessment, such an assessment as the necessities of the State require to be made. The impotent conclusion of all Captain Forsyth's work is, that he proposes to fix it at 4 annas 7 pies per acre upon the Malgoozaree area, or 10 annas per acre on the area actually cultivated, for the next 20 years! The proposal is idiotcy itself. We are most sorry to apply such a term to it, but our officers plainly need awakening to the delusion they are under. Look at these figures.

Capt. Forsyth's own low estimate of the harvest ... Rs.	34,30,097
The rent he proposes for 20 years to come ... Rs.	1,81,800

According to his own admission, he proposes to fix the rent at 1-16th to 1-20th of the produce, while having omitted to value the fodder altogether, it is doubtful if the proposed assessment would really amount to 1-30th of the produce. If we are to assess the land upon rates of this order, we may as well abandon it altogether. Engagements, says Captain Forsyth, "have been taken for the proprietors for a term of 20

"years only. I cannot, however, avoid expressing my opinion "that of all districts in the Central Provinces, Nimar perhaps "is the best fitted for, as well as the most deserving of a 30 "years settlement." One can hardly suppress a smile at such a statement. Where in all India is there a district, does Captain Forsyth suppose, *not* fitted for a settlement of 30 years at 1-30th of the produce! The truth is the Settlement Department of India wants a rude awakening to the fact, that the State must assess the land from a different stand point altogether. The one idea of the Department seems to be that its business is to nurse and pet the cultivator; not to raise a revenue adequate to the need of the State. Where formerly the Department entertained the fixed idea of obtaining one-third of the produce—the old immemorial right of the State—it has now apparently taken up with the notion of 1-30th. There is nothing but financial ruin before us, if this wild reaction is to last. Lord Mayo must refuse sanction to this Nimar Settlement absolutely. The proposal is simply monstrous, look at it in what light we may, that this rich and peculiarly favored province should be allowed to commute its rents and taxes for 20 years to come at £18,000 a year! about the rent of 10,000 acres of land anywhere but in India. Sanction the Settlement, and the rest of India must be burdened with a Nimar deficit.

To understand precisely and at once what this Nimar settlement means, let the reader make himself master of the following data:

Land under actual cultivation.....	Irrigated	8695 acres.
	Unirrigated	279,387 ,,
		288,082 acres.
Waste Land fit for cultivation		337,621 ,,
Or Total Malgoozaree area		625,703 acres

The rental or assessment (*Jumma*) under the settlement that has expired, was

	As.	P.	
On actual cultivation	8	7	per acre.
On Malgoozaree area	4	0	,,

The rates proposed by Captain Forsyth for the next 20 years are

	As.	P.	
On actual cultivation	10	0	per acre.
On Malgoozaree area	4	7	,,

The reader will understand that the settlement covers 625,703 acres of land, of which 288,082 are now under cultivation. The remaining 337,621 acres consist of the culturable waste lands adjoining the villages. The whole together (625,703 acres) make up what is called the Malgoozaree area, *i. e.* the amount of culturable land which the settlement places at the absolute disposal of the malgoozars, or village headmen. The whole of this area, it must be remembered, is culturable. The malgoozars may cultivate it themselves, or let it out to tenant cultivators, or keep it waste for pasture, or do with it anything else they please. The total rental they will be called upon to pay—do what they will with the land—is 10 annas per acre on the 288,082 acres already under cultivation, or the equivalent sum of 4 annas 7 pies per acre on the whole area of 625,703 acres culturable. The State leases this vast area of land to its present occupants for 20 years, at the rate of 4 annas 7 pies, or allowing for exchange, about six pence per acre as nearly as possible, all round. Now this land belongs to the Commonwealth, and before our time the State was accustomed to look to the rental, or *jumma*, as it is called, of this land for the expenses of the administration. Under the earliest Hindoo system, as Captain Forsyth himself tells us (foot note page 57) the State was accustomed to take *one-sixth* of the gross produce of the soil for this purpose. Under the Mahomedans who succeeded them the people regarded themselves leniently dealt with when one third of the gross produce only was taken. By Mahommedan law, the State was allowed to exact one half however, and in the troublous times which immediately preceded our advent, it is certain that this proportion of the gross produce was commonly exacted from the cultivator, in all parts of the country. But whatever the equitable proportion may have been, one fact is certain, that the State possessed, and ever asserted, a prescriptive right to a proportion of the gross produce of the land varying from *one-half* to one *one-sixth* of the amount. The right of the State to this share in the produce has never been contested in any part of India. The cultivators make no claim to retain it; offer no opposition to its levy; have no thought of grievance connected with its levy; but shew the utmost willingness and readiness to pay the assessment even where by accident it has unfairly trenched upon their industry. In addition to this important fact, there is the further one that all economic authorities agree, that so long as the share claimed by the State does not exceed the true rent of the soil—which is found almost universally to amount to about one-third of the gross produce—the impost is the very wisest and best mode of obtaining a national revenue that any people can possess. Because such an impost is a tax upon the property and upon the industry of no man. The State simply claims what otherwise would be taken by a class of idlers called landlords, who, as all experience shews, are the great hinderers of good agriculture in all lands.

Now it has been our good fortune to inherit this most wise and happy fiscal system from our predecessors. But England is a land cursed with private landlordship—and its inevitable attendants, a multitude of taxes upon industry and property. Economic science being in its infancy when we arrived in the country, our early administrators were unaware of the value of the institutions which they found in the land; and full of the Saxon conceit that every thing English must be better than anything *Native*, began at once to change the fiscal system of India—the wisest and best a people can possess—for that of England, about the very worst and most oppressive a nation could be cursed with. Blind to what he was really doing, but with the most benevolent intention, Lord Cornwallis with a stroke of the pen laid the curse of private landlordship upon Bengal, under which its people are now groaning almost without hope of relief. The school of revolutionists has lasted down to our own day; the last field in which they have employed their folly being these Central Provinces, where Sir Richard Temple has done his utmost by the new settlement to sow the seeds of the very same evils that crush all hope and life out of Bengal. The doctrine of this school is that English society with its thousand insoluble social problems, is the model which we should aim at in India. Give away the land to a body of middlemen (private landlords) and look to the excise and the Custom House for your revenue. A mind that has been exercised with this question, and with the social problems mixed up therewith, finds it difficult to speak of such folly without passion. In so far as it was in his power to do so, Sir Richard Temple has thrown a blight over the future of the Central Provinces, which we know not how to remove or how to counteract. He has done his utmost to destroy the wisest and best fiscal system the Provinces could possibly have, and to substitute in its room a system, which while it fills the cities of Europe with wealth and luxury, leaves the masses of the people to fester and starve like vermin in garrets and cellars too foul and loathsome for description. This is the natural, direct outcome of private landlordism wherever it exists. The concentration of wealth in the hands of the few; and the abandonment of the masses to poverty and degradation too deep for words. Bengal is on the high road, already well advanced thereon, to this final end of "civilization," and all that Sir Richard Temple could do to get the Central Provinces upon the same road, he has done, by deliberately creating a race of private landlords in the Provinces, and conferring upon them the old immemorial rights of the State on the soil.

Thus, while in other parts of India the State is looking to *the land* for its revenues, in the Central Provinces the land is being settled by hundreds of thousands of acres at 6 pence per acre. We have happily succeeded in stopping the sales of waste land that were going on therein, and we trust yet to arrest the folly of these land settlements in progress. At all events the guilt shall not be ours if they are allowed to proceed.

EDITORIAL NOTES.

THE Cash Balances at the close of October compare with those of the two preceding years at the same period as follows :—

31st October	1870	Rs. 10,73,15,338
,,	1870	,, 7,89,69,348
,,	1868	,, 7,04,14,121

As the balances are usually lower in October than at any other period of the year, and the receipts from Opium continue to be in excess of the estimates, we shall have a plethora in the treasury in all probability throughout the remainder of the official year. A cash balance of eleven crores in October, means a balance of fourteen crores in April ; about four crores in excess of the right amount.

THE imports of silver into India continue to shew a heavy falling off. The amount tendered for coinage at the Bombay Mint during the ten months ending 31st October last, compares with the imports of the two preceding years as follows :

January to Oct.	1870	Rs. 1,38,57,584
,,	1869	,, 1,52,84,941
,,	1868	,, 1,63,22,314

The falling off is of course attributable to the low price of cotton. A total stoppage of bullion imports into Bombay for a while, would possibly bring down the price of food in that Presidency, to the relief of its urban classes who are suffering terribly from the famine rates that prevail there.

THE Local Cess Committee have recommended, we are told that the rate to be levied upon the land "should be 4 pies in the rupee upon the rental, of which the zemindar is to pay *one* pie, and the ryot *three*" on the ground that the former will engross the profits arising from the outlay of the cess, the zemindar being "a mere annuitant" upon the land. The question is a complicated one, and before expressing an opinion upon the equity of this arrangement, we should like to see the Report of the Committee. That the zemindar has chosen to divest himself of the duties of landlord, is a very insufficient reason *prima facie* for casting his responsibilities upon the ryot That the ryot of the Lower Provinces is in general rack-rented, would seem to be sufficient ground for exempting *him* from the cess altogether.

WE urge once more upon the Governments of the country the desirableness of their requiring the price lists which they severally publish, to be made out upon a uniform plan. The form now adopted by the Government of the North West Provinces leaves nothing to be desired, and the other Governments could not do better than imitate it. The Bombay and Madras lists require to be completely changed. The Punjaub list should cease to mix the rainfall up with the price list. The returns from Oudh and the Central Provinces do very well, but it would be a great reform if every Government in the country would adopt precisely the same form. Bengal publishes no price list whatever, and we are indebted to the special courtesy of its Secretariate for the quotations in the *Economist*. Why does neither Burmah, nor Berar, nor Mysore, nor Sindh furnish us with a monthly price list ?

FROM a calculation made by a Native Deputy Collector in the North-West Provinces, and published in the local *Gazette* of 11th May last, the amount of cotton required to clothe the population is only from 3 to 4 pounds per head per annum. It is estimated that the better class of adults, require nearly 8 pounds ; the lower classes less than 2 pounds each. A considerable quantity however is required for stuffing *rezais*, which are used by all the better, and most of the lower, classes in Upper India, except near the hills, where woollen blankets are often used. The amount which the mass of the people can afford to spend upon cotton clothing is very limited, and says the Punjab Report "unless a cheap and lasting material is imported from England, they will continue to manufacture cloth according to their own taste."

THE introduction of Cinchona cultivation into India must be held to be a complete success. Mr. Broughton, the Government Quinologist affirms of the Neilgherry bark that :— "In yield of quinine it is of the finest quality that has ever "been recorded. It possesses every characteristic constituting "excellence. It yields alkaloids in such purity that the first "crystallization gives sulphate of quinine which stands the "usual tests as well as the refined salt." We quote this at second hand from the Parliamentary Blue Book recently published upon the subject. There seems to be some danger of the cultivation being overdone, the demand for the drug being limited. We have noticed the question in the *Agricultural Gazette of India* which accompanies this issue.

THE eleventh Opium sale of the year was held on the 5th instant, with the following results :

Behar.....	2150 Chests.	at Rs. 1179	average.	Rs. 25,34,250
Benares...	1850 ,,	at ,, 1141	,,	,, 21,10,595

The estimates of the year were based upon an expectation of Rs. 975 per chest only. There has been a curious coincidence in the prices obtained at these December sales, for the last three years :

Behar...	1868-69	Rs. 1178	average price.
	1869-70	1180	
	1870-71	1179	
Benares.	1868-69	,, 1140	
	1869-70	,, 1143	
	1870-71	,, 1141	

We take these figures from the *Friend of India*, but have not verified them.

MALWA Opium continues to come forward in undiminished quantities. From the opening of the season (1st October) down to date of latest advices, the number of passes granted compares with the last year was as follows :

Up to	7th December	1869	6,230 Chests.
,,	5th ,,	1870	7,020 ,,

It is now certain that the revenue from Opium will be heavily in excess of the estimates.

THE following important notification by the Government of Madras, appears in a late issue of the *Official Gazette* of that Presidency :

Fort St. George, November 18, 1870.

His Excellency the Governor of Fort Saint George in Council notifies, for the information of all occupiers of ryotwary land in this Presidency, that in those districts or portions of districts, where the land assessments have been recently revised, and in those where it may hereafter be revised by the Settlement Department, such revised rates of assessment will be liable to be re-considered after thirty years' duration, from the date at which the new settlements were introduced, but not sooner. If it should then be determined to form a new assessment, any increased value, which may have been given to the land by any works or improvements effected by the labour or capital of the ryots will not be taken into account.

We believe that this peculiar Indian tenure is the very best upon which the land of any country can be settled ; and it is time that its superiority over other systems that have been tried in India were generally recognized.

LET the Government of India note the following facts. The Cotton Commissioner of Bombay is conducting experiments in the growth of cotton in that presidency. To obtain land for these experiments, the Commissioner has to rent it of the ryots. And at what rate does the reader suppose ? In Sattara he has had to pay 30*s.* the acre, the assessment upon the ryot being 6*s.* ; in Khandeish 20*s* ; in Broach 60*s.* the acre ; in Ahmedabad 22*s* ; in Dharwar 20*s.* to 24*s.* and in lower Sind 15*s*t The average of these quotations is 26*s.* or 13 Rupees per acre, This is the rate the ryot is exacting from the State when is wants land for its cotton experiments. The State, meanwhile, charges the ryot a fifth or sixth of this rental. And yet we have men amongst us who talk of the land bearing all the burdens of the State, and would have us permanently settle the land revenue at rates fixed 20 or 30 years ago, at 3*s.* an acre. Cannot even a child see that instead of taxing the ryot, the State has conferred upon him a vast property at the expense of the urban classes ?

WE are indebted to the *Madras Gazette* for the following information as to the dates at which the existing 30 years' leases in the ryotwarree districts of the Madras Presidency will expire :—

Districts.		When settled.	When the settlement will be reconsidered.	
		Fusli.	Fasli.	A. D
Godavery	Western Delta Taluq...	1272	1302	1892
	Eastern and Central Deltas and Upland Taluqs.....	1276	1306	1896
Kistna	Masulipatum portion...	1276	1306	1896
Kurnool	Kurnool proper.....	1278	1308	1896
South Arcot	Chellumbaram, including the late Manargoody Taluq	1271	1301	1891
Trichinopoly	Entire district	1274	1304	1894

The introduction of the new settlement in the taluqs of Kurnool proper, commenced in Fasli 1275, and finally ended in Fasli 1278. The thirty years' duration of this settlement will, therefore, be calculated from the latter Fasli.

A CORRESPONDENT writes to us from West Berar :—"In your No 2 vol. 2 of the 15th August last you give an extract from a letter from Major Trevor Clark to the Cotton Commissioner in which the following appears :—

"I have just had a letter from Ashburner with some beautiful "Hinguughaut bolls and from a selected plant with naturally "yellow-tinged staple. I do not know if you are acquainted with "'Coconada' which is a cotton of this sort ; now 'Coconada' is "much sought for by spinners, *strange to say, on account of the "colour.*"

"As a person who has been both a spinner and manufacturer for some years, I should say the Major should have said "on account of the colour *it takes*." I have very often had to agree that certain lots of cloth I made should be of weft spun from what the trade knows as "Red Coconada." This is because the cloth so made *takes a better colour in dyeing* than when made from other cotton.

"Coconada cotton is supposed to have a peculiar sort of oil in it that causes dye thus to act upon it.

"I take the liberty of writing on this subject, as I think a statement of this description is better explained by any person who understands the subject as it might lead Mr. Rivett-Carnac wrong.—Yours, A LATE LANCASHIRE SPINNER.

THE London *Globe*, in commenting upon Mr. Fowler's proposition, that India should pay for her public works, not out of revenue, but by loans, complains that Mr. Fowler proceeds upon the fallacious notion that in India and England things are so identical, that public works can be paid for in the same way. The *Globe* says further that, as India would on this plan, have to borrow from England, the interest would have to be remitted to that country, swelling the home charges, "and increasing the irritation of our Indian fellow-subjects." The readers of the *Economist* will hardly thank us for noticing such twaddle, but it seems to be taken for sense by one of our contemporaries.

As an illustration of the error made in financing for our public works, take the fact that all the telegraphs in India have been made out of the taxes. What would the people of England say to an attempt to make them pay for such works out of the general revenues of the State ? Down to the close of the year 1868-69, the construction of these lines had cost the Indian tax-payer upwards of £2,000,000 sterling. In the same way the great Ganges Canal, which at home would have been built out of private capital, was here constructed out of £2,000,000 of taxes. While the great want of India is capital, and English capitalists are willing to lend us whatever we require at 4 or 5 per cent., it is insanity to take money out of the pockets of the people for such works as those. The money if left with the people would realize 15,20, or 25 per cent. in private enterprise. What we are really doing therefore is constructing our public works out of capital that costs the country 15,20 or 25 per cent., when we might get the very same works at a cost of 4 or 5 per cent. only.

IT is officially estimated [*Punjab Cotton Report*] that the Punjab contains 223,000 cotton looms, giving employment to 700,000 people, and turning out 122 lacs of rupees worth of cotton cloth. This quantity, divided over the whole population of 17½ millions, gives an average of a little over 11 annas per head. The population are supposed to require only about 4 lbs. of cotton per head per annum, which would be worth in a manufactured state, about two rupees. It is believed that the amount spent on imported cotton cloth is very small, but it is difficult to determine the exact proportion. The trade returns of 1868-69 show that 8,000 maunds of country cloth were imported and 9,156 maunds exported, the average value being about Rs. 40 a maund. The quantity of European cotton cloth imported is stated at 31,991 maunds, and that exported at 23,002 maunds which would leave very little for the consumption of the province.

The total export of cotton from the Punjab to the sea-board, via the Indus, during the six months from October to March last, was a little over 80,000 maunds, which, though more than last year, is considerably less than in previous seasons. Owing to the scarcity of food in the last two or three years, the cheap and durable native made cotton cloth has been increasing in demand, the people being unable to purchase the dearer and lighter imported cloth. The result has been that a considerable proportion of the stock of raw cotton has been used up for local consumption. It is very generally believed that the local manufacture will maintain its ground, until Manchester sends a cheaper and more durable fabric, better suited to the wants of the poorer classes.

We have received an important and interesting letter concerning these lower Provinces, which we defer publishing till our next issue. Its facts seem to us simply to give increased urgency to the demand for Governmental interference. We pointed out in our last issue that as settlement operations are now coming to a close in Oudh and the Central Provinces, the Government has here ready to its hand a body of trained Officers of the utmost skill in questions pertaining to rights in the land. Now it is an old saying that knowledge of the disease is half the cure. Why not, then, lay bare to the world the disease that afflicts these Provinces ! What is wanted, is an exact and comprehensive description of matters just as they are. We cannot divest ourselves of the belief that were the nature and full extent of the disease clearly made known, there would come with this knowledge power to deal with it. God rules over the world. There is infinite hope in this fact. It cannot be that the 40 millions of people in these Provinces and their descendants for all time, are to be the victims of a single act of benevolent but mistaken legislation less than a century ago. Let us know the exact nature and full extent of the evils which the settlement has brought upon the people. To ascertain this, let the ablest Settlement Officers we have, be set upon the task of describing matters as they are in a single pergunnah of each division of the Provinces. We have often thought that had we belonged to the Civil Service of India it would have been our highest ambition to make a mark upon the future of these Provinces. Great reforms are commonly very simple, when they are discovered. We are persuaded that the Settlement Officers of India number amongst them men capable of dealing with the difficulties that beset the question. Let them be set to work to report upon what they find.

THE Bombay papers tell us that the Municipal Commissioner of that city has "let" its sewage farm at Coorla for the ensuing year, at Rs. 60 per acre. This is a great success undoubtedly ; but if the Bombay papers will make enquiry they will find that market garden ground in their island lets as high as Rs. 180 per acre, where there is water at command. The seven acres of garden in front of Lowjee Castle is let for Rs. 1,350 a year, the ground yielding three crops annually. The Bombay sewage farm consists, we are told, of about 45 acres. The farm was first cultivated in 1868, when 3 Rs. per acre were obtained for it. The rent rose to 10 Rs. in the last season, and is now let at 60 Rs. an acre for the next year.

In view of facts of this kind, and the consideration that a very

large part of the soil of India is under cultivation with garden stuff for the urban classes, how preposterous are the rates fixed upon the soil by these modern land settlements, we are doing our best to shew. Western India, for instance, is full of wealthy cities. Bombay alone has a population of 800,000 persons, and its markets are wholly supplied from the surrounding Mofussil. If we estimate the consumption of food in the island at 2 lbs. of grain per head of population, the single city of Bombay alone indents upon the Mofussil for Rs. 80,000 worth of grain per day, or a sum of Rs. 29,200,000 a year. But the average standard of living in Bombay is very high, as every one knows who is familiar with its bazaars and markets. There is an enormous consumption of vegetables, meat, poultry, condiments, oil, milk, sugar, fodder &c. in the island. We reasonably doubt whether the one city of Bombay pays a less sum than £5,000,000 sterling every year to its Mofussil for food alone. The total land revenue of the whole Presidency meanwhile is less than half that amount!

The Bombay leases are now beginning to fall in, and in renewing them it will be necessary to assess the land upon very much higher rates than have ruled hitherto. The cultivating classes of Western India *must* be exceedingly wealthy, and the Settlement Department of the Presidency must not lose sight of the fact in reassessing the land. Rates of one and two rupees per acre are simply absurd, in presence of the revolution that has everywhere taken place.

In the course of the discussion, in April last, of Sir Arthur Cotton's paper upon the proposed expenditure of another £,100,000,000 sterling upon Indian railways, read before the East Indian Association, Sir Bartle Frere made a statement with reference to the Sindh Railway that ought not to have escaped remark in the Indian Press. He reported to have said:—

> That railway was originally projected as a canal. I believe nobody had any doubt but that it would have answered precisely in the way Sir Arthur Cotton would wish it to answer, by carrying very large quantities of goods, very cheaply and very certainly. Then why was it not made [in preference?] Simply because at that time it was impossible to get any capitalists to look at a scheme for a canal; and not being able to get the stage wagon, we were only too glad to get the post chaise.

So we are to understand that the Government deliberately substituted a railway for a canal in the teeth of its conviction that a canal was what was really required, simply because English capitalists were not willing to advance money for the construction of the latter work. Were this really true, the fact would reflect immeasurable disgrace upon the State. But we are persuaded that Sir Bartle Frere has been misreported It is not, and never has been, the English capitalist who is to blame, but the State itself. The Government has set its face against canal navigation, from the very first. It has refused to admit the idea of the canal competing with the railway. Only the other day, when a project for connecting the G. I. P. Railway with the Godavery for the carriage of coal and timber, was under discussion in Calcutta, the Government did not think it worth while even to notice the fact that a canal had been proposed for the purpose And yet it is simple insanity to construct these high cost railways for the carriage of agricultural produce, where it is possible to give canal communication instead. The question admit of no argument; and it is a terrible reproach to Govs ernment that all these years have gone by, without its having ever taken up the question of canal navigation in the country in earnest. It is open to no blame for having constructed the existing railways, nor to the least censure for vigorously preparing to construct others. We would not have a single project dropped, but in Heaven's name do wake up to the fact that the great and crying want of the country is cheap communicaton, cheap transit for the produce of the interior. The two things are distinct. We want every railway you can give us; but we want still more that canal communication, the need of which, by some unhappy fatality, you refuse so persistently to recognise.

We quote the *Pioneer* of 29th ultimo:

> "Orissa is now beyond the reach of starvation for another year. Till within the past six weeks, there seemed to be an almost certain prospect of great scarcity, and a chance of absolute famine. As in 1866, not only was the local rainfall tardy and deficient, but the rivers failed to bring down their usual supplies from the hill country. Had it not been for the providential, and we may add, unexpected, recent rains, Orissa would have been, so far as regards its own resources, almost exactly in the position in which it was in the autumn of 1865. We might at this moment have had the dismal prospect which would cost the total disorganisation of a Province, and the lives of between three quarters and a million of men."

That is "so far as regards its own resources." Our contemporary proceeds to point out that by means of improving False Point harbour, so strenuously urged in the Famine Report of 1867, the province is happily no longer cut off from outside aid in the event of another famine.

> "It is gratifying to know that by means of False Point harbour alone the Bengal authorities have created an invaluable safeguard. Hereafter whatever may happen to the crops of Orissa, natural scarcity will not produce, as it has hitherto always produced, inevitable and overwhelming famine.
>
> "While, therefore, the recent drought has once more compelled us to realize the annual liability of Orissa to a terrible dearth, the efforts of the Bengal Government since 1866 have broken through the former isolation of the Province, and removed the risk of the wholesale starvation of the people."

We congratulate the Government of Bengal upon the fact; but while doing so, recall with distress that a million of people are believed to have perished of hunger in Rajpootana during the last 18 months, through, what we cannot but regard, as the neglect of the Paramount Power. The fact has excited comparatively little remark, but Lord Mayo will not forget it, when the calamity recurs. He must give effect to the assurances of his durbar address at Ajmere.

It appears to be taken for granted that the country will be relieved of the income tax by the next budget. The propriety of its total repeal seems to be the only question. As the oldest opponent of the tax in the Indian Press, and the only consistent one if our memory serves us rightly, we shall disappoint some persons perhaps if we express a doubt of the wisdom of totally repealing it. We have fought the tax consistently from the day when Mr. Wilson, with the approval of almost all our contemporaries, first laid it upon the country, and we may fairly lay claim to having done much to familiarize men's minds with the considerations that demonstrate its unwisdom and injustice in a country so circumstanced as this. We shall certainly not regret its disappearance from the ways and means of the year, should the Supreme Government determine to dispense with it. We do not however feel free to urge its total repeal upon the Government. The tax has now been a part of our fiscal system for ten years, and to abolish the machinery for its collection after the valuable experience which that machinery has come to represent, is doubtfully wise. We cannot forget that practically the wealthy part of the population enjoys an immunity from taxes altogether. The salt tax is an appreciable burden to the poor. To the rich it is really no tax at all. We think then that we would retain the tax, for the sake of its machinery, in view of the possibility of resort thereto becoming necessary through some emergency. It should be reduced however to a very low rate, and should be levied only upon the really wealthy. In each case, justice requires this; and strictly speaking, the tax will be unjust even then, but human rights seldom admit of exact adjustment any where. If we lower the tax to 1 per cent. and confine it to incomes of 10,000 Rs. a year and upwards, we shall perhaps do better than by repealing it altogether.

The G. I. P. Railway Company have, we observe, issued a revised scale of charges for the carriage of goods by its lines for the present season. There seems to be no principle in the classification of the traffic. Five different rates of charges are made, but the only approach to system which we can discover in the tariff seems to be an attempt to adapt the charge to the value of the goods. The rates appear to be loosely based upon an *ad valorem* principle, without regard to what the carriage costs the Company. Thus grain, salt, coal and firewood, all very troublesome cargo, are charged from 6 to 8 pies per ton per mile according to the distance, while piece goods the most convenient of all goods, are made to pay because they can afford it we suppose, 34 to 48 pies per ton. Garden seeds pay 20 to 24 pies, while the common oil seeds of the country pay only 9 or 10.

A system of this kind can only of course be provisional. The efforts of Railway officials to make out the best balance sheet they can for the Company are natural and excusable, but the

system is faulty from its foundations. The classification and rates are as follows :—

I. Class		to 10 pies	per ton	per mile.
II.	13½	to 14	,,	,,
III.	20	to 24	,,	,,
IV.	28	to 34	,,	,,
V.	34	to 48	,,	,,

In English money, these charges are from1½d. (9 pies) to 6d. (48 pies) per ton per mile. For cotton, the Company charges special rates. On the Berar line their charges are :—

Full pressed bales	18	pies per	ton per mile.
Half pressed ,,	28	,, ,,	,,
Unpressed docras	34	,, ,,	,,

In other words, all that the Railway can do for Bombay is to carry cotton thereto from the interior at from 2½d. to 4½d. per ton per mile, and as Nagpore is 500 miles from Bombay the carriage there from varies from £5 to £9 a ton. Such a rate might be borne while cotton was a shilling a pound, but with the staple down to 6 pence, and carriage on the Mississippi at *one pie per ton* per mile, it is not difficult to see the end.

FOR the first time for very many years past, there is a stoppage of all importations of bullion into India. We have been approaching this state of matters for some time The latest official returns of Trade and Navigation come down to 31st July last only, and we are indebted thereto for the following figures :

Imports of Bullion into India.

Four months ending	31st July	1868	Rs. 5,01,54,327
do	31st ,,	1869	,, 4,66,76,229
do	31st ,,	1870	,, 2 37,62,852

The Mint returns shew the following steady diminution in the imports, from the commencement of the official year 1870-71.

Bullion coined and examined during the month.

	Calcutta	*Bombay*
April..... .....Rs.	5,59,260	Rs. 21,99,388
May ..... ,,	22 18,732	,, 23,99,310
June..... ,,	10,35,778	,, 22,11,376
July ..... ,,	9,30,351	,, 26,51,675
August..... ,,	.....	,, 11,23,536
September	,,.....	,, 3,28,585
October ..... ,,	.....	,, 1,53,625

The Madras Mint was closed many months ago, and the Bombay and Calcutta Mints might, it seems, be almost as well closed too. The result is that exchange has fallen from 1s. 1½d. to 1s. 10½d. within the last six months :

31st March 1870	.....Bank Bills 6 month's sight	1s. 1½d.
30th Nov. 1870.....	Do	1s. 10½d.

Within the same period no less a sum than Rs. 1,73,00,000 of the Indian debt held in the country has been transferred to England. The exact figures are as follows :

For Promissory Notes enfaced for payment in London.

31st March 1870.....Rs.	16, 00, 03,000
30th Nov. 1870 ..... ,,	17, 73, 74,288

Thus there is not only a stoppage of all imports of bullion into India, but a heavy transference of capital going on from this country to Europe. So onerous is the demand upon our industry, that the ordinary surplus exports of the country no longer meet it, and a transference of the capital of the country is required to liquidate the claim. Should this state of matters last, we shall see the prices of produce begin to fall once more.

THE somewhat passionate reply of the *Pioneer* to the charges made against the Government of the North West Provinces by the Rev. Mr. Robson, for its alleged indifference to the sufferings of the people of Rajpootana during the late famine, would carry more weight, if our contemporary would but tell us whom we *ought* to blame for the catastrophe. It is now generally admitted that half a million to a million of people perished in the famine. It is only three years since most deaths by a calamity the Foreign Office in Calcutta. Both Governments had the clearest warning of what was impending, and nothing we have yet seen warrants the belief that the State was not able to cope with the famine. We believe it was quite capable of doing so, and of rescuing the people from the last extremity of death. If it is contended that the blame rests with the Native States, since it was their subjects and not ours who perished, we shall then have to make some inquiries as to the responsibility of the Paramount Power at such crises. We are dissatisfied with the attitude of the Supreme Government upon the subject, and the complete silence it has maintained thereon reveals pretty clearly, we think, that it is itself dissatisfied therewith. We have not yet learned the right spirit in which to encounter these recurring seasons of famine. The Government is itself conscious that the lesson is not yet learned, and it will take more than the bland assurances of the *Pioneer* to subdue the misgivings and uneasiness which we all feel in contemplation of such scenes as have been witnessed in Rajpootana within the last 18 months. The man will arise by and bye, who will shew us the way to encounter these calamities in the right spirit and with the right means. Of one thing we are sure—we must cease to weigh human life against the silver it may cost to save it.

CONDITION OF THE COUNTRY.

BENGAL.

ORISSA DIVISION.

Cuttack.—The accounts from this district up to the 8th instant were good. Heavy rain fell on the 4th and 5th, and much benefited both the rubbee and rice crops. The rainfall previous to the 4th, was also most beneficial, and saved all that was in danger and backward owing to deficiency of rain earlier in the season. The Commissioner anticipates in an average that a good 12-anna crop will be reaped, but has called for fuller particulars from the Collector, regarding crops on the higher lands, which were previously in imminent danger. In the Kendrapara sub-division the crops will nowhere fall short of 12 annas.

Balasore— Up to the 5th instant, fears were entertained in some parts of the district that owing to the heavy rainfall during the week the crops had sustained some injury. The Collector, however, is assured that it has done no harm ; grasshoppers and locusts have nearly disappeared, but not until much damage was effected ; this is estimated at about 1-16th to 2-16th. In some places where the plants were not far advanced, they are again sprouting, and the Collector does not expect that any material injury has been done. From Bhuddruck the Assistant Collector reports having visited the country between the sub-divisional station and Agurpara to the west and near the hills ; here the crops are bad and loss is estimated at 10-16th. There will be considerable deficiency in parts of Dhamnugger, Sohoo, Randiaworgarah ; of the three, the former is best, as the crops there are doing fairly and promise a harvest of from half to 14-16ths ; near Monzah, and Churakothi, however, there will only be a one fourth crop ; on the east side of Dhamnugger the crops are good. Since the recent heavy rain grasshoppers have diminished in number. In Randiaworgarah the crops will be worst near Koopari, as was the case last year. Many of the fields are absolutely without any crop at all, others may give from ¼ to ½ an harvest and on an average there will not be more than a 4-anna crop in the Menzah, Bhimpore, Koopari, Dysing, and Arungee ; the ryots of that neighbourhood have worked on the roads, and must continue to do so to make up for deficiency in their crops. Prices of rice in the sub-divisional markets continue low, and from all the Assistant Collector can see and hear there are good grounds for concluding that the sub-division will, with exception of a few localities, not suffer at all. The Collector of Balasore, speaking generally of the district, states that the crop is very good, and in some villages exceptionally so.

Pooree.—Up to the 6th instant, rain had fallen in excess, and there are fears of damage therefore to the early lughoo rice and rubbee crop. The Commissioner, however, does not consider

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the thing as impossible. The *Pioneer*, we presume, knows as well as we do the fact that nearly a million of people are supposed to have perished of hunger last year in Rajpootana ; but it indignantly repudiates all responsibility for this catastrophe on the part of the local Government at Allahabad, and assures us that "the conduct of the Supreme Government in the matter may safely be left for the calm criticism of history." We are far from resenting this defence of the State, but having made it, we ask the *Pioneer* to be good enough, looking what has occurred fully in the face, to tell us upon whom the guilt of this unheeded suffering rests. *Prima facie*, the blame rests upon the Government at Allahabad, and

past it was feared that importaions of rice into Pooree as well as relief works would be indispensable, but the Collector is now sanguine that the former will not be necessary, though the latter may be yet required. In Khoordah the Collector thinks relief must in some places be necessary, and that provision of labor only to be paid for in money will not be sufficient. The average expectations of crops in the Pooree district in 19 pergunnahs reported on by Canoongoes, amount to a little above 9 annas. The average on 46 police reports, taken on the main, rice or paddy crop only, gives an expected yield of considerably above 11 annas. The Khoordah Deputy Collector reports from returns of 4 Canoongoes, expectations of 9, 12, 8 and 8 annas respectively, or an average of a little above

9 annas crop, though certain villages have suffered very severely. It is doubtful whether Khoordah can get through the year without receiving food from elsewhere and certain that a large number of people, resident in villages where the crops have suffered exceptionally, must be provided with a liberal supply of labor; this can be effected by putting in hand local roads and repairs of tanks, bunds, and works of irrigation, which will also permanently improve the estate.

Reports from Bankee estate are very similar to those from Khoordah. Rain had fallen abundantly and done immense good; the fields were full of water and no more was required. Rubbee crops sown on low lands had suffered. The accounts from Ungool and other tributary states are tolerably favorable.

BURDWAN DIVISION.

The prospects of this division have considerably improved and recent heavy rains appear to have removed all apprehensions regarding anticipated deficiency in the rice crops.

Howrah.—Up to the 7th instant, the crops were in a most satisfactory condition.

Bancoorah.—A full average crop is anticipated in this district

Beerbhoom.—The prospects are favorable.

Midnapore.—On the 31st ultimo, the Collector reported that "there has been abundance of rain all over the district The "rain was hailed with delight, in as much as the rice plants had "just begun to wither."

Burdwan.—The Amun crop has very considerably recovered itself.

CHOTA NAGPORE DIVISION.

Lohardugga.—Up to the 15th October, the prospects of an abundant harvest in this district were very favourable. In Palamow, early crops, "Bhudai" had been cut and stored, and the Indian corn and Murwah, on which the poor people greatly depend, were particularly fine. The rice crop everywhere presented a very fine appearance but in some of the highly cultivated parts of the Amanut valley it was partially attacked by diseases of two kinds, one a simple blight called *chatter*, in the other the roots were injured by a worm called *Banki*, but the disease was not widespread. Otherwise the rice harvest promised well and a good cotton crop was expected.

Manbhoom.—The extent of land this year under cultivation is larger than usual, except in pergunnahs Manbhoom and Supoor, where there was little early rain the crops to the east were not thriving as those in the western half of the district, but on the whole the Deputy Commissioner anticipates a fair average harvest for the entire district.

Hazarreebaugh.—The late heavy rains may have done slight injury to the crops, but give good hopes for the cold weather-crops.

Singbhoom.—The reports from this district are less favorable, though the price of rice has fallen considerably. There was a deficiency of rain up to October, and this was most felt in Dhulbhoom where it is feared the rice crop will be below an average harvest. From the rest of the district an average rice crop is expected and the pulses and early oil seeds are said to be very good. The reports from the Tributary Mehals are all very favourable. The prices of rice and wheat prevailing in each district of the several divisions of the lower provinces of Bengal for the week ending the 19th instant are annexed.

OUDH.

The Financial Commissioner and district officers have now had full opportunity of personally inspecting a large part of the Province, and they find it generally admitted by all classes that the prospects of the *rubbee* (spring wheat) harvest are the finest known for some years, and there is little doubt that the damage done by the heavy rain of October was a good deal exaggerated. In some instances it is being discovered that the kharf crop was a fuller one than was anticipated in earth reports.

Prices continue to fall and it is worthy of remark that in the third November last, barley was selling at 28 seers 33 chittaks which in the corresponding period of last year, the price was twice as great or 14 seers 7½ chittacks per rupee. The drain upon the province grain for exportation has lessened.

SEPREE

A LETTER FROM SEPRIE REFERS TO THE present condition of that part of the country, and the prospects of the future in respect of food for the people, in the following terms :—"This district was swept by famime and cholera last year, and the effect upon the population and quantity of land under culture is most apparent, yet such a season of plenty as this has not been known in India for ten years. Jowarissis so abundant, wherever seed was dropt that the cultivators, without railways are unable to put it in a selling market. Wheat and gram will find their way, for Bunjarras crowd the road. Altogether the crops of this year will supply means for extending cultivation in the next. The dearth of cattle has been a heavy blow, but the bounty of the sun and soil has supplied every deficiency.

THE PUNJAB.

THE mortuary of the Punjab disclose a death rate in the large towns which is little short of appalling, and which is yet certainly below the truth. In Delhi, for instance, which is not generally a city as far as natives are concerned, the average mortality for the last four years has been between forty-three and forty-four per thousand. In other words the average duration of human life in this locality is less than twenty-three years. Doubtless excessive infant mortality accounts to a great extent for this enormously high death-rate, but all classes must be seriously affected.—*Pioneer.*

MADRAS.

Cauvery.—Rains during the latter half of the month were scanty and particularly so in the Tanjore District,—Over the portion of the Tanjore District, the cultivation of *Samba Peshanam* and the dry grains was vigorously pushed on.

Northern Section.—The rains all over this section were exceedingly good and plentiful.

Western Section.—The rain-fall was deficient during the first half of the month in South Canara, but was made up for by the heavy showers during the latter half. In Malabar the fall was favourable.

Southern Section.—There was but a scanty fall of rain in this section.—The transplantation of *Paddy* and the cultivation of *Ragyy, Cumboo,* and other cereals were progressing. The early *Cumboo, Gingely-oil-seed,* and *Raggy* crops were being harvested. *Cotton* and *Indigo* plants were thriving. The usual freshes were received in the Tambrapurni river. *Peshanam* or second op cultivation under rain-fed tanks was progressing, and wet ands in other localities were being ploughed. *Cumboo Samai,* and *Raggy* were sown on dry lands.

MYSORE AND COORG.

The season has been exceedingly favorable throughout Mysore. The tanks are all full, and prices have fallen heavily. The quotations are ;—

Ragi	39 to 60 Seers per Rupee.
Gram	30 to 40 „ „ „
Rice 2nd shot	14 to 20 „ „ „

In Coorg the frequent showers of rain which fell during the season have greatly improved the appearance of the paddy, and in many places the ears have formed.—Reaping of the rag, crop has been completed, and the out-turn is, on the whole, considered to be good. Kulthi or horse gram continues to thrive, fields are being prepared for the sowing of Bengal-gram.—Coffee Weeding has been nearly completed, and preparations are being made for gathering the berries which are ripening fast. In native gardens picking has begun.

The gathering of *cardamoms* is still continued, and the yield has been plentiful, but damage has been done by the rain which fell while the crop was being dried

SOUTHERN MAHRATTA DISTRICTS.

Since the publication of the last weekly report, a return has been received from Mr. Shearer, describing the progress of the cotton crop in the Hooblee talooka up to the 26th of November. Owing to the continued wet weather in October, and the long neglect of the cotton fields, the crop in this district, according to present appearances, promises to be a light one, the expected out-turn being only 8 to 10 annas in the rupee. Much, however, still depends upon the weather during the six or seven weeks that the cotton has yet to grow. The plants are still dwarfish, but are branching, and may improve very much before they are quite matured.

PURNEAH.

THE INUNDATION AND INCOME TAX.

Mr. Gouldhank writes to the *Indian Daily News* concerning the late inundation in South Purneah : After it had subsided, the ryots, as usual, began sowing mustard, kullie, &c., or rather they were scattered over the still moist surface, or sown with very slight ploughing. These sowings had gone on extensively when we had another rise of the rivers quite out of season, and nearly as high as the previous rise. Paddy and Indian corn were destroyed by the first rise; mustard and kullie went with the second flood. Cattle, which always are taken to higher and more northerly pastures, when the usual inundation is about to take place, had been brought back. They had scarcely returned when the rivers suddenly rose, and shut them up in the villages. All communication with the higher country was cut off. The reasult has been a fearful mortality among the cattle. By eating the half-rotten inundated grass, a purging was brought on ; and the whole country is covered with the remains of bullocks, cows, and even buffaloes. That the latter should have suffered appears strange, yet such is the case. Some have lost entire herds. I had a small herd, and all have died except five or six calves. As my loss is above Rs. 400 in buffaloes alone, one can form some idea of what the losses of the ryots have been there. Impoverished by the loss of their crops, and the death of cattle, the ryots find it difficult to cultivate their lands; and

at this phase in their condition, the Government Income-tax Assessor arrived at my factory, and took up his quarters without asking my leave. It is a convenient place. The high land ends here. Had he gone further south, he would have enjoyed the fever-giving nuisance of that region. People from many miles round were kept waiting for five and six days. Many of them I could not recognise, but hurkarus and servants of Peergunge Sahara, Kolassy, and Munshye factories were among them—men on Rs. 3 or 4 a month. We may safely take their means and the detention they experienced as a correct sample of the working of the Income-tax.

THE LAND.

RENT SUITS IN THE NORTH-WESTERN PROVINCES

When litigation is increased by the introduction of a new law, a dispute generally ensues between its opponents and advocates, as to whether this is the natural effect of a bad measure, or is simply due to the fact that a remedy can now be obtained for injuries formerly without redress. Such a controversy, for instance, has long raged in England, in regard to the Divorce Court. In all such cases the truth usually lies between the two extreme opinions; but be that as it may, no one can regard the astounding increase in the number of suits between landlord and tenant since the passing of Act X. of 1859, especially amongst a people so prone to litigation as the natives of this country, as by any means a certain proof of improvement in government. The importance of the subject in a country where all except a small minority live by the soil and where every provision of the law touching land immediately affects the masses, can hardly be overrated; and it may be worth while, though perhaps the subject is not one of much interest to the general reader, to devote a few minutes to consider the present working of the rent law, in this part of India.

The ultimate decision of all rent cases of importance rests with the Civil Courts, and so well do the people understand this that they have come to regard the first trial in the Revenue Court as nothing more or less than a preliminary skirmish in which it is hardly worth while to put forth all their forces, as the final result will not be affected. In the Revenue Courts, and still more so in the Civil Courts, the decision of almost every case is based on the village papers, the rent-roll, and account of arrears compiled by the village accountant. The theory of Government in regard to these village papers is a most admirable one; the only pity is there is such an immeasurable gulf between the theory and the practice. The theory is that these papers are compiled by the village accountants, the putwaries, in open consultation with all parties concerned, landlords and tenants, and that an actual inquiry is made into the state of each field before the entry regarding it is written. The canongoe of each pergunnah is then supposed carefully to test and sign the papers, which are liable to further examination and correction by the tehsildar. Lastly, it is the duty of the Collector and his assistants in their cold weather tours, to test as many village papers as possible. Such is the theory; and the papers elaborated in this way are held to form a sufficient basis for the decision of the most important class of civil suits in the country. Now let us look at the practice. The putwaree still clings, and ever will cling, to the idea that he is the servant, not of Government, but of the village proprietors. They virtually appoint him, and they can generally manage to eject him. Besides he looks to them for the greater part of his pay, for surely no one is so credulous as to suppose that with such opportunities before him he will content himself with the pittance doled out by Government. Naturally enough, therefore, he is in most cases only too willing to obey his patrons' behests and further their interests in every way. He may of course, though this rarely happens, be at enmity with the landowners and disposed to injure them. In either case, the checks upon him are equally ineffectual. Instead of each individual being made acquainted with the entries which concern him, an unfortunate tenant generally learns for the first time the particulars of his holding (whether true or false) when a suit for arrears of rent is brought against him. In the desire to curtail the expenditure, the canongoes of many pergunnahs have been dismissed. Those who remain are simply employed as writers in the tehseelees, and the utmost supervision they exercise over the village papers is to sign their names on the outside. As to the tehsildar, he can scarcely find time to do even this; collecting the land revenue, assessing and collecting the income-tax, house-tax, and an innumerable crowd of other cases, deciding cases, criminal and revenue, conducting local investigations, road making,—these are only a small number of the trifles which engage his attention. This remark applies with tenfold force to the last link in the chain,—the Collector and his assistants. Occasionally, an unpassed assistant, by way of preparing himself for his examination, finds time to glance into a few putwaree's papers. This is the utmost supervision that exists.

What is the result of all this? The result is that the village papers in all districts, except those where settlement officers are at work, are in the vast majority of disputed points utterly untrustworthy, and that our Courts, instituted to dispense equal justice to all, are too often turned into a means of oppressing the ignorant cultivators. In many parts of the North-West numbers of estates were in the early part of the century sold for alleged arrears of revenue at nominal prices to the corrupt omlahs and their friends. These men, who to the present day never receive the honorable title of "zemindar," but are simply termed auction-purchasers, are in deadly hostility with the tillers of the soil. They are frequently influential and educated men; and it is to be granted that, in too many cases, so far are they from trying to conceal their oppression, that they find in British laws and British Courts their most effectual instruments for grinding the noses of the poor. Can no remedy be found for this? In Lower Bengal the trial of all rent suits has been wholly transferred to the Civil Courts. Is any such measure in contemplation for the North-West? or is the attention of Government so much taken up with founding Universities and Municipalities and collecting taxes as to have no time to spare for such trifles as only affect the welfare of those who cannot make themselves heard in Debating Societies. If some such measure as the Bengal one were passed and Government took steps in real earnest to ensure the correctness of village papers; if revenue officers not in theory only but in fact, were held personally responsible for them and were made to understand that their principal duty during the cold weather was to hear and dispose of objections to them, such a scheme would do more to help those whom we are most bound to help, those who cannot help themselves, than even the enrolment of countless rural policemen and the ruler that carried such a measure would be blessed in many a home where his name was all unknown.—*Pioneer.*

INDUSTRIAL RESOURCES.

FISH OIL.—MALABAR COAST.

THE appearance recently of large shoals of Sardines on this coast has revived a branch of trade in which for the last five years absolutely nothing has been done, and judging from all accounts, we believe there is every prospect of the seaside population being kept fully employed in the preparation of Fish Oil for the next three months. The sudden disappearance for five successive years of the myriads of fishes of the sardine tribe from these waters, is a matter which might well engage the attention of eminent pisciculturists, as the fishermen of these parts who are mighty "knowing," in most matters, and to whom the failure of the fisheries had been a cause of sore disappointment, are completely unable to offer any solution of the question. They are now very hopeful that the tide has turned, and anticipate being able to recoup themselves in some measure for the disappointments of the previous years. We hear that the extraction of the oil is largely carried on both in the Sircar and British territories, and as a fee of Rupees twenty per annum is levied for licences for carrying on the business within the Municipal limits, some addition to the income of the Municipality may be looked for from this source. The sardines on this coast usually begin to appear about the Begining of September; and at this period of the year they are said to be in splendid condition, and to yield large quantities of oil. About a hundred boats set out from Cochin and its vicinity, daily, and if they do a good day's work each boat will contrive to capture about 20 @ 30,000 sardines which would sell readily for about 8 to 10 Rupees per Boat. If the haul is not a large one, and the demand on shore appears to be lively, they are counted and sold at prices ranging from 4 to 6 pies per hundred. There are two different ways of extracting the oil; one is as follows:—the sardines are thrown into a large cauldron and boiled with a quantity of water, and the oil floating on the surface is skimmed off, and poured into another vessel, to allow the water and other sediment with which it is mixed, to settle, when it is filled into casks and removed to the yards of the purchasers. In Chowghaut, Ponany, and other northern villages, another and a more disgusting method is adopted. The fish is put into vats or boats and filled up with water, and when decomposition has throughtly taken place, the oil on the surface is removed. This abominable process has in the eyes of the natives of those parts the great recommendation of cheapness, and although the stench is insufferable and cholera invariably breaks out in the vicinity of such places, they never think of abandoning this method of extracting the oil, so long as a saving in the item of firewood could be effected. We think this is a matter in which Government interference is imperatively necessary, and when we remember that the preparation of the oil after the method we have described above, is largely carried on, not in one or two villages, but along the whole northern coast, we are decidedly of opinion that the Collector of the

District should issue some orders entirely prohibiting it, or lay down some rules regulating the extraction of the oil in a manner less detrimental to public health. The oil prepared as above is easily known by its highly offensive smell; on the other hand the boiled oil has a less disagreeable odour, although the atmosphere in the locality where it is prepared is rather overpowering. The *debris* as in France is generally used for agricultural purposes; it is buried for some time after which it forms excellent manure for cocoa nut trees. We should imagine that the men who catch the sardines realize about half of what the manufacturers of the oil get, and when we are in possession of statistics, we may be able to form some idea as to the probable profits made during the season. It is however well known that during the fish oil season, most of the fishermen caste do not care for work for which they at other times would be most thankful. It is uncertain how long the sardines will continue in these waters, but they have been known to do so in abundance until January and February, and during this time there is also an abundance of large fish of all discriptions, which evidently prey upon their more diminiutive finny brethren. There is hardly any demand for Fish oil at Calicut, Tellicherry or Mangalore, and consequently all the oil prepared in those ports finds its way into Cochin, so that it is rather difficult to form an approximate idea, from the statistics of previous years, as to the average quantity of the article prepared at Cochin alone. We subjoin however the following figures which represent the quantities which have found their way to Europe through this place from all the ports on the Western Coast.

In	1862-63	Cwts.	137
	1863-64		23,150
	1864-65		21,160
	1865-66		21
	1866-67		
,,	1867-68		
,,	1868-69		
,,	1869-70		

The cwts 21 shipped in 1865-66 was not actually the production of that season, but of 1864-65, and it is also just possible that the cwts 137 against 1862-63 may have been the balance of the shipments of 1861-62, but of this we are unable to speak with certainty. When we consider that the sardines of the Malabar Coast, can, both as regards size and flavour, bear favorable comparison with those which come from Europe, we cannot help enquiring whether the people here could not direct their attention to curing the fish and exporting it to other countries? To those who have a plethora of capital and the enterprise to embark in an undertaking of this nature, we think sardine-curing would prove a profitable speculation They enjoy here several facilities which the sardine-curers in Brittany do not. In the first place, the fish here being caught in nets in large quantities can be bought at incredibly low prices; whereas in France, notwithstanding the hackneyed proverb "that they manage things better" there, nets are not employed, but the sardines are baited, which is a most expensive plan. Codroes are employed for this purpose, and these are supplied from the North Sea where extensive Codfisheries have been established. They cost about £2 per barrel, and each boat uses about fifteen barrels every season. As the number of sardine boats in Brittany is estimated at about 3000 about £90,000 alone is anually expended in codroes alone !! Again, labour in India is cheap, and the only difficulty to surmount which Europeans will have to be employed is, the sealing and soldering of the boxes. The manner of curing is simple and the plan followed in Concerneau, one of the chief ports in France where the curing of sardines is extensively carried on is as follows: As soon as the boats come in, the curers buy just the quantity they require, and the process is commenced by the sardines being beheaded, sorted according to their sizes, and washed. This part of the work is done by women who are paid at the rate of 14 to 15 shillings per week. They are then dried in the open air and are placed in pans over wire grating and boiled in olive oil, after which they are removed to drip, the drippings being carefully collected. They are next arranged in the little tin boxes in which they are exported and any little dripping remaing is then carefully poured away, and each box is filled up with pure, fresh olive oil, and hermetically sealed and soldered, and boiled in a steam chest. There are no actual statistics as regards the number of fishes captured, but we may be able to form some idea from the fact that in addition to the large quantity exported to almost all parts of the world, as many as 4,000,000 boxes are prepared for home consumption. We have not the least doubt that should we be able to cure sardines successfully here, the French trade would suffer heavily, as the curers in Brittanny would find it difficult to compete with us, considering the advantages we have over them in many respects.

PORT CANNING RICE MILLS.

From W. E. and H. G. MORRELL, ESQRS., *to* H. A. COCKERELL, ESQ., *Officiating Commissioner of the Presidency Division,—(dated Bengal Club, the 17th May* 1870.)

DEAR SIR,—We have not any Rice Mills at Morrellgunge, and the only ones we know of in Bengal are the Port Canning Mills.

The information you require could be obtained from Rangoon and Akyab, at both of which places there are several mills at work.

From W. A. SHEPHARD, ESQ., *Officiating Secretary, Port Canning Company, to* A. SMITH, ESQ., *Collector of* 24-*Pergunnahs, Alipore,—(dated Calcutta, the 8th June* 1870.)

SIR,—In reply to your memorandum No. 93 G, of the 25th ultimo, I am directed to state that the company will be happy to give "all the information in their power," and in pursuance thereof, I now furnish you with such details as appear to be called for in Mr. A. A. Borradaile's letter, No. 549, dated Ahmedabad, the 25th March 1870, with a view to the saving of time.

The Port Canning mill is the first of its kind set up in India, as those erected in British Burmah apply exclusively to rough husking or preparation of cargo rice, which contains a large percentage of paddy necessary for the better preservation of the grain while in transit to a distant port.

The Port Canning mill is supplied with thirty pairs of rough husking stones and thirty dressing mills; the latter prepare the rice for local consumption, under the denomination of dressed or table rice.

The rough husked rice not only contains from 10 to 15 per cent. of paddy, but is turned out from the husking stones with the pellicle of the grain unremoved, consequently the best Patna paddy, when drawn through the husking stones, has the appearance of the lowest class rice, being largely mixed with *red grain* and paddy. On passing through the sifting sieves the paddy is entirely separated, and the product is then termed clear husked rice, being by this process freed of all paddy. To prepare this description of rice, used for table purposes, clean husked rice is passed into the dressing mills, which remove the red skin or pellicle known as *bran*, and the grain is ejected, possessing the ordinary uniform white color, peculiar to table rice.

The cost of preparing the rough husked rice, containing from 10 to 15 per cent. of paddy, is estimated at four annas per maund.

The clean husked, or rice free of paddy, is produced at an estimated cost of five annas per maund, and the clean dressed, or table, rice at seven and a half annas per maund, under the present arrangement of the mill.

Patna paddy, *rough husked*, yields from 67 to 70 per cent. of rough husked rice.

Patna paddy, *clean husked*, yields from 62 to 65 per cent. of rice free of paddy.

Patna paddy, *dressed*, will yield about 52 per cent. of table rice.

The cost of machinery imported for the Canning mill is entered in the books of the Company at £20,000, or two lacs of rupees, free on board-ship at Liverpool; and the massive buildings, fitting into them of the machinery, freight to Canning, cost of the land, raising of the land 4 feet, supervision, hire of numerous Chinese carpenters, and numerous additions, have increased the first estimated cost of the entire mill from 3¼ lacs to 9 lacs of rupees.

The capabilities of the mill in point of daily out-turn are represented to be as follows:—

Rough husked rice per day of 12 hours, 4,000 to 5,000 maunds
Clean ,, ,, ,, ,, ,, 12 ,, 2,000 maunds.
Table rice ... ... only 600 ditto.

The mill is fitted with two engines of 75 horse power and five large boilers.

The building is 260 feet in length, 90 feet wide, and is three-storied; has one pucka godown detached from the mill capable of storing 15,000 bags, each 2 maunds of rice, and a second godown of similar capacity, but at present in an unfinished state.

The expenditure at the mill when in full work in the item of salaries to the employed is over Rs. 2,000 per month, and the consumption of coal is not under ten tons, 270 maunds per diem.

The Company do not possess a plan of the mill, otherwise I would have furnished a tracing of it.

The mill is constructed under the late Mr. Thomas Sutherland's patent specifications, and plants, of which patents have been filed by the patentee in the *Home Office*, (Government of India.)

SILK.

AGRICULTURAL AND HORTICTURAL SOCIETY OF INDIA.

(Concluded from our last.)

HINTS FOR THE FURTHER IMPROVEMENT OF BENGAL RAW SILK.

THE secretary read a note from Mr. St P. Griffiths, forwarding copy of a circular which he had received from Messrs. Frederick

Huth and Company of London, on the defects of Bengal raw silk, and giving suggestions which, if attended to, would greatly improve the quality of it.

This circular is signed by Messrs. J. B. Martin, plush and velvet manufacturers, of Tavare, Paris, Lyons, Metz, and Roanna, and is dated from Lyons, 1st July, 1870.

Agreed that this circular be incorporated in the proceedings of this day's meeting, with the view of drawing greater attention to the subject on which it treats :—

"For several years past, the standard of quality of Bengal raw silk has singularly lowered, and on this account, those who habitually used this class of silk in large quantities, have abstained and still abstain from purchasing them.

"As we are ourselves regular customers for this silk, and consequently well able to make a correct estimate of their worth, *throwing them, as we do, in our own mill, dyeing them on our own premises and lastly weaving them on our own looms*, we venture to offer such practical observations, which if taken into serious consideration, may tend to ameliorate the quality and consequently render the silk more saleable on this and on other markets, and at much higher prices than can now be obtained.

"We can attribute the inferiority of Bengal silk to the following causes (we speak of first-class filature silk, as we cannot use other qualities) :—

"1*stly*.—*The size, which is spun too fine.*—Bengal silk, being of a soft and brittle texture, requires to be spun from at least 7 to 8 cocoons, which would make 14 or 17 deniers. This size we think, would be to the best advantage of quality, and is in fact the size usually received six or seven years ago, when surdahs were so superior.

2*ndly*.—*In one and the same parcel of silk, we often find different qualities mixed up together, which is very prejudical*.—Each filature ought to be sold separately, and the second-rate quality after careful selection, put aside and also sold seperately. As is now, we often find in the same bale some pale coloured skeins and others of a bright colour, some long and some short, in fact evidently wound upon different swifts, and consequently of divers filatures. This compels us to go through the process of choosing the different qualities, skein by skein, which, besides being tedious, deteriorates the quality of the silk.

"The pale coloured skeins are always the best.

"3*rd*.—*The hanks are in general too heavy*—which is a great impediment to the winding, the swifts having to bear the greater weight, turn too heavily and snap the thread much more frequently than if the skeins were lighter.

"*Summary*.—We would advise spinners of Bengal silk :—

"1*srtly*.—To spin a thread of 7 to 8 cocoons, which will make 14 or 17 deniers, a size preferable in every respect.

"2*ndly*.—Not to mix up in the same parcel the silk of one filature with that of another, and silk of inferior quality to be made up in separate bales.

"3*rdly*.—To make the skeins lighter and of even length."

EXPERIMENTAL TRIALS WITH JAPANESE SILK WORMS IN BENGAL.

Read the followig letter from Mr. O. DeCristoferis, dated Gadee, via Jungypore, in continuation of his communication submitted at the April meeting :—

"In reply to your favor of the 13th instant, and in continuation of my letter of the 21st March ultimo, I beg to give you further particulars on the rearing of the Japanese silk worms, which, I regret to say, has proved a total failure.

"The seed, in small quantities, were given out to several natives, in April last, for the purpose of doing the experiment in a more practical manner. These rearers, native like, took little or no pains with the worms, and eventally allowed them to be nearly all destroyed by that large grey fly which is so great an enemy to all silk worms during the hot season. In consequence of this failure, I could only collect a very few healthy cocoons to try a third reproduction of the eggs ; but I am sorry to say, owing to the great dryness in the weather, and perhaps for other causes difficult to be ascertained as yet, not a single moth bit through, thus closing an experiment (which promised very fair) to a most unsatisfactory end, Other Europeans have tried the experiment with the same worms, and have met with the same result as myself, and I am therefore of opinion that the Japanese worms will not answer for the purpose of rearing in the climate of Lower Bengal.

"From the first reproduction there were some eggs that from their size and color, and not hatching at the same time as the rest, appear to me to be the real Bievoltine, or altogether annual. These are yet on hand, and have still a healthy look, and very probably may be hatching in the next cold weather. Of these I have the pleasure to send you a small quantity herein, which I trust will answer your purpose of sending them to your friend at Mussoorie."

The Secretary intimated the despatch of the eggs to Captain Hutton, who fears they will not hatch, as surmised in the winter. Captain Hutton has examined them under a lens, and finds every one to be deeply sunken on the upper surface, which is cup shaped, and, apparently, there is not a prolific egg amongst them.

EGGS FROM THE JAPAN SILK WORM.

Read a letter from Mr. G. DeCristoferis, forwarding copy of a letter which he had addressed to Captain. Hutton, in respect of the Japanese eggs alluded to at the last meeting, of which the following is an extract :—

"I duly received your letters of the 31st August, 5th and 6th September. When I read in the report of the Agricultural and Horticultural Society that you feared that the eggs I had sent to Mr. Blechynden would not hatch, I thought you might have been too quick in condemning them.

"The eggs were certainly sunken on the upper surface when I sent them to Mr. Blechynden, but by breaking some of them I ascertain that life was not destroyed yet.

"It is nevertheless no wonder that these eggs should have come out so irregularly with you, and so few at a time. It was not their season to come out at all, but independently of this, have you ever seen Italian, Chinese, or Japanese annual eggs come out regularly in this country, even when brought out with the greatest care ? I think not. The reason is that no annual eggs will hatch regularly, unless they are submitted to the changes of the four seasons in a temperate climate from the heat of a summer, to the cold of a winter below zero. The Japanese annual eggs that always fail here in Bengal, hatch most regularly in Europe when wanted in the spring. They would not do so in the previous autumn if forced.

"The annual Boro Pullo of Bengal is the only annual eggs that will hatch after a few months of being laid, if proper care is taken to keep it in a cool place, well protected from the air in earthen pots. In this way the eggs will keep for the twelve months, and would hatch after a few days of being exposed to the air.

"In future, if you get any annual eggs from China or Japan, I would recommend you to send them up to Darjeeling at once, and to get them back from there in the spring, when, with ordinary care, you would find the eggs to hatch very satisfactorily. You may try this with the eggs I sent you, if any are left."

The Secretary also read the few following remarks from Captain Hutton, regarding the above eggs :—

"The eggs you sent me from Mr. DeCristoferis' Japan worm, about 4,000 in number, have produced 25 worms, but these came out sometimes two, at others three, then none, and at the most five per diem ; they are some of them in the third stage, and have all the appearance of *B Sinensis*, answering nearly also to the description formerly given by me in the journal, when I sent you the cocoons about which you said nothing. If I succeed in getting any seed from these, I may perhaps restore the worms to order, but I scarcely think Bengal a good climate for Japan species."

SILK CAPABILITIES OF THE PUNJAB.

Submitted the following communication from Captain Thomas Hutton, in reply to the remarks of Mr. Cope which were laid before the July meeting :—

"Whatever may be the value of Mr. Cope's '*hard facts*,' as he terms them, I cannot say that I admire either his logic, or his persistence in advertising the Punjab as a proper field for silk culture, especially as he himself lately condemned it by assuring the public that he cannot recommend the re-opening of experiments in which, according to Sir R. Temple's report, he so signally failed. As to his laudation of Goordaspore, it may, for all I know to the contrary, be capable of growing very good silk, but still such a fact could never convert the Punjab into a good silk-growing province. It appears that Mr. Cope's paradise is situated about 30 miles from the base of the Punjab hills, and we are told that everywhere along that base, and within that distance, would probably be found equally good. Well, what then ? It does not follow because at the foot of the hills, in a greatly modified temperature, silk can be grown, that therefore it can be successfully cultivated throughout the plains of the Punjab where the conditions of climate are very different ; and even although this one belauded spot produces good silk, it is to be borne in mind that '*one swallow does not make a summer*.'

"Against Goordaspore I have nothing to say, for I have never been there, yet, nevertheless, I denounce the Punjab in general, and Mr. Cope unwillingly does the same by telling us he cannot recommend any one to re-open experiments in which he failed ; for he acknowledges that his having made a profit of seventeen per cent. is altogether *exceptional*.

"What little I have said of Goordaspore was called forth by the statements of Mr. Cope and Lieutenant Powlett, and if my inferences, founded upon those statements, were wrong, I have only to thank these gentlemen for giving me false data. For

the account formerly given by Lieutenant Powlett is now contradicted by Mr. Cope; both statements cannot possibly be true, and as Lieutenant Powlett's appears to me, under all the circumstances of the case, to be the most reliable, I am inclined to pin my faith upon him. Mr. Cope now modestly assures us that he is still *practically a tyro*; what, then, was he eleven, years ago! And yet he, then, in a lecture delivered at Lahore took the opportunity of sneering at my attempts to extricate our Indian species of *Bombycidæ* from the confusion into which ignorance of natural history had plunged them, assuring his audience that there was but *one specie*! How do the facts stand now? It will, however, be sufficient to substantiate all I have written, if I quote the conclusion to which Sir D. F. McLeod, then the Financial Commissioner, and Sir R. Temple, then Secretary to the Chief Commissioner for the Punjab, were compelled to arrive at, since it may well be allowed to close this controversy as to the silk capabilities of the Punjab. From Lahore the 16th July, 1856, Mr. Temple thus writes—'In reference to your letter No. 871 of the 27th February, 1855, sanctioning a total expenditure of Rs 17,000 for silk experiments at Lahore, under supervision of the Agricultural and Horticultural Society of the Punjab, to extend up to close of 1856, I am now directed to submit a final report on the subject as follows:—At the commencement of 1855, it was reported that Rs 5,279 had been already expended, and a further expenditure of Rs. 11,721 was sanctioned for 1855 and 1856; at that time the Agricultural Society were sanguine that the outlay *would be at least nearly covered by proceeds.*

"'During the season of 1855, the experiment was vigorously carried on; there was as Superintendent, *a gentleman of much practical skill,** and a staff of eleven silk-winders from Bengal. The worms were also, for the most part, of the Bengal species. At first, the generation of the worms was very successful. The insects came forth in surprising abundance; they throve on the mulberry leaves that were given them: and at the first began to spin excellent cocoons,—everything prospered, *until the weather became hot and the atmosphere dry.*' [Precisely my own remarks scattered through several papers.] 'But as the spring advanced towards summer, *the food became deteriorated by the shrivelling up of the leaves; the worms grew sickly; and the cocoons fell off.* The early promise was fair, *but the ultimate result was almost nil.* Some 94lbs. of silk were procured, valued at Rs. 500,† where some 800lbs. had been expected at Rs. 6,000, and there only remained these scanty proceeds to set down against an expenditure of Rs. 12,000. After this season the European Superintendent abandoned the undertaking; but the silk-winders remained. Perceiving this state of things, the Chief Commissioner, in the commencement of 1856, directed the Council of the Society to deliberate on the further continuance of the experiment,—copies of the minutes recorded by those officers are appended as shewing the opinions entertained. It was then decided to continue the experiment‡ during the season of 1856, by means of *Cashmere silk worms*, as there appeared a hope that perhaps this species would prove more hardy than the Bengal species which had failed during 1855.

"'But from the two reports of the Society herewith appended, it will be seen that the same fate befel the Cashmere worms as the Bengal worms. The Cashmere worms also flourished at first, but as soon as *the season became inclement, they began to wither.* Their cocoons ultimately produced no more silk than the meagre quantity which was produced the year previous; and the Society pronounce the Lahore silk experiment *to have failed in toto.* The establishment have now been discharged and the concern wound up.

"'From the abstract account annexed, it will be seen that Rs 10,569-9-8 have been expended in all or Rs. 6,430-6-4 less than the sum sanctioned. But the value of the silk produced *is only Rs.* 1,100 *instead of* Rs. 10,000, as originally hoped for by the Society. The result has not been fortunate, but the Government liberally supported the experiment for three consecutive years, and the Society did its utmost in the way of supervision As regards skilled agency all reasonable advantage was enjoyed; excellent shelter for the worms was provided, and two species of worms were tried.

"The conclusion, therefore, I am to state, appears to be that the climate in this part of the Punjab *is inimical* to the production of raw silk *For this purpose an equable temperature and a tolerably moist atmosphere* are required, but in the spring, which is the season for silk-spinning, the weather is at first comparatively mild. So long as that lasts the worms thrive, on rich green fodder, and spin fair cocoons, but in *about the middle of April, the weather rapidly changes for the worse*, and the *worms are ruined.* For the northern parts of the Punjab, which are submontane, that is, within the influence of the Himalaya, *different climatic conditions exist.* There the atmosphere may retain its humidity and coolness longer than in the southern districts, and there the production of silk in quantities may be *possible.* Private experiments have been conducted occasionally in some of these places with a certain measure of success,* but there are neither the means nor the agency for such experiments, on the part of Government, available in these quarters. But in the Central Districts of the Punjab, a few pounds of marketable raw silk might be produced as samples, but no considerable quantities can be raised.

'(Signed.) R. TEMPLE.

"Here then we find ample proof of the truth of my statements that the climate of the Punjab, as a whole, is inimical to the constitution of the Chinese domesticated *Bombyces*; and further, we have evidence, *first*—that the Punjab experiments were a a total failure; *secondly*—that in my reports on silk cultivation I have stated nothing but the truth; *thirdly*—that such being the case, no amount of sophistry will serve to make the Punjab a proper field for the cultivation of silk, and *lastly*—that with these strong proofs of utter failure before us, it is high time that this fruitless controversy should be laid at rest. Mr. Cope's continual ill-judged praises of the Punjab being calculated only to mislead those who have learned to regard him as an authority instead of being only *practically a tyro*'"

* Surely here is no allusion to Mr. Cope, who now, fifteen years afterwards, has wisely come to the conclusion that he is only a "practical tyro."

† About Rs. 10 per seer instead of Rs. 14 per seer.

‡ "Quem Deus vult perdere prius dementat."

CULTIVATION OF THE MULBERRY: THE SILK WORM.

An exceedingly interesting and exhaustive report written by the Tahsildar of Tenkasi, doing duty at Tinnevelly, has been published by the Madras Government. The writer enters into the entire question of the cultivation of the Mulberry, and the production of silk. The plant, he says, is perennial, and would grow into a tree if not kept down, to the proper height of four or five feet, by early training. For the cultivation, a mixture of red and black soil is best; Punjab land will not do unless it can be watered once or twice in summer, and the uplands of Southern India are better suited for the purpose than the low-lands. The mulberry field requires hoeing once a month, and manuring once or twice a year, with ashes, and cow-dung, or sheep-dung, the last being preferred. As the silk-worm feeds entirely on the mulberry leaves, the number and health of the caterpillars, and hence the quality of the cocoons spun by them, must depend on the quality of the leaves. To secure this quality the bad leaves must be thrown away, the leaves wet from rain or dew well dried, and irrigation must be very carefully attended to under all circumstances. With proper attention from six to eight crop of silk worms can be had in the year, at an annual cost for cultivation, in English money, of about £10-10. This includes workmen, manure and assessment.

Then as to breeding. The worms are hatched from eggs no larger than poppy seed, and each egg should produce a moth on the morning of the tenth day; "an hour of difference in the time of hatching making a difference of days in the transformation of the caterpillar to the chrysalis." The moth crawls on sixteen short legs, and is fed six times a day on chopped tender mulberry leaves. Four times—on the fifth, tenth, fifteenth and twenty-first days after birth—the caterpillar undergoes changes, and turns against its food. Then it needs nursing. On the tenth it may be weaned; that is, left to chop its own food with its own teeth. About the thirty-third or at latest thirty-fifth day, it is a full grown, dignified, respectable silk-worm, an inch long, a third of an inch in circumference, of a white colour tinged with white yellow, and able now to fight its own battle of life—that is, to spin silk for "gentle dames and ladies fair," as Burns, with a different meaning, has it. Still, great attention is needed, as in the case of many fullgrown and pretentious animals going on two legs instead of sixteen. The worm is moved from plate to plate, for cleanliness, and when it seeks concealment it is assisted to carry out its wish. And then the little weaver does its work, wonderful among the wonderfulest when it is viewed in its day of small things and of great ones. When the work is done, the looms and weavers—work and workers together—are put into water, and boiled; and then the silk is coiled off, and the dead weavers are thrown on the way side, as human weavers, too, of silks or thoughts, are when the time comes.

Abstain from the boiling, and on the forty-third day after birth a beautiful butterfly comes out. Ten of its legs are gone—no great penalty one thinks—but to make up for the loss it has two big horns, and two small wings. In this state, only half awake, the male finds, as Adam found at the dawn of creation, that it is not good to be alone; and he draws to the female, finding her out somehow, and in accordance with some old-fashioned law, changeless in the case of silk-worms, and also, some people say, is that of man. How is it that the male butterfly finds the female? How was it that the wonderful lad, in that story as true as truth, found out that of all things he had seen the one thing he would most wish to take home was a goose? The story runs in this wise. A cross soured man, was left to himself, in a lonely mountain district, with one son, whom the lonely man resolved to keep to himself till the chapter's end. He resolved, it is said, that the lad should not see a female till he was 21 years of age; and the great resolution was carried out When the day of maturity was well gone the old man took the young one to a fair, and the young one asked the old one what

a petticoated person that he saw was. "*That*;" said the father—"*that's* a goose"; and so they went on, and saw wonders upon wonders—wild beasts, mountebanks, talking fishes, giants, dwarfs, gingerbread, merry-go-rounds—everything. When the night came the old man, well pleased with his son, said—"Now what shall I buy for thee to take home?" "Father," said the strange lad, "buy me a goose." A goose! Who can explain the mystery? Let who can next try to tell how it is that the half asleep butterfly finds the way to its mate. When the time comes the male is separated by force from the female; the gentleman is thrown on the dunghill; the lady is left alone, and lays her eggs, after which she follows her mate into nothingness, the young race meanwhile coming on, fatherless and motherless to spin, and weave, and be boiled. The obstacle to Hindoos making silk is their objection on religious grounds to take life. The Mussulmans therefore are to be the silk men, and the work seems to promise a handsome profit. Certainly the subjects makes an interesting book for a Government return. It is a little treatise on natural history, and it is annoying to find that after reading such a document, showing that the silk trade, from some cause has rapidly fallen away, the Government should refuse to "lower the assessment on land cultivated with mulberry." Very likely the Government is right—we do not know, but so racy a report deserved some return. Well, but it has a return; the report is pronounced "perspicuous and complete" which it certainly is, and more.

GOVERNMENT OF INDIA (HOME DEPARTMENT.)

SERICULTURE IN BRITISH BURMAH.

The following Note by the Deputy Commissioner, Thayetmyo on Sericulture in British Burma, with reference specially to the Districts of Prome and Thayet, is published for general information:—

Concerning the period at which and the country from which the silkworm and mulberry were first introduced into Burmah nothing certain can be ascertained from the traditions of the people themselves. From time immemorial the present silk-growers and their forefathers have been engaged in the manufacture. Neither the worm nor the mulberry are indigenous, *i. e.*, neither of them are found in a wild sate. They appear therefore to have been imported, and I am inclined to agree with the prevailing belief that they were introduced by the Valley of the Irrawaddy from Assam or China, and not across the mountains from India.

The occupation of manufacturing silk in British Burma is a lucrative one, and many parts of the country are admirably adapted for it. That under these circumstances the occupation is not more extensively followed than it is, is due mainly to the Budhistic prejudice against the taking of life. The manufacture of raw silk of the best quality involves the death of the chrysalis in the cocoon, an act of impiety which is looked upon by orthodox Budhists with horror. The people who live by the commission of this sin therefore are considered by their neighbours as of "low caste" if such a term can be appropriately used with regard to a people who acknowledge no distinction of caste. The silk-grower live in villages by themselves, and hold but little social intercourse with their neighbours for fear of being taunted with allusions to the wickedness of their calling. In the Eastern Yoma range these people, though of pure Burman descent, have come to be regarded as a distinct tribe and are called Yabaings or Zabaings.

The Burman mulberry *(Morus Indica?)* is a thin, lanky shrub, throwing out several vertical shoots from near the ground, and growing to a height of eight or ten feet. It has no flower or fruit, and is propagated by cuttings. After about three years a plantation of mulberry trees ceases to produce good and succulent leaves, and is then uprooted or abandoned. The plant is grown chiefly on the slopes of hills, but a small quantity is likewise produced on alluvial soil by the margin of mountain streams, where it appears to thrive well though the silk produced in such localities is inferior to that obtained on high land. The Burmans call it "Po-tsa-beng" (literally "silk-worm's food trees"). I am not aware whether it differs from the *Morus Indica*, but have sent some plants to the Horticultural Society at Rangoon with the view of ascertaining its species.

If the mulberry leaves fail, the worms are fed on the leaves of the *Bronssonetia papyrifera* (Burmese Mahlaing-beng) a tree belonging to the mulberry family from the bark of which Burmans also make their coarse paper known as "*paraback*." The leaves of the above two trees are the only ones ever used to feed silk-worms upon in British Burma, or at least in this District.

The silk produced in Burma, though admirably adapted for the manufacture of the strong coarse silks so universally worn by the natives of the country, is of a very rough and inferior description, and would, it is believed, be almost unsaleable in Europe. The European value of a specimen of it was in 1855 estimated by the Calcutta Chamber of Commerce at 5 shillings or 6 shillings a pound, or not much more than half the price which it fetches in the local market.

In British Burma the manufacture of silk carried on in the Districts of Prome, Thayet, Henzadah, and Toungoo, and in the northern portion of the Rangoon District. The mulberry is grown chiefly on the slopes of the Yoma range—the watershed between the valleys of the Irrawaddy and Sittoung. A small quantity also is grown on the eastern slopes of the Aarakan range, and a still smaller quantity in the valley of the Pairee stream which rises on the Arakan range. The silk produced here (on the Pairee) fetches a lower price than that grown on the high lands; but the people make a profit by the sale of the eggs which are taken across the silk-growing localities on the east of the Irrawaddy and sold there. The whole of the silk produced is used in local manufactures. None of it, it is believed, finds its way to the Rangoon market.

From the information I have collected the following appear to be the most prominent statistics connected with Sericulture in the Districts of Prome and Thayet, the two northern most Districts of Pegu extending on the both sides of the Irrawaddy from the Yoma range on the east to the Arakan mountains on the west, covering an area of 5,500 square miles and containing a population of 360,712 souls. The number of persons engaged in silk culture is 713, of 422 are men, and 291 women. The number of acres under mulberry cultivation is 452, and the average annual out-turn of raw silk is 5,469 viss (1 viss = 3·65lbs.) or about 9 tons. The price of the raw silk when brought to the markets on the river bank varies between Rs 15 and Rs. 24 a viss, and the average price is about Rs. 20. The value of the whole at this rate will be Rs. 1,09,380, or 10,938. The above statistics for Prome and Thayet may be depended upon as tolerable accurate, though, as the information is obtained from the silk-growers themselves, the out-turn of silk is probable rather under than over the mark. I have no statistics to guide me in estimating the amount of silk produced in the other Districts, but I have travelled through them and believe that the following estimate is not far wrong.

Toungoo probably produces as much as Prome and Thayetmyo together and Rangoon and Tharrawaddy together about the same amount. This will make the total out-turn of raw silk in Pegu amount to 16,400 vish or about 27 tons, of the value of £32,800.

Silk is produced also along the Yoma range beyond the British frontier in Burma Proper.

The method pursued by the manufacturers of raw silk in British Burma is rude and careless in the extreme. All the processes are carried on in the ordinary bamboo dwelling-houses of the country, which are open to all the elements, and generally smoke begrimed and dirty. The worms and cocoons share the accommodation with the family of the house-owner, and live and thrive in close proximity to the place where the culinary and other domestic operations of the household are carried on.

The Japanese silk-worm is said to be of such delicate organization as to be seriously affected by bad smells or tainted air. He certainly must be a much more sensitive insect than his Burman *Congener*, and his life in a Burman hut would be a very brief one.

The plant of a Burmese silk filature is simple and inexpensive consisting only of the following articles:—A number of circular flat trays with slightly raised edges. They are made of strips of bamboo, plaited, and are from 2 to 4 feet in diameter; some neatly made circlets of palm leaves three or four inches in diameter; some strips of coarse cotton cloth; a common cooking pot; a small bamboo reel, a round block of wood with handle and axes turning on wooden or bamboo supports, and a two-pronged fork.

The different processes commencing from the time when the eggs are laid are as follows:—The males and females having completed the procreating process, the males are thrown away and the female placed within palm leaf circlets on a sheet of coarse cotton cloth, two or three feet square. The eggs are then deposited on the cloth, and as they adhere to it the cloth becomes covered with circular cartoons of eggs in this fashion.

These cartoons when sold, are sold at the rate of about eight for a rupee.

The moths having completed the laying of their egg, which takes them about a day, they (the moths) are thrown away. The pieces of cloth with the eggs, are wrapped up and left to themselves. About the eight, day the eggs are hatched; the cloths are then opened and worms begin to appear. As the worms, tiny little black specks, emerge, they are swept by a feather off the cloth on to a tray. The worms cling tenaciously to the cartoons and cannot be shaken off. The feather-brushing operation, though rough, does not appear to hurt them. The produce of one circular cartoon will more than fill one large tray 2 or 3 feet in diameter with worms when full grown. The worms are hatched in the morning. In the afternoon they are fed with finely chopped-up pieces of the tenderest mulberry leaves. This goes on for four or five days, when the worms become torpid, sleep for 24 hours, and shed their skins. They then become voracious and require plenty of strong leaves. Beyond being plentifully supplied with food they receive but little care. Very little attention is paid to cleanliness. They

live and thrive on heaps of *excreta* and refuse leaves, and they bear handling of the most rough and reckless description, being scraped up in handfuls and tossed about in a way which looks most dangerous to their delicate frames.

Their only enemy appears to be a kind of blue-bottle fly, which, when a tray is exposed, alights for a second, punctures and lays its eggs on the body of a worm These worms become unhealthy, and are generally picked out and thrown down through the bamboo flooring to the fowls which lie in wait for them below the house. If such worms are allowed to make cocoons, the fly eggs develope in the chrysalis and spoil the cocoons. To protect the worm from this fly, the trays are generally kept covered with a cloth.

The silk-worm's existence lasts about 30 days, during which period he becomes torpid and moults four times. When "ripe" or ready to commence cocooning, their colour changes from a blueish to a pinky white. The ripe ones are then picked out by the hand and thrown in heaps on to a small tray, in which they are conveyed to the cocooning tray. This is a large sized tray 3 or 4 feet in diameter, within which a long ribbon of plaited bamboo, a couple of inches wide, is wound round and round with its edges on the flat of the tray, as described by the figure in the margin. The worms are then taken up in handfuls and scattered with as little care as if they were so many grains of corn over the tray. They gradually find their places and then spin their cocoons attaching them to the walls of the plaited bamboo.

Whilst this operation is going on the trays are covered with a cloth. The cocoons are generally yellow: some few are pure white. In 24 hours the cocoons are completed. They are then torn away from the tray and placed in baskets. In two or three days those cocoons from which the best silk is to be reeled are taken out and placed in a pot (the family cooking pot) of water, which is allowed to simmer over a slow fire. Above the pot is placed a pair of cross sticks from which a bamboo reel is suspended, and beside the pot is a wooden cylinder turning on a trestle. Some filaments of silk are caught and drawn out of the pot, run over the bamboo reel, and fastened to the cylinder.

Then the reeler (generally a woman) with an iron fork in one hand and the handle of the cylinder in the other keeps catching up the filaments in the pot with the fork and reeling them on to the cylinder. The thread produced is coarse and dirty, and brings with it from the pot bits of pupæ and other refuse, all of which goes with the silk on to the cylinder.

The silk in the pot having been exhausted, the denuded grubs are taken out and fried in oil; they form a savoury addition to the family dinner

Those cocoons which are left to produce moths are ready, in about eight days. The moths are then formed. As they emerge they are put into large trays and kept there for a day, during which time the coupling process goes on. The males having been thrown away, the females are arranged on a cloth as before described to lay their eggs.

A coarse and inferior kind of silk is reeled off the cocoons which have been allowed to come to maturity This silk fetches only a third of the price obtained from those cocoons which are reeled whilst the chrysalis is still in them, but as, by this process the sin of taking life is avoided, it is preferred by some who are more [illegible] to the duties of religion than their neighbours.

The length of the different stages making up the cycle of the Burman silk-worm's existence is as follows:—

Eggs	.	8 days or 11 days in cold weather
Worm	... ...	30 ,,
Cocoon	..	8 ,,
Moth	. ..	1 ,,
Total		47 days

From the completion of the cocoon to the appearance of the worm, therefore, there are only 17 days in the hot weather and 20 days in the cold weather. This is altogether too short a time to allow of the Burman species being conveyed to Australia by one stage at least) with any hope of success.

The chief merit of the Burman silk-worm appears to be its extreme hardiness as compared with other species Whether the coarseness of its silk is inherent in the nature of the worm, or is due to the rough and careless manner in which it is treated, my limited knowledge of silk manufacture does not enable me to say. There certainly appears to be room for improvement as far as concerns the manufacture of silk fitted for the European market. Whether the manufacture of such silk would pay the growers better than the manufacture of the coarse stuff they now produce, I can hardly say. But any recommendations for the improvement of the present system of silk culture made by a person having a competent knowledge of the subject, would not be wasted on the Burman silk growers, provided such recommendations were at all feasible.

The silk growers are quite ready to adopt any measures, whether by the introduction of new breeds of silk-worms or the improvement of their machinery, which may be expected to be profitable.

Horace A. Browne,
Thayetmyo, 16th August 1870. Deputy Commissioner.

The following communication from Captain Thomas Hutton regarding the present state of Silk culture in India, with a few remarks on certain kinds of Silk yielders was read before the Agri-Horticultural Society in Calcutta on the 28 October.—

"At a time like this when, through the state of misrule existing in China, vast numbers of the mulberry trees have been destroyed, and the culture of Silk has been greatly impeded,—when France is being desolated, by war and her cultivators are called upon to relinquish sericulture and draw the sword in defence of the country,—it would seem to be a fitting time for the Government of India to step forward and seize upon so favorable an opening for extending the cultivation of Silk. Upwards of a year has elapsed since the Duke of Argyll called upon the present Indian Government to exert itself in giving aid to the views and wishes of the Silk Association in London and yet, with the exception of calling for information from all parts of the country from persons many of whom had probably never examined a caterpillar in their lives, we appear to be just as far from aiding and improving the culture of this valuable article as if there were really no room for improvement.

"The misfortunes of China and of France should be regarded as most fortunate events for our own country and for India and the Government should now promptly seize the opportunity of striking while the iron is hot. It appears to me that under existing circumstances there are just two courses open to us, namely, either to enter heart and hand into the task of extending and improving the silk culture of the country, or to let things go on as they are until, as lately in France, the worms die out altogether, and sericulture in India becomes a thing of the past. The present condition of all the Bombyces, and the frequent failures of the bund, especially as regards B. textor, furnish ample evidence that it is high time the Government should liberally step forward to arrest the downward progress of this branch of commerce, and restore the constitutional vigour of the worms by breeding them in more favorable climates than that of Bengal and annually distributing both cocoons and eggs to those who may be willing to cultivate them on common-sense principles instead of handing them over to the natives to be again destroyed. There are men in the country who are perfectly willing to devote their time and attention to sericulture, provided they can obtain assistance in procuring species and a few judicious hints for their guidance. The expenses incurred by the Government in establishing an experimental Silk Farm for the purpose of issuing such healthy supplies of seed, would soon be amply compensated for by the increase and superior quality of the Silk produced for exportation from healthier stock.

"As regards the health of the insects now domesticated in Bengal, it is a well-known and oft-repeated fact that all are gradually degenerating; and what the wonder when we consider the remarks lately made by Mr. G. DeCristoferis on the Japan silk-worm, namely, that 'no annual worms will hatch regularly unless they submitted to the changes of the four seasons in a *temperate* climate from the heat of a summer to the cold of a winter below zero.' This is rather running to extremes, for I never resort at Mussoorie to any artificial means of protection, neither in this climate is it at all necessary to do so. Eggs and cocoons alike remain suspended in the same room, in which, taking the whole year through, the thermometer may occasionally rise as high as 82°, and fall as low as 26°. I have never found any irregularity in the hatching, unless like these Japan worms they were very unhealthy, or were naturally bivoltines converted, like *B. textor* of Bengal, into annuals. As to keeping 'the eggs well protected from the air *in an earthen pot*'; for fear of their hatching at unseasonable times, the practice is quite sufficient to show how thoroughly unsuitable and injurious to the constitution of the worms is the climate of Bengal, and how artificial is the treatment of the eggs, since exclusion from air is one of the very best methods of rendering the eggs sickly and unprolific. How would Mr. DeCristoferis thrive, if shut up in a small room from which all air was studiously excluded?

"The so-called monthly worms of Bengal are likewise showing signs of deterioration, but I strongly suspect that this is less the fault of the climate than the vile native methods adopted in rearing them. With respect to *B. textor*, Mr. C. S. Turnbull of Ghuttal informs me that 'the bunds for the last two years have been a failure' in his neighbourhood, and he adds, when kindly sending me some seed of this species, 'perhaps it may interest you' to find out the cause.' This I shall certainly endeavour to do, for the eggs appear to me about half the size of those sent to me from the same locality about five or six years ago, and prove that the worm is already well on the road to ruin. I do not despair of being able to restore it, and even the Japan worm, I feel confident, will prove next year a very different worm from what it is at present, although some of the worms are even now 2½ inches in length, or as large as the Boro-pooloo of six years ago. The cocoons are by no means to be despised, being well formed, compact, and pale sulphur coloured. The Japan worm will doubtless thrive up here, although it will not submit to the suffocating pot and-pan system of Bengal.

"Of the worm discovered last year by Mr. R. W. King at

Ranchee, Chôta Nagpore, feeding on *Artocarpus lacoocha*, think I may pronounce it to be *Bombyx Bengalensis*, discovered by Mr. Grote on the same species of tree, but he has figured i so incorrectly that no one could recognise the larvæ o Ranchee in the published figure of *B. Bengalensis*. Mr. R. Fritl of Calcutta told me many years ago that he had taken a moth which he considerd to be *B. Huttoni* of Westwood as he found i in mulberry fields near Moorshedabad, and could see n difference in the markings. In this he was perfectly correc though the species are proved to be distinct by the differenc exhibited by the larvæ. So closely allied to *B. Hutton* is it, that had I not known from whence it came, I should have been tempted to pronounce it a diminutive specimen of the mountain species.

"When the cocoons arrived from Ranchee I found that many of the moths had come out and laid their eggs; these in a few days produced small black caterpillars resembling those o *B. Huttoni* at that stage. The puzzle now was how to feed them for there were no *Artocarpus lacoocha* tree nearer than the Doon so I tried several wild figs—*Morus Sinensis Migra M. multicauli* &c., none of which would they touch, and I expected to lose the brood. At last I bethought me of *Morus Indica*, and succeeded wonderfully, the young leaves being riddled into sieves in a very short time, and from that moment I reared the brood on branches of this tree placed in jars of water. During the firs stage the worms were just as intractable and wandering as those of *B. Huttoni* and required incessant watching but at night they remained quiet. A good crop of cocoons was secured, from which the moths again emerged, the worms from which are now feeding, and thriving, upon young mulberry tree in the open air. When the second brood of worms came forth the leaves of *M. Indica* had become so hard and tough that th young insects entirely refused them, so I substituted leaves o *M. nigra* and *M. multicaulis*, which they readily ate, and on which they are now thriving. The Silk in colour resembles tha of *B. Huttoni;* the cocoon is small, but well-formed, and the silk strong and elastic, and I see no reason to doubt its utility A full description in all its stages I reserve for another paper. Another species has lately been brought to my notice, which I suspect will prove new to science, and from the description it would appear to belong to the genus *Antheræa*; but of this more when I have seen the species.

"This shows that we have still a fine field for research before us, if we can but induce the Government to come forward to our assistance; and, in order to avert the impending wholesale destruction of our present stock, an experimental Silk Farm situated in a temperate climate, and under the liberal auspices of Government, is all that is necessary.

"This system I have advocated and urged for the past twelve months but without any good result, and I am beginning to grow heartily sick of the subject, for few things are more annoying to an energetic mind than constantly bawling into the ears of those who either cannot or will not hear and understand."

"P. S.—In continuation of the above I may now add, that last night, 9th October, I received a letter from the Government declining '*at present*' to enter into the extension of sericulture, so after a correspondence extending over 12 months, and furnishing all the information called for, I am cast aside, and sericulture may go to rack and ruin.

"The words '*at present*' may lead to the supposition that the subject may hereafter be renewed, but it may not then be very easy to find a practical hand to carry on a silk farm, for certainly I will not do so unless on my own terms. I am sorry to say, therefore, that I must abandon my intention of publishing a work already in hand, the letter press of which would have formed a manual of instruction to beginners, while the plates would have contained colored figures of every known species of Indian Bombyx, and with the caterpilars in the first and last stages of growth, the cocoon, and perfect insect both male and female.

"It is obvious, however, that such a work would be expensive, and that, without the aid of Government far beyond my private means.

"Hence the scheme falls to the ground. Not only will the young sericulturist be deprived of a practical guide but scientific men in Europe will regret to lose figures taken from life, and some of which have never yet appeared.

Such, however, is the decree of fate and my career as a scientific sericulturist must cease."

The Secretary mentioned, in reference to the first portion of the above letter, that no reply had yet been received from the Government of India to the letter of the Society forwarded in March last with the Report of the Special Committee on the present state of Silk Cultivation in Bengal.

REPORT FROM SYDNEY ON ASSAM SILK WORMS' EGGS.

The Secretary next read the following letter from Dr. Geo. Bennett, Honorary Secretary, Acclimatization Society of New South Wales, and submitted the report from Mr. Brady on the condition of receipt of a packet of eggs of the Mezankoory Silk worm of Assam (*Antheræa Assama*), forwarded in July last:—

"I received your letter of the 30th of June, and have sent you by book-post, this mail, the correspondence with India respecting Silk, printed by the Colonial Government and presented to both Houses of Parliament. Many persons in the Colony have been now induced to plant this season a large quantity of mulberry trees of the most suitable kinds, preparatory to the cultivation of Silk, this will give an impetus to the exertions of the Society, who having succeeded in already introducing the best kinds of worms, and as the report of the grain sent to Europe by Mr. Brady (as you will see in the correspondence) has been acknowledged to be of a very superior quality, the Society are now disposed to rest from any further importation of worms of any kind until they see what success attends those at present in their possession, or whether the Colonists will enter with energy into the cultivation of this important industry, for which the climate of New South Wales is so suitable. In the interval the Society would feel obliged if you would kindly inform them what amount would be required to be remitted to meet the expenses attending the introduction of other varieties and species of Silk worms, which will enable them to ascertain how far the funds of the Society (necessarily limited) will enable them to avail themselves of the opportunity offered, unless the Society could induce the Colonial Government to assist them in so laudable an object.

"I have also received by this mail your kind letter of the 29th of July, and also a packet containing eggs. Mr. Brady, to whom I sent them, has given me a letter reporting upon them, which I have enclosed, with many thanks for your attention."

GEO. BENNETT, ESQ., M.D, *Honorary Secretary, Acclimatization Society of New South Wales*,

"I have received the package containing eggs of the Mezankoory Silk worm just arrived by the mail, for which we are indebted to Mr. Blechynden.

"Upon examination I found the grain in good order except that the eggs had become loose from the sticks, and (the bottle having been hermetically sealed) the sweating had been excessive; a fair proportion of the seed appears very good, and I think the vitality is unimpaired, but in future it would be well not to cork or seal the bottles. In my opinion the best stopper is a piece of muslin, or thin stuff, stretched tight and tied over the wide mouth, this allows sufficient air to pass to sustain the embryo and prevent fermentation; in this instance the stink in the bottle was very strong.

"I shall carefully watch the progress of this new lot and, in due time, let you know how they get on.

"CHARLES BRADY."

There is a good opportunity for enterprising European and Native merchants in this province to encourage the growth of silk in the Punjaub. The London Silk Supply Association are purchasers to almost any extent of raw silk and on this account the Punjaub with its mulberries, is looked upon by them as a hopeful field for their operations. The silk which is reeled here is badly done, and indeed much of what reaches England in a "reeled" condition, whether it be from here or China, is almost worthless We believe that not only England, but the whole of the continent is much in want of raw silk in the cocoon. The only place where "reeling" is brought to the perfection of an art is Brussa in Asia Minor whose manufactures for brilliancy and solidity surpass the best productions of Lyons. But we too have our Bukhara and Khotan quite close, with their immense mulberry growth, and which—when Mr. Forsyth opens up our trade with Central Asia—will, barring the chance of being strangled by "Ghazis," be most attractive to our silk and gold seekers.—*Indian Public Opinion.*

PUBLIC WORKS—RAILWAYS.

THE TRACTION ENGINE

THE Traction Engine Company hopes to begin operations in Madras by the beginning of December next at the latest. The first engine will be shipped in London for Madras via the Suez Canal, so as to arrive here in the early part of November. We learn with reference to an assertion made in one of the North-West papers that engines working between Umballa and Kalka proved a failure, is entirely false. The postal department which is working these six power engines has no reason to find fault with them, on the contrary, they have worked so well that one of the officers of the department is going to Scotland next year for the purpose of procuring one or two twelve H. P. engines for the conveyance of the mails. The assertion made by the North-West paper after this goes for nothing The engines expected for the Madras company will be of eight horse power and will traverse the sandy beds of rivers with the greatest ease, as is done between Umballa and Kalka. The wagons for passengers

and goods are being built at Madras under the superintendence of the company's consulting engineer, M. DeClosets, and the manager, M. Defries, is making the necessary arrangements to begin work on the arrival of the first engine. The second will be shipped in England a few weeks after the arrival of the first engine. From all accounts we have reason to believe that the company will be a remunerative and well-worked one.

Our Railways.—Oudh.

(From the Lucknow Times.)

The vast Empire is being opened up by lines of railway intersecting it in different directions. The shriek of the steam engine is heard where once existed the silence and desolation of forests, all of which have been cleared away at the advance made by what we may call the great civilizer of nations. We are now in communication with Bombay by railway, and will shortly be in communication with Madras in the same way, so that before the close of the year 1871 the three Presidencies will be connected by a net-work of railways, affording every facility for travelling at an easy and rapid rate and at a trifling cost. Let us turn to the Province of Oudh and see what progress has been made in it by the railway

The lines of railway controlled by the Oudh administration, may be described as follows. A branch and main line from Benares to Lucknow 203 miles in length; a branch line from Lucknow to the junction with the East Indian Railway at Cawnpore, 45 miles long; a branch line from Nawabgunge junction to Byramghat on the river Gogra, 22 miles in length; a main line from Lucknow to Moradabad, 217 miles in length; a branch line from Chundosi junction to the junction with the East Indian Railway, at Alyghur 60 miles in length; a branch line from Moradabad to Ramnagur of the Kosi river at the foot of the Himalayas, 45 miles in length. The whole of the lines aggregate 592 miles, of which 285 miles are situated in Oudh, and 307 miles in the North Western Provinces.

Of this total length, 42 miles of the line between Lucknow and Cawnpore, so far as the Oudh bank of the river Ganges, were open for traffic during the year 1869-70; 40 miles between Lucknow and Byramghat were under construction; 45 miles of the line between Moradabad and Ramnagur were under trial survey; and the remaining 465 miles were finally located and aligned.

This Railway we learn, intersects a country, which has throughout a larger population per square mile than any other part of India or even than England, Scotland, Italy or France, and its importance may therefore be easily judged. In a military point of view it will afford many advantages by improving the transport of troops to such an extent, as to render a portion of their present number available for service elsewhere, and in the event of any internal commotion or disturbance, two distinct and independent lines of communication can always be commmanded for military operations between the sea and the heart of India, or between Calcutta and Delhi, the modern and ancient capitals of India.

It does not appear to be known to the outward world how nearly railway communication between Bombay and Madras is advanced towards completion. It is due to the energy of the engineers of the Great Indian and Peninsula Railway that the break between the two lines is now about thirty miles only—the distance which separates the Kistna from the Toongabudra river. The traveller may now cross that space in the mail cart, in a bullock gharry, or in a palkee; and the through journey from Bombay to Madras can be made in about fifty hours. It remains to carry the rails over the belt dividing the two rivers; and it is satisfactory to know that, by the middle of March at the latest, the G. I. P. Railway Company will have finished their line as far as Raichore, where it will join the Madras system. Although the permanent bridge over the Kistna, of course, will not be built in that time, there will be a temporary crossing; and if the Madras engineers have done the work expected from them, there will then be unbroken railway communication—though without that latest improvement, a break of gauge between Madras and Bombay, and the time of transit will probably be reduced to about forty-four hours.—*Bombay Gazette.*

On the 22nd instant eighty miles of rail were added to the Madras and Bombay Railway, leaving, therefore, only the Kistna Doab, a distance of about thirty miles, to be crossed to make the communication between the capitals of the east and west complete. The line when entirely finished will be about 350 miles in length, and will run for about one-fifth of its course through the territories of the Nizam of Hydrabad. Its direction is at first more northerly than westerly, but at Koolburgah, rather more than half-way, it takes a decided turn and runs almost west into Bombay. It crosses *en route* eight streams. Among these, however, the only perennial rivers of importance are the Kistna and the Toongabuddra. We should have rather said "will" cross, for the Kistna has not yet been bridged, and considering its size and importance, the work will for very many months to come be a serious obstacle. The Madras Company, we are told, hope to run into Raichore by April next, and the Bombay Company are not likely to allow themselves to be far beaten in the race. At present, if the traveller is unencumbered and lucky in his horse dâk through the Doab, he can travel across the South of India in less than three days.—*Pioneer.*

PUBLIC WORKS IN INDIA.

TO THE EDITOR OF THE "ECONOMIST."

Sir,—At the end of the Session, in one of those hasty Indian debates when the affairs of a great Empire are discussed as if the House of Commons had never wasted an hour in the former part of the Session, I referred to the question of the Public Works as lying at the root of the present financial difficulties of India. I wish, with your aid, to call attention to the subject at a time when legislators have more leisure for reflection than on the 5th of August.

It is perfectly well known to every one who has paid the smallest attention to finance, that here in England, when we have a public work to do, we borrow the capital required to complete it, and spread the repayment over a term of years longer or shorter by means of a sort of sinking fund. That is, we pay every year, along with the interest, a portion of the principal. A familiar instance may be found in the vast sanitary works which have been completed during the past twenty years. A board of health, or vestry, or board of guardians, or other like body, would not dream of paying even for a small work of public utility out of revenue. The money is borrowed, the work is done as quickly as possible, and the repayment of principal and interest are charged on the rates to which by the Act of Parliament, the district is made liable. Objections may be made to this plan, but it is so well known that the charge of paying for such works out of revenue would be unbearable, that, therefore, the works would not be commenced were any attempt made thus to defray their cost, and that the existing mode of proceeding is now completely established. Moreover, it is obvious that if a work is of permanent utility it is most unfair to make the residents in the district at any given moment pay for that which will last long after they may have removed or died. It is true, that the facility of borrowing, has in some cases induced carelessness in spending; but this inconvenience is deemed to be far less than that of paying out of the revenue of a single year, and so the Legislature has adhered persistently to the existing arrangement. Again, such a work, if worth doing at all, ought to be done quickly—not merely because it is required by the public, but also because, thus only can it be completed with economy. A work which is paid for out of revenue is liable to languish if the revenue of the board happens to be deficient, and public bodies are often short of funds. Waste of time means waste of money in public works as well as in law; and nothing is so sure to cause waste as the sudden stoppage of a work just when everything is progressing well. Such stoppage is certain to take place, when a work has to be paid for out of revenue, and contractors make their calculations accordingly.

All this seems so simple that one is almost ashamed to repeat it, and yet when we turn to our Indian Empire we find a vast system of works where all these views are utterly ignored; and a great Government is so virtuous as to pay for huge works of permanent importance out of revenue. Last year the Indian Government paid out of revenue, about £5,000,000 in public works, a very large part of which was expended on new works, and, as a natural consequence, the Government found itself so short of cash that it was compelled to increase the most odious of taxes—the salt tax, in order to bring about a financial equilibrium. It also imposed an income tax; but, leaving this as more defensible, though extremely unpopular, what I wish to ask is, on what principle it can be right to charge on the poor people of India a tax on their salt, because the Government thinks fit to make roads or bridges, or such like works, which must either be of permanent value or ought not to be made? I ask attention to these figures:—

	1867-1868.	1868-1869.	1869-1870. (Estimate.)
Total revenue	£48,534,412	49,262,691	48,549,910
Total expenditure, exclusive of public works, but including guaranteed interest	43,660,850	45,452,874	44,415,882
Surplus	4,873,562	3,809,817	4,134,018
Spent on public works ordinary	5,887,257	6,593,847	5,064,000

Thus we see that, were public works paid for as they are paid for here, there would be no ground for that financial despair to which readers of Indian blue books have so long been accustomed. These figures certainly show the vast importance of the subject.

Of course, every one admits that all charges for repairs must be paid out of revenue. These charges must be heavy, and will

abundantly try the resources of the country ; but, as at present advised, I protest against a mode of payment for new works in India which would be scouted in England, the only reason why it is endured being that the people of India are not represented in the Imperial Parliament.

It is perfectly true that a distinction has been taken between one kind of works and another. It is admitted that what are called "public works extraordinary" should be paid for out of borrowed money, because they are said to be "reproductive," whereas other public works are not so. The distinction really amounts to this, that the former class of works—as irrigation works, &c.—are expected to produce an immediate revenue, and are, therefore, "reproductive," whereas the making of a road, for instance, is not so, because it brings in no revenue which is at once calculable and tangible. I do not believe in the soundness of this distinction. A road may be a most important and most "reproductive" and essential work although it brings no money to hand. It may add vastly to the comfort and well being of a great population, and so ultimately bring an increase to the revenue. Such works are of the greatest value in a country where twenty years ago hardly a road existed ; and the question ought to be, not whether a money revenue will or will not accrue from a given work, but whether the work is or is not really needed for the development of the country? But, however this may be, the principle is here admitted that some works, at any rate, ought to be paid for out of borrowed money and not from revenue.

It is a curious and most natural consequence of the present plan that the great desire of the Public Works Department is to check new works. The country is poor, and the surplus uncertain. Therefore the less that is spent on works the better. So it becomes the object of the officers to cut down all such works to the lowest possible point. Hear Sir B. Frere in a speech delivered last summer (22nd June) to the East Indian Association—"The good administrator connected with the Department of Public Works is not the man who can get the most useful works undertaken, can most speedily remove difficulties, push them to conclusion, and so get the advantage of them for the country —on the contrary, the best man in every department connected with public works, according to the inevitable judgment of his official superiors, is the man who is most adroit in finding objections and in stopping works ; and this arises, be it observed, not from any wish *a priori* to stop public works, but because the crush and the crowd of public works calling for execution is so great that ability is best shown in preventing too many projects pressing into the narrow opening which is left." And yet Colonel Chesney, in his recent work, speaks as follow (*Indian Polity*, p. 370 :—"The business of supplying the country with good roads is only just commencing, and a very great and sustained effort is called for, in order to carry out to completion all that has to be done in this respect. The construction of railroads, so far from obviating the necessity for roads, only renders the absence of a sufficient number of feeders to the former more glaringly apparent.....The rest of the country, where the population and surplus produce are sufficient to support a great traffic, is so extensive, that the time when it can all be supplied with tolerably good roads, under the most vigorous administration must be yet deferred to the dim future." There are other greater works even more important than roads. So that the work is now only begun. It is in fact admitted that works are required all over the country—that without them the country cannot progress as it ought to do. But the Department will do nothing that can by any possibility be deferred. And why? The answer is plain: The Financial Secretary dares not part with the money lest his surplus should dwindle into a deficiency, or he cannot turn a deficiency into a surplus without cutting down existing and putting a stop to prospective expenditure on such works.* •

But it is said the borrowing if once commenced would be so great that the credit of the Empire would be ruined. I think Lord Salisbury is right, that loss of credit is far more likely to result from frequent deficits than from such borrowings. You have borrowed 100 millions to make railways without loss of credit ; you may borrow much more without danger. I am no advocate for hasty borrowing and waste, but I maintain that money thus laid out, if spent judiciously, will produce such excellent results in the improvement of the condition of the people that your revenue will be even more elastic than it has been, and your gradual repayments will be made with the utmost ease.

I can understand that the Duke of Argyll and Mr Grant Duff are filled with despair when they think of the story of the barracks, and how, after spending several millions with the best advice, they are told that they have done nothing, or worse than nothing. We could almost pardon them if they were to fold their hands and say—"No more public works for us." But they do not say this. They go on spending vast sums on these works, and then, to check their number and cost, they persist in paying for them out of revenue. That this does not prevent waste, the story of the barracks itself shows ; and surely the direct and natural result of such a plan must be not that money will never be wastefully spent, but that the most persistent and determined official gets his money—not always the man who has the best case. No officer is really trusted, but every one is checked and counter-checked with the hope of getting good work and avoiding waste. "It is a part of the cast-iron system to which they are subjected that it shall not be taken for granted that any man is able to spend honestly the money required for the work he has in hand. What would be the fate of works in England if a civil engineer of—say ten years' standing—proposed a road from Bristol into Devonshire and that was revised by another man of twelve years' standing in London that this was again referred to another man of fifteen years' standing at Paris, and from him to one of twenty years' standing at Constantinople." This is the pertinent question of Sir B. Frere.

If it is impossible to get competent men to superintend the completion of those works, in the name of common sense give them up ; but do not rely on a false system of finance as a protection against waste and bad work in the expenditure of £5,000,000 per annum. We are told that railways have cost twice as much as they ought to have done, and there is much wrangling over the cause. The Secretary of State may possibly say that one reason has been that the money, being borrowed, was obtained too easily. But I would reply that yet more money in proportion was wasted over the barracks, and in that case the money was paid out of revenue, according to the plan at present so much praised. It stands to reason that a sanguine man, filled with a sense of the importance of the work under his charge, may waste the resources given him, whether arising from borrowed money or from revenue. He will not ask whence the money comes. He takes it, and if he is not skillful and vigilant, he will waste it. This system will not give sense and discretion to a fool, but it cripples the action of a clever man, who has to waste precious time and energy in pestering the Government for money ; whereas, if his work is worth doing, and he is competent to superintend it, the money ought to be supplied without stint or delay. Let any man study the history of the works on the Godavery, and he will see what I mean—vast sums have been dribbled away over that work, and the patience of the engineers has been well nigh worn out by order and counter-orders from head-quarters. I give no opinion as to the value of this work, but I say that a huge sum has been wasted simply from the fact that the money had been doled out in uncertain dribblets.

It may fairly be asked, what do you propose? It would ill-become me to make suggestions to men who have spent their lives in India. But what I ask is that the whole system of the Public Works Department should be thoroughly overhauled and reconsidered, so that its defects may be discovered and the true remedy applied, and that we should no longer be satisfied with the fancied security arising from the present mode of finding the funds. I do not even say that an effectual remedy can be found ; but I am satisfied that this plan of paying for such works out of revenue is no remedy at all, and it has the great disadvantage of being supposed to do that which, in the nature of things, it cannot do ; while on the other hand, as a matter of finance, it is flagrantly unjust. The time has come when these questions can no longer be trifled with. The natives of India are beginning to understand these questions for themselves, and they will demand fair treatment from Parliament, or the day may be near when we may have an Indian difficulty even more serious than that Irish difficulty which has so long puzzled our statesmen—

I remain, yours faithfully.

W. FLOWER.

* See Parliamentary Paper 95—1870, p. 28. where the Council take credit for cutting down expenditure on public works £600,000 in the current year, in order to secure a better financial result.

PUBLIC WORKS—IRRIGATION.

OPERATIONS OF THE IRRIGATION DEPARTMENT IN THE CENTRAL PROVINCES DURING 1869-70 AND UP TO THE END OF JUNE LAST.

From T. W ARMSTRONG, ESQ., C.E., Officiating Secretary to the Chief Commissioner in the Central Provinces, Public Works Department, to the Secretary to the Government of India, Public Works Department,—No. 6—58 I., dated Nagpore, the 1st July 1870.

With reference to the orders contained in letters noted on the margin, I am directed by the Chief Commissioner to forward a report received from the Irrigation Department reviewing the survey operations carried out during the past official year, and since then up to date, in the Central Provinces.

Seven projects have been under survey and examination.

The "Shere," a small scheme, has been carried out, and the works necessary were completed in April last at a cost of Rs. 3,136. This little work is described in paragraphs 2, 3 and 4 of the Report.

The Kanhan project has been submitted for the orders of Government, and the Pench and Balaghat schemes are now

under consideration, and the necessary plans and estimates are being compiled.

There remains "The Dham," "The Wurdah" and "The Deo."

The two last have been practically abandoned on financial grounds, but the former presents favorable features which further investigation will, it is believed, develope, and so allow of its being submitted for orders. It will not be an expensive undertaking.

On the whole, the Chief Commissioner is satisfied at the progress made and field-work executed. The staff is small; and owing to the sudden illness of Lieutenant Shepherd, some inconvenience and delay was experienced last working season.

Note by T. W. Armstrong, Esq., C E, *Superintending Engineer, Irrigation Works, in the Central Provinces, Public Works Department,—Dated the 30th June* 1870.

Report submitted in accordance with orders contained in Government of India's No. 205 of the 26th May 1870.

THE UPPER DHAM PROJECT.

The investigation of this project was commenced, in the first instance, by Mr. Carey, with a view of supplementing the supply in the lower portion of the Wurdah Canal It was then taken up at the commencement of the last field-season as a separate scheme. The idea entertained was to throw an anicut across the Dham at either "Kachnoor," the site first hit upon, or at "Kharangua," a later and better selected site, and to lead the water of the river off by channels on either bank. Lieutenant Shepherd, however, found that even so early as January, there was a flow in the river of only 2¼ cubic feet per second, and that officer consequently recommended that a reservoir site higher up the river should be searched for with the view either of supplementing the channels below in the drier months of the year, or else of taking out the channels direct from the reservoir itself, and so avoiding the construction of the anicut. Two sites were examined for this purpose by myself and Lieutenant Skipwith, one just above the village of Kachnoor, and the other at the junction of the Mahadeo, and another large nullah with the Dham, near the village of Masodh. This last was found to be the most favourable locality. It has been surveyed and cross-sectioned. The field-work was not completed until the month of May. It was found impracticable from the physical conformation of the country just below the proposed reservoir, to lead out the channels direct from it, except at a great expense, and the project has consequently been designed with a view to storing water in the reservoir at "Masodh," and then passing it down the river bed to the anicut and canals on either bank. This will involve waste from absorption, but it is unavoidable The scheme sketched out as it stands, is not likely to prove a financial success, but it is known to be capable of modification and extension. The quantity to be stored in the reservoir is in excess of the supply requisite for the area under command as at present surveyed. The project is now under examination with a view to such modification and extension. The preliminary report on it having been returned for that purpose to Lieutenant Skipwith, who is in charge of the surveys.

The following is a general statement of surveys made and levels taken :

	Miles.
(1.)—Miles of channel surveyed	31¾
(2.)—Subsidiary miles surveyed including check l	101
(3)—Miles of cross-sectioning	56
(4.)—Standard of supply, 100 acres kharreef crop 200 acres rubbee crop ...	1 cubic foot per second
(5.)—Trial lines surveyed ...	59

"THE SHERE PROJECT."

This is a small project for "monsoon" irrigation only. It consists of a masonry dam, or little anicut across the bed of the Shere, which is an affluent of the Dham River, an earthen channel and some masonry works as culverts to pass drainage, have been executed also. The little anicut is three feet high, and the length of channel is somewhat over one mile. Its dimensions are, one foot width of bed, height of banks of about 2½ feet. It is intended to carry a depth of water of one foot only. The estimated cost of the whole scheme was Rs. 3,168, and the actual cost of construction was Rs. 3,156 Of this sum about one-half was spent by the close of the past official year, and the balance in the month of April. The channel and works have now been handed over to the Civil authorities for the prosecution of experiments in cotton cultivation, which are undertaken at the wish of the Viceroy, expressed when here in March. Manure of different kinds is to be used, and experience will be obtained as to which class of cultivation and quantity of irrigation water, the cotton plant will best thrive under, and yield more abundantly a supply of staple. Valuable data are expected from the results. The cultivation is under the direct charge of two officials, one a practical gardener or overseer, the other is Mr. Noble, an Assistant to the Cotton Commissioner, Mr. Carnac.

The surveys and the levels were carried out by Lieutenant C. E. Shepherd. The work were executed by Mr. Scott, Supervisor, Lieutenant Skipwith being then in executive charge. The large proportion that the number of subsidiary miles levelled bears to the channel length, is due to the work having been connected with the mean sea-level, which was brought down from the railway station at Wurdah, distant some 12 miles, and also to more than one trial line having been surveyed.

The project was sanctioned by the Local Administration in Public Works Department Secretary's No. 2—15 I, dated 7th March 1870, and funds were supplied from the grant "Agricultural"—minor works Irrigation. The following is a general statement of surveys made and levels taken :—

	Miles.
(1.)—Miles of channel surveyed	1¼
(2.)—Subsidiary miles surveyed, including check levels	23¼
(3.)—Miles of cross-sectioning	1
(4.)—Number of acres it is proposed to irrigate ...	80 acres.
(5.)—Standard of supply	None*

WURDAH AL PROJET.

The Wurdah Canal was designed by Major Fischer to take its rise from the Wurdah River at the village of Laraigaon, not far from the important town of Arvee, about 20 miles distant in a direct line from the Great Indian Peninsula Railway at Nachungaon. It was intended for "monsoon" irrigation only combined with navigation. The line of canal after leaving the Wurdah follows a rough contour line for the first 19 miles of its course as far as the village of Russoolabad, where it divides into several branches, one of which crosses the Great Indian Peninsula Railway near Nachungaon—here it is upon a ridge line which it follows to Kangaon. Another and smaller channel follows the Deolee ridge. A third and a principal one, after taking a tortuous course along a rough contour line, crosses the Great Indian Peninsula Railway near the civil station of Wurdah, and ultimately gets upon the Ulleepoor ridge, throwing out a branch for that of Mandgaon.

The anicut was designed by Major Fischer to be 29 feet high, with an estimated rise of flood waters on its crest of 12 feet. As calculated by formula, the rise amounted to 16 feet, but 4 feet were deducted on account of the increased velocity of approach. The canal channel was designed to carry 8 feet depth of water, with a bottom breadth of 41 feet, and side-slopes of 1 to 1. The estimated velocity with a fall in bed of 6 inch per mile, was 2 feet 3 inches per second, nearly. The nullahs and streams met by the channel on its course, were passed by lines of single embankment, provided with escape weirs for the overflow of surplus water. There were scarcely any other masonry works proposed, with the exception of sluice heads and the Baklee Nuddee aqueduct

Colonel Strachey objected to the proposed method of crossing drainage lines by single embankments. Various other objections have been raised from time to time, and several modifications and alterations proposed, the principle of which will be found in the report which accompanied Lieutenant Shepherd's No. 452, dated 17th September 1869. Of the total amount of work done, as shown in the tabular statement, 412¼ miles were executed in the early part of the last official year. Since then, no field-work has been undertaken.

Major Fischer estimated that 280,000 acres would be commanded by the proposed channel, after deducting two-fifths of gross area for jungle, waste, village sites, and so on; and of this amount he proposed to irrigate 90,000 acres. The standard of supply being 100 acres for each cubic foot of discharge.

The project was reported on by Lieutenant Skipwith in April 1870, as directed by me in March last. Since then, no further investigation of this project has been made and no further enquiry has been undertaken. The report was unfavourable to the scheme, chiefly on financial grounds. One principal point in it being that it was found that only 42,437 acres were under command of the channel estimated for by Major Fischer, instead of 90,000 acres as reckoned on by that officer; and, moreover, it being now established that monsoon irrigation schemes will not be remunerative in the Central Porvinces, they are rejected by all Departments and by the Chief Commissioner.

The following is a general statement of surveys made and levels taken .—

	Miles.
(1.)—Miles of channel surveyed	162
(2.)—Subsidiary miles surveyed, including check levels ..	445
(3.)—Miles of cross-sectioning	551
	Acres.
(4.)—Number of acres it is proposed to irrigate	90,000
(5.)—Standard of supply, 100 acres to 1 cubic foot of discharge	
	Miles.
(6.)—Trial lines surveyed...	70

KANHAN PROJECT.

By the Kanhan project, it is proposed to utilize the water of the Kanhan River by storing a portion of the monsoon flow in a large reservoir at the village of Khapa. The water spread will cover 40½ square miles. This reservoir contains, when full, 19,758,000,000 cubic feet of water. The waste weirs are 13,000

* No exact standard is fixed, the project being an experimental one as explained above.

feet inlength, and in extreme floods, 3 feet is the greatest depth of water which will flow over them.

With the source of supply noted, it is proposed to irrigate a large tract of country, chiefly situated on the right or south west bank of the Kanhan River, but also including a smaller District on the left bank, lying between that river and the River Pench, at their point of junction and in the Pergunnah Bhewgurh.

The larger District includes lands in the Pergunnah Patunsoungee, Kailod, Hingna, Nagpoor, Boree and Ambora, and extends from near the town of Khapa to the banks of the Weingunga, near the point of debouchure of the Kanhan River.

The cost of the appropriation of the land for this reservoir, with the villages submerged, is estimated by Mr. Bernard, the Commissioner of Nagpoor, at one lakh and-a-half of Rupees. To cover contingent payments, two lakhs are included under this head in the estimate.

The channels are laid to command a gross area of 448,000 acres, and on the supposition that three-fifths of this total area will eventually have to be provided with water.

Mr. Bernard reports from actual returns that 786 or four-fifths nearly of the gross area is either cultivated or culturable. The irrigable duty of the water is taken at the rate of one cubic foot per second for each 200 acres.

The estimate for the scheme is 72 lakhs of Rupees for 1,344 cubic feet per second, of Rs 5,349 for each cubic foot per second of perennial supply.

If the water is charged at the rate of Rs. 3 per acre, per annum, the revenue is estimated at 3¾ per cent. for the first five years, if one-fifth of the gross area is irrigated; 7½ per cent for the second five years, if two-fifths of the gross area is irrigated; and 11¼ per cent for the third five years, if three-fifths of the gross area is irrigated The supply of water is shown by the actual gaugings of the river to be practically perennial.

The field-work for the Kanhan project last year extended from February 1869 to June 1869. Two European overseers and one Native sub-surveyor were engaged taking contour levels on the site of the proposed store reservoir at Khapa, whilst the Executive Engineer, Mr. Hooper, was reserved for the important duties of contouring the line of main channel between the reservoir and Nagpoor, a distance of 33 miles, fixing the position of the aqueducts, river crossings, and communication bridges, &c. He also took check levels over the line of head-works at the reservoir, and a large series of check and trial levels in the district to fix contour cannals and so on.

The following is an outline of the work done by the staff of the Kanhan River Irrigation project:

	Miles.
(1.)—For contours for reservoir	429
(2.)—Section through line of hills forming dam to reservoir ...	5
(3.)—Section for waste weirs...	8
(4.)—Check levels of head work at Khapa	2
(5.)—Longitudinal section of bed of River Kanhan	23
(6.)—Cross sections of the River Kanhan	
(7.)—Trial line of Canal contoured from Khapa to Bunwaree	38
(8.) —Trial line of canal from Tegaie to Nagpoor . .	25
(9)—Main canal bearing and levels from Khapa to Nagpoor	33
(10.)—Checking the same	22
(11.)—Trial levels in the Oomrair District	80
Total Miles ...	670

BALAGAT IRRIGATION PROJECT.

The District which can be commanded by the line of main canal, is bounded by the River Mussurra on the east and the Weingunga on the west. The canal after reaching the village of Durpewara about six miles north of Bhoora, or as it is more commonly called Balaghat, is at a sufficiently high level to command the land sloping away towards the Weingunga, and at a point two or three miles north of Balaghat gains the ridge or back-bone of the Doab, and, consequently, the whole of the land east and west of the main canal as far as the Bagh Nuddee, would be capable of irrigation if sufficient water could be obtained.

PROPOSED SOURCE OF SUPPLY.

The supply of water will be obtained from two rivers, *viz.*, the Musmer and the Nehra which are affluents of the Weingunga. They empty into the latter river together, at a point near the village of Titwa.

No surveys exist of the catchment basins of these rivers, but cross-sections have been taken and necessary levels, to enable calculations to be made of flood discharges, and the summer season discharge has been accurately gauged at intervals.

These rivers, from their close proximity to the hills, are quickly affected by showers and it has been found that after a little rain, the flow of the Nehra increased from five cubic feet per second to about 30 cubic feet. Then gradually, and in about 10 days, returning again to five cubic feet a second, less than which it has not been. A gauge is now fixed in the Nehra to establish the flow with certainty.

The summer flow of the Musmer is very small, being about 1½ cubic feet per second, as a minimum.

DESCRIPTION OF PROPOSED WORKS.

The works proposed to regulate the flow and utilize the waters of these rivers, are as follows:—

(1)—Store Reservoir on the Musmer at Kinaree Tola.
(2)—The restoration of a tank at Sacoree.
(3)—The construction of channel of 1½ miles, to convey the waterstored in the Kinaree Tola reservoir to the Sacoree tank.
(4)—A channel from the Sacoree tank to pass the water stored in the Kinaree Tola reservoir into the River Nehra.
(5)—A store reservoir on the River Nehra near the village of Tikaree.
(6)—An anicut across the Nehra near the village of Mondper.
(7)—A canal from the anicut to convey the united waters of the Musmer and Nehra to the Balaghat Doab.

PRESENT CONDITION OF THE DISTRICT PROPOSED TO BE IRRIGATED.

The District proposed to be irrigated is already supplied with a system of small tanks, and the ground is laid out for watering. This existing arrangement will suffice for one crop of rice, so that except in years of small rain-fall, none of the stored water will be required during the months from June to November inclusive, the flow of water in the Nehra during that period will be amply sufficient to supplement the supply in the existing village tank

THE DISPOSAL OF THE STORED WATER.

During the remaining six months from December to June, the stored water will be drawn upon, and the supply that can be afforded, is calculated as follows, *viz.*—

From Kinaree Tola Reservoir per second for 150 days ...	11	cubic feet
Nehra Reservior	14	,,
Nehra River minimum flow	5	,,
Musmer ditto	2	,,
Total	32	

The approximate cost of the works to supply 32 cubic feet per second, amounts to Rs. 3,48,974, reckoning that each cubic foot per second will water 200 acres. We have—

Cubic feet per second.	Acres.	Square miles.
32 × 200	6,400 =	10

as the area capable of being irrigated by the proposed supply. To obtain 7 per cent. on the outlay, the following figures show that Rs. 24,400 must be received:—

	Rs.	Rs.
7 per cent. on	3,48,974 =	24,428
6,400 acres, @ Rs. 3-13 .	=	24,400

This is based on the assumption that the whole of the water will be quickly sought after, and it is considered certain that it will be.*

The estimate allows for the canal being carried down the Balaghat Doab as far as the Bagh Nuddee, so that if difficulty is found in the disposal of it in the neighbourhood of Bhoora, it may be advanced down the District at a small cost. The expense of the channel is very slight after reaching the ridge.

On the first of last February, field-work was begun in connection with the Balaghat Irrigation project with a staff of one Executive Engineer, Mr. Hooper, two European overseers, and one Native sub-surveyor. Mr Anderson, Assistant Engineer, joined the camp on the 23rd February. The following is an outline of the field-work completed on the 3rd of the present month:—

	Miles.
Contour levels Musmer Reservoir	18
Seoree Reservoir cross-section	2¼
Trial levels for channel between Musmer and Nehra Rivers	11½
Cross-sections and longitudinal sections of Nehra River at site of proposed Reservoir	12
Section for waste weirs of Nehra Reservoir	4
Survey of nullahs	10
Levels of main canal	34
,, branch canal	16½
,, Sub-branch canals	5
Trial levels main canal and in bed of Nehra River ...	36
Check levels of main and branch canals	40
Longitudinal sections of Musmer, Nehra, and Weingunga Rivers	45
Trial levels on banks of Weingunga	11
Trial levels near Punchaila and in the Durpowara Nullah	12
Traverse Surveys	7½
Cross-sections of Doab	59
Total number of miles surveyed	327

OTHER PROJECTS EXAMINED IN THE BHUNDARA AND BALAGHAT DISTRICTS.

When Mr. Hooper proceeded to examine the projects recommended to notice for the Balaghat and Bhundara Districts, he found at Chandpore, a village 30 miles north of Bhundara, a spot where the Lamundoho Nuddee has cut its way through the line of hills lying in the direction of Ambaghur and Chandpore. It is a good site for a reservoir, provided the ground higher up stream is favourable. A dam might be formed at a point near the village of Chandpore, where the hills are not more than five

* The Commissioner of Nagpore is of this opinion.

or six hundred feet apart. The banks and bed of the river are rock. The ground which lies between the Lamundoho and Ambaghur Rivers slopes gently from the hills towards the Weingunga and contains an area of 40 square miles. The greater portion of this is under rice cultivation, now a single crop, and is at present irrigated by a series of small tanks which often fail and do not afford water till late in the monsoon.

THE DEO NUDDEE PROJECT.

Being first under consideration, the Executive Engineer proceeded to Godree, a village on the banks of the Deo, beyond which all is dense jungle—a reservoir in the valley is impracticable. The course of the river has been traced from a point about three miles up stream from Assurma, to the village of Dhutta down the nuddee. It is found that no spot exists suitable for storing water on a large scale, and even if there was, the expense of leading a channel from it to the lands below, would be very great. It would pass through heavy jungle, the ground being cut up in the wildest manner by nullahs, hills, ravines, immense heaps of boulders, &c. It is only on reaching a point, near Dhutta, that any work could be done. Trial levels were commenced from this point, and 30 miles of levels were also taken down the bed of the river from Assurma to Kokha.

There was a considerable stream of water passing down the river in January, which measured as 40 cubic feet per second. It is believed that the river near runs dry, but the "Deo," throughout, is of such a character, that irrigation works from it would be of a most expensive nature, and the land which could be irrigated even at this great cost, is so limited in quantity, that it was not advisable to attempt to lay out a project. Mr. Hooper's attention was, therefore, directed to the Musmor and Nehra Rivers directly north of Bhoora. Trial levels were taken from the Weingunga at several rocky barriers with the idea of leading off a channel from an anicut, but the excavation and head-work would be such a great depth and so expensive, that reluctantly the investigation was abandoned

PENCH PROJECT.

In the latter end of April last a site for a reservoir on the Pench River, which had been proposed and reported on by Lieutenant Shepherd from some rough measurements, was again examined.

These have been now supplemented by a set of cross-sections within the basin of the reservoir, and a top contour line round its margin at a fixed height above the bed of the river, has been surveyed. At the proposed dam site, an accurate section of the ground along the line of the proposed head dam, completed the data required.

This information is now being worked up into form and will be submitted as soon as completed.

"ABSTRACT OF FIELD-WORK."

	Miles.
Contour of proposed Pench Reservoir	8½
Cross-sections of Reservoir	5
Flying levels	12½
Sections of gaps in hills on right and left banks of Pench River and section of river at proposed site of bund	2½
Total ...	18

From the above detailed report, I trust it will be allowed that the working staff of the Irrigation Department at Nagpoor, have been fully engaged the past year and with good results. The staff is small and the establishment inexpensive.

Practically, it consists of only one Executive Engineer and one Assistant Engineer, assisted by three overseers. Lieutenant Skipwith is acting as Assistant Secretary, Public Works Department, and Assistant to the Chief Engineer.

Every project investigated or under survey, has been recommended, in the first instance, by the Civil Department, and orders were then passed on their proposals by the Chief Commissioner.

An abstract of the field-work put out of hands since February 1869, up to the 1st current, is as follows :—

	Miles of Levels, &c.
The Dham Project	247½
,, Shore ,, ...	24½
,, Wurdah ,, ...	412½
,, Kanhan ,, ...	670
,, Balaghat ,, ...	327
,, Deo ,, ...	30
,, Pench ,, ...	18
Total	1,729½

No. 341 I, dated Simla, the 17th August 1870.

From—The Government of India, P. W. Dept.,

To—The Chief Commissioner, Central Provinces.

A copy of the report will be forwarded to the Secretary of State for information.

Government Promissory Notes enfaced for payment of Interest in London, under deduction of amount re-transferred to India, and outstanding in the Books of the Bank of Bengal on the 31st March 1870.

PARTICULARS.	3½ per cent Loan of 1853-54.	4 per cent. Loans					4½ per cent.	5 per cent.		5½ per cent. Loan of 1859-60.	5 per cent. Debentures for					TOTAL AMOUNT.
		of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43	of 1854-55.	Transfer of 1865.	Transfer Loan dated 15th July 1870.	P. W. of 1854-55.	of 1856-57.	2 years	3 years.	5 years.	10 years.	15 years.	
												Repayable Jan. 1869.	4½ per cent Transfer Loan. Repayable Jan. 1871.	4½ per cent. Transfer Loan Repayable June 1872.	Repayable June 1877.	Repayable June 1882.	
31st March 1870. ..	53,100	34,133	2,346	21,43,040	40,38,200	1,52,0?,980	1,23,79,700	1,54,14,100	14,500	20,89,600	31,50,630	5,61,82,730	....	6,00,000	2,47,000	9,50,000	31,04,000	29,60,000	33,94,000	36,00,93,319
30th April 1870. ..	53,100	34,133	2,346	21,46,373	40,63,900	1,55,31,390	1,24,37,900	1,52,05,900	14,500	38,78,400	7,21,500	5,61,19,400	..	60,000	1,65,000	9,50,000	31,64,000	26,96,000	33,44,000	36,10,97,052
31st May 1870. ..	53,100	34,133	2,346	21,24,373	40,60,000	1,53,00,990	1,21,13,300	1,49,96,400	14,500	46,18,200	4,01,600	5,70,18,000	....	60,000	1,65,000	11,67,000	33,04,000	30,96,000	33,45,000	36,43,12,952
30th June 1870. ..	53,100	34,133	2,146	20,89,134	40,06,600	1,51,02,600	1,39,82,900	1,38,72,500	14,500	46,22,700	3,03,750	5,74,92,900	....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	34,04,000	36,40,12,713
30th July 1870. ..	53,100	34,133	2,773	20,60,480	41,11,800	1,49,64,840	1,22,64,000	1,32,05,600	14,500	46,50,900	2,52,750	5,69,16,600	....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	33,14,000	36,50,92,286
31st August 1870. ..	53,100	34,133	2,773	20,60,480	41,14,200	1,50,24,460	1,23,05,700	1,65,85,700	14,500	47,21,500	2,46,200	5,76,46,500	....	....	1,65,000	13,50,000	33,08,000	33,60,000	32,94,000	36,62,96,966
30th Sept. 1870. ..	53,100	34,133	2,347	20,54,614	42,06,200	1,51,31,600	1,24,03,300	1,72,67,700	14,500	47,94,500	2,25,100	5,84,23,000	....	....	1,65,000	12,90,000	33,58,000	33,60,000	36,00,000	37,16,91,284
31st Oct. 1870. ..	53,100	34,133	2,347	20,54,614	42,11,700	1,53,25,300	1,24,27,600	1,83,32,400	14,500	48,55,000	2,03,300	5,87,81,000	....	....	1,65,000	18,60,000	33,58,000	34,15,000	36,16,000	37,50,18,994

THE BANK OF BENGAL.

Statement of Affairs.	29th Nov. 1870.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,74,966 7 0
General Treasury Balance at Head Office	1,51,12,490 3 5
Ditto ditto at Branches	1,33,38,897 5 4
Other Deposits at Head Office and Branches	3,30,86,094 14 9
Bank Post Bills, &c.	11,16,164 14 4
Sundries	7,74,161 6 1
Total...Rs.	8,70,02,775 2 11
Assets.	
Government Securities	1,00,02,924 2 0
Loans on Government Securities at Head Office and Branches	47,41,047 3 9
Accounts of Credit on ditto do do	53,51,537 7 7
Mercantile Bills discounted at do do	1,52,64,907 7 5
Dead Stock	11,59,434 5 1
Stamps	14,933 14 0
Balances with other Banks	12,07,873 2 6
Sundries	90,286 1 3
Cash and Currency Notes at Head Office	2,19,01,335 7 7
Cash and Currency Notes at Branches	2,72,68,495 15 9
Total...Rs.	8,70,02,775 2 11

THE BANK OF MADRAS.

Statement of Affairs.	26th Nov. 1870.
Liabilities.	Rs. A. P.
Capital	56,25,000 0 0
Public deposits at Head Office	75,31,440 9 1
Do. at Branches	23,29,926 14 1
Other deposits at Head Office and Branches	1,18,83,968 3 6
Cash Credits undrawn at do	2,96,149 6 2
Post Bills	11,25,971 14 8
Reserve Fund	5,62,500 0 0
Rest	2,05,605 6 5
Total...Rs.	2,95,60,562 5 11
Assets.	
Silver and Notes at Head Office	50,17,188 15 11
Silver and Notes at Branches	83,18,464 9 11
Government Securities	3,89,040 8 0
Government Reserve—Cash	50,31,440 9 1
Securities	.....
Loans at Head Office and Branches	18,04,047 2 8
Accounts of Credit at Head Office and Branches	6,86,690 0 0
Mercantile Bills discounted at Head Office and Branches	64,44,302 1 1
Dead Stock at Head Office and Branches	2,34,887 11 4
Bills of Exchange do	14,68,243 11 5
Due by other Banks	1,66,257 0 6
Total...Rs.	2,95,60,562 5 11

THE NEW BANK OF BOMBAY.

Statement of Affairs.	26th Nov. 1870.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance	48,61,423 0 0
Deposits at Head Office	2,21,79,234 0 0
Deposits at Branches	18,11,895 0 0
Bank Post Bills outstanding	5 54,713 0 0
Reserve	4,15,000 0 0
Undrawn Cash Credits	9,30,056 0 0
Total...Rs.	3,67,52,321 0 0

Statement of Affairs.	26th Nov. 1870.
Assets.	Rs. A. P.
Government Securities	13,23,055 0 0
Loans at Head Office & Branches on Govt. Sec. &c.	3,23,960 0 0
Credit Accounts do do on Govt. Securities.	21,98,553 0 0
Bills discounted and purchased at do do	46,02,868 0 0
Dead Stock and Loss written off	4,43,328 0 0
Stamps	6,024 0 0
Balance with Agents and Correspondents	17,66,796 0 0
Overdrafts	11,709 0 0
Government Reserve Cash	8,61,423 0 0
Cash and Currency Notes at Head Office	1,83,25,133 0 0
Do. do. at Branches	50,81,043 0 0
Bullion at H. O and Branches	18,08,429 0 0
Total...Rs.	3,67,52,321 0 0

Cash Balances in the Government Treasuries in India, 1869-70 contrasted with previous years.

	April.	May.	June.	July.	August.	October.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	1,62,44,872	1,11,67,665	1,13,96,105	1,52,43,515	1,36,15,865	1,47,55,373
Bengal	1,40,54,667	1,27,91,234	1,49,51,970	1,23,40,473	1,12,23,907	1,28,20 478
British Burmah	36,16,189	37,54,864	27,50,490	28,44,725	32,10,450	41,59,849
North-Western Provinces	1,39,47,004	2,05,84,544	2,41,33,186	2,39,69,426	2,14,9,8002	1,52,06,179
Oudh	35,92,342	47,80.982	63,08,804	62,19,612	53,75,649	36,55,325
Punjaub	94,15,066	89,94,758	1,14,40,931	1,17,81,232	1,08,05,965	83,31,333
Bombay	3,67,57,721	3,72,42,836	3,39,55,1.6	3,05,03,255	2,35,10,012	1,83,78,648
Central Provinces	56,89.548	66,53,284	68,20,440	63,53,106	61,53,053	56,31,696
Madras	2,72,70,925	2,89,32,294	3,04,71,972	3,07,95,345	2,75,09,862	2,43,76,457
Total	13,05,88,334	13,63,02,461	14,22,29,014	14,00,50,689	12,29,02,765	10,73,15,338
1867-68	10,24,66,923	11,49,73,104	11,62,04,798	11,00,92,360	9,63,10,342	7,89,69,348
1868-69	10,45,09,269	11,73,38,501	11,81,90,260	10,94,54,805	10,02,49,204	7,04,14,121

INDIAN SECURITIES.—LONDON.

Share.	Paid.	INDIAN RAILWAYS.	Closing Prices Nov. 3.	Closing Prices Nov. 10.
st.	100	Bombay, Baroda, and Central India (gua. 5 per ct.)	105 to 106	105 to 106
20	all	Ditto Ext. do.(s. st.12p	20 to 21	20 to 21
20	100	E. Indian Stock (gua. 5 p. ct.)	110 to 111	110 to 111
st.	100	Eastern Bengal (gua 5 p ct.	105 to 106	105½ to 106½
st.	17½	Ditto, ditto, 5 ditto....	— —	— —
20	100	Gt. Ind. Peninsula (g. 5 p. ct.)	106 to 107	106 to 107
20	32	Ditto, New (gua. 5 p. ct.)	¾ to 1¼ prem.	¾ to 1¼ prem.
st.	6	Ditto, New (gua. 5 p. ct.)	¾ to 1¼ prem.	¾ to 1¼ prem.
st.	50	Ditto, scrip, ditto, ditto	— —	— —
20	all	Ditto, scrip, ditto, ditto	— —	— —
20	all	Ditto, 4 per c debenture..	89 to 91	89 to 91
st.	100	Gt. South of India (g 5 p. c.)	105 to 106	105 to 106
st.	100	Ditto (4½ per cent)	98 to 102	98 to 102
st.	100	Madras (guar. 5 per cent) ..	105 to 106	105 to 106
st.	100	Ditto, (4½ per cent.).....	98 to 102	98 to 102
st.	100	Ditto, (4½ per cent.).....	93 to 97	93 to 97
2	1·0	Ditto	— —	— —
st.	100	Oude & Rohilkund (g. 5 p. ct.)	104 to 105	103 to 104
10	4	Ditto, shares (ditto)	par to ½ prem.	par to ½ prem.
st.	4	Ditto ditto, ditto.....	prem.	prem.
st.	100	Ditto Nulhatee	— —	— —
st.	100	Scinde (guar. 5 per cent.) ..	104 to 105	104 to 105
st.	100	Ditto, Delhi (gua. 5 p. c)	104 to 105	103 to 105
20	5	Ditto, ditto (gua. 5 p. c.)	¾ to 1⅛ prem.	¾ to 1 prem.
st.	100	Ditto, Punjaub (g 5 p. c.)	104 to 105	103 to 105
st.	100	Do. Ind. St. Flo (g. 5 p. c.)	102	

INDIAN GOVT. SECURITIES.	Closing Prices August 4	Closing Prices, August 11.
Indian Stock, 10½ per cent ....April, 1874	— 207	207
Ditto. for Account.....	— —	— —
Ditto 5 per Cent .....July 1880	110½ to 110⅝	110½
Ditto 4 per Cent .....Oct., 1888	100½ to 100⅝	100⅝
India Enfaced Paper 4 per Cent.....	91 to 92	91½
Ditto 5 per Cent .....Jan. 1872	99½ 100¼	100¼
Ditto 5½ per Cent.....May, 1879	107 to 107⅛	107⅛
Ditto 5 per Cent. Rupee Deben. 1872	90 to 92	90 to 92
Ditto ditto 1877	— 107	— 107
India Debentures, 5 per Cent....Aug. 1873	103½	103⅜ to 103½
India Bonds, 4 per Cent £1,000	19s prem.	19s. 1 prem.

Amt of Share.	Paid.	MISCELLANEOUS.	Closing Prices, August 4	Closing Prices, August. 11
5	all	Bombay Gas (Limited)	6 to 6¼	6 to 6¼
5	4	Ditto, New	1 to 1½ prem.	1 to 1½ prem.
20	10	Ceylon Co Limited	4⅛ to 3½ dis.	4½ to 3¼ dis.
20	5	Ditto, A Shares	3 to 2 dis	3 to 2 dis.
50	7	East India Land Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis.
100	st.	Madras Irrigation & Canal (guar. 5 per cent by the Indian Government) ..	100 to 102	100 to 102
1	6·6	Nerbudda Coal and Iron	par to ¼ prem.	par to ¼ prem.
5	all	Oriental Gas (Limited..) ..	8 to 8¼	8 to 8¼
5	1½	Ditto, New	1 to 1½ prem.	1 to 1½ prem.
50	all	P. and O Steam Company ..	47 to 49	49 to 51
50	10	Ditto, New, 1867	3 to 1 dis.	2 dis. to par

Amt of Share.	Paid.	JOINT STOCK BANKS.	Closing Prices, Nov. 3.	Closing Prices, Nov. 10.
10	all	Agra Limited, A	8 to 9	8 to 9
10	—	Do., do. B.....	— —	— —
20	all	Char. of India, Aus. & China	14½ to 14¾	14 to 14¼
25	all	Chartered Mer. of India, London, and China.....	24¼ to 25¼	23 to 24
20	all	Eng. Scot. and Aust. Chart.	15⅝ to 16¼	16 to 17
20	4	Land Mortgage Bank of India	3⅝ to 3⅞ dis.	3⅝ to 3¼ dis
100	all	Do., 5 per cent. Debentures, 1864 for 30 years	84 to 87	84 to 87
25	all	Oriental Bank Corporation..	40 to 40	40½ to 41½

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council.

Debenture Capital.	Rate	COMPANY.	Closing Prices, Nov. 3.	Closing Prices, Nov. 10.
£237,595	5	Bombay, Baroda, and Central India	102 to 104	102 to 104
881,700	5	Ditto ditto....	102 to 104	102 to 104
100,000	4½	Ditto ditto....	98 to 100	98 to 100
1,292,400	5	East Indian	108 to 110	108 to 110
1,806,300	5	Ditto	108 to 110	108 to 110
3,000,000	5	Ditto	99 to 101	99 to 101
1,000,000	4½	Ditto	99 to 101	99 to 101
440,000	4½	Ditto	98 to 100	98 to 100
—	5	Eastern Bengal.....	100 to 102	100 to 102
1,968,600	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto....	102 to 104	102 to 104
883,900	4½	Ditto	98 to 100	98 to 100
175,500	5	Great Southern of India	102 to 104	102 to 104
100,000	4½	Ditto	98 to 100	98 to 100
42,900	4½	Madras	— —	— —
916,600	5	Ditto	102 to 104	102 to 104
499,800	5	Ditto	102 to 104	102 to 104
20,000	5	Oude & Rohilkund (Lm)	102 to 104	102 to 104
180,800	5	Scinde (Indus Flotilla)	— —	— —
650,000	4½	Ditto	98 to 100	98 to 100

GOLD AND SILVER.

	Per Ounce.
Foreign Gold in Bars	£3 17s. 9d.
Silver in Bars (Standard)	5s. 0½d.
Mexican Dollars....	4s. 10½d.

THE EXCHANGES.

Banks Drawing rates on Calcutta .. .. .. at 60 days' sight.	1s. 10½d.
Ditto on Bombay	1s. 10⅝d.

Advertisements.

G. I. P. RAILWAY.

COTTON AND GRAIN RATES.

ON AND AFTER THE 1ST NOVEMBER, revised rates for the Carriage of Cotton to Bombay, will come into force.

Special reduced rates for the carriage of grain over the Great Indian Peninsula Railway, between Bombay and Jubbulpore, and the East Indian, and Scinde Punjaub and Delhi, Railway Stations, will also come into force on the 1st November.

Full information can be obtained from the undersigned.

HENRY CONDER,
General Traffic Manager.

Bombay, 31st October 1870.

TIMBER SALE IN NORTH CANARA.

NOTICE is hereby given, that the undermentioned quantity of Timber, the property of Government, will be sold by public auction in December 1870 and January 1871 at the Ports of Gungawally, Carwar, and Sedashigur :—

	Teak, best Southern.		Blackwood.		Junglewood.		Date of sale.
	Logs.	Candies	Logs.	Candies.	Logs.	Candies.	
Gungawally..	262	327	33	29	5	5	19th Dec. 1870.
Carwar..	2,679	5,639	506	558	221	494	5th Jan. 1871.
Sedashighur..	223	210	409	215	1	9	Ditto.
Total ..	3,164	6,176	948	802	257	508	

1. The Timber is arranged in lots.
2. The bids will be by the lot, and not by the candy, except in the case of such lots as may, for special reasons, be sold by the candy.
3. Intending purchasers are at liberty to examine the lots, and will receive from the Storekeeper any information they may require as to the registered size of each log.
4. No bid will be invalid on account of any discrepancy or dispute as to the contents of any log or lot.
5. *Terms.*—Purchasers to pay down 15 per cent. of the sale price on the day of sale, and the balance on or before the 1st April 1871.
6. Interest will be charged at the rate of 12 annas per cent. per mensem on all purchase money not paid by the above date, viz. 1st April 1871.
7. No lot is to be removed till paid for in full.
8. All Timbe to be paid for and removed from the Depot on or before the 1st April 1871, and each log not removed on that date will be charged Depot rent at the rates specified below.

TEAK AND BLACKWOOD.

1. For logs above 5 candies, 4 Annas per month per log.
2. For all logs below 3 candies, 2 Annas a month per log.
3. Junglewood of all scantlings, 1 Anna per log per mensem.

9. The Timber will at any time be liable to be removed by Government, at the risk and cost of the purchaser, the cost of removal, and the amount of Depot rent due being recovered, if necessary, by the attachment and sale of the Timber, or any portion thereof.

10. All Timber, the price of which is not paid by the 15th April 1871, will be, liable to be taken possession of by Government and resold at the risk of the first purchaser, whose deposit money will be forfeited, and who will be liable for any loss from resale thereof.

11. Further particulars of sale and rules may be obtained at the office of the Superintendent of the Timber Depot, Carwar

J. ELPHINSTONE,
Acting Collector, Canara.

Canara, Collector's Office, Carwar, 1st October 1870.

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OPINIONS OF THE PRESS.

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The Centenary number of the *Calcutta Review* which has just appeared, exhibits a marked improvement upon its predecessors for some time past. It has not only increased in bulk, but contains a large variety of really able articles on subjects of general interest, European as well as Asiatic.—*Englishman April*, 1870.

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From our advertisement columns it will be seen that an event important to the history of the CALCUTTA REVIEW has lately occurred. For the first time since that serial was set on foot a second edition has been called for. No. CI. is the notable number, and we hope that every succeeding unit in the century will deserve the same popularity.—*Pioneer, September* 6,1870.

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J. L. MADDEN,
Agent.

Bombay, 1st August 1870.

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Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

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Billiard Cloth, Cues, Billiard and Pool Marking boards, Tips, Chalks, India-rubber Strips for Cushions and every requisite for the Billiard Table. Billiard Cushions renovated. Billiard Tables repaired and re-cushioned on their new principle, thereby making an old table as good as new.

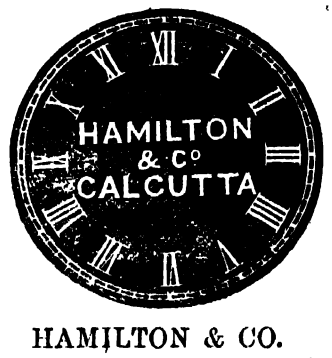
B. B. B.

In accordance with their established practice of introducing novelties to the Indian public, C. LAZARUS & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusements, by importing the popular B. B. B. Tables. The peculiarity of these is, that on the *one* table the favourite games of BILLIARDS, BATTUF, and BAGATELLE may be played, thus affording a *pleasing variety* of amusement concentrated on a single board at little more than the cost of one. Anticipating that the demand for these tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, it being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

THE EXHIBITION ENGLISH LEVER WATCH.

IN FINE SILVER, double-bottomed, engine-turned hunting case, of medium size and with a first-class full plate Lever movement.

Rs. 50 Cash.



Rs. 50 Cash.

HAMILTON & CO.

Beg to state that for some years past, their endeavour has been to introduce to their Constituents a good, reliable, English Silver Watch, at a really moderate price. Owing to recent valuable improvements in the Watch-maker's art, by which the aid of machinery has been brought to bear with marvellous success, they are now enabled to offer the above Watch, which they guarantee to be entirely English-made throughout, at the hitherto unprecedented price of Rs. 50 cash, and the same Watch in Gold Engine-turned hunting case, at Rs. 160 cash.

NOTE.—*Our new Illustrated Watch Pamphlet can be had free on application.*

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HAMILTON & Co.,
Watch and Clock Manufacturers,
Jewellers and Silversmiths in ordinary to His Excellency Earl Mayo, K. P.,
8, Old Court House Street, Calcutta.

Printed for the Proprietor by WILLIAM BOYD, at the *Oriental Press*, Bombay. Published by WYMAN & Co. Calcutta.—Dec. 15, 1870.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH FEBRUARY, 1871. No. 7.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden, Suez, Brindisi, Malta, Gibraltar, Southampton — From Bombay every Saturday at 5 P. M.

Galle, Madras, Calcutta, Penang, Singapore, Batavia, Hong Kong, Shanghai, Japan — Thursday, the 28nd December, and every alternate Thursday thereafter at noon.

King George's Sound, Melbourne, Sydney — Thursday, the 22nd December, and every fourth Thursday thereafter, at noon.

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London and Liverpool.

A considerable reduction has been made in the Tariff of charges for small parcels to England.

For further particulars apply to

GEORGE F. HENRY,
Superintendent.

P. & O. S. N. Co.'s Office, 3, Rampart Row, Bombay.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE of STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*.

PASSENGER RATES FROM BOMBAY.

	Cabin.	Deck	without food.
To Aden	£ 16		£ 6-15
To Suez	„ 28		„ 11-15
To Port Said	„ 30		„ 12-10
To Trieste	„ 40		„ 16-10

Cargo taken for Trieste, Venice, Constantinople, Odessa, Aden, Egypt, England, and the Continent generally.

There is also a weekly service by MAIL STEAMERS between Alexandria and *vice versa*, in conjunction with the P. & O. Co 's Mail Steamer to and from Suez. The Austrian Lloyd's Mail Steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 209 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4½ to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers to Southampton, at a charge of 10s. per cwt., to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned Agents grant also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria.

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS ..... £18 | SECOND CLASS £9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLASS, £7-10 per head.

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In conjunction with Austrian Lloyd, Cargo for Trieste and Venice can be booked through from Bombay by the P. & O. Co., and the Bombay and Bengal Steam Ship Co., and via Bombay from the various ports touched at by the steamers of the British India Steam Navigation Company.

TRANSHIPMENT SERVICE AT PORT SAID.

Goods for Trieste, Venice, Odessa, and ports on the Syrian, Turkish and Greek coasts, shipped by steamers under any Flag whatever from Japanese, Chinese and Indian ports bound to Mediterranean or British port VIA Suez Canal, are received and transhipped by the Austrian Lloyd's Agent at Port Said, and forwarded to their destination by the Company's regular lines of Steamers.

For further particulars, and for freight and passage apply to

A. C. GUMPERT & Co.,
Agents for the Austrian Lloyd.

Bombay, 2 Ash Lane.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to KURRACHEE every Monday at noon.

Bombay, 1870 W. NICOL & Co., Agents.

AUSTRIAN LLOYD'S STEAM NAVIGATION COMPANY,

IN Addition to the Monthly-Line of Steamers between BOMBAY and TRIESTE, the Company have resolved upon establishing a transhipment service at Port Said for goods shipped for Trieste by steamers sailing under any Flag whatever, from the Japanese, Chinese, and Indian Ports to Mediterranean or British Ports via Suez Canal

Merchants and Shippers, who avail themselves of this mode of conveyance, are respectfully requested to address such goods to the Austrian Lloyd's Agency at Port Said, which will care for their transhipment upon and forwarding by the Company's weekly steamers running between that port and Trieste, via Alexandria, charging the following rates of freight:—

Cotton, Wool, Skins, Tea	24 shillings	per ton of 40 Eng. c. ft.
Indigo, Silk	60 „	„ 20 cwt.
Gum, Incense, Coffee, Pepper, Oil-Seeds, Ginger, Rice, Oils, &c	40 „	„ 20 cwt.

inclusive of transhipment expenses, as also of eventual charges for disembarkment, storing and re-embarkment On these rates a reduction of 8s per ton of 20 cwt is allowed when goods are received and embarked at Port Said by any other medium than that of the Lloyd's Agency.

The Company undertake, at Merchants' request, the Insurance against Sea risks the following premium per cent. List:—

From Port Said to Trieste 8 shillings from 1st of April to 30th September.
10 „ 1st of Oct. to 31st March.

Goods for Odessa and ports of the Syrian, Turkish, and Greek coasts touched at by the Company's steamers, will also be received and forwarded at the above rates of freight.

By order of the Board of Directors,
Trieste, 15th February 1870. A. C. GUMPERT & Co.,
Bombay, 23rd March 1870. Agents of the Austrian Lloyd's S. N. & Co.

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MESSRS. R. RUBATTINO & Co.'s Italian Mail Steamers are running between GENOA and BOMBAY, calling at LEGHORN, NAPLES, MESSINA (occasionally ALEXANDRIA), PORT SAID, SUEZ, ADEN and *vice versa*.

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More precise information regarding her departure will be given on her arrival.

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INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

	1st Class.	2nd Class		3rd Class.	
To Aden	£22	£15	Including Wines.	£4	Without food.
„ Suez	36	22		8	
„ Port Said	38	24		9	
„ Alexandria	39	25		9-10	
„ Messina	45	32		12	
„ Naples	47	33		13	
„ Leghorn	50	34		14	
„ Genoa	50	34		14	
„ Marseilles (transhipment at Genoa)	52	35		14-10	

Children under 3 years, free of charge Children not above 10 years half fare.

Passengers are allowed to *break the voyage at any of the above named Mediterranean ports*, and are free to resume it by any of the Company's steamers to the port of destination marked on their tickets

Passengers returning within six months of their departure from Bombay by the steamers of the Company, are entitled to a reduction of 20 per cent on the return fare

Berths may be secured in advance by depositing half the Passage Money.

For prospectus, rates of freight, and further particulars, apply to

VOLKART BROTHERS,
Bombay, 19th December 1870 Agents, Rubattino Steam Navigation Company.

STEAM COMMUNICATION WITH THE PERSIAN GULF, VIA KURRACHEE.

Interchanging Cargo and Passengers at Bussora, to and from Bagdad, with the Euphrates and Tigris Steam Navigation Company.

THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, will despatch a steamer every 14 days to the PERSIAN GULF, touching at KURRACHEE, GUADUR, MUSCAT, BUNDER ABBAS, LINGA, BUSHIRE, FAO, MAHOMERAH and BUSSORAH.

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.

THE British India Steam Navigation Company (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days.

This route is the most expeditious and economical for passengers for the Neilgherry district, Bangalore and Madras, who can land at Calicut for Seypore, and proceed from thence by rail.

Passengers for Calcutta can take the same route, picking up the steamer at Madras.

Bombay, January 1870. W. NICOL & Co., Agents.

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PHARMACEUTICAL CHEMISTS, BOMBAY.

Established, January 1868.

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a medicine whose extraordinary curative powers in Parasitic Ringworm is renowned throughout the Torrid Zone.

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In Muscular debility it is unapproached by any other remedy.

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LIEBIG'S MILK.

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A preparation which, since its introduction into this country, has, we are assured by parents, saved many infant lives.

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are the objects of our unremitting attention Having very large experience of the wants of residents in India, we believe we can meet a greater variety of requirements in this respect than any other house A new edition of Kemp's Medicine Chest Companion is now in preparation

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Liebig's Nutritive Extract Liquid.	Equatorial Hair Douch
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Tonic Refresher	Fever Mixture and Fever drops.
Aromatic Desiccate for claret cup	Corroborative Drops.

Sodaic Lother Æratel Water in all the Dilutions, by powerful machinery

Established in 1820.

C. LAZARUS & Co.,

(Incorporated with Shearwood & Co.)

CABINET MAKERS, Upholsterers, Billiard and Bagatelle Table Manufacturers, by appointment, to His Excellency the Right Hon'ble EARL OF MAYO, K.P., G.C.S.I., Viceroy & Governor General of India, and to His Royal Highness the DUKE OF EDINBURGH, K.G.K.T., G.C.S.I. Importers, Appraisers, House and Land Agents, General Furnishing Contractors, 56, 59, 60 & 61, Bentinck Street, *Calcutta*.

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C. LAZARUS & Co., sensible of the very liberal support extended to their Establishment during the past *fifty years*, desire on this occasion to return to their friends and patrons their most sincere thanks To merit a continuance of that esteemed patronage will C. Lazarus & Co beg to state, at all times be their studious endeavour; nor will they be wanting in any respect to maintain that uniform excellence of workmanship, combined with economic charges, with which their establishment has hitherto been identified.

BILLIARD TABLES

C. LAZARUS & Co., as Manufacturers, invite particular attention to their large stock of full-size Billiard Tables, the cushions of which are constructed on a entirely new principle, similar to those supplied by C. L. and Co and now in use at the Bengal Club, and in most of the Clubs and Messes of the three Presidencies.

CONSEQUENT on the numerous applications that C. LAZARUS & Co., have lately had from parties residing at a distance from Calcutta to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the old Cushions to Calcutta for that purpose [illegible] C. L. & Co. can now supply a set of Cushions, ready for fixing on any Table on hand, which can be fitted to Slate Bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

JAQUES', BURROUGHES', WATT'S & THURSTON'S BILLIARD & POOL BALLS,

Billiard Cloth, Cues, Billiard and Pool Marking boards, Tips, Chalk, India-rubber Strips for Cushions and every requisite for the Billiard Table. Billiard Cushions renovated. Billiard Tables repaired and re-cushioned on their new principle, thereby making an old table as good as new.

B. B. B

In accordance with their established practice of introducing novelties to the Indian public, C. Lazarus & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusements by importing the popular B. B. B. Tables. The peculiarity of these is that on the one table the favourite games of Billiards, Battus, and Bagatelle may be played, thus affording a *pleasing variety* of amusement concentrated on a single board at little more than the cost of one. Anticipating that the demand for these tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

F. HARLEY & Co.,

OIL COLOR, SOAP, AND TALLOW MERCHANTS,

IMPORTERS OF COLORS, PAINTS, VARNISHES,

CANVAS, &c., &c.,

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RAILROAD AND STEAM NAVIGATION STORES.

VERY IMPORTANT TO

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Call special attention to the following requisites which can always be procured from their Establishment at a few hours' notice, and will be found suited to all climates :—

1 Overland Suit	1 doz. Cambric Handkerchiefs.
1 Warm Suit	1 doz. Colored Handkerchiefs.
1 Over Coat	1 doz. Merino Socks.
1 Rug with Strp	1 doz. Cotton Socks.
2 Sleeping Suits	2 doz. Linen Collars.
3 Flannel Shirts	1 Railway Portmanteau.
3 Silk and Wool or Oxford Shirts	2 Overland Trunks.
6 Under vests	1 Clothes Bag.
3 Merino Drawers	1 Cour er Bag.
3 Made up Scarfs	1 Umbrella with cover.
3 Ties	1 Overland Chair.

Ladies' Overland Trunks.

Catalogues on application, combining a most Liberal System for Cash and Credit Payment.

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CIVIL, NAVAL, AND MILITARY TAILORS, AND GENERAL OUTFITTERS.

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Waterproof Military Ground Sheets,

REGULATION SIZE.

F HARLEY & Co.

Patent Improved Tarpaulins of Sizes

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F. HARLEY & Co.

Improved Patent Tarpaulins.

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C. E. MITCHELL & Co.

11, Hummum Street, Bombay.

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THE REVEREND H. SELLS receives private pupils at Hampton Court, Mussoorie, to prepare them for the Public Schools at home, or for Examinations in India.

GROVE PARK SCHOOL, WREXHAM.

PRINCIPAL,—J. PRYCE JONES, L. C. P.

ATTENTION is respectfully invited to the following facts :—1. The locality of the School is remarkably healthy. 2. The premises are extensive, and fitted up with due regard to the comfort of the Pupils. 3. Every facility for recreation is afforded by the large playground and cricket-field which adjoin the house. 4. There is a sufficient staff of well qualified Masters, including a Classical Master (B. A. in classical honours, Cambridge and a resident Frenchman. 5. At the Examinations of the College of Preceptors and the Oxford and Cambridge Universities, Pupils from the School have taken Honours in several distinct branches of Education, *e. g.*, Latin, French, Mathematics, Book-keeping, and English. 6. At five examinations by the College of Preceptors, Certificates were awarded to one-third of all the Pupils in the School. 7. At five out of seven Examinations by the College the highest place in Book-keeping was given to candidates from the School. 8. The Principal earnestly endeavours to form in his Pupils a manly Christian character. 9. The Diet is liberal.

TERMS which are moderate, and inclusive with lists of successful pupils, on application.

THE

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A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH FEBRUARY, 1871. No. 7.

The Indian Economist.

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THE GERMAN PRESS ON THE CHANGE IN ENGLISH SYMPATHIES.

"My friend, if thou hadst all the artillery of Europe trundling at thy back, in support of an unjust thing, and infinite bonfires visibly waiting ahead of thee to blaze centuries long for thy victory on behalf of it, I would advise thee to call halt, to fling down thy baton, and say, "In God's name, No!" Thy 'success'? Poor devil, what will thy success amount to? If the thing is unjust, thou has not succeeded; no, not though bonfires blazed from north to south, and bells rang, and editors wrote leading articles, and the just thing lay trampled out of sight to all mortal eyes an abolished and annihilated thing. Success? In a few years thou wilt be dead and dark,—all cold, eyeless, deaf; no blaze of bonfires, ding-dong of bells, or leading articles, visible or audible to thee again at all for ever. What kind of success is that!" (*Past and Present.*)

THE *Allgemeine Zeitung, of 12th January*, "complains that the change in English sympathies is founded on a great lie. John Bull has not changed his sympathies, for the simple reason that he has not, and never had, any either for France or for Germany. He is easily persuaded, and desires to be confirmed in the notion by daily repetition, that he supported the Germans with his precious sympathies so long as they carried on a defensive war, and thereby gave a striking proof of his virtue an love of justice; but that, for the same reasons, he must now transfer all his good feelings and wishes to France, since the defensive war has been turned into one of aggression and conquest. Far still higher than the feelings of the heart he values liberty, which, as he easily persuades himself, exists in the world only in so far as it is protected and furthered by English sympathies. It is a pressing necessity for humanity and for England that France should be great and free. France represents the free, and Prussia the despotic, principle; the former represents republican virtue, the latter military arrogance. In short, the love of liberty, which has struck such deep root in the English people prevents them from continuing to sympathise with the German side. It would be lost labour to disprove such false statements by arguments. . . . ."

We may properly remind our German contemporary that there are Englishmen who have shown no change of sympathies throughout this war, Englishmen who from the first pointed out the error into which their country was led by the conduct of the *Times*, through which the Prussian Minister had contrived to debauch the public opinion of England at its fountain head. There has been no change in the sympathies of those who have read the history of this war aright from its beginning, instead of being imposed upon by the delusion so sedulously propagated in the English press, that the Germans are a peaceful, non-aggressive race, anxious only to be let alone by their neighbours and forgotten in the bosoms of their homesteads and families. Look at the German boast in the very article from which we make this extract that Rome "has been conquered innumerable times since Alaric by the German armies." What was this peaceful, non-aggressive race doing there—these thousand times? Conquering there. On the whole, nations are astonishingly true to their national character, which indeed, as Carlyle says, "runs in the blood." German is by his very name *guerre-man*, or man that wars and *gars*. The German character is essentially selfish, unscrupulous, and aggressive. The very name German has become associated in history with the term "mercenary." We are familiar enough with the expression "mercenary German troops," but who ever heard of mercenary French, or mercenary English? It is always to Germany that England looks, as she did in the Crimea, for mercenaries, and were war to take place tomorrow between Prussia and ourselves, we could fill our armies with Germans by the mere offer of high pay. We do not say this to pain the German mind. It is a simple fact, that the individual German has not a very high sense of the sacredness of human life, and the guilt of unrighteous war. The history of Prussian hegemony in particular is a mere record of the most guilty, unscrupulous, and violent aggressions upon its neighbours. No well-informed German who may read these lines will deny the truth of our statement By a course of unparalleled violence, perfidy, and oppression; by conduct base and despicable abroad, and by the stern repression of all freedom at home, the Hohenzollern family have at last reached the goal towards which they have been struggling, at the expense of honor, good faith, and conscience, for two centuries. The goal is at last reached, and the Prussian monarch places the bloody ensign of Empire on his brow, in the presence of two millions of famishing men, women, and children clad in the black garb of death. From the palace at Versailles, he advertizes the world—

"We, William, by God's grace King of Prussia [the old blasphemy of successful might] hereby announce that the German Princes and Free Towns having addressed to us a unanimous call [the result, oh King, of two centuries of bloodshed by thee and thine] to renew and undertake with the re-establishment of the German Empire the dignity of Emperor, which now for sixty years has been in abeyance [and should have remained so for ever more; at all events the Empire was never *thine* but by violence] and the requisite provisions having been inserted in the Constitution of the German Confederation, we regard it as a duty we owe to the entire Fatherland to comply with this call of the united German Princes and Free Towns, and to accept the dignity of Emperor.

"Accordingly, we and our successors to the Crown of Prussia henceforth shall use the Imperial title in all the relations and affairs of the German Empire, and we hope to God [why, speak of God, oh king] that it may be vouchsafed to the German nation to lead the Fatherland on to a blessed future, under the auspices of its ancient splendour. We undertake the Imperial dignity conscious of the duty to protect with German loyalty the rights of the Empire and its members to preserve peace, to maintain the independence of Germany, and to strengthen the power of the people. We accept it in the hope that it will be granted to the German people to enjoy in lasting peace the reward of its arduous and heroic struggles within boundaries which will give to the Fatherland that security against renewed French attacks which it has lacked for centuries." [What, oh king, about Poland, Italy, and Denmark. You want immunity for German crimes by destroying France their avenger?]

The continuance of the war on the ground that Alsace and Lorraine must be restored to Germany for the safety of its frontiers, violates the universal conscience of Europe. A home writer says well:—"If there must be a re-vindication of lost territories, let it be general and thorough; for, if general and thorough, it will leave no Prussia on the map of Europe. This mushroom Power, which prates about the necessity of restitution, and the wickedness of robbery, only became a kingdom in 1701. Prussia was a petty Margravate, an unconsidered obscurity, when France was a great, an enlightened, a polished, and an ancient nation. Restitution! By all means let there be restitution, searching and complete, and when it is finished, what will there be left for King William to reign over? Prussia is but another name for stolen provinces, for by fraud and force Prussia has waxed great. And this *parvenu* Power, this product of pitiless and perfidious spoilation, this nation, so strong in its selfishness, and so selfish in its strength, is to wreak her wrath without limit upon France, which, with all her faults, with all her foibles, and they are ineradicable, is notwithstanding still that generous and high-minded France, whose sword has often been drawn in defence of the weak, whose blood has been nobly shed for the downtrodden of the earth, and whose uplifted arm, whose heroic spirit, whose fiery indignation at the sight of wrong, have spoiled the schemes of the dynasties of Europe, and made tyrants tremble. We do not believe that the people of England wish to see France subjected to a wrong so foul without a protest. 'Liberals' of all parties should insist at least on a national protest against this European Power whose origin is of yesterday, and whose only right to a place in the map of Europe is based on successful robbery."

Vehement as this denunciation is, it is but the expression of righteous feeling. The misfortune is that it comes so late. The fact simply is that no one can be familiar with the facts of Prussian history, the course by which this Hohenzollern family has risen to Empire, without sharing this indignation, and an overwhelming desire to see the very name of Prussia blotted out of Europe. It was a most unhappy business that English sentiment was so led astray at the commencement of the strife from a traditional distrust of the French alliance and the French Emperor's ultimate views.

It is an injustice to the French nation to attribute this war to their desire to keep Germany disunited. It was *not* the unity of Germany in itself that France dreaded, but the appearance upon its borders of the portent of a Germany united under the most perfidious and aggressive power the world has seen since the Romans. Germany united and peaceful was what every Frenchman of character desired; Germany united and aggressive under the leadership of Prussia was a most just object of alarm, as the event has proved. Germany divided, and therefore weak, was a traditional object of French statesmanship, to which the French Emperor shewed himself superior, while, in return for the services rendered by him to the nation in 1866, the fallen Emperor met with nothing but provocation and insult. It is astounding that Englishmen so generally ignore the deadly provocation at last given by Prussia, in secretly attempting the Spanish throne by a *coup-de-main*, in face of its plighted honour 18 months before that it would make no such attempt. We ought to have no difficulty in placing ourselves in the position—the stand-point—of the French nation. The truth unhappily is that we are very defective and slow in our sympathies as a nation. Had we been the neighbours of Prussia, we should have been just as much excited, alarmed, and irritated by her unscrupulous march to empire over her neighbour's rights as were the French people. Are we so blind as to forget our own jealous, irritable alarm at the United States, removed from us by the whole Atlantic? Englishmen ought to be familiar with the fact that the history of Prussia is unique in the world. It is a record of perfidy, violence, and unprovoked aggression from beginning to end. The attempt upon the Spanish throne was a deadly offence against the comity of nations, under the circumstances of the European position. Mr. Gladstone's statement that the foreign policy of Prussia has ever been *brutal* and unscrupulous, ought to have been made in the face of Europe instead of in the pages of a Review; and it is the vivid memory of the fact that every Cabinet of Europe was counting upon peace and longing for its continuance, except this infamous power, that has inspired the writings of the *Indian Economist* with so much bitterness. For ourselves, we would gladly see the whole might of England arrayed against her. Mark the fact, that were this Hohenzollern family blotted out of Europe tomorrow by the manifest judgment of God, the world would witness the event with awe, and the full conviction that its career of blood merited the judgment that had at last overtaken it. Why should we wait for that judgment to decide our convictions concerning this dynasty, when the record of its ambition, and violent aggressions upon its neighbours is an open book? The truth is, the career of the first Napoleon has served to divert European attention in the last half century from Prussian to French aggressions. The latter were but a casual phenomenon; the former have been the result of a settled, cherished policy from generation to generation. We find it impossible to bow down before the success of this most guilty family. Our whole nature rises up against it, and the very name of Prussia stinks in our nostrils for her selfish violence, blasphemous pretensions to piety, her falsehood, duplicity, and dishonour. We ask with the ancient prophet, "Can the Ethiopian change its skin, or the leopard its spots? "Then may she who has been accustomed to do evil learn to do "well." There is plainly perfect and complete accord between the Prussian and Russian Courts, and we fear that Europe has entered upon a long period of bloodshed and confusion. The English Cabinet, we believe, might have prevented the outbreak of this war, but not in the way most Englishmen suppose. When the disclosure was made in July that Prussia had been intriguing against France to place a Prussian prince upon the Spanish throne, Mr. Gladstone should have protested, in the face of Europe, in such terms against the outrage as would have compelled the Prussian Court to give France the satisfaction which she rightly demanded. There are times in the history of nations when the guarded language of diplomacy should give place to the unstudied language of an honest indignation. Mr. Gladstone would not believe at the first that Prussia really had been guilty of this new offence against the peace of the world; but when the fact was absolutely certain, he owed it to France, to ourselves, and to humanity, to denounce it in terms such as Cromwell would have used in the circumstances. Why did he not indignantly protest in July, against the "brutal and unscrupulous" conduct, which he denounced in October in the pages of the *Edinburgh Review*! Had the English Ministry been true to itself—true to the French alliance to which the nation owes so much—the Ministry would have put a brand upon these Prussian intrigues in the face of Europe that would not have been forgotten for a generation of years. Here was the real mistake of the English Ministry. It had not the courage to offend the English Court by openly branding the Prussian King for his dishonour.

EDITORIAL NOTES ON THE WAR.

THE executors of Marshal Prim would do a service to the age if they could be prevailed on to publish the correspondence which passed between Bismarck and the late Marshal concerning the candidature of the Hohenzollern puppet for the Spanish throne. Every effort has been made by the Prussians on the one hand, and the Parisians on the other, to damage the French Emperor, by the publication of the private correspondence of the Empire. Upon the whole, Louis Napoleon has come through the ordeal better than might have been reasonably feared. Let Bismarck's private correspondence now see the light in the same way, and the world will obtain a wholesome disclosure of what Prussian diplomacy means. The memory of Prim has nothing to fear; but it would be worth a king's ransom to get at the Prussian letters. M. de Miranda might attempt this task we think.

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A MADRAS paper, distinguished for the general care and moderation with which it is written, declares in its Retrospect of the year 1870, that the war arose in the following way:—

"The head of the house of Hohenzollern, the now renowned King William III. of Prussia, allowed a member of his family, the Prince Hohenzollern Sigmaringen, to become a candidate for the Spanish throne, and the Prince's candidature was accordingly announced on the 8th June. This aroused the jealousy of France, and a strong remonstrance from the Court of the Tuilleries was the result, to which King William listened, and directed the withdrawal of his kinsman's candidature. The conduct of Prussia on the occasion was such as would have satisfied any power less ambitious and restless than France. But the ex-Emperor demanded that Prussia should guarantee that no Prince or King William's family or any Prince of Germany, should ever again become a candidate for the sovereignty of any other realm which might want a ruler. This insolent demand was too much for the pride of the Prussian monarch, and a dignified refusal to give any such guarantee was the consequence."

That so complete a travesty of the facts should be possible so soon after their occurrence is really incredible. We forbear to name the journal.

THE *Daily News*, which has been intensely partizan through out this war, tells us that its issue has handed over "the domination of the Continent to a Power which, whatever may be its educational and intellectual advantages, represents the old monarchical and feudal system of Europe." It adds doubtingly "what hidden issues are still within the womb of the great revolution no man can as yet determine. * * * We are willing to hope that a future, better, if less brilliant and adventurous than her past, awaits the Prussian nation and monarchy, now that her great providential task of bringing about German unity is on the eve of accomplishment. If it were otherwise, Europe would have to stand on her guard against a possible enemy, as ruthless as France was, in its most aggressive and ambitious moods, and far more steadfast."

A few years ago, we met the correspondent of this journal in Paris, and were very unfavorably impressed by the fierceness of his hostility towards the Empire. The truth we suspect is, that the *Daily News* has had for many years past somewhat close relations with the Mazzini school. The French and English Radical press between them have pulled down the Empire, and now stand face to face with the new Emperor Wilhelm, hardly knowing what to make of the situation. They might have learned from Mr. Buckle's estimate of the comparative civilization of the two peoples, that it was better for Europe that France should be in the ascendant than for Germany.

"VERY like self-defence to train hard for six months and then "propose something which is certain to create a row." The author of the squib upon the war, from which we quote this epigram, discerns clearly what most Englishmen still want eyes to see; that while every other Cabinet in Europe was bent upon peace, this base Prussian power was secretly making gigantic preparations for war; and that its attempt to carry the Spanish throne by a secret *coup-de-main*, was deliberate and premeditated and designed to bring on war. The effort of all parties to make a scapegoat of the fallen Emperor—to accumulate the guilt of the strife upon his head, will by-and-bye excite only contempt and indignation. The Prussian Court with its usual cynical dishonesty, at first declared the war to be the personal act of the Emperor; and the *London Times*, which was in Bismarck's hands, got up the same cry in the home press, while the French in their extremity have been but too ready to seize upon the pretence, and declare themselves guiltless of all complicity in the strife. History will lay its guilt primarily upon the Prussian Court, and then upon the madness of the Parisian mob on the one hand, and the rooted deadly-hatred of France cherished these 60 years past in Germany on the other. France gave no provocation to this war. The provocation came from the other side. The real significance of the Spanish intrigue has not yet fairly dawned upon the British mind.

THE *Saturday Reviewers* devote two columns and a half in one of their recent issues to a pompous eulogy of English munificence towards "the sick and wounded" of the nations at war, and complain with an affectation of offended susceptibilities, that "nations are moved by the same jealousies and suspicions as individuals," and that the spectacle of our unbounded wealth, and "*of our capacity for giving*," has irritated both France and Prussia. The gentleman who writes in this way should be allowed, however, to speak for himself:—

"The time has, it seems, arrived when it is necessary to review the position of the great English subscription which has been entered into for the sick and wounded in the present miserable war. Indeed we are not sure that a friendly but discriminating examination of the whole matter might not have been offered before this. First, we have to deal with the fact that we have a huge sum of £260,000 collected. This national offering has been given from the best and highest motives. The charity of the whole community has been invoked under the most sacred appeals, and the answer has been given with unstinted generosity. Corporal duties as well as private feelings have been addressed. The Church, in obedience to the Archbishop of Canterbury, has been called upon in several congregations. Local associations and energy have done their best; there is hardly one of our social and municipal corporations which has not taken up the work. Town councils, trade associations, mercantile bodies, regiments and ships' crews, have engaged in an amiable rivalry of beneficence. Above and beyond all this, the personal munificence of those who recognise the duty of ministering to the afflicted, in whatever shape the miseries of human life present themselves, has on no occasion been more widely or more largely poured out. We have scorned coldly to inquire, who is my neighbour? When we were told of the ghastly incidents of the war, and when we could not escape the fact of the most terrible sufferings afflicting at the same moment thousands and thousands of our fellow-creatures."

When we remember the wealth of the nation, and learn that the gift amounts after all to no more than £260,000, the *Reviewer* who enlarges upon it with the pomposity of a parish guardian holds the nation up to ridicule by not knowing what figures mean. It is necessary, it seems, to point out, that £260,000 represents a contribution of just 2d (two pence) per head of the people. The annual income of the nation estimated from the income tax returns and other data, is as follows:—

Annual Income of middle and upper classes ...	£ 490,000,000
Income of working classes	„ 325,000,000
	£ 815,000,000

Of these eight or nine hundred millions sterling annually accruing to the nation, it spends about seven hundred millions only, its annual savings being variously estimated at from £90,000,000 to £130,000,000 a year. To understand therefore what national contribution has really been, look at the following figures:—

Annual Income of the nation	£ 850,000,000
Annual Spending of the nation	„ 750,000,000
National Munificence	„ 260,000

In other words, we have made "the sick and wounded" a present of about one four-thousandth part of our annual income. To glorify the nation for a contribution of this order, is simply to cover it with ridicule. The poorest body of dissenters in the kingdom, the Wesleyan Methodists, contribute almost as much as this "munificent national gift" to their foreign missions every year. The amount is unworthy of the country. Instead of £260,000 the sum might reasonably have been expected to reach two millions, and even then would not bear to be talked about in the terms employed by the *Reviewer*.

THE correspondent of the *Times* at Versailles is in a delicate and difficult position. Required to associate with the Prussian leaders on terms almost of intimacy, he is still expected to be their impartial and fearless critic, although every line he writes is read in Versailles within a few hours of its being published in London. Upon the whole, Dr Russell has done well; perhaps as well as we could fairly have expected any man to do in a position so difficult. His letter of 19th December is curiously marked by the double purpose of a wish to glorify and flatter the Prussian monarch as the author of German unity, without betraying, while doing so, the interests of civilization, by deliberately approving what he has done. On the one hand he tells us that the Prussian "army is the creation, one may say, of the King, "and of the King alone. Its existence is due to him. For "four years he stood face to face with his people. They yearned for one object, but they would not, or did not, see how "and how only it could be attained. The King saw it clearly. "There was one way, which philanthropists might contemn, "statesmen dread, and philosophers despise; but to his eyes it

"was the sole way of giving to Germany that complete mastery "and that absolute independence of all foreign interference and "dictation which would enable her to become the great central "power of Europe. It was force, brute force—if you will,—ex-"pressed by an army complete in all its parts, to be supplied "by a nation, every man of which was trained to arms.

"For four years from 1861 to 1865 the King overcame opposi-"tion by the simple exercise of the royal prerogative, or by the "might of the royal will depending for its full exercise on the "use of the machinery he had in his grasp. And now he is in "the heart of France, and sees the last enemy of German unity, "if not at his feet, powerless to prevent his work. First he con-"quered his own people; next he smote the rival power of "Austria; and eagerly accepting the rash challenge of his sole "remaining foe, he rushed upon him with resistless force, and a "captive Emperor and an army of 300,000 men in bondage "attest the strength of the weapon he prepared and put into "the hands of his generals." Dr. Russell is discreetly silent upon the guilt of the course which he describes, and says nothing of the duplicity, the perfidy, and the violence which marked its every step. He will not however, so far betray the interests of civilization as to leave the world in doubt as to what his private judgment upon this history really is. With more courage and honesty than courtiers in general are capable of, he concludes his letter thus:—"We are on the edge of a vast revolutionary tor-"rent *let loose by kings and statesmen*. The landmarks of the "past, the traditions of the last centuries vanish from our sight, "and out of the midst of the deluge there rises a portentous "figure armed and terrible, which is to be received as the God-"dess of Peace, whose attributes are perpetual readiness for bat-"tle. The solitary of Wilhelmshöhe was not far astray when "he prophesied a cataclysm if the nations would not agree to "a Congress; and certainly he bore his part in opening the "sources of the flood. What a prospect for the closing years of "this wicked and bloody old century! What a legacy to the "future! No faith in treaties—mitrailleuses and rifled cannon, "military service, iron-clad fleets,—the preparation for the "millenium." It is not upon the "solitary of Wilhelmshöhe" who prophesied this cataclysm of the nations, and strove to prevent it by introducing an era of arbitration into European counsels, but upon the Court of Versailles—that the real guilt of this dread-ful strife rests. "Perpetual readiness for battle and the arming of the manhood of all nations to the teeth." Such is the outcome of Bismarck's repression of all freedom in Prussia, and of the personal despotism set up by the ambition of the King. The same base power which a century ago by the partition of Poland plunged Europe into half a century of wars, in which millions perished by sword and famine, has now, by its dismember-ment of Denmark, again launched the Continent upon a sea of blood. And because the German people are a phlegmatic race, who profess no love for war, although ever ready to plunge into it for greed, Englishmen are to forget the crimes of their leaders, and lay upon the shoulders of the mercurial Frenchman the guilt of this new and terrible complication, because he will dance to the music of the drum. No! The character of the German people but increases the guilt, while it masks the odiousness of the Prussian Court. The setting up of the German Empire in Europe means, so far as man can see, a century of confusion and bloodshed in Europe.

THE PERMANENT SETTLEMENT, BENGAL.—VI.

IMPOSSIBLE.

"Of a certain two-legged animal with feathers, it is said, if you draw a distinct chalk circle round him, he sits imprisoned, as if girt with the iron ring of Fate; and will die there, though within sight of victuals, or sit in sick misery there, and be fatted to death. The name of this poor animal is goose!"

Our last issue contained an able letter upon this subject from a gentleman signing himself "An Occasional Contributor to the *Englishman*," who, in fact, is a Bengal Civilian of standing, and as such very exactly informed of the position of the land question in these Lower Provinces. In the eyes of this gentleman the position is hopeless. Agreeing with us in almost very abstract proposition we advance concerning the land, and admitting the frightful evils of which the Cornwallis settlement has been the parent, and that in consequence of "its peculiar land laws, Bengal "contributes less than its share towards the expenditure of the "Empire." The only difference between us, we are told, lies in the fact that while *we* are of opinion that the work of Lord Corn-wallis can still be undone, our correspondent maintains that "such a measure is for many, if not most, parts of Bengal practi-cally impossible." And the writer proceeds to prove this by statistics. He points out, for instance, that in the small district of Chittagong alone, there are 60,000 tenures held directly from Government, while the extent to which the process of subinfeu-dation has gone may be estimated from the fact that "during the past year alone 14,992 permanent under-tenures were created." The general conclusion of all is—that while our "leading doctrine is valuable and true" enquiry itself, much more redress, is—impossible. May we venture to reply in the words of Carlyle?

"There is a phenomenon which one might call Paralytic Radi-calism, in these days, which gauges with statistic measuring-reed-sounds with philosophic plummet the deep dark sea of troubles, and having taught us rightly what an infinite sea of troubles it is, sums up with the practical inference that nothing whatever can be done in it by man, who has simply to sit still, and look wistfully to time and general laws; and there-upon, without so much as recommending suicide, coldly takes its leave of us. Most paralytic, uninstructive; un-productive of any comfort to one! They are an unreasonable class who cry 'peace, peace', when there is no peace. But what kind of class are they who cry 'peace, peace—have I not *told you* that there is no peace!' Paralytic Radicalism is one of the most afflictive phenomena the mind of man can be called to con-template. One prays that *it* at least might cease. Let Paralysis retire into secret places and dormitories proper for it; the public highways ought not to be occupied by people demonstrating that motion is impossible. Paralytic; and also, thank Heaven, entirely false! Listen to a thinker of another sort: All evil, and this evil too, is as a nightmare; the instant you begin to *stir* under it, the evil is, properly speaking, gone. Consider, O reader, whether it be not actually so? Evil, once manfully fronted, ceases to be evil; there is generous battle-hope in place of dead passive misery; the evil itself has become a kind of good."

Surely the truth these words embody should be engraven upon all minds. Whatever we do, let us keep clear of Paralytic Radi-calism, the Radicalism which acknowledges with the utmost frankness the existence of intolerable evil, and yet counsels us to sit down contented or hopeless under it. No! the instant we begin here in Bengal to *stir* under the dreadful evil that afflicts us, that evil, properly speaking, will be gone, and generous battle hope will have come in place of dead passive misery. To all practical men therefore we say, let us gird up our loins for doing, and know well that we are here for this very purpose and for no other. "Once rightly girded up, how may things will present themselves as possible" which no one now dreams of attempting.

We are most glad to see the *Friend of India*, that old tradi-tional Power in the State, if not always wisely exercised, taking a decided step in this question. In its issue of 9th instant, it says:—

"The nation retains its right to abrogate laws and internal compacts for the public good, but it also always admits its duty to pay the cost, great or small. If a railway act is passed the power is given to take land in the public name; only it is to be paid for at its full value. Why should not this be done in the case of the Permanent Settlement? Declare that the time has come when the public interest demands that the Permanent Settlement should give way. But let it be paid for. In other words pay the zemindars to return to the ranks of nationality from which an act of Englishmen excluded them. They have a right to hold England to her word without quibble or equivo-cation. England has a right to say that the mistake of one period shall not be perpetuated to all time. England has no right to repair the mistake without paying the price. One would think that a man like Mr. Stephen, for instance, could adjust this difficulty to the satisfaction of the zemindars, or, if not to that, at least to the meting out to them of strict justice, and at the same time of abrogating a compact which sooner or later must fall. This is exactly the course that has been taken in Ireland. The State admitted its compact with the Irish Church, but it added that that compact had become immoral, and could not be maintained. The fabric was unsound and must be pulled down to prevent it from falling down and burying greater interests in its ruins. Only the State paid the price. We think that this is the course indicated by the signs of the times

—the buying out of the Permanent Settlement. It is the most honourable course. It is the soundest policy. It is strictly right. And as we view the matter, no other right, honourable, and practicable course is open to the Government of India."

This is the right spirit, we venture to think, in which to approach this subject, and not that of Paralytic Radicalism however Radical.

THE DECENTRALIZING SCHEME.

THE Indian Press has done scant justice to the financial reform which has been inaugurated by Lord Mayo. Thus one of the two leading Bombay journals describes it as "the grasping scheme put forward in December," and the other as a scheme that treats "the Bombay Presidency like a subjugated province." Upon the whole, the Resolution has been received with a very discreditable amount of carping, and with the smallest possible amount of either able or candid criticism. In our issue of May last, we put the following words into Lord Mayo's mouth as the expression of popular convictions upon the subject of decentralization, in the "Financial statement that should have been delivered and was not!"—

"I now come to a question which I am persuaded lies at the root of all administrative reform in this great empire. We must divest ourselves, as the Supreme Government, of a very large share of those responsibilities which are so unwisely engrossed by us. It is simply impossible, gentlemen, that we should succeed in the attempt to regulate and administer from this city, the affairs of an empire consisting of at least a dozen different nations. It is only by stating the difficulty in these terms that I can excite in your minds the idea that fills my own. Was it ever yet heard, I ask, in the history of the world, that such a task as has been devolved upon us, or undertaken by us, was successfully performed? I believe the effort to be without precedent. What would be thought of an attempt to devolve upon a cabinet sitting in Paris the administration of the affairs of two-thirds of Europe? And yet such a task would be easier than that we have undertaken here, where the people themselves render so little assistance to the State, and local self-government is unknown. Were the English ministry at this moment charged with the administration of justice, the control and disposition of the armies, the management of the finances and debt, the construction of the public works, the oversight of the police and municipal institutions, and the education of the people of all France, Spain, Austria, Italy, Prussia, Denmark, Poland, and the minor states of Europe, in addition to the affairs of the United Kingdom,—it would but image forth what we are attempting in this city. This truly monstrous state of matters must come to an end. It is simply impossible for us, without indefinite harm and mischief, to interfere as we now do with the administration of affairs in provinces of which we know nothing. I would not exaggerate the evil, and it is all but impossible to do so. I am not advocating the disintegration of the empire. I would bind its provinces more closely together, but I would not attempt to do so by the clumsy device of engrossing all authority in this city. Surely we have before us in America an example of the course which we might follow here—a Central Executive, omnipotent for all imperial purposes, with complete local independence in the several States of which that wonderful empire consists. Do you think America would have constructed forty thousand miles of railway in the same time in which we have painfully laboured to construct *four* if the system of government which paralyzes all local action here had existed there? Gentlemen, the Governor in Council in Madras should be a real and not a sham administration. If that Government is not competent to determine what public works are essential for the Presidency, what taxes least objectionable to its people, what expenditure it should make upon education, what upon the thousand works of local improvement which it needs, and what establishments are required for its public service, then should it give place to one that *is* competent to decide upon these questions. What must cease is the casting upon us of purely local responsibilities, which we are not fitted to discharge, and the exigency of which precludes our giving just attention to purely imperial affairs."

Now we appeal to the candour of the Indian public whether this passage does not fairly represent what we have all been demanding for years past? Well, what has Lord Mayo done? He has complied litorally with a very substantial part of the request thus preferred. Henceforward, each local Government will determine for itself what "public works are essential for it, "what taxes least objectionable to its people, what expenditure "it should make upon education, what upon the thousand works "of local improvement which it needs, and what establishments "are required for its public service." The concession is honestly, frankly, and loyally made, but is spoiled it appears, because it comes burdened with the condition that each province is to determine for itself—what was part of our demand—"the taxes that are least objectionable to the people." The criticisms which have been passed upon the measure will not raise the character of the Indian Press. When we remember how conservative power makes men, and with what difficulty concessions of this order are wrung from administrations, we think that Lord Mayo and his Council deserve public gratitude. Certainly we never expected last May, when embodying the popular wish in the terms we have quoted, that its concession was so near at hand. No one could reasonably have expected the full reform desiderated to be at once granted; nor would it have been wise to proceed in a matter of so much gravity but in the tentative form that has been adopted. We regret that we did not in our last issue recognize the value of the concession with less reserve. It is a most substantial and weighty reform, and merits full acknowledgment on the part of the public, for it has been conceded not to outside pressure, but to the loyal recognition by Government of the fact that what the people desired was wise and just in itself.

The fact that the concession comes attended with the necessity of retrenchment or local taxation has been made too much of. The real mistake of the Resolution is the declaring the present allotments from the Imperial Treasury to be permanent. That these allotments are unfair was shewn in our last number. When they come to be readjusted upon really equitable principles, it will be well if some of the noisiest of the clamourers against the Resolution, do not find that undue favor has been shown them therein.

Our own conviction is well known—that no satisfactory decentralization of the finances is possible that does not begin with the revenue side of the account, with an intelligent determination of what revenues are properly local and what imperial. Madras, Oudh, and the North-West Provinces burden their cultivators with an impost upon the land that suffices to defray the whole cost of the civil administration and of the purely local public works in each province, and still shews a large surplus every year. Why should the Imperial Treasury claim that surplus as its own? It does not belong to it: it belongs to the province in which it is raised. Mr. Strachey tells us that the secret of "setting our financial house in order is "shortly this,—'Don't expend imperial revenues upon local "objects, but give the local Government a discretionary power "to raise their own funds for purely local purposes.'" But the previous question arises, what are imperial revenues? If we are to assume that the existing revenues of Madras are imperial and to be appropriated by the Imperial Government, while we leave Madras to such supplemental resources as it may be able to command for the construction of the public works which it requires, we mock its demand for independence. We take the revenues, and get rid of all importunities for their restitution. Surely, we must see that decentralization of this order would simply inflict further wrong upon the local Governments. The principle which should guide us is obvious. To meet the imperial charges of the army, debt, home treasury, &c., the Imperial Government should receive in the first place, the proceeds of all such taxes as fall with equal weight upon the whole country, such as customs' duties, salt, stamps, opium, the post office, &c. The land revenue which falls with *unequal* weight upon the provinces, must plainly be held to be a local tax, also the abkaree, and all other taxes, the weight of which is not

uniform throughout the country. The proposal that we should take the Madras revenues while the Madras Government should undertake out of supplied revenues to construct such public works as require very convenient arrangement for the Imperial Government for Madras. Madras must keep own revenues of a local order, and with them, or upon loans contracted upon the credit of them, execute purely public works. The great lines of railway and telegraphs, and military works, are perhaps the only public works which the Imperial Government should undertake. All local lines, tramways, roads, irrigation, and other works should be executed out of the revenues of the local Governments, or out of loans raised by them upon their own credit. In other words, we want decentralization of the same order as in America. If the imperial resources fall short of the imperial necessities, then should each Government be assessed according to its population and resources in an annual contribution thereto. The reform is simplicity itself, and neither difficulty nor danger would attend its introduction. We must not be deluded by a shadow of the thing we seek for while we miss the substance.

We perceive that the average annual receipts from the land taxes for purely local purposes for 61 to 69 were as follows:

	Area	Population	Land Revenue £	Annual Deficit £
Bengal	249,000	24,000,000	810,000	639,000	
Madras	140,000	22,000,000	765,000	1,275,000	
Bombay	350,000	24,000,000	1,200,000		195,000
N. W. Provs	106,000	30,000,000	665,000	1,805,000	
Oudh	24,000	11,000,000	191,000	546,000	
Punjaub	100,000	16,000,000	610,000	260,000	
Central Provinces	86,000	10,000,000	278,000		152,000

The table reveals the fact that these Lower Provinces are contributing no more than £639,000 a year towards the charges of the Imperial Government. The whole of the land revenue, except this amount, is annually absorbed in the cost of the civil administration and public works. In Bombay the case would be worse, but that the land there not being permanently settled, may be expected by-and-bye to return the outlay made upon public works many times over. The land tax is, we say, the *local* tax of each province, all the other taxes, customs, duties, salt, stamps, opium revenue, &c., being strictly imperial in their nature; as in general they bear equally upon the whole country, and where they do not, ought at once to be made to do so.

Let us once more summarise and compare the expenditure upon purely local purposes, with the proceeds of the one purely local-tax during the last eight years:—

	Land Revenue £	Local Expenditure £	Surplus £	Deficit £
Bengal	31,202,400	26,148,100	5,054,300	.....
Bombay	27,606,000	29,055,870	.....	1,449,870
Madras	32,846,000	22,793,000	10,053,000	
N. W. P.	32,887,000	17,562,000	15,325,000	
Punjaub	15,180,198	13,556,100	1,524,398	
Oudh	8,734,121	4,722,000	4,012,121	
C. Provinces	4,290,000	5,738,000	.....	1,448,000
Burmah	4,194,522	4,099,000	95,552	

It is clear at a glance from this table that Madras, the North-West Provinces, and Oudh are overweighted. The expenditure upon public works in Bombay has been abnormally high (£9,500,000 in eight years), and the result is a deficit there, justly chargeable, however, against the future increment of its land revenue. Bombay should be allowed to spend what it pleases upon its land, but should not be allowed to look to the Imperial Treasury for the funds. The North-West Provinces, Madras, and Oudh are at present being made the "milch-cow" of the Imperial Treasury. These figures will come, we believe, upon all as a surprise, our finance being a chaos, full of darkness and injustice, but happily ever struggling into light and order.

THE STANDARD OF LIVING.

TAXATION.

We have been attempting in the last two or three numbers of the *Statistical Reporter* to give some general idea of the standard of living among the people of India. Upon the whole, the jail dietaries of the provinces are perhaps a somewhat favorable picture of the ordinary style of living in the country, and if we add thereto the simple luxuries of tobacco, pan-supareo, and sweetmeats, we exhaust the table of the Hindoo.

"The food of the common people," says Mountstuart Elphinstone, "both in the country and in towns, is unleavened bread with boiled vegetables, clarified butter or oil, and spices. Smoking tobacco is almost the only luxury. Some few smoke intoxicating drugs; and the lowest castes alone, and even they rarely, get drunk with spirits. Drunkenness is confined to damp countries, such as Bengal, the Concans, and some parts of the south of India. It increases in our territories, where spirits are taxed; but is so little of a natural propensity, that the absolute prohibition of spirits, which exists in most Native states, is sufficient to keep it down. Opium, which is used to great excess in the west of Hindoostan, is peculiar to the Rajpoots, and does not affect the lower classes. All but the poorest people chew betel (a pungent aromatic leaf) with the hard nut of areca, mixed with a sort of lime made from shells and with various spices, according to the person's means. Some kinds of fruit are cheap and common. The upper classes, at least the Brahmin part of them, have very little more variety; it consists in the greater number of kinds of vegetables and spices, and the cookery; assafœtida is a favourite ingredient, as giving to some of their richer dishes something of the flavour of flesh. The caution used against eating out of dishes or on carpets defiled by other castes gives rise to some curious custom. At a great Brahmin dinner, where twenty or thirty different dishes and condiments are placed before each individual, all are served in vessels made of leaves sewed together. These are placed on the bare floor, which, as a substitute for a table cloth, is decorated for a certain distance in front of the guests with patterns of flowers, &c., very prettily laid out in lively-coloured sorts of sand spread through frames in which the patterns are cut, and swept away after the dinner. The inferior castes of Hindoos eat meat, and care less about their vessels; metal, especially, can always be purified by scouring. In all classes, however, the difference of caste leads to a want of sociability. A soldier, or any one away from his family, cooks his solitary meal for himself, and finishes it without a companion, or any of the pleasures of the table, but those derived from taking the necessary supply of food. All eat with their fingers, and scrupulously wash before and after meals."

One of the most curious delusions of our time is the notion that a people whose tastes are so simple, and yet so much in accordance with the climate, should ever be successfully taxed through the Custom House. The hope of such success is cherished in forgetfulness of the fact that no tax ever draws well until it reaches the masses. The success of indirect taxation at home arises from the fact that through the Custom House lies the highway of half a dozen products of foreign industry, consumed by every man, woman, and child in the country. In India, the people grow literally everything which they require at their own door. In England we get a very large revenue from a very small duty upon tea, because every one uses tea; from sugar because every one uses sugar; and from coffee, because every one uses coffee, and because tea, sugar, and coffee are all products of foreign industry that must pass the Custom House. A glance at the following table, showing the consumption per head of population in the United Kingdom of a few articles of foreign produce, may help to fasten on the mind of the reader the conviction we have so long striven to spread in this country:—

Annual Consumption of foreign Produce, United Kingdom 1870.

Sugar and Mollasses	51·06	lbs.	per head of population.
Tea	3·84	„	„ „
Coffee	1.01	„	„ „
Cocoa	0.23	„	„ „
Tobacco	1·37	„	„ „
Tallow	5·72	„	„ „
Rice	6·43	„	„ „
	69·66	lbs.	per head

Wines 1869. ..... 0·49 gallons per head
Spirits „ home and foreign 0·98 „ „

With every man, woman, and child in the kingdom thus consuming 70 lbs. of foreign produce per annum, and nine bottles (1¼ gallon) of wines and spirits, what wonder that the Custom House yields a revenue!

Few persons have any adequate idea of the quantity of foreign produce consumed by even the poorest in England. A wealthy family, keeping 17 indoor servants, carefully managed, and spending £6,000 a year, will consume every year we are told,—

Tea	230 lbs., or	11	lbs. per head.
Coffee	180 „	8½	„ „
Sugar	2,051 „	98	„ „
Wine	166 gal.	8	gallons
Beer	2,200 „	105	„ „
Spirits	51 „	2½	„ „

The consumption of the manual labour class throughout the country, was made the subject of exact enquiry by Mr. Baxter about two years ago. He found that the average consumption of fifteen families of journeymen printers in Westminister, each family consisting of 4½ persons, was as follows:—

Tea	21	lbs. per year.
Coffee	21	„ „
Sugar	151	„ „
Tobacco	6½	„ „
Beer	105	gallons per year
Spirit	2	„ „

The average income of these families amounted to about £92 a year, of which the rental absorbed £25, and there was still this enormous consumption of foreign produce. The average consumption of six families in still poorer circumstances, living in the east of London, and earning an average income of £53 10s. per year, was,—

Tea	19	lbs. per year
Coffee	5½	„ „
Sugar	147	„ „
Tobacco	6¾	„ „
Beer	35	gal. per year.
Spirits	1	„ „

The rental in this case absorbed nearly £14 of the income. The consumption of the same class of workmen in the country towns of England was considerably higher, the amount saved in rental being spent in food. Thus the consumption of a Sheffield workman's family earning £62 a year, but paying only £8 rental, was,—

Tea	32½	lb., per year.
Coffee	39	„ „
Sugar	182	„ „
Tobacco	14½	„ „
Beer	150	gal. „

The consumption of the agricultural classes in the same neighbourhood, but earning lower wages, told still the same story:—

Earnings	Father	£39-0-0	
	Mother	3-12-0	
	Children	5 -8-0	
			£ 48-0-0
Expenditure	Rent and Rates		£ 4-11-6
Consumption	Tea	19 lbs.	per year.
	Coffee	13 „	„
	Sugar	90 „	„
	Tobacco	6 „	„
	Beer	68 gal.	„

The consumption of the very poorest class of agricultural laborers in the country, the farm laborers of Devonshire, where families of 5 and 6 persons are earning less than £29 a year (25 Rs. a month) and paying £3-10 a year for rent, was still as follows:—

Tea	6½	lbs. a year per	family of 5 persons.
Coffee	½	„ „	„
Sugar	8½	„ „	„
Tobacco	2½	„ „	„

We pause for a moment to express our indignation at the disclosure this table makes. No one will allege that the standard of living of the average workman in the towns of England is above the requirements of the climate, while it is plainly luxury itself compared with the starvation standard of the agricultural poor. And yet we have men in India whose one aim seems to be to introduce the landlord system with its attendant curses into India, as the height of their statesmanship and ambition. Now we have adduced these figures to give nerve to the conviction so imperfectly grasped in this country, that taxes are really productive only when they reach the masses, only when they reach everybody. We have not the smallest doubt of the possibility of raising a very considerable revenue in India from *direct* taxes falling upon everybody, like the capitation tax of Burmah. What we have ever doubted and denied is the possibility of our raising a large revenue in India from *indirect* taxation, unless we tax the necessaries of life grown in the country itself; for the simple reason that the tastes of the people and the traditional standard of living amongst them are so exceedingly simple.

OUR EXCISE.—II.

It is impossible to follow up the suggestions which were raised in the *Indian Economist* for January regarding the possible state of our Excise Revenue in India without collecting and sifting all kinds of details known and understood only by experts and local officials. Figures are only symptoms which may easily mislead; they may indicate wide differences of result; but the causes can only be ascertained positively by a much more comprehensive analysis than can be effected by mere comparison of returns. However, if any official personage thinks the matter worth looking into, we can propose one or two rules for his general guidance. His object is supposed to be to satisfy himself that the revenue from intoxicating spirits and drugs in India is not diminished, or at least kept from rising as it might, by smuggling on a considerable scale. And he may confine his investigations to those provinces in which the Central Distillery System is used; since, where distillation is in the hands of the monopolist farmers, they themselves may be relied upon to put down interlopers; on the other hand, where the State has broken up all monopolies of distillation, and has merely insisted that all stills must be worked under Government inspection, in order that the still-head duty per gallon may be duly realized—there it is obvious that the State has undertaken, as the first condition of a successful excise revenue, to put down and utterly extinguish contraband distilleries. If this condition be not rigidly fulfilled, the system has failed; and even a non-official can perceive at a glance that the task is very difficult. The raw material for brewing liquor grows wild over half of India; the only machinery needful is a pipkin and a bamboo; the jungles afford at once fuel, material, and concealment; and the police have been known to be conveniently blind. Moreover, even when the distillery is actually carried on within the Government enclosure, the danger is hardly less. The officer who measures quantity, tests quality, and levies the duty, is an ill-paid native clerk, who is exposed to severe temptations, for he can cheat the Government both as to the quantity and quality of the liquor passed out, and can levy the differential duty for his own privy purse, without the possibility of being detected save by treacherous espionage. We believe that recent close scrutiny into the management of the Salt duty as taken at the pans in Bombay, has produced a violent presumption that very large quantities of salt pass out free; yet the Salt Customs establishment is much stronger in every sense than the ordinary staff of an Excise Department.

Thus stand the probabilities of the case. They must be taken for what they may be worth in various parts of India; but they seem to present *prima facie* ground for disquietude, wherever the Central Distillery System has not been rigidly supervised. Of course, we cannot tell whether rigid supervision is or is not universal; but the mere examination of returns, if they could be compared throughout India, might lead one a little further. Suppose, for instance, we could obtain from each province and government under the Central Distillery System, a statement giving the number of shops licensed to sell liquor, and giving also the number of gallons of liquor passed out (duty paid) from the stills,—we should then see what rates the number of shops bear in different parts of India to the number of gallons—that is, what quantity of liquor each shop draws from the taxed still. If some shops drew an

exceedingly small quantity, this would be suggestive, for the dealer must sell a certain quantity, or the trade would not keep him. And if these returns could be taken for a term of, say five years, we should be able to determine the very important question whether the number of retail shops is increasing or decreasing in due ratio with the variations in quantity of liquor distilled. All the retail shops are supposed, be it remembered, to deal with the taxed stills, and with no other. If, therefore, in any province the number of retail shops has increased, while the quantity of liquor passed from stills is the same, this is odd, but not very remarkable, for competition may have come into play; but if the retail trade in liquor is found, by the gradual multiplication of shops, to be flourishing handsomely, while the outflow from the taxed stills remains sluggish, then we may begin to sniff very suspiciously about the neighbouring jungles and hole-and-corner suburbs. And as soon as the still-head liquor begins actually to decrease in quantity passed out, while the retailers are driving a thriving and spreading trade—if such a coincidence be ever disclosed by any statistical comparison—then we may fairly and reasonably adopt the conclusion that the smuggler has been too much for the virtue or the vigilance of the exciseman. We have recently observed in the *Indian Mirror* an article upon "Abkaree Administration," which brings up again very heavily against the English Government the old charge of encouraging liquor distillery for the sake of increasing the revenue derived from it. Upon this matter our present article does not touch, for the only point now at issue is whether the Farming System (when properly managed) encourages drinking more than the Central Distillery System; or whether it merely raised more revenue from the same consumption. We have said that if the Central Distillery System can be *proved* to have checked intemperance, the loss of revenue is a gain to the commonwealth. However, we observe that the *Indian Mirror* declares that "the number of "shops for the sale of intoxicative liquor and drugs has, *we be-* "*lieve*, more than quadrupled in most of the large villages and "during the last 20 years, at the lowest estimate." If this be true, then no condemnation can be too strong for such shameful maladministration. But may we venture to ask our contemporary for statistics? It is easy, moreover, to repeat the cry that no drinking went on under Native rule; but the only persons who can now say what did go on in provinces which we now hold, are those who have carefully examined the old revenue accounts of our predecessors, and who know what a vast amount of contraband distillation prevailed under their loose and unmethodical administrations. We should be glad to see the *Indian Mirror* return to the subject, and deal with it more precisely.

PRODUCE OF THE LAND IN N. W. PROVINCES.

To the Editor of the "Indian Economist."

SIR,—I acknowledge the courtesy and ability of your criticism on my estimate of the agricultural produce of the N. W. P., but I will not trespass on your space by going largely over the same ground again. I will only say that I did not intend to draw such a "hard and fast" line as you represent. I accepted a rate of 25 seers per rupee, although I asserted that 30 seers was a more accurate rate to assume as the price which agriculturists get for their produce, for this, and not the average market price, is the true point to be considered. The cultivator sells his produce in December and in May, and sells it always at a rate a little below the market rate for that produce at that time, the market rate itself being lower at that time than at any other month in the year. That jowaree sells much higher in May, and barley in October, is no good to the cultivator but pure loss: the increase goes to the bunnia as interest on the capital embarked in his trade. At 30 seers the gross consumption, by my reckoning, amounts only to 26 millions sterling; I added on 4 millions to cover the margin necessary for the items you mention, the small luxuries of the agriculturists, and the higher style of living in towns. You confront me with an estimate which gives Rs. 0-2-3 a day as the cost of a man's subsistence. To this I reply that in every English household in the N. W. there are several servants receiving only Rs. 4 or Rs. 4-8 a month, or Rs. 0-2-2 to Rs. 0-2-6 a day. Yet on this I have frequently known a family of 5 and 6 mouths to be fed and clothed. Such people are, of course, far worse off than a cultivator who consumes the produce of his own land, and so far is not affected by a rise in the market.

But the principal point that you insist on is the value of fodder, (jowar stalk, chaff, oil-cake, and cotton seed,) which you estimate much more highly than I did, putting it, on the strength of some Sindhana returns which I have not seen or have forgotten, at half the value of the grain. Now here you will notice that I was careful to speak of the *selling* value of fodder, meaning thereby not the market value, but the quantity for which I suppose that a market exists. The distinction I wish to draw is this: Fodder is not, and from its weight cannot be, carried far, nor is there much more produced than is required for home consumption. The demand of the large central towns is supplied by the neighbouring villages from their surplus production. But suppose that over a large tract the system of cattle-feeding was suddenly changed, that stall-feeding was given up, and more land placed under pasturage, and that all the fodder was suddenly thrown on the market, what would be the result? There would be no sale for it, and the price would fall to nothing. Under the present economic condition of the country, there is a demand only for a very moderate supply, that supply being the surplus above home consumption. If a hundredth part of the fodder produced is sold, and if much more than that could not be sold at all, it is idle to take the market price as the ruling rate, and, multiplying it by a hundred, to say that is the "value of the fodder." As a matter of fact, the "selling value" is the price fetched by the surplus only—the price of the small quantity that is not required for consumption at home, and for which alone a demand exists.

But whether this be so or not, I wish to point out how little any concession on this score assists the main line of your argument as to the relation between produce and land-tax. If the discussion is to be conducted only in the dry light of a philosophical enquiry, and to turn merely on the purchasing value of agricultural produce, I will agree (for the sake of the argument) that a higher value ought to be placed on fodder. But when you try to effect a junction between this branch line and your main argument as to what the assessment ought to be, I must assert that your argument is, to a certain extent, self-destructive. The higher you raise the rate of consumption, the less margin you leave for taxation, since it is obvious that whatever be the quantity that the agriculturist with all his frugality, necessarily consumes, that minimum must be deducted from his income in a financial point of view, and only the balance remains as a fund out of which rent can be paid. From this point of view, I think you must concede the truth of my statement about fodder. Of course if the fodder is used, as you say it is in Nimar to support cattle bred for sale, that is not home consumption in my sense, and the fodder goes as fairly into the fund for taxation as if it was sold direct. But in the North-West the conditions are different: not only is there no breeding of cattle for sale, except in a few peculiar tracts, but, of the plough-cattle who are required to raise the produce we are discussing, not more than half (if so much) are home-bred, the rest are purchased from Bundlekhund and Central India. This fodder, then, supplies nothing to the tax-fund; it only goes to support the human and animal mechanisms by the exertions of which the existence of a tax-fund at all is created and made possible. In order to ascertain what this tax-fund is, we must deduct the necessary minimum consumption of agriculturists whom I take at ¾ of the total population from the gross produce. I add to the consumption 1½ million sterling (in Hume's calculation put it at 8 annas per head) paid for salt, and half a million as the price of half the plough-cattle, (assuming the total number to be 50,000 pairs at 6 annas per plough, average value Rupees 20 per pair (duration of working life 10 years.) This, then, is how the calculation of the surplus stands on your own

	Gross produce (Indian Economist)	Minimum consumption by Agriculturists (23½ millions.)
Food of 30 millions	60 millions.	45 millions.
Seed Corn	10 „	10 „
Clothing	6 „	4½ „
Fodder and Garden	8 „	... „
Exports	8 „	... „
Salt	0 „	½ „
Plough-cattle	0 „	½ „
	92	67½

surplus 24½ millions, so that if the true theoretic rack-rent were taken, if every cultivator paid in rent every penny that the produce over and above what is necessary to keep him alive, the gross rental of the province would be 24 millions, and the land-tax, which is half the rental, would amount to 12 millions. The possible maximum, on your assumption, is therefore nearly three times the present assessment, or 2½ times what it will probably be when the re-settlement is completed; but far less than you have yourself calculated a fair and full assessment to be. But now turn to my estimate. I put the total produce at 47 millions, reckoning export at 10 millions, but this figure, which I assumed with the greatest hesitation, was meant as an approximation to the full market value of the manufactured exports, which are chiefly indigo and sugar. It is obivious, however, that the value to the agriculturist is very much less. A great portion of the price is due to the manufacturing labor and capital expended on it. Indigo, for instance, which as *plant* is worth 40 Rupees to the cultivator, sells for 320 Rupees in its manufactured state, and I shall probably be well within the mark if I put these exports as worth in the market double the value of the raw produce to the cultivator, *quaod hoc*, they may be taken at 5 millions. I confess that this is more a guess than an estimate, but I offer it only as the best I can form :—

	Value of Gross produce to the cultivator.	Home consumption of the cultivator
Food of 30 millions	30 millions	22½ millions.
Seed corn	3 „	3 „
Clothing	2 „	1½ „
Fodder	2 „	0 „
Export	5 „	0 „
Salt and Plough bullocks	0 „	2 „
	42	29

The surplus here, *i. e.* the rack-rent, is 13 millions. The full land-tax, if no cultivating or intermediate rights intercepted any portion of the rent-fund, would be six and a half millions. As I have said before, the full account, when completed, would probably be five millions if no part of the province were permanently settled, and three millions, by my calculation of the rack-rent, are intercepted by cultivators who enjoy a beneficial interest in the land. The actual rent-roll of the North-West Provinces is ten millions sterling, of which the Government share at present is four and will soon be four and a half millions. If all our districts were liable to re-settlement, it would be five millions, and the actual and theoretical land-tax would agree together.

There is another way of testing your conclusion which I have not left room for myself at the close of this long letter to do justice to. We in this province are not unfortunately without records of assessments which have crushed out the life of the people, destroyed the heritage of races, imperilled the safety of the State, and broken down in the end. These records stand as beacons to our settlement officers to warn them off the shoals they should avoid. It is possible, of course,—nay, it is natural—to fall into the opposite extreme ; but though you have shown that Charybdis is dangerous, it is not the less true that Scylla is fatal. If, then, I can shew that an assessment framed on your principles would be more crushing and more ruinous than an assessment famous for its severity, and which was found to be impracticably high, I shall have urged a strong rebutter against the charge you bring against settlement officers.

I have lying on my table, in the December number of the *N. W. Revenue Reporter*, Mr. McConaghey's excellent report on pergunnah Thiror in the Mynpooree district. This pergunnah was assessed in 1840 by one of the best of the settlement officers of those days, Mr Edmonstone, afterwards Lieutenant Governor of the N. W. Provinces He fixed on it an assessment of Rupees 96,177. In ten years, this assessment had utterly broken down, a third of the land had changed hands, the revenue could not be collected, and in 1845 it had to be reduced by 24 per cent to Rupees 74,920. Now by your calculation 24 millons of acres produce 92 millions sterling, or £3 5/6 per acre, and you maintain that in the good old times half or a third of this was actually taken, and that now even a mistaken lenity ought not to reduce the land-tax below a sixth. In 1840 there were in this pergunnah 36,838 acres of cultivated land, whose produce at £ 3-5-6 per acre was 14,12,140 Rupees. Your minimum assessment on this would be Rupees 2,35,456. Grant that that produce has doubled in value since 1840 (which is an extravagant admission), still the gross value was then Rupees 7,06,070, one-sixth of which would be Rupees 1,17,680 or larger by Rupees 21,503, or nearly 20 per cent more than an assessment that signally broke down.

I am, yours faithfully,

C. A. Elliott.

The same gentleman writes to us in another letter—

"As to Nimar, you say nothing of *tenures*. If our assessment "was a rent, you would be unanswerable, but it is a tax on rent, "and as such we can't raise the rent, or touch it, or take more "than half of it, be it ever so low."

It is necessary to remind the writer that that which seems to him so natural, the commutation of the State claim to rental into a mere *tax* upon the rental, is one of the chief subjects of our complaint. Under the ascendency of the school that has been incessantly tampering with the land revenue these years, our settlement officers have been instructed in the North-West Provinces to abandon half the rental (nett assets they call it) to the so-called proprietor, whereas under the last settlement his appointed share was but one-third. In the Central Provinces, there was no proprietor-class at all, but Sir Richard Temple, equal to the occasion, has been allowed deliberately to *create* a class to share the rental with the State. Without entering upon the vexed question of the existence of proprietary rights in the North-West under Native rule, we are willing to accept it as a fact that such rights did exist, and that they were properly recognized by allowing their owners to appropriate a third of the rental, or nett assets, in assertion of those rights. Nothing is more certain at the same time than that this concession created a settled proprietorship in land, unknown in the country under the exigencies and irregularities of Native rule.

A most generous and considerate treatment of these most doubtful rights had been shewn, and if any change whatever were to be made with regard to them, every teacher of economic science will affirm, as with one voice, that the interest of the commonwealth pointed either to the reduction of their amount, or to their redemption by the State. But in some way or other the world knows not now, some one or other, the world knows not who, has taken it upon himself in the last few years to lay it down as a rule of all re-assessments that the State claim should be again lowered, and that instead of one-third assets these so-called proprietors should be allotted one-half the rental. The settlement officer is simply carrying out his instructions. It is a school of statesmen in Calcutta who are responsible for the change ; a change, as we have said, in the teeth of the direction in which the State should have moved, as all economic authorities agree. The same school having their fling in the Central Provinces, have there *created* a proprietary class for the very purpose of conferring upon them one-half the State rights. Our correspondent complains that we "say nothing of tenures" in Nimar. Why our columns were filled, we thought, with the Malgoozar, at the risk of sickening our readers with the name.

We say "nothing of tenures"—why ! We simply refuse to recognise them ! We demand their abolition ; we say that their creation is an outrage, and that the men who have assumed a right of alienating one-half the State rights in the soil, should see their work reversed before their eyes. A more daring revo-

lution was never made than that which Sir Richard Temple has effected in these Central Provinces, in transferring the State claim to the rental of the land to the malgoozar. We are only upon the threshold of this Malgoozar question, and we shall have to burden our columns with it many days to come. We take up the first Settlement Report of these Provinces that comes to hand. It happens to be the Chindwaree report, and here is what the Commissioner himself tells us about its tenures: "From the time of the Mahratta rule, the land has always been "held on what may be called Zemindaree tenure. Every "village had its Patel, who paid the revenue to Government, "drawing the rents from the cultivators. The remuneration "of the Patel was, as is stated, about 15 per cent. on the rental. "The amount assessed on the village was made known to him; he, "again, distributed this amount among the various cultivators. "As is shown by Mr. Ramsay, *neither the Patel nor the culti-* "*vators had any fixed and indefeasible rights in the soil.* The "whole of the land belonged to the Government absolutely; and, "if a Patel refused to accept the terms offered him, or a culti- "vator to pay his quota of the assessment, the former would "have been ousted from the Patelship, and the latter from his "holding. The present settlement has been made with the "Malgoozars (Patels) *to whom proprietary rights over their villages* "*have been conceded.*" And so, instead of the traditional 15% upon Government collections, these mushroom proprietors are allowed and encouraged to screw whatever they can get out of the cultivator, while their own contribution to the State is fixed at a few annas per acre for 30 years to come. The course is so monstrous, so scandalous, so fraught with ruin in the future, that we are amazed that the whole Press of India has not long since forced its reversal upon the State. We protest with our whole might against the modern proceeding in the North-West of conferring half the rental upon men who were but doubtfully entitled to a third, and in the Central Provinces of conferring the entire rental—for that is what it comes to—upon a class that had no claim even to a fraction of it, but from time immemorial had received merely 15 per cent. for collecting the Government assessment.

Were this revolution one socially or economically desirable we could understand its having been sanctioned, but it simply means social convulsion and economic ruin to the provinces. Who shall arise to reverse the wrong? And when do our contemporaries mean to look into it?

We have replied not without some pardonable but unintentional warmth to our correspondent's statement, that we say "nothing about tenures." We protest to Mr. Elliott—who is in a very influential position, a position which no one, moreover, in the country is more qualified to fill—that this modern practice in the North-West of raising the so-called proprietor's share in the rental from one-third to one-half the assets, to the loss and damage of the State, is an injustice and a wrong. Mr. Elliott himself tells us in his interesting letter, that the actual rent-roll of the Provinces is £10,000,000 sterling a year. Well, we should be well content with £10,000,000 sterling as the issue of all our criticism; and we know very well that under native rule a very mild percentage of this sum would have been accorded to private proprietary rights. Where our native predecessors would have taken £10,000,000 sterling, less a mild percentage for collection or for doubtful proprietary rights, we, it is allowed, have been taking only £4,000,000. It will soon be a four and half millions however; and if all the districts were liable to re-settlement, would be five millions. Four millions and half, then, are all we are to expect from the land of the North-West Provinces for 30 years to *come*, where our predecessors would have been taking ten. So that in the face of our enormous expenditure upon irrigation and railways in the Provinces, past and prospective, the rent receivable by the State in the year 1900 is to be about what it was in 1840. So great a revolution in the condition of the people has taken place already, while we are but half way through the period, as to be without parallel, and the gross produce of the land upon the most moderate computation has risen 40 per cent. in value: still the assessment cannot be raised. We put the case thus, because in the absence of exact statistics, it is in this way only that we can *demonstrate* the fact we are insisting upon, that the land is under-assessed. It is only right to add that our correspondent does not conceal that he does some injustice to his own convictions by his letter. There is no violation of confidence in our saying that he tells us in private communications that our strictures were really needed, and that our settlement officers were undoubtedly drifting into under-assessment from the fear that higher ones would break down.

It would be easy for us to go through the letter step by step and reply to it, but in the absence of statistics that are reliable it would serve no good purpose, and we have no desire for a mere argumentative victory any more than Mr. Elliott. His letters are very valuable and welcome, and we rejoice to know that he, at all events, is alive to the wisdom and necessity of our resisting the further efforts of a school who, by their tampering with the revenue, have brought upon us all our present embarrassments. To check this evil is all we write for.

What Mr. Elliott says concerning the fund from which the rent comes is of course true; but it does not help us in this controversy. The fund will vary in amount according to the value of the harvest, and it is this question of *value* that is in dispute. We are satisfied that Mr. Elliott's estimate is too low, and the tax-fund from which the rent comes considerably higher than he supposes. The harvest consists in the main of food for man and fodder for beast, and we believe that his estimates of both are too low, but in the absence of exact information we can only fall back upon such general demonstrations as we have given above.

Before leaving this subject of produce however, and the consumption of food by the people, we may observe that Mr. Elliott seems to have forgotten, and we had ourselves overlooked, his own elaborate account some years ago of the style of living, and the value of fodder in the Central Provinces. In his Settlement Report of the Hoshungabad district, he tells us (para 84) "that the cultivator or laborer generally "eats three times a day, and that a seer of rice or wheat flour, "or one and a quarter seers of jowar, are reckoned the average "food of a hard-working able-bodied man."

As a seer of flour is equivalent to 2⅔ lbs. of grain, Mr. Elliott's estimate of the average consumption of the Central Provinces corroborates Captain Forsyth's. Is the standard of living lower in the North-West than in Central India? In spite of the finer *physique* of the people, we are half disposed to believe that it must be so. Upon the whole, we are disposed still to maintain that our estimate of the food-crop of the Provinces at 2 lbs. per head per day, including therein the consumption by cattle, cannot be safely lowered. Mr. Elliott himself tells us in the Report already quoted, that "the cultivator who owns four "bullocks has, on an average, two or three cows and a buffalo "also, and that the bullocks will get half a seer of *ulsi* or *teora* "a day for two months." Again (para 50) that "almost every "cultivator has at least one buffalo, and many have more; "large cultivators owning often eight or ten buffaloes. They "calve in July or August and remain in milk for six months; "those that do not calve again next year, give milk for a whole "year. The buffaloes are very well fed, and as long as they "are in milk their owner will grudge them nothing. A seer of "*binola* and a seer of oil-cake or *ulsi* are commonly given as a "daily ration, and in the cold weather the cultivator regularly "cuts a large basketful of leaves of the *ber* for his buffalo. *In old* "*times he sold the ghee: now that he is rich he eats it.*"

We suppose that this is a fair description of the farmer's management in the North-West as well as in these Provinces; and that there also, as the cultivator has become rich of late years, he himself consumes what formerly he sold. Surely, however, we must include such fodder in our estimate of the produce of the land. Under the undue dominance of such views as are expressed in his letter, Mr. Elliott excluded from his estimate of the produce in Hoshungabad the fodder-crops of *kurbi*, "*bhoosa*, and cotton seed, on the ground that they were all con-

cially in a matter connected with the mineral resources of Southern India, as we are very busy in a quiet way exploring several districts with the assistance of the Board of Revenue and the collectors, assistant collectors, and officers of the Engineers and Department of Public Works. The first thing that has struck me is the great abundance of the metals, with sandstones, shales, and limestones; next the enormous quantities of porcelain materials, colored clays, and substances useful for pottery. These we have been attempting to utilize for many years, and I hope that ere long we shall be able to disseminate a good deal of practical knowledge in the manufacture of good kinds of stoneware, glazed pottery, building, draining, and ventilating materials, and articles suited for culinary, domestic, and sanitary purposes. The materials for making, glazing, and coloring these are to be found in almost every district in Southern India, but the great want for utilizing them is the discovery of coal, and to this our attention has been directed for some eight years past, and with better success than I at first anticipated.

"Colonel Haig has found coal in extensive beds on the Tal river and the Godavery. Colonel Applegath is boring for coal on the banks of the Kistna, and has come to very good indications. Black limestone, grey shale (like the pins of our Scotch coal fields), sandstones with soft slates, and impressions of plants very like those of the Burdwan and Talcheer coal strata. Mr. Boswell has found better indications, I think, of the same coal field, further up the Kistna and in the Palnad, Guntoor, and Datchpilly talooks. The same beds appear to extend into the Guntoor, Nellore, and Cuddapah districts, where they are accompanied by all the proper mineral and metallic indications of coal, and now that attention is being drawn to the subject, the proper fossils and sandstones are turning up not only in these districts, but in several others where we had very little expectation of finding them. I will enumerate all these. I have been getting minerals sent to the School of Arts for the last fifteen years in very large quantities by carts, steamers, ships, the railway, and canals, often in twenty to thirty tons at a time, and usually accompanied by a few baskets-full of the stones, clays, metals or minerals which occur in the immediate vicinity. This has given me opportunities for ascertaining a good deal about the mineral and metallic wealth of Southern India. I will tell you more about the metals hereafter, if you and some of your friends, the superintendents of divisions in the Mysore territories, will kindly try to assist us, which they can easily do at a very trifling expense, through some of the native subordinates. The latter seem in general to be well acquainted with all the metals of their districts, and they can soon collect samples of them with the assistance of a couple of coolies, a pickaxe, hammer, and mommatie.

"In this letter, however, I will keep to coal and its indications, telling you where search ought to be made, and in what districts, and amongst what strata. Now-a-days it is universally admitted that coal is far more widely disseminated than was thought to be the case about thirty years ago, and that it is not confined to the true carboniferous strata, though it is always amongst them that the thickest and richest seams occur, but almost invariably at great depths. I must classify these suggestions under the three heads of the—

1. Geological indications of coal.
2. Mineralogical ditto.
3. Miner's and coal-viewer's indications.

"It is a melancholy fact that there are still great disputes between men of science and miners and mineralogists, about what are the best indications of coal. I will give you these concisely. The geological indications of the best qualities of coal, viz, the *buthracite*, or jetty coal, stone or cannes coal, and rich bituminous coal, are trap or basaltic rocks alternating with sandstones, soft or hard slates, shales, millstone grits, magnesian limes, or tuffacious limes, and white and yellow ochrey clays. These strata usually rest upon gneiss mica schists, rolled pebbles of jasper, quartzite, and the debris of granite rocks or those of primitive formation; and as soon as the older solid granites are reached, it is thought unnecessary to make further search for coal. Amongst the slates, shales, and sandstones of the true coal formations, there are usually found vast deposits of vegetable remains; plants resembling tree ferns, club mosses of a large size, and smaller plants of genera nearly all now extinct, though their representatives are still to be found in tropical climates. The shells and the crustacea which occur amongst the true coal formations also belong to genera and species a good many of which are now extinct. Besides the true coal formations, there are others which bear coal beds, as the new red sandstone or tria deposits just above coal, the magnesian limestone or dolomites, and the lias oolite, cretaceous and tertiary deposits; but the beds of coal found in these, although often very extensive, are seldom so thick, or of such good quality, as the first series which is most developed in England, Scotland, Ireland, and North America. The other series, as the trias, oolitic, and dolomitic coals are extensively deposited in France, Germany, Austria, Hungary, parts of Russia, and North America. The indications which accompany them are extensive deposits of sandstones, bones, or whetstones, soft grits, clays, lithomarge, and sand with gypsum and fossil trees on the surface, usually more allied to the dicotyledonous, or branching trees, now existing. The shells are both of fresh-water lacustrine or brackish water, and sea shells, often of a gigantic size, as amongst the cretaceous and greensand formations, which often rest upon the lias, oolite, dolomite, and new red-sandstone (called also trias or jurapic).

"Now it is with this series that we are most likely to find coal at first in Southern India, as these deposits occur in very extensive beds, and are often accompanied by the remains of gigantic animals. The tertiary and sedimentary deposits often contain coal, but usually of an imperfect kind, as lignite and thin beds of bituminous shale. The geological indications of this class are chiefly soft sandstones, gravel, rolled pieces of quartz, and concretionary lime with fossil trees occasionally converted into stone in the centre, and encrusted with a thin layer of black lignite which burns feebly. The mineralogical and metalliferous indications of coal are usually gneiss-pegmatite, or some stratified form of recent granite in fine crystals resting upon mica schists, slates, and quartzite, or upon the older granites in large crystals. These form the bed upon which coal deposits rest, and it is supposed that they mark the lower limits of the transition formations which correspond with the period of the Noachian Deluge. Above these strata occur enormous deposits of sandstone, mica slates, shales, fire clays, and strata containing salt, sulphurets of the metals, lead, antimony, copper, manganese, and iron, sulphates of lime, barytes, &c., showing almost incontestibly that salt-water coming into contact with melted rocks and metals, was one of the great chemical agents which assisted in the production of coal deposits.

"The miner's or coal-viewer's indications are entirely different from the above. He is guided in his search partly by the general features and scenery of the country, with a few indications of a practically useful nature. These are the result of a long series of investigations that are now reduced by practice into a working system which has probably been of more practical value than the geological researches. The miner starts by saying that the best deposits of coal are usually in flat, level, rich alluvial countries, often with miles of black loamy carbonaceous soil on the surface, low undulating hills usually of sandstone alternating with ironstones, nodular lime, and thick beds of clay, these usually rest upon grits, compact, slaty limestones, and band iron. If the slaty limestones are magnesian there will probably be no fossils, as this substance is very destructive both to animal and vegetable life. If band iron and flinty slates and shales alternate, the coal will probably be of fine quality, and in frequently repeated strata. If whetstones and magnesian limestones occur above the coal, it will also be of good quality, but it may occur at great depths, as in Lancashire and about Newcastle, where shafts have been sunk to 1,800 feet, but the coal at this depth is always of very fine quality. There are a few other indications which the miner considers to be almost invariably good, as the occurrence of galena or sulphuret of lead, sulphurets of iron and copper, thin deposits of manganese and beds of granular, white, black or grey limestone, cropping out upon fine-grained sandstone, or gneiss, on the sides of low undulating hills backed by precipitous bluff, basaltic, or trap dykes with tufaceous lime. Petrifying springs with travertine and encrusting concretionary lime almost invariably occur within a few miles of coal fields, but not above coal. They usually mark the vicinity of transition lime and carboniferous strata, the carbonic acid from which makes the lime more soluble. There are seventeen or more instances of this in Great Britian and Ireland.

"In my next I will give you the result of our practical applications of these indications of coal to the Madras Presidency. Some of them are very encouraging."—*Madras Mail.*

COAL AND THE GEOLOGICAL DEPARTMENT.

WE have been requested by Dr. Hunter, the Superintendent of the local School of Arts, to give insertion to the following letter:—

"As the best answer to the letter of Mr. Bruce Foote which appeared in your issue of the 8th instant, trying to throw ridicule upon Captain Newbold, Colonel Applegath, myself, and others who have been searching quietly for coal, will be a statement of a few important facts which have lately come to light, I shall be glad if you can find room for the insertion of the accompanying letter in your issue of this evening, and also of the accompanying copy of a letter to the Secretary of the Board of Revenue on a similar subject.

"I differ entirely with some of the members of the Geological Survey who have been lately exploring in the Madras Presidency in two or three points, and I think it of great importance that the public should hear both sides of the question. In the first place, Mr. King, Mr. Bruce Foote, and the late Mr. Oldham, seem perfectly to ignore the importance of all mineralogical and metallic indications of coal, and in my opinion they

attach far too much importance to mere geological and fossiliferous indications. I do not deny the importance of these, if we had at our command the means for thoroughly searching the different strata by borings or deep excavations, but as yet I have not heard of a single boring having been made by the department in the Madras Presidency. In the second place the metallic and mineral indications which have for some time past been sent to the School of Arts have also been accompanied by sandstones, iron ores, black, grey, and carboniferous limestones, shales, and slates, all of which, with a few other indications of both marine and fluiatile deposits, and the frequent occurrence of petrifying and chalybeate springs, point to the probability of the occurrence of coal. I have found by practical experience that the samples of minerals, metals, fossils, and other strata, which accompany coal when distributed through districts where similar substances occur, speak far more quickly both to the European and Native officials and subordinates of a district, than more written or illustrated descriptions; so I have adopted this as a simple and practical method of getting at the mineralogy, the metals, and the geology of Southern India. I have to return most sincere thanks to a number of friends, both in this country, and to scientific and old Indian friends at home, who are quietly and unostentatiously helping us to try to find coal. I will give you full particulars of what has been going on in this way for some years past, as it is but fair to friends and the public, that this information should be made known.

"If Mr. Bruce Foote and Mr. King think that the subject is one of such trifling importance as to be put a stop to by ridicule and pointed personalities, I decline entering into any controversy with them on subjects of this kind. I have visited most of the coal-fields of England, Scotland and India, and have collected the strata minerals, metals, and fossils which occur in these coal-fields, and have distributed specimens widely in Southern India in the belief that this is a practical way of searching for coal. The public can judge for themselves whether it is so or not. Coal and coaly deposits are turning up in places where they were not expected."

To the Secretary Board of Revenue.

SIR,—I have the honor to request you will do me the favor to forward the accompanying minerals to Mr. Charles Minchin, Agent to H. H. The Maharajah of Vizianagrum.

2. I have received on several occasions from the vicinity of Vizianagrum and Vizagapatam some important minerals useful in aristic and industrial manufactures; as well as three or four others also of an important kind, which lead me to expect that there will be found large deposits of useful metals and perhaps deposits of coal. As the latter would be of immense value to the coasting trade of this Presidency, I will point out where the search for coal ought to commence.

3. I have received from the Vizagapatam district, and I believe from the vicinity of the Punnigherry waterfall, specimens of incrusting concretionary lime, evidently from a petrifying spring, and from the same vicinity sandstones, iron ores, and clay iron stone conglomerates. Now, as these are minerals which almost invariably accompany coal in other parts of the world, I think it not at all improbable that coal may be found between Vizagapatam and Vizianagrum, as there are evidences in this vicinity of the upheaving of the old granite hills, and of the formation of sandstone and iron deposits resembling those on the borders of coal fields. The occurrence of iron, manganese, copper, lead, and antimony in very large quantities, along with soft sandstones, plumbago, or carburet of iron, and plumpudding stone conglomerates, all point to this locality as one where the transition rocks have burst through the old coarse granites and the finer grained gneiss or more recent granites, and I believe that if proper search were made in this vicinity it might lead to the discovery of coal.

4. It is now acknowledged by Sir R. Murchison, Sir W. Mitchell, and other mineralogists, that wherever these combinations af metallic deposits occur, along with sandstones, micaschists, decayed granites or trap rocks, there search ought to be commenced for coal, as these are the mineralogical and metallic proofs of the existence of the commencement of transition or secondary formations in the vicinity of which the best kinds of true coal occur.

5. Coal deposits occur at no very great distance from Vizagapatam on the Godavery, and I have lately received good evidence of the occurrence of coal from several other localities on the Coast. A box of coal with the accompanying fossils and mineral deposits is daily expected from Cuttack. Sandstones, shales, and clay ironstone deposits with bandiron ore have been received from Rumbah and Gopaulpore, at the southern extremity of the Chilka Lake. Some very interesting fossils of the oolite and lias deposits have been found at Rajahmundry both by Col. Applegath and Major Mullins, and as coal of different qualities accompanies deposits of these periods (now called jurassic) there is no reason why extensive beds of coal may not be found in this and several localities in Madras where jurassic fossils occur.

6. May I request that a copy of this letter be sent to Mr. Charles Minchin, with the accompanying metals, minerals, and limestones.

Your most obdt. servant,

10th February 1871. ALEX. HUNTER.

PUBLIC WORKS—RAILWAY.

THE GAUGE OF THE FUTURE.

AT the meeting of the British Association in Liverpool, Mr. R. F. Fairlie, C.E., read an able paper on "The Gauge of the Railways of the Future," much of which had special reference to India. Having shown that in England the competition between the companies leads them often to despatch goods, whether the loads be paying loads or not, and that whatever explanation may be made of the small proportion of paying to non-paying loads, the fact must in any case tell in favour of the narrow gauge, Mr. Fairlie shows that a 3 feet gauge line can carry, without an additional shilling for haulage, 2½ times as many tons as are now carried over the 4 feet 8½ inch gauge. He then goes on:—

In India the competition between companies does not exist, and it is possible to detain goods at stations until a maximum quantity is obtained for transport. Time is there of little importance, and hence it has been urged that under such circumstances a large gauge and large waggons are the best, in order that it may be practicable to run a small number of heavy trains per day. It is impossible to conceive an argument more fallacious than this; and its employment has saddled India with the commencement of a system of railways extravagantly beyond the requirements of the country for the next hundred years, or even for over. Whence, then, arises the necessity for constructing the Indian railways on a 5 feet 6 inch gauge?

Taking the case of the East India Railway as being the North-Western of India, let us see how the absence of competition and the 5 feet 6 inch gauge affect the question of transport. The number of net tons hauled over the line for the year ending 1869 was 938,629, in 32,490 trains—amounting to about 29 tons per train. The average number of waggons composing a train is taken at 25, of 6 tons each; which gives 150 tons of train to 29 tons of freight, or a proportion of over 5 tons of dead to 1 ton of paying load, it will be seen that, notwithstanding the absence of competition, and with everything to favour the working of the line, the actual dead weight is over 5 tons to 1 ton. If, on the other hand, the gauge had been 3 feet instead of 5 feet 6 inches, the dead weight, under the same management, would have been reduced from 5 to 1, to 1¼ to 1. Let us imagine the saving that this change would effect in fuel alone; considering that less than one-fourth of the tonnage now hauled would afford precisely the same accommodation to the traffic that now exists, and would produce the same paying result. It surely does not require a philosopher to see that the narrow gauge is infinitely superior in every respect even to the 4 feet 8½ inch gauge, and it ought to be engraved on the mind of every engineer that every inch added to the width of a gauge beyond what is absolutely necessary for the traffic adds to the cost of construction, increases the proportion of dead weight, increases the cost of working, and in consequence increases the tariffs to the public, and by so much reduces the useful effect of the railway.

The present railways in India, although doubtless valuable for military purposes have cost about £20,000 per mile [nearer £25,000 ED. *I. E.*] The average rate per ton paid on the East Indian Railway is 2¼d. per ton per mile. How different would the results have been, even now, if the lines had cost £5,000 instead of £20,000 per mile, and if the tariff of rates had been ½d. per ton per mile instead of 2¼d.!

In January last, my presence was hurriedly required in St. Petersburgh by the Russian Minister of Public Works, with reference to the subject of the Fairlie system of railways. His Excellency the Minister required me to give a short distinct account of the advantages claimed for my system. I replied that by the adoption of that system, railways could be made at a cost of little over one-half the sum required to construct them on the ordinary plan, so that it would be possible to give nearly two miles for the sum now expended upon one; that these lines, when finished and equipped would possess a carrying capacity equal to, if not greater than, that of those on the old system. In other words, they should be capable of carrying as many passengers and tons of goods in twenty-four hours as the best lines now existing; and that this should be done at a reduced cost, independently of the reduced wear and tear of the permanent way, and of the value of the increased line of rails. His Excellency observed, that if only a portion of this could be accomplished, it would be a great thing for Russia, and that the matter should be at once inquired into. Not many days elapsed before an Imperial Commission, composed of a number of the most scientific men in Russia, and presided over by His Ex-

cellency the Count Alexis Bobrinskoy, private attaché to his Imperial Majesty the Emperor, was instructed to come to this country and to investigate the correctness of what I had asserted. Early in February the Commission arrived in London, and after a thorough examination of the question in all its theoretical bearings, it was resolved to put it to some practical tests. The Council of India, the Board of Trade, Norway, France, and other countries sent their representative men to be present on the occasion, as it was felt that what was good for Russia would be equally good for the countries I have mentioned.

The Commission returned to Russia, and sent in its report to the effect that I had fully proved the correctness of all my assertions. This was in March; and in April a railway of fifty versts, on the new system, was ordered by His Majesty the Emperor to be constructed, and to be opened in November next. The locomotives for this railway may be seen any day during the next month at the establishment of Messrs. Sharp, Stewart, & Co., Manchester. The new system has also been adopted for working some of the old lines, and the stock for the Tamboff Saratoff Railway, the Great Russian, and others, may be seen under construction at the same establishment.

The members of the Council of India were so struck with the many advantages of the system that they forwarded copies of the reports of the experiments above described to the several Indian railway companies both at home and in India. They also forwarded copies to the Governor-General and the Public Works Departments in India; many of the companies invited their engineer to examine and report on the question raised, and with one or two honourable exceptions,* these reports are unanimous in their opposition to any improvement, or to any interference with the system under which the writers have lived, and moved, and had their being; but in only one of them is there any argument that requires a moment's notice.

PUBLIC WORKS—IRRIGATION.

CENTRAL PROVINCES.—LAKES AND TANKS.

NEXT to the boundless forests and the bold mountain scenery, there is perhaps nothing which strikes the traveller in the Central Provinces so much as their large and numerous tanks. In one part they are so numerous, that the country has been aptly been called the Lake Region. These sheets of water are of three kinds. There are first the natural lakes like that at Saugor, and the Booragurh Tal on the road between Jubbulpore and Gosulpore. Then there are the tanks in the flat country. These are not generally the well-formed excavations which are to be met chiefly in Hindoostan, although there are many of those square well-sloped tanks even in the Central Provinces. But more commonly the tanks in the low lands of the Central Provinces are formed by raising a long low dam across a declining plain. Their centres are excavated into which a stream is turned if there is one in the neighbourhood, and the reservoir is also fed by the fall of rain on its own slope. A large sheet of water is formed by the close of the rains, not of considerable depth, but rather over the greater portion of the surface, somewhat shallow; still it is of service in the irrigation of rice fields. After the rice crop is cut, the water which may be left in the reservoir, is let out by a sluice cut in the dam, and a crop of wheat is raised in the bed. The Rewah country to the north of Jubbulpore, abounds in these tanks, so does the district of Bhundara. We hardly know of any better method of raising dry crops in these provinces or elsewhere. It puts the agriculturist almost in a position of independence, for his wheat is a clear profit to him. It may be said to have its great disadvantage also in a year in which the rain-fall may be short; for then both the rice and wheat crops suffer. But it is necessary to note here that droughts are not of frequent occurrence in these provinces; indeed there have been more famines from excessive or untimely rain and hail than from drought; and time has given its approval to the system of tank cultivation.

We come now to the other large artificial tanks and lakes in the provinces, formed by throwing a dam across a valley so as to form a basin for the drainage from the hills. Here, wrote Sir Richard Temple, is not a piece of water with regular banks, crowned with rows or avenues of trees, with an artificial dyke and sluices, and with fields around it, but it is an irregular expanse of water; its banks are formed by rugged hills covered with low forests that fringe the water, where wild beasts repair to drink; its dykes, mainly shaped out of spurs from the hills, are thrown athwart the hollows, a part only being formed by masonry; its sluices often consist of chasms or fissures in the rocks: its broad surface is often, as the monsoon approaches, lashed into surging waves. A description from even so able a pen fails to convey the impression which is formed on seeing one of these basins. The great ages of most of them add interest to them. Some were constructed upwards of five hundred years ago. Many have fallen completely out of repair. The masonry debris of others in the wild fastnesses of the hill regions, tell their own tale of energy and agricultural prosperity hundreds of years ago where now there is nothing but forests and wild beasts. But, whether in repair or in ruins, they all signify that lakes and tanks have played no small part in the administration of the country during the earlier dynasties. The effect of this can be seen to this day in whole districts which, compared to the North-West, for instance, may be said to be devoid of wells. Even for drinking purposes, the people in many parts depend on tanks, into the waters of which cattle are allowed to go and wallow. Many of these lakes and tanks have their fairy legions associated with them.

But it is not in the interior alone that these monuments of the past are to be found. If not so large, or useful as the reservoirs in the vallies and plains, the Juma, Aurbajhirri, and Pelingkheri tanks at Nagpore, that at Seoni and the Hunnooman Tal at Jubbulpore, are still extraordinary works of which even a scientific age and a highly civilized government may be proud. It is impossible to take an account of what has been done in the way of providing water-supply by native dynasties in the country now known as the Central Provinces, without being convinced that one great duty of the government of the day is to reclaim the really useful works of the past, before attempting to project new ones. If we can by cleaning out old tanks, removing their silt and repairing their banks, contribute towards a sufficient supply of good water, we shall confer a real blessing on the people; we shall secure their gratitude; and prove to them that, fully appreciating one good feature of native government, we wish to vie with past dynasties by giving to the people the two absolute necessaries of life—pure air and water; and that rather than attempt to stamp out the virtues of the past by introducing new projects, we wish to revive byegone memories, by rescuing from further decay all the important works from which their ancestors derived benefit. It is not to be doubted, that if the people found us heart and soul in this object, they would aid the British even more cordially than they do now, in the work of improved government.—*Jubbulpore Chronicle.*

DEVELOPMENT OF COMMERCIAL RELATIONS BETWEEN RUSSIA AND INDIA THROUGH THE SUEZ CANAL.

(Continued from our last.)

THE prices of coffee were as follows in 1869:—

AT ST. PETERSBURG—

Best	R. 13-75 to R. 17	per pood,	113s. 8d. to 140s. 9d.	per cwt
Middling .	„ 12-75 to „ 13-75	„	105s. 5d. to 113s. 8d.	„
Ordinary...	„ 11-50 to „ 12-75	„	90s. 2d. to 105s. 5d.	„

AT MOSCOW—

Round.....	R. 14 to R. 15-15	per pood,	115s. 10d. to 120s.	per cwt.
Inferior...	„ 12-50 to „ 13-70	„	93s. 5d. to 113s. 7d.	„

AT ODESSA—

Ceylon.....	R. 10-75 to R. 11	per pood	89s. to 91s.	per cwt.
Inferior ...	„ 8 to „ 9	„	66s. 2d. to 74s. 6d.	„

Ceylon coffee, of which the excellent quality is well known in Russia, will probably come into Russia in large quantities by the Suez route.

5. *Sago.*—Sago is but little used in Russia. Its average price in Russia is R. 8-30 per pood (68s. 8d. per cwt.) The import duty is R. 1 per pood (9s. 9d. per cwt. at par.)

6. *Spices.*—The most important of these in the Russian trade are pepper, cloves, cinnamon, cardamoms, nutmegs, mace, ginger, &c. (*Vide* Table A. for quantities imported.) The prices were as follows in 1869:—

AT ST. PETERSBURG—

Pepper, black..	R. 7 to R. 7-60	per pood,	58s. to 63s.	per cwt.
Cardamoms.....	„ 120 to 130	„	£49-18 to £53-15	„
Cloves.....	„ 7	„	58s.	„
Clove heads.....	„ 6 to 7	„	49s. 8d. to 58s.	„
Nutmegs.....	„ 28	„	£11-11-8s.	„
Mace	„ 26	„	182s.	„

AT ODESSA—

Pepper.....	R. 7-20 to R. 7-80	per pood,	59s. 8d. to 60s. 6d.	per cwt.
Clove heads....	„ 5	„	41s. 5d.	„
Cinnamon.....	„ 22	„	182s.	„

* It is most gratifying to find that one at least, if not more, of the home engineers for the Indian railways, after a patient and careful investigation of the new system, has decided in favour of it. It appears after the second series of ...ts with the "Little Wonder," the "Mountaineer," and the "Progress" ...ne, a committee, composed of Colonel Strachey, R.E., Colonel Dickens, ...E., Mr. John Fowler, C.E., and Mr. A. M. Rendall, engineer of the East ...lway, was appointed to consider the question of the applicability of ...ge for India, and I understand that Mr. Rendall has joined ...lonel Strachey and Colonel Dickens in recommending 3 feet 9 inches as the most suitable gauge, whilst Mr. Fowler alone goes in for the 3 feet 6 inch gauge. This split in the scientifics will no doubt give to India the 3 feet gauge. I have long held this gauge to be the best for that country or any other with a similar climate, because this gauge gives ample ac... ...gers, to the extent of three first-class, four t... ...seat, and is space for the conveyance of all war ... ...merchandise such as cotton, with a maximum speed of

The duties charged on this importation into Russia are as follows:—

Cardamoms, mace, nutmegs, and cinnamon	...	..R 250 per pood	24s. 7d. per cwt.
Cloves, pepper, ginger, &c.	.. „	1-50 „	14s. 8d. „

7. *Silk.*—Russia imports only the higher qualities of raw and spun silk. She draws the bulk of her supplies of raw silk from the Caucasus and from Central Asia. Its importation from China and Japan is not expected to increase much. Mr. Skalkoffsky considers that about 6,000 poods (1,930 cwt.) may be annually brought to Russia by Suez Canal at a cost of £20 per ton. The prices of Chinese silk were as follows at Moscow:—

Floss	... R. 290 to R.	360 per pood	£120 to £149 per cwt
Organzine	... 450 to ... 570 „	...	£186 to £ 236 „

The import duties in Russia on silk are as follows:—

Silk, raw and waste	... ...	50c per pood	4s. 11½d. per cwt. ¶
„ twist, traim, organzine	R. 5 „	...	49s. 1d. „ ...
„ yarn of silk waste	... „	4-50 „ ...	44s. 1d. „ ...

8. *Tin.*—The quantity of tin imported into Russia is small. England supplies almost half the quantity. The prices of tin in 1869 were as follows:—

At St. Petersburg—

Tin in blocks, R. 18 to R 19 per pood, £7-9-0 to £8-17-0 per cwt.
„ bars (rods). 16 to 17-50 „ 6-12-5 to 7-4-10

At Odessa—

Tin in bars...R. 20 to R. 21 per pood, £8-5-6 to £8-13-9 per cwt.

The price of tin is rising in Russia. The duty charged on importation is 20 copecks per pood, or 1s. 11½d. per cwt., at the par rate of exchange.

9. The prices of gum and drugs in Russia in 1869 were as follows:—

At St. Petersburg—

Common incense storax	R. 8 to	R. 14 per pood,	66s. 2d. to £1-15s 10d.
Gum benzoine	...R. 40 to 90 „		£16-11-0 to £37-4-9 „
„ Ammoniac.	„ 8 „		66s. 2d. „
„ Arabic.	..... „ 9 to 13 „		74s. 5d. to 107s 6d. „
Gamboge	..... „ 55 to 78 „		£22-15-3 to 32-5s -0
Copal	..... „ 9 to 10 „		74s. 5d. to 82s. 9d.
Shellac	..... „ 12 to 15-50 „		89s. 3d. to 128s. 4d
Catechu	..... „ 5-50 „		45s. 7d.
Kino	..... „ 3 „		24s. 9d.
Gallnuts	..... „ 13-50 to 15 „		111s. 8d. to 124s. 2d.
Camphor	... . „ 20-50 to 23-50		169s. 8d. to 194s. 5d.
Turmeric	..... „ 4 „		33s. 1d

The import duties to which the above goods are liable are as follows:—

Gums, resins	..... 30c.	per pood,	2s. 11½d.	per cwt**
Storax	..... R. 1	„	9s. 9d.	„
Gum, benzoin	..... „ 4	„	39s. 2d.	„
Gamboge	... . „ 1-10	„	10s. 9d.	
Gallnuts	..... „ 5	„	6d.	
Camphor	..... „ 30	„	2s. 11½d.	
Turmeric	..... „ 5	„	6d.	
Shellac	..... „ 30	„	2s. 11½d.	
Catechu, Kino free				

10. *Tea.*—Mr. Skalkoffsky advises the merchants of Russia to send their tea to Odessa direct from Shanghai by way of the Suez Canal. By the overland route through Mongolia, the tea of China takes 14 months, to reach the fair of Nijni Novgorod, whereas by the Suez route it could come in 60 to 65 days from China. The sea-borne tea which at present enters Russia is principally shipped from London. Mr. Skalkoffsky does not think that much East Indian tea will enter Russia, where it is almost unknown.

The cost of carriage from Foochoo to Suez is about 95c. per pood (7s. 10d. per cwt.) and that from Suez to Odessa 30 copecks per pood (2s. 6d. per cwt.)

The expense of carrying tea from Odessa to Moscow, inclusive of all charges for commissions, &c., is about R. 1-30 per pood (10s. 9d. per cwt.) Consequently, the cost of the tea shipped to Odessa from Shanghai is increased by R. 2-53 per pood. (21s. per cwt.) On the other hand, the cost of carrying it to Moscow by way of Kiakhta is R. 8-80 to R. 12 per pood (£3-12-9 to £5 per cwt.), or 22 copecks to 30 copecks per Russian lb. (8½ to 10½d. per lb. avoir.) more than by Suez, independently of the great loss of time by the former route.

By way of the Cape, the present cost of carrying tea is as follows:—

Freight Shanghai to London,		£6 to £8	per ton.
„ London to St. Petersburg,		30s.	„
„ St. Petersburg to Moscow,		50c. per pood,	83s. 4d. per ton.*
	Total cost	R. 2-40 „	£19-16-8 „

The prices of tea were as follows in 1869:—

At St. Petersburg—

Black Congou,	75c. to 100c.	per lb.	2s.2d. to 2s. 11½d. per lb. avoir.
„ Souchong,	95c. to 100c.	„	2s.10d. to 2s. 11d. „
Flowery Pekoe,	150c. to 200c.	„	4s. 5d. to 5s. 11d. „

At Moscow—

Canton (sea-borne) tea, 85c. to R. 1 per lb., 2s. 6d. to 2s. 11½d. per lb.

At Odessa—

Tea, 1st sort...	160c. to 200c.	per lb.	4s. 8½d. to 5s. 11d. per lb.
„ 2nd „	120c.	„	3s. 6½d. „
„ 3rd „	100c.	„	2s. 11½d. „

The duty on tea, imported on the overland and maritime frontiers of Russia in Europe, is as follows:—

Flowery, green and yellow,	R 22	per pood,	or £10-16-3 per cwt†
Ordinary black & brick tea,	R. 15-40	„	or £7-11-3 „

Exports.—After passing in review the various articles of commerce that may be brought to Russia by the Suez Canal route, Mr. Skalkoffsky shows that Russia has but few goods to export to the far East wherewith to pay even for the indigo or coffee which she will import. Among the goods that might, perhaps, be to some extent exported, the following are mentioned:—

1. *Flour and biscuits.*—These find a market even now in Egypt and in the Red Sea. Flour might be exported to the East Indies, as well as maccaroni and vermicelli.

2. *Coals.*—The coal of the Dion basin, when reduced in price, which is at present 14 copecks per pood (1s. 3d. per cwt. at Odessa), might be carried even to Bombay, and sold there at the rate of 55 copecks per pood (4s. 7d. per cwt.)

3. *Meat, tallow, salt beef, butter.*—All these, Mr. Skalkoffsky thinks, might be exported with profit to Egypt, and even to the East Indies.

4. *Cattle and horses.*—There is a great demand for Russian cattle at Alexandria.

5. *Candles and soap.*—Mr. Skalkoffsky thinks that Russian soap and candles might compete in Egypt with similar French and Australian goods.

6. *Ice.*—Large quantities might be shipped to Egypt, the Red Sea, and the East Indies from the Sea of Azoff.

7. *Cordage.*—Russian cordage reaches the East Indies by way of Hamburg and England. If depots were established at Aden and Bombay, a large trade might be done.

8. *Timber.*—Much required in Egypt, Arabia, and on the shores of the Persian Gulf. Might be exported in large quantities in sailing vessels from Kherson, Taganrog and the Eastern Coast of the Black Sea.

9. *Kerosine* made in the south of Russia, might be exported to Egypt, where large quantities of American kerosine are now consumed. It may become an important article of commerce in the East Indies.

10. *Salt* might be exported to Calcutta from the coast of the Black Sea.

11. *Spirits.*—There is a considerable demand for spirits in Egypt, and Russia can well compete with the spirits distilled in Austria and the United States.

12. *Boots and shoes, clothes,* &c, might be sent to Egypt, and particularly for the army.

13. Brocades and embroidered leather, in great demand in Egypt, Arabia, and on the shores of the Red Sea.

14. Tar, canvas, tow, &c, will be in a great demand for ships navigating the canal.

15. Hardware, &c, copperware, cheap fire-arms, stirrups, bits, cast iron rods, knives, locks, brass coffee pots, dishes, &c., all cheaply made in Russia, would find a large market in the East

16. *Textiles.*—Mr. Skalkoffsky thinks it possible to send good cotton prints, &c., up the Suez Canal. He quotes the *Times* to show that English cotton goods have acquired a bad reputation in the East, and urges his countrymen to study the Asiatic taste in those goods. He gives no facts or figures in support of his opinion that Russian cotton goods can be exported to India &c., with profit. ‡

In summing up this part of his report, Mr. Skalkoffsky says that it would not as yet be safe to reckon upon more than 500,000 poods (about 8,000 tons) weight of Russian goods (irrespective of coal) that might be exported in return for cotton, indigo, &c. He thinks that at the utmost the value of the Russian exports by the Suez Canal would not amount to more than 1½ or 2 millions of roubles (£188,000 or £250,000.

In conclusion, Mr. Skalkoffsky enquires into the position and prospects of the Russian Steam Navigation Company in the Black Sea. He thinks that the Company (being subsidized by the Government) should not be guided by commercial considerations alone, and that it should not, by running steamers, pro-

‖ Now 24 per cent. less.
¶ At par; now 24 per cent. lower.
** These duties are calculated at the par exchange. They are now 24 per cent lower.
* This total does not agree in sterling with the previous item. Mr. Skalkoffsky has probably taken the par exchange in converting sterling into Russian money.

† At the par rate of exchange; now 24 per cent. lower.
‡ In 1867 the number of cotton-spinning and weaving manufactories in the Russian Empire was 485 and 586 respectively, the number of hands employed in those factories being about 97,000.
The value of the cotton goods manufactured in Russia was at the same period about 12 millions sterling.

mote the trade of ports in which Russia could have no interest, such as Bussorah and Kurrachee. It should not look so much to the quantity of goods which it carries as to the duty of extending Russian trade in Egypt on the shores of the Red Sea and in the East Indies. The Company, he urges, should maintain six steamers (and one in reserve) on the line between Odessa and Bombay. These steamers should not carry Manchester goods, which penetrate into Central Asia and compete with Russian cotton carried there at great cost, nor should they visit Bussorah and Kurrachee, which compete with Russian wools, linseed, &c. Calcutta, Colombo, Penang, and Batavia are not as yet of sufficient importance to Russian trade and navigation to warrant any Government aid in the establishment of a line of Russian steamers.

Mr. Skalkoftsky terminates his reports by recommending the adoption of the following measures in addition to the establishment of a line of steamers to Bombay:—

1. The reduction of port charges and transit dues.
2. The improvement of the navigation of the Sea of Azof, which is not, according to Mr. Skalkoffsky, included in the stipulations of the Treaty of Paris, and which should, therefore, he thinks, give shelter to Russian vessels-of-war.
3. The establishment of bonded warehouses at Kief and Kharkof.
4. Reforms in the excise laws, which would admit of Russian spirits being exported with greater advantage.
5. A re-arrangement of the rates of coinage, and the classification of goods on Russian railways.
6. The establishment of Russian branch banks at Bombay and Shanghai.
7. The laying of a sub-marine cable between Odessa and Constantinople.
8. The immediate appointment of a Russian consul at Bombay. "He should be a sensible and energetic representative of the merchant class, or a naval officer."
9. A careful study of the trade of the far East.
10. A reduction of Customs duties on goods brought direct from the far East in Russian ships.

St. Petersburg, 1st August 1870.

THE PUBLIC REVENUE AND EXPENDITURE.

Revenue and Expenditure of the Government of India for the first *eight* months of the year 1870-71, as compared with the corresponding period of 1869-70.

Revenues and Receipts	April to Nov. 1869.	April to Nov. 1870.	Increase.	Decrease.
	£	£	£	£
Land Revenue	9,814,288	10,268,808(a)	454,520	...
Tributes, &c., from Native States	410,766	466,111	55,615	..
Forest	245,227	220,423	...	24,804
Excise on Spirits and Drugs	1,432,939	1,540,135	107,196	...
Assessed Taxes	534,809(b)	1,208,188(b)	673,379	...
Customs	1,479,478	1,655,726	176,248	.
Salt	3,591,625	3,928,828	337,193	..
Opium	5,212,739	5,209,879	...	2,860
Stamps	1,507,303	598,961	...	908,342
Mint	112,518	26,149	...	86,369
Post Office	[illegible]	[illegible]	161,077	...
Telegraph	117,206	169,81[illegible]	[illegible]5	...
Law and Justice	613,397	1,550,019	936,622	.
Police	168,576	170,907	2,331	...
Marine	108,157	155,518	17,361	...
Education	52,169	40,207	...	11,962
Interest	233,884	208,753	...	25,131
Miscellaneous	537,747	104,945	...	132,802
Total	26,625,754	28,379,171	2,945,687	1,193,270
Army Miscellaneous	From April to Sept. only. 439,441	409,129	...	30,312
Public Works Ordinary. Miscellaneous Receipts	From April to Oct. only. 99,936	78,564	...	21,372
Public Works Ordinary. Railway Exchange, Gain.	274,457	92,785	...	1,81,672
Public Works Ordinary. State Railways Traffic Receipts	5	2,929	2,924	...
Do. Extraordinary do. Capital Account	...	2,843	2,843	...
Total Revenues	£27,439,593	28,965,421	2,951,454	1,425,626

Expenditure.	April to Nov. 1869.	April to Nov. 1870.	Increase.	Decrease.
	£	£	£	£
Interest on Funded and Unfunded Debt	1,795,589	1,850,740	55,142	...
Interest on Service Fund and other Accounts	372,878	335,820		37,058
Refund and Drawback	264,754*	223,560*	...	41,194
Land Revenue	1,495,208	1,490,993	...	4,235
Forest	182,110	251,593	69,483	...
Excise on Spirits and Drugs	135,483	216,868	71,385	...
Assessed Taxes	24,141	28,769	4,625	...
Customs	120,591	122,142	1,551	...
Salt	252,416	244,144	...	8,272
Opium	1,[illegible]	1,667,018	200,722	...
Stamps	68,044	38,694	...	29,350
Mint	57,665	39,931	...	17,734
Post Office	412,766	416,102	3,336	...
Telegraph	266,547	201,431	...	65,116
Administration	752,711	751,124	...	1,587
Minor Departments	140,045	128,682	...	11,363
Law and Justice	1,839,940	1,935,243	85,303	..
Police	1,583,668	1,482,707	...	100,941
Marine	284,722	250,654	...	34,068
Education	414,211	386,259	...	27,952
Ecclesiastical	105,571	100,459	...	5,112
Medical Services	293,860	315,924	22,064	..
Stationery and Printing	164,134	147,267	...	16,867
Political Agencies	261,995	169,456	...	92,539
Allowances, &c., under Treaties & Engagements	813,816	846,971	33,125	...
Miscellaneous	453,801	535,136	81,335	...
Superannuation, &c., Allowances	459,956	488,188	28,232	...
Total	14,502,793 From April to September only.	14,666,211	656,806	493,388
Army	6,239,570 From April to October only.	5,902,002	...	337,568
Public Works Ordinary. Public Works Railways Guaranteed.	3,345,541	1,985,406	...	1,360,188
Public Works Ordinary. Railway Exchange, Loss.	36,485	49,719	13,234	...
Public Works Ordinary. State Railways	198,115	84,195	...	13,920
Do. Extraordinary—Irrigation, &c.	...	4,212	4,212	...
State Railways	462,729	371,656	...	91,073
	10,696	126,234	9,538	...
Total Expenditure	£24,801,932	23,189,635	688,790	2,296,087

(a) Includes Irrigation receipts in the Public Works Department up to October only.

(b) Includes Income Tax realised in the Military Department up to September and in the Public Works Department up to October only.

* Includes Refunds in the Military Department up to September and in the Public Works Department up to October only.

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 31st day of January 1871.

Date.	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1870.							
15th December...	27,82,760	15,02,500	20,79,100	55,77,700	22,46,500	2,69,59,000	4,11,47,560
31st December...	27,12,550	14,75,060	20,22,000	54,09,300	22,61,000	2,71,76,000	4,10,55,910
1871.							
22nd January....	26,27,590	14,30,240	19,76,650	50,27,800	19,44,000	2,67,19,000	3,97,25,280
31st January....	26,16,440	14,33,420	20,05,600	51,92,500	19,16,500	3,07,19,000	4,38,83,460

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Retired by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
31st Dec., 1870....	Calcutta ..	3,62,55,580	1,08,440	3,61,47,140	1,21,52,456	35,08,488	3,12,495	1,42,42,231	3,02,15,670
Ditto ...	Madras	97,36,090	5,09,080	92,27,010	55,01,576	...	...	17,28,404	72,29,980
Ditto	Bombay	4,10,55,910	1,07,900	4,09,48,010	2,41,69,438	11,15,371	...	1,31,49,861	3,84,34,670
Ditto ...	Allahabad	80,09,060	35,50,470	44,58,590	68,32,699	...	...	11,03,291	79,35,990
Ditto ...	Lahore	47,19,010	24,77,500	22,41,510	39,40,263	...	...	7,00,037	46,40,300
Ditto ...	Calicut	16,45,550	7,46,840	8,98,710	13,54,551	...	...	1,00,059	14,54,610
Ditto ...	Trichinopoly	19,21,640	16,18,900	3,02,740	16,04,921	...	...	1,00,059	17,04,980
Ditto ...	Vizagapatam ...	5,36,980	1,61,220	3,75,760	3,28,651		...	1,00,059	4,28,710
Ditto ...	Nagpore	46,84,140	1,68,270	45,15,870	40,83,218	...	...	5,47,902	46,31,120
Ditto ...	Kurrachee	47,39,100	23,96,490	23,42,610	42,09,074	..	...	5,00,106	47,09,180
Ditto ...	Akola ...	21,35,260	73,360	20,61,900	21,34,640	...	...	...	21,34,640
	Total ...	11,54,38,320	1,19,18,470	10,35,19,850	6,63,11,487	46,23,859	3,12,495	3,22,72,009	10,35,19,850

SILVER received and coined in the MINTS OF CALCUTTA, MADRAS, and BOMBAY, 1869-70.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
July	1,201	2,722	9,30,351	...	3,594	...	88	1,03,558	26,51,675
August	66,565	2,020	...	...	644	..	...	43,631	11,23,536
September.....	39,122	3,28,445	...	...	...	...	40,524	49,655	3,28,585
October	8,487	2,12,373	...	...	8,903	...	8,241	1,09,243	1,53,625
November	520	59,349	...	...	3,806	...	1,44,504	92,117	...
December	2,600	1,81,929	...	...	...	...	...	1,61,541	...

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1869-70 contrasted with previous Years.

	June.	July.	August.	October.	November.	December.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	1,13,96,105	1,52,43,515	1,36,15,865	1,47,55,373	1,83,59,723	1,99,90,320
Bengal.....	1,48,51,970	1,23,40,473	1,12,23,907	1,28,20,478	1,21,74,892	1,38,42,355
British Burmah.....	27,50,490	28,44,725	32,10,450	41,59,849	36,45,337	31,82,587
North-Western Provinces	2,41,33,186	2,39,69,426	2,14,98,002	1,52,06,179	1,96,74,077	2,34,78,368
Oudh.....	63,08,804	62,19,612	53,75,649	36,55,325	47,42,276	58,29,690
Punjaub	1,14,40,931	1,17,81,232	1,06,05,965	83,31,333	92,46,874	1,11,23,599
Bombay	3,39,55,116	3,05,03,255	2,35,10,012	1,83,78,648	1,88,67,631	1,79,41,554
Central Provinces.....	68,20,440	63,53,106	61,53,053	56,31,696	56,52,447	61,08,760
Madras.....	3,04,71,972	3,07,95,345	2,75,09,862	2,43,76,457	2,56,50,415	2,69,76,113
Total.....	14,22,29,014	14,00,50,689	12,29,02,765	10,73,15,338	11,75,13,672	12,84,73,346
1867-68.....	11,62,04,798	11,00,92,380	9,63,10,342	7,89,69,348	7,15,23,402	8,01,62,356
1868-69.....	11,81,90,260	10,94,54,805	10,02,49,204	7,04,14,121	8,14,11,652	977,02,951

THE BANK OF BENGAL.

Statement of Affairs.	31st Jan. 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,67,119 7 0
General Treasury Balance at Head Office	2,40,72,374 6 9
Ditto ditto at Branches	1,56,63,316 4 1
Other Deposits at Head Office and Branches	3,25,32,095 5 6
Bank Post Bills, &c.	4,34,615 15 2
Sundries	6,15,908 12 5
Total Rs.	9,68,85,430 2 11
Assets.	
Government Securities	1,23,68,779 0 0
Loans on Government Securities at Head Office and Branches	54,44,887 3 9
Accounts of Credit on do. do.	21,87,990 14 4
Mercantile Bills discounted at do.	1,49,14,832 3 2
Dead Stock	11,78,675 1 11
Stamps	15,130 5 0
Balances with other Banks	9,46,441 8 6
Sundries	2,24,639 10 6
Cash and Currency Notes at Head Office	2,64,31,815 14 1
Cash and Currency Notes at Branches	3,31,72,238 5 8
Total Rs.	9,68,85,430 2 11

THE NEW BANK OF BOMBAY.

Statement of Affairs.	28th Jan. 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance	70,47,112 0 0
Deposits at Head Office	2,12,76,991 0 0
Deposits at Branches	24,82,685 0 0
Bank Post Bills outstanding	10,27,605 0 0
Reserve	4 ,15,000 0 0
Undrawn Cash Credits	9,69,205 0 0
Total Rs.	3,92,18,598 0 0
Assets.	
Government Securities	12,81,185 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	10,27,038 0 0
Credit Accounts do. do. on Gov. Sec.	24,84,442 0 0
Bills discounted and purchased at do.	49,49,854 0 0
Dead Stock and Less written off	4,84,008 0 0
Stamps	6,316 0 0
Balance with Agents and Correspondents	11,04,061 0 0
Overdrafts	9,202 0 0
Government Reserve Cash	
Cash and Currency Notes at Head Office	2,71,28,381 0 0
Do. do. at Branches	
Bullion at H. O. and Branches	7,84,111 0 0
Total Rs.	3,92,18,598 0 0

THE BANK OF MADRAS.

Statement of Affairs.	21st Jan. 1871.
Liabilities.	Rs. A. P.
Capital	56,25,000 0 0
Public Deposits at Head Office	71,28,398 6 4
Do. at Branches	36,86,997 6 3
Other deposits at Head Office and Branches	1,15,14,871 8 11
Cash Credits undrawn at do.	3,13,031 4 11
Post Bills	6,60,718 13 6
Reserve Fund	5,62,500 0 0
Rest	41,643 12 7
Total Rs.	2,95,33,126 4 6
Assets.	
Silver and Notes at Head Office	48,59,821 4 6
Silver and Notes at Branches	90,33,778 8 4
Government Securities	5,06,940 8 4
Government Reserve—Cash	46,28,398 6 4
Securities	
Loans at Head Office and Branches	17,72,134 11 8
Accounts of Credit at Head Office and Branches	7,06,440 0 0
Mercantile Bills discounted at Head Office, and Branches	62,86,420 4 8
Dead Stock at Head Office and Branches	2,44,847 11 1
Bills of Exchange do.	13,86,622 8 2
Due by other Banks	6,21,723 0 0
Total Rs.	2,95,33,126 4 6

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54.	4 per cent. Loan. of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	4½ per cent. of 1856-57.	Transfer Loan dated 15th July 1870.	5 per cent. P. W of 1854-55.	of 1856-57.	5½ per cent. Loan of 1859-60.	5 per cent. Debentures for 2 years. Repayable Jan. 1869.	4½ per cent Transfer. Loan.	3 years. Repayable Jan. 1870.	4½ per cent Transfer Loan.	5 years. Repayable June 1872	10 years. Repayable June 1877.	15 years. Repayable June 1877.	Total Amount.
31st May 1870.	53,100	34,133	2,346	21,24,373	40,60,000	1,53,00,900	1,21,13,300	1,49,96,400	14,500	46.16.200	4.01.600	5,70,18.000	4,24,41,100	.....	60,000	1,65,000	11,67,000	33,04,000	30,96,000	33,45,000	16,43,12,952
30th June 1870.	53,100	34,133	2,146	20,82,134	40,06,600	1,51.02,600	1.39,82,900	1,39,72,500	14,500	46,22.700	3.03,700	5,74,02,900	4,29,28,600	.....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	34,04,000	16,40,12,713
30th July 1870.	53,100	34,133	2,773	20,60,480	41,11,800	1,49.64,900	1,22,64,000	1,52,05,600	14,500	46 50,900	2 52 700	5,69,16,600	4,32,06,800	.....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	33,14,000	16,50,92,236
31st August 1870.	53,100	34,133	2,773	20,60,480	41,14,200	1,50,24,400	1,23,05,700	1,65,85,700	14,500	47,21,500	2,46,200	5,76,46,500	4,41,02,800	.....	...	1,65,000	13,50,000	33,08,000	23,60,000	33,04,000	16,82,98,986
30th Sept. 1870.	53,100	34,133	2,347	20,54,614	42,06,200	1,51,31,600	1,24,03,300	1,72,67,700	14,500	47,94,500	2,25,100	5,84,23,000	4,52,18,300	.....	...	1,65,000	12,90,000	33,58,000	33,60,000	36,00,000	17,16,01,396
31st Oct. 1870.	53,100	34,133	2,347	20,54,614	42,11,700	1,53,35,300	1,24,27,600	1,83,52,400	14,500	48.05,000	2.03,300	5,87,81,000	4,63,50,000	.....	...	1,65,000	18,60,000	33,58,000	34,15,000	36,16,000	17,50,18,994
30th Nov. 1870	53,100	34,133	2,347	20,52,908	42,62,900	1,53,63,100	1,25,12,000	1,88,67,600	14,500	48,29,500	1,35,700	5,92,13,300	4,76,20,000	.....	... ..	1,65,000	.....	33,63,000	34,16,000	36,19,000	17,73,74,288
31st. Dec. 1870.	53,100	34,133	2,347	19,59,468	41,43,100	1,52,55,100	1,23,79,800	1,83,26,100	14,500	48,78,100	87,700	5,96,27,700	4,88,75,900	.. .	.....	33,63,000	.....	.....	33,46,000	36,43,000	17,80,14,043

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Div'd.	Quotations.
Banks			
Agra Bank, Limited, A.	£10	1½ p. c.	95 a 69
Ditto, new contributory A.	.....	.....	.....
Ditto B. Shares	.....	.....	£4-15
Agra Savings' Bank	.....	.....	.....
Allahabad Bank, Limited	100	5 p. c.	101 a 102
Bank of Bengal	1000	2½ p. c.	1355
Bank of Calcutta, Limited, A.	38½	3 p. c.	22 a 25-8
Ditto ditto B.	50	3 p. c.	32 a 35-8
Bank of Upper India	50	6 p. c.	62 a 63
Delhi and London Bank, Limited	250	1½ p. c.	148 a 150-8
Mussoorie Savings' Bank	100	6 p. c.	139 a 140
National Bank of India	£12½	2½ p. c.	112 a
Oudh and United Service, Limited	100	*nil.*	*in liqdn.*
Punjaub Bank, Limited	100	4 p. c.	80 a 81
Simla Bank, Limited	500	6 p. c.	575 a 580
Uncov. Ser. Bank (Agra)	100	4 p. c.	90 a 92-8
United Bank of India	100	5 p. c.	100
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	*nil.*	400 a 410
Ditto ditto	200	*nil.*	80 a 82
Bengal Coal Co, Limited	1000	5 p. c.	1445 a 1450
Bonded Warehouse	440	20 p. sh.	530 a 535
Brunton's Press Co., Limited	300	4 p. c.	170 a 172
Burdwan Stone Co., Limited	100	5 p. c.	6 a 7
Calcutta Docking Co., Limited	700	*nil.*	250 a 300
Ditto New ½ Shares	350	*nil.*	125 a 150
Delhi Railway Co.	£20	2½ p. c.	229 a 230
Eastern Bengal Indigo Co.	100	*nil.*	35 a 38
Eastern Bengal Railway	£20	2½ p. c.	236 a 237
Eastern Steam Tug Co., Limited	250	*nil.*	*nominal.*
East India Railway Co.	£20	2½ p. c.	248
Equitable Coal Co., Limited	250	5 p. c.	217½
Goosery Cotton Mills Co.	200	5 p. c.	212
Gourepore Co., Limited	1000	6 p. c.	1300 a 1310
Ditto ½ Share	125	.....	162 a 163
Great Eastern Hotel Co	250	2 p. c.	148 a 150
Howrah Docking Co., Limited	500	*nil.*	150 a 175
India General S. N. Co	1000	2 p. c.	335 a 340
Ditto ditto, ½	500	2 p. c.	167½ a 170
Ditto ditto, ¼	250	2 p. c.	84 a 85
Landing and Shipping Co.	100	7 p. c.	47
Nasmyth's Pat. Press Co.	500	2½ p. c.	600 a 700
Oriental Gas Co.	£5	4½ p. c.	60 a 70
Ditto (Contributory)	£1	4½ p. c.	13½ a 14
Oudh and Rohilcund Railway	£10	2½ p. c.	103 a 106
Port Canning Land Co.	1400	*nil.*	250 a 255
Punjab Railway Co.	£20	2½ p. c.	229 a 230
R. Scott Thomson & Co.	500	3 p. c.	220 a 222
Tirhoot Indigo Limited	200	*nil.*	52 a 55
Tea Companies.		*Yearly.*	
Assam Tea Company	300	6 p. c.	210 a
Bengal Tea Co., Limited	100	5 p. c.	40 a 42
Ditto (Contributory)	60	5 p. c.	45 a 42dis.
Bienauth Tea Co., Limited	200	*nil.*	130 a 132
Ditto (Contributory)	50	*nil.*	21 a 20dis.
Central Cachar Tea Co.	200	2 p. c.	56 a 58
Dehing Tea Co., Limited	85	*nil.*	70dis.
Dehra Doon Tea Co., Limited	100	*nil.*	.....
Durrung Tea Co., Limited	100	*nil.*	8 a 10
Eastern Cachar Tea Co.	100	*nil.*	26 a 27
East India Tea Co., Limited	100	8 p. c.	93 a 94
Jellalpore Cachar Tea Co.	100	*nil.*	26 a 28
Kunchunpore Tea Co., Limited	250	6 p. c.	260 a 270
Ditto (Contributory)	1000	*nil.*	*nominal.*
Kurseong and Darjeeling Tea Co	375	*nil.*	*nominal.*
Ditto (Contributory)	250	2 p. c.	60 a 61
Kuttal Tea Co., Limited	200	2 p. c.	157 a1556½dis.
Lower Assam Tea Co., Limited	.....	.....	.....
Monacherra Tea Co., Limited	£5	*nil.*	*nominal.*
Moran Tea Co., Limited	90	*nil.*	75 a 70dis
Muddenhaut Tea Co., Limited	75	*nil.*	*nominal.*
Muttuck Tea Co., Limited	250	*nil.*	*par.*
New Golah Ghat Tea Co.	125	*nil.*	85 a 82dis.
New Mutual Tea Co.	£10	.....	100 a 101
Punkabaree Tea Co., Limited	30	15 p. c.	72 a 75
Soom Tea Co., Limited	100	*nil.*	28 a 30
Tuckvar Tea Co., Limited	100	*nil.*	35 a 45
Upper Assam Tea Co., Limited	200	*nil.*	38 a 40
Victoria Tea Co., Limited	£10	*nil.*	*nominal.*
	250	*nil.*	*nominal.*

BOMBAY SHARE LIST.

Bank.	Shares.	Nomi. Value per. Sh.	Paid up.	Last Div'd.	Rate Share.
		Rs.	Rs.	per cn.	Rs.
Agra Bank	100,000	100	*all*	3 *pr. ct.*	96
Bank of Bengal	22,000	1,000	*all*	9 *pr. ct.*	1,375
Bank of Bombay (New)	10,000	500	*all*	6 *pr. ct.*	612½
,, New issue Do	10,000	500	100	6 *do.*	102½
Bank of Madras	5,250	1,000	*all*	12 *pr. c.*	1,500
Chartered Mercantile	80,000	250	*all*	6 *pr. ct.*	240
Delhi and London	..	..	..	.....	...
Chartered Bk. of I. & C.	40,000	200	*all*	*nil*	150
National Bank of India	37,096	250	125	5 *pr. ct.*	110
Oriental Bank	10,000	250	*all*	12 *do.*	440
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	...	£20	218-3-0	*pr. ct.*	237
Do New £20 shares	...	20	109-1-5	*do.*	126
Bombay, B. & C. I. R Co.	...	100	1,000	*do.*	1,100
Do. New shares	...	18	196-5-1	*do.*	200
Land Companies.					
Elphinstone Land	10,800	1,000	*all*	30	
Ditto New Issue	10,800	1,000	650	11-14	
Frere Land	8,000	150	*all*		157
Mazagon Land and R.	750	2,000	2,000	*nil.*	1,000
Port Canning	4,000	2,000	1,400	*nil*	265
Colaba Company	4,000	3,000	*all*	70	...
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,880	250 *p. s.*	2,860
Albert Press Company, Kurrachee	200	2,000	1,100	75 *do.*	775
Alexandra Press Co.	250	3,000	850	*nil.*	470
Apollo Press Co.	150	12,000	11,000	200 *do.*	7,200
Bombay Press Co.	200	2,000	*all*	365 *do.*	2,325
Ditto (New)	200	500	*all*	66½ *do.*	580
Colaba Press Co.	500	1,880	*all*	300	5,800
East India Press Co	350	2,000	*all*	...	3,500
Fort Press Co.	150	8,500	*all*	1,000	9,700
Framjee Cowasjee Press	300	2,000	1,800	....	1,000
Hydraulic Press Co.	200	6,000	*all*	*nil.*	2,550
Kurrachee Press Co.	1,000	5,000	2,000	120 *p. s.*	950
Mofussil Press & G Co.	2,000	400	350	35 ,, ,,	435
Prince of Wales Press Co.	125	2,500	*all*	350 ,, ,,	2,350
Victoria Press, Madras	220	2,000	750	75 ,, ,,	1,000
Spinning & Weaving Cos.					
Albert Mills Company	400	2,000	1,700	50	1,375
Alliance Spinning Co.	500	2,500	*all*	125 *p. s.*	2,555
Bombay	100	5,500	*all*	.....	3,000
Bombay United	800	1,000	*all*	25	1,020
Broach Mills	1,600	150	150	....	275
Do. New	800	150	50	....	...
Dhurumsey Spinning	800	5,000	*all*	....	2,375
Great Eastern	750	2,000	*all*	150 *p. s.*	1,800
Manockjee Petit's	2,500	1,000	*all*	80 ,,	1,920
Oriental	800	2,500	*all*	80 ,,	2,275
Royal	600	2,500	2,300	.....	1,725
Shipping Company.					
Bombay Shipping Co.	1,000	5,000	3,500	1,800	..
Miscellaneous.					
Mechanics' Building Co	1,000	50	*all*	5 *p. ct.*	30
Kurrachee Landing and Shipping Co,	500	2,000	300	21 *p. s.*	170
Treacher and Company	2,000	500	*all*	25 *p. s.*	400

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation.	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs.	Rs. end.
Bank of Bombay	*Jan.* '56	200	500	75	20
Bank of Chin's	..	4,000	25	19½	1
Bombay Presidency Bank	*Aug.* '67	40,000	250	.....	
Bombay T. and B. Association	*Sept.* '67	20,000	200	35	6
Brokers' Banking Co.	*Sept.* '67	20,000	200	40	15
Central Bank	*Mar.* '66	40,000	250	2	1
East India Bank	..	25,000			1
Indian Peninsula Bank	*Feb.* '67	25,000	200	..	14
Royal Bank of India	*May.* '67	50,000	200	13	1
Old Financial	*Apr.* '67	30,000	130	68½	5
				74	1
Companies.					
Back Bay Reclamation Co.	*Nov.* '66	1,000	5,200	2,375	95
Bombay, and Bengal S. S.	.....	892	3,500	2,440	10
Victoria Spinning Co.	55	5,000	5,000	2,400	10

EXCHANGE ON LONDON.

	Calcutta.
	s. d.
Bank Bills, at 6 months' sight	1 10 *to* 1*s* 10 13-16*d.*
Do. at 3 months' sight	.....
Do. on demand, ditto	1 10½
Credit Bills (1st Class) at 6 months' sight	1 10½
Documentary Bills at 6 months' sight	1 11 *to* 1*s.* 11 3-16

BANK RATE OF DISCOUNT.

	per cent.
Discount on Private Bills and Notes	5 *to* 6
Ditto on Acceptance of Local Banks	5 *to* 6
Int. on Loans on Security of Govt. Paper	4½

GOVERNMENT SECURITIES.

	Calcutta.		Bombay.
Five-and-a-half per cent.	118½	*to*	114½
Five per cent.	107	*to*	106½
Four & half per cent. (Public Works Loan)	107½	*to*	106½
15 years' Debenture Loans	109½	*to*	102
10 years' do. do.	108½	*to*	106
5 years' do. do.	108½	*to*	108
Six per cent. Municipal Loans	109½	*to*	113

THE FREIGHT MARKET.

CALCUTTA.

London	*Cotton*	£2 0*s.* 0*d.*
	Cases	£2 0*s.* 0*d.* *to* £2 15*s.* 0*d.*
	Seeds	£1 10*s.* 0*d.*
Liverpool	*Iron Ships Cotton*	£1 12*s.* 6*d.* *to* £1 17*s.* 6*d.*
	Wooden Ships	£1 12*s.* 6*d.* *to* £1 15*s.* 0*d.*
	Myrabolns & Coir bdls	£0 10*s.* 0*d.* *to* £0 12*s.* 6*d.*
	Seeds	£0 15*s.* 0*d.* *to* £1 0*s.* 9*d.*
Havre	*Cotton*	£2 5*s.* 0*d.* *to* £2 10*s.* *Nominal*
	Coffee	*Nominal*
Overland . Steamers		£4 10*s.* 0*d.* *to* £5 0*s.* 0*d.*
Liverpool via Suez Canal		£3 5*s.* 0*d.*
China	*Steamer Cotton*	Rs. 6 *per bale.*
	,, Opium	Rs. 25 *to* 30 *per chest.*
	Sailing Ships	*Nominal.*
Calcutta . Salt		Rs. 2 0 *to* 3 0 0 *per ton*
Calcutta to Bombay		Rs. 13 *to* 14 *and Calcutta Port charges*
Mauritius		8 *emass per bag nominal.*

BOMBAY.

For Liverpool—	
Iron ships	£2 12*s.* 6*d.*
Wooden ships	£2 12*s.* 6*d.*
For London.—	
Cotton	*No ship.*
Seeds	
P. & O. Steamer	£2 5*s.* 0*d.* *to* 3-12-0
B. & B. Steamer	
For China —	
Cotton—Steamer	£2 10 0 *to* 3 12 6
Opium—Steamer Hong Kong	Rs. 10 *per bale.*
	Rs. 25 @ 30 *per chest.*

INDIAN SECURITIES.—LONDON.

Share	Paid	Indian Railways	Closing Prices January 5.	Closing Prices January 12
st.	100	Bombay, Baroda and Central India (gua 5 per ct)	102½ to 103½	103 to 104
20	all	Ditto Ext do. iss at 12s pm	20 to 21	20 to 21
20	3	Do. do.	par to 1 prem	par to 1 prem
st.	100	Eastern Bengal (gua 5 p ct.)	102½ to 103½	103 to 104
st.	100	East Indra (gua 5 p ct)	107½ to 108½	109 to 110
st	100	Gt Ind Peninsula (g 5 p ct)	105 to 106	106 to 107
20	12	Ditto, New (gua 5 p ct)	¾ to 1½ prem	¾ to 1½ prem
20	6	Ditto, New (gua 5 p ct)	¾ to 1½ prem	¾ to 1½ prem
st	—	Ditto, scrip, ditto, ditto	— —	— —
—	—	Ditto, scrip, Ditto, ditto	— —	— —
st.	all	Ditto, 4 per c deb stk	87 to 89	87 to 89
st	100	Gt South of India (g 5 p c)	101½ to 102½	102 to 104
st	100	Ditto (4½ per cent)	95 to 97	95 to 97
st	100	Madras (guar 5 per cent)	102 to 103	103 to 104
st.	100	Ditto, (4½ per cent)	95 to 97	96 to 98
st	100	Ditto, (4½ per cent)	92 to 94	92 to 94
—	—	Ditto	— —	—
st	100	Oude & Rohilkund (g 5 p ct)	100½ to 101½	100½ to 101½
10	4	Ditto, shares ditto	½ dis to ½ prem	¼ dis to ½ prem
st	—	Ditto ditto ditto	— —	— —
st	—	Ditto Nulhatee	—	—
st	100	Scinde (gua 5 per cent)	100½ to 101	100½ to 101
st	100	Ditto Delhi (gua 5 p c)	100½ to 101½	100½ to 101½
—	—	Ditto ditto (gua 5 p c)	— —	— —
st	100	Ditto Punjaub (gua 5 p c)	100½ to 101½	100½ to 101½
st	—	Do Ind St Rlo (g 5 p c)	—	—

Indian Govt Securities	Closing Prices January 5	Closing Prices January 12
Indian Stock 10½ per cent April 1874	shut	204½ to 205½
Ditto for Account		
Ditto 5 per Cent July 1880	110½ ex div	110½ to 110¾
Ditto 4 per Cent Oct 1888	101½	101⅝ to 101⅞
India Entaced Paper 4 per Cent	89½ to 90½	89½ to 90½
Ditto 5 per Cent Jan 1872	98¾	98¼ to 99
Ditto 5½ per Cent May 1879	106½ to 106¾	106½ to 106¾
Ditto 5 per Cent Rupee Debn 1872	90 to 92	90 to 92
Ditto ditto 1877	107	107
India Debentures 5 per Cent Aug 1873	103½ to 104½	104½ to 104¾
India Bonds 4 per Cent £1 000	26s prem	27s prem

Amt of Share	Paid	Miscellaneous	Closing Prices January 5	Closing Prices January 12
5	all	Bombay Gas (Limited)	6 to 6½	6½ to 6¾
5	4	Ditto New	1 to 1½ prem	1 to 1½ prem
20	10	Ceylon Co, Limited	4½ to 5 dis	3½ to 4 dis
20	5	Ditto A Shares	5½ to 6 dis	3½ to 4 dis
50	7	First India Land Credit and Finance (Limited)	6 to 5 dis	6 to 5 dis
80	100	Madras Irrigation & Canal (gua 5 per cent by the Indian Government	100 to 102	100 to 102
1	7s	Nurbudda Coal and Iron (Ld)	1 16ths to 1 16 prem	1 16d to 1 16 prem
5	all	Oriental Gas (Limited)	7¾ to 8¼	7¾ to 8¼
5	2½	Ditto New	1 to 1½ prem	1 to 1½ prem
50	all	P and O Steam Company	46 to 48	46 to 48
50	10	Ditto New 1867	3 to 4 dis	3 to 4 dis

Amt of Share	Paid	Joint Stock Banks	Closing Prices January 5	Closing Prices January 12
10	all	Agra Limited A	7½ to 8¼	7½ to 8¼
10	—	Do do B	—	—
20	all	Chartered Bank of India Aus & China	13½ to 14¼	13 to 14
25	all	Chartered Mer of India London and China	22½ to 23½	22½ to 23½
20	all	Eng Scot and Aust Chart	15½ to 16½	16 to 17
20	4	Land Mort Bank of India, Ld	3½ to 3⅝ dis	3⅛ to 3¼ dis
100	all	Do 5 per cent Debentures 1864 for 30 years	81 to 84	81 to 84
25	all	Oriental Bank Corporation	40 to 41	41 to 42

INDIAN RAILWAY DEBENTURES

Principal and Interest Guaranteed by the Secretary of State for India in Council

Debenture Capital	Rate	Company	Closing Prices January 5	Closing Prices, January 12
£237,595	5	Bombay, Baroda, and Central India	103 to 104	103 to 104
881,700	5	Ditto ditto	103 to 104	103 to 104
100 000	4½	Ditto ditto	98 to 100	98 to 100
1,292 400	5	East Indian	109 to 109	107 to 110
1,800,300	5	Ditto	106 to 109	107 to 110
1,000,000	4½	Ditto*	99 to 101	99 to 101
440,000	4½	Ditto*	98 to 100	98 to 100
—	5	Eastern Bengal	100 to 103	100 to 102
1,968,000	5	Great Indian Peninsula	100 to 103	100 to 104
1,074,450	5	Ditto ditto	103 to 104	104 to 104
—	—	Ditto	— —	— —
175 500	500	Great Southern of India	101 to 103	101 to 101
100,000	4½	Ditto	99 to 100	98 to 100
916 000	5	Madras	102 to 104	102 to 104
490,000	5	Ditto	102 to 104	102 to 104
30,000	5	Oude & Rohilkund (Lan)	100 to 102	100 to 102

* Transferable by endorsement, without stamp.

GOLD AND SILVER

	Per Ounce
Foreign Gold in Bars	£3 17s. 9d
Silver in Bars (standard)	5s 0⅝d. to 5s. 0⅞d.
Mexican Dollars	4s. 10½d to 4s. 10¾d

EXCHANGE.

Banks Drawing rates on Calcutta at 60 days' sight	1s 10¾d to 1s 11⅛d
Ditto on Bombay	1s. 10¾d. to 1s 11⅛d

Advertisements.

MESSRS. NICHOLAS AND CURTIS.

PHOTOGRAPHERS AND ARTIST'S COLOURMEN.—Messrs. N. and Co.'s views of Madras, with the recent additions, now comprise the following Taken on 12 by 10 Plates

Price 3 Rs each, or 30 Rs per dozen unmounted.

The Cathedral	The Surf
The Pier	Mount Road (2 Views)
Government House	Royapooram Station
Munro Statue	Moorish Tombs
Neal Statue	The Light House.
Club	Memorial Hall
Napier Bridge	St Andrew's Church.
Budgerows and Top Pats	Moorish Mosque
Vepery Church.	Partasarthy Pagoda.
Patchiappah's Hall	Cocoanut Palms
Moss House Fort	Date "
Government Office, Fort	Palmyra "
The Flag Staff Fort	Areca "
Indian Well and Lodge	Catamaran "

Panoramas of the Beach the Fort and Back Town and a number of other subjects not specified As Views of Conjeveram and all the other stations of the Nellgherries Bangalore Seven Pagodas Tirupatty, Conjeveram, Mysore, the Pulney Hills Tanjore Madura &c

Photographs illustrative of native character in Madras, also Burmese, Nicobarese, Andamanese &c

Detailed Catalogues of all the above may be had on application

Customers residing in any part of India who have not an opportunity of selecting views for themselves may rely upon Messrs N and Co sending the most interesting when the selection is entrusted to them

Madras, April 1870

JOSEPH GILLOTT'S

CELEBRATED

STEEL PENS

SOLD

BY ALL DEALERS THROUGHOUT THE WORLD.

COMMERCIAL UNION ASSURANCE COMPANY

HEAD OFFICE 19 & 20, CORNHILL, LONDON

Capital fully subscribed	£2 500 000
Amount paid up	£250,000

LONDON BOARD OF DIRECTORS

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ALFRED GILES Esq 9 Adelphi Terrace W C
NEHEMIAH GRILLET Esq Tea Kent
SAMUEL HANSON Esq (Samuel Hanson & Son)
FREDERICK W HARRIS Esq (Dixon & Harris)
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JAMES P. WOODHOUSE Esq (J C & M Woodhouse.

INDIAN BRANCH—CALCUTTA

No 1, HARE STREET

DIRECTORS OF THE INDIAN BRANCH

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G M BRACKER Esq Merchant
I G FIDDIDGE Esq (Messrs Atkinson Tilton & Co) Merchant, Vice President of the Chamber of Commerce
J C MURRAY Esq (Messrs Kettlewell Bullen & Co) Merchant
G C PAUL the Honble Officiating Judge of the High Court
C SANDERSON Esq (Messrs Berners Sanderson and Upton) Solicitor and Registrar of the Diocese of Calcutta

MEDICAL OFFICERS.

DR N C MACNAMARA 6 Russell Street Hours 10½ to 1 P M Saturdays 3 to 4 P M
DR S B PARTRIDGE General Hospital Hours 12½ to 2 P M

BANKERS

The Oriental Bank Corporation
The Chartered Mercantile Bank of India London and China

SOLICITORS.

Messrs Berners, Sanderson, and Upton

LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half sterling, of which Pds 250 000 is paid up effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees The prospect of Bonus to the Participating Policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income

The first Life Policy was issued in May 1862. On the 21st December 1869, the Life Premium Income, exclusive of Re-assured Risks, was upwards of 53,000*l* and at the same date the Life Trust Funds *for the Primary security of Life Policies* exceeded 180,000*l* being upwards of sixty per cent., of the amount received upon whole Life Policies then in force, *after providing for all Special Policies, and for the Reversionary Bonuses declared upon existing Policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* Profits of the Life Branch are divisible among the Participating Policy-holders.

Rates of Premium.

These are generally lower than the rates of other Offices.

Premiums are received—

1. Annually.
2. Half-yearly, Quarterly, and Monthly.

Examples of with Profit Rates.

For the Assurance of 1,000*l*, *for the whole Term of Life.*

CIVIL.					MILITARY.					
Age next Birthday.	Annual Premium.	Monthly Premium.			Age next Birthday.	Half-yearly Premium.			Quarterly Premium.	
		Rs.	a.	p.		Rs.	a.	p.	Rs.	a. p.
30	39	3	8	2	35	24	7	0	12	7 3
40	47	4	3	8	40	27	0	8	13	12 6
50	62	5	9	3	45	30	10	11	15	10 2

Examples of without Profit Rates.

CIVIL.					MILITARY.					
Age next Birthday.	Annual Premium	Quarterly Premium			Age next Birthday.	Half-yearly Premium.			Monthly Premium	
		Rs.	a	p.		Rs.	a	p.	Rs	a p.
35	38	10	1	1	30	20	12	10	2	0 7
40	42	11	2	1	40	24	7	0	4	3 [illegible]
45	48	12	11	6	50	31	3	2	5	6 5

Examples of Short Term Rates

Age next Birthday.	Annual Premium.	Half-yearly Premium.			Age next Birthday.	Quarterly Premium.			Monthly Premium.		
	CIVIL.					MILITARY.					
		Rs.	a	p		Rs.	a	p	Rs.	a	p.
35	28	14	9	0	45	10	1	1	3	13	11
40	29	15	1	3	50	11	6	4	3	6	9

BONUS.

Policy-holders have the option, when their Policies are unencumbered, of selecting any of the following —

Modes of receiving the Bonus declared.

1. By an increase of the sum assured
2. By a payment in cash
3. By a permanent reduction of future Premiums.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits,* 31*st December*, 1867.

Age at entry,	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	lbs. s. d.	lbs. s. d.	lbs. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

Surrender Values.

Policies are purchased by this Company at an equitable value after payment of Premiums for three years.

Days of Grace.

Thirty days are allowed for the payment of Premiums, when they are payable yearly, or half-yearly, and fifteen when quarterly or monthly.

Forfeited Policies may be revived at any time within six months, if satisfactory medical evidence of the health of the life be produced (at the expense of the Assured) and a fine of one-half per cent. be paid on the sum assured.

Claims.

These are paid *one month* after proof (satisfactory to the directors) of the decease of the Lives assured has been furnished to the Company, and the rate of Exchange will invariably be two shillings sterling per Rupee. Should death occur within the days of grace, the Policy will still be valid, and the sum assured paid after deduction of the Premium. The importance of this last regulation is obvious.

Limits as to Residence and Travelling.

Lives assured at Indian rates, who are not sea-faring persons, are allowed to reside or travel without license, *in any part of the world* provided they do not proceed to any country which is at war.

General Regulations.

The English rate takes effect from the date of departure for Europe from Alexandria or Port Said, and the Indian rate from the date of arrival at either of those places outward bound.

Medical Fees are paid by the Company. No Entrance Fee or other payment is required of the Assured beyond the Premium.

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bullock Brothers.
Bankipore	W. Frazer, Esq., Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R Bain, Esq.
Bombay	Messrs. G. W Wheatley & Co.
Cawnpore	W Neill, Esq , Bank of Bengal.
Ditto	Bank of Upper India.
Ditto	T Lucas & Co.
Chittagong	Messrs Bullock Brothers.
Chumparun	James Begg, Esq.
Chumparun Districts	E. C. Lamb, Esq.
Cochin	Peirce, Leslie, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq , Bank of Bengal.
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Jhansie	Bazenjee Furdoonjee, Esq.
Kurseong	T. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Walters, Esq., Bank of Bengal.
Lucknow	W Dickson, Esq., Bank of Bengal
Ditto	Delhi and London Bank.
Madras	Messrs Arbuthnot & Co.
Mean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nowpore	T. A. Clarke, Esq
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq.
Purneah	P. H. D. de Dombal, Esq.
Rangoon	Messrs. Bullock Brothers.
Rohilkund Districts	H Costley, Esq.
Sylhet	E. G Foley, Esq.
Sangor	J. A Withall, Esq.
Simla	United Bank of India.
Tirhoot	E Dalgleish, Esq.
Umballa	United Bank of India.
Ditto	Greetham & Co.

Fire Department.

The Fire Premium income of the Company, as at 31st December, 1869, exceeded £120,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on Merchandize, Warehouses, Screw-Houses, Mills, Dwelling-Houses, Shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built, and tiled or roofed with metal, slate, or chunam	Per Rs. 100.				
	12 months.	6 months.	3 months	2 months.	1 month
	as.	as.	as.	as.	as.
Private Dwelling Houses	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building.)	10	7½	5	4	2½
(from to)	12	9	6	5	3
Bonded Warehouse, no Hazardous Goods	8	6	4	3½	2
Jute and Loose Cotton	10	12	8	7	4
Presses or Screw Houses Cotton or Jute (warranted no artificial light used.)	20	15	10	8	5
Without such Warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide Advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the Company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,

No. 1, Hare Street,
Calcutta, 13th February 1871

C. H. OGBOURNE,
Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782, UNLIMITED.

The importance of this Company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 9,000,000*l*. sterling as losses under insured risks and without a single call on its proprietors whose liability is unlimited.

The undersigned are authorised to issue policies in Bombay and the Mofussil at the tariff rates of all the old established company, which are as low as the nature of the risks can justify.

The rates on bungalows in the Mofussil, and residences, offices, and godowns in Elphinstone Circle, have been lately much reduced. Particulars on application at the Agency office.

A. C. BRICE & Co.,
Agents.

No. 6, Rampart Row, Bombay, 1870.

THE INDIAN LIFE ASSURANCE COMPANY (LIMITED.)

REGISTERED UNDER ACT X. OF 1866.

Head Office—MEERUT.

DIRECTORS.

Chairman, W. McLeavy, Esq., ... *Manager, Bank of Upper India, (Limited.)*
C. J. Collins, Esq.
R. R. Dean, Esq. ... ... *Manager, Allahabad Bank.*
W. Hobson, Esq. ... . ,, *Mussoorie Savings Bank.*
J. C. Farry, Esq. ... ... *Late Genl. Manager, Delhi & London Bank*
F. Peterson, Esq. ... . *Manager, Simla Bank Corporation.*
C. W Stowell, Esq. ... ... ,, *Uncovenanted Service Bank*
E. Warner, Esq. .. .. *Barrister-at-Law.*
Sheikh Ellahee Bux ... ...

MEDICAL ADVISER.

William Moir, Esq., M.B., Civil Surgeon, Meerut.

SECRETARY.

D. Lancaster, Esq.

This Company was formed towards the end of 1869, and has already received substantial patronage from the public.

The object for which it was established with a full direction in India was to secure the Indian Public against a repetition of such heavy losses as have recently been sustained by the collapse of certain Assurance Offices in England, where the entire management of those institutions was located.

Security.—To ensure absolute security, the funds of the company are invested *only* in Government Securities. The company is strictly prohibited from making advances on house or landed property or on stocks, shares or obligations of any company whatever, though such advances are usually extensively made by other Assurance companies.

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the assured. Policies are also granted for short terms from one to ten years at moderate rates.

The Proposal Form is simple in its terms and the *Conditions* of the *Policies* are liberal, all *unnecessary restrictions having been removed.*

The Rates of Premium are made as moderate as is consistent with *complete Security* of the assured.

Advantages of Assurance.—It secures by a small monthly, quarterly, half-yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the borrowers' property from claims and sureties from loss

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscriber loses the benefit of all he has paid, whereas in the case of a Policy it still ensures and may be made available for any other purpose

Forms of Proposal, Tables of Rates, and all further information may be obtained by letter or on application to any of the Agents or to the Secretary.

ANNUAL PREMIUMS.

Required for an Assurance of Rs 1,000 for the whole Term of Life.

Age	Civilians				Military and Naval.			
	Without Profits.		With Profits.		Without Profits		With Profits.	
	Rs	As.	Rs.	As	Rs.	As	Rs.	As.
20	31	9	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	3	50	15	57	14
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

D. LANCASTER,
Secretary.

Meerut, 12th November 1870.

IMPORTANT REDUCTION IN THE RATES OF FIRE INSURANCE.

NATIVE LIVES INSURED ON EQUAL TERMS WITH EUROPEANS.

ENGLISH ASSURANCE COMPANY FIRE AND LIFE.

Capital £ 500,000

Head Offices, Palmerston Buildings, Bishopsgate Street, London, with branches at Liverpool, Manchester, Glasgow, Dublin, Southampton, Hamburg Antwerp, Brussels, Rotterdam, Melbourne, and Bombay.

The Life Department

Offers the following advantages :—

I.—Moderate premiums.
II.—One calendar month's grace allowed for renewal.
III.—Liberal provision for non-forfeiture of Policies.
IV.—Fixed surrender value after 3 years.
V.—Freedom from unnecessary restrictions as to foreign residence and travelling.
VI.—*Unconditional* reduction to English rates on return of the assured to Europe.
VII.—Military men holding civil appointments reduced to civilian rates.
VIII.—*Eighty per cent.* of the profits divided among the assured in the participating scale.
IX.—No partnership liability whatsoever.
X.—Medical fees and stamps paid for by the company unless the amount be less than Rs. 2,500.
XI.—No charge for assignments.
XII.—Prompt settlement of claims.

Fire Department.

Owing to the company being free from combination, Policies are granted, covering property in all parts of the Presidency, at some 25 to 50 per cent. below the rates of other offices in Bombay.

Floating Policies renewed and all reasonable clauses of other companies adopted. Claims settled promptly.

For further particulars, prospectuses, &c., apply to

HILL, POLLOCK & Co.,
Sassoon's Buildings, Elphinstone Circle, Bombay. Agents.

THE MADRAS EQUITABLE ASSURANCE SOCIETY.

Successor to Madras Laudable Society, Established in 1829.

Regulated by Act No. 6 of 1869, of the Legislative Council of Fort Saint George.

HEAD OFFICE IN MADRAS AND NO BRANCHES.

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H. G. PRICHARD, Esq. ... ... (Government Solicitor.)
The Hon. A. F. BROWN... ... ... (Parry & Co.)
R. C. WALKER, Esq. ... ... (C. Shand & Co.)

ACTING MEDICAL EXAMINER.

W. H. HARRIS, Esq., M.D.

SECRETARIES AND TREASURERS.

Messrs. ARBUTHNOT & Co.

The *Chief characteristics of this Society are :*

Claims paid immediately after satisfactory proof of death.

Announcement of death in the *Fort Saint George Gazette*, sufficient in the case of the members of the civil and military services.

Medical fees paid by the society on all proposals.

Mutual Assurance.

Policies for a term of years issued at reduced rates, without participation in Surpluses.

Premiums payable half yearly, on 1st January and 1st July.

Policies issued free of charge for stamp duty.

Assurants may reside in any part of the world, so long as they continue to pay the original rate of Premium stipulated in their Policies.

This society being founded on the sound principle of Mutual Assurance, divides all its surpluses, or so much thereof as the Directors deem expedient, amongst the Members or Life Policy Holders, by deductions from Premiums, and does not work for the benefit of a separate Proprietary body.

The Members of the society consist of all persons who hold Policies of Assurance, upon their own lives, or upon the lives of others, for the duration of life

The Directors must be residents at Madras, and are elected by the Members.

The society's funds can be invested only in securities of the Government of India, or in securities, the interest of which is guaranteed by the Government of India, or by the Secretary of State for India in Council.

All Investments are made in the joint names of three of the Directors.

Annual General Meetings of the Members are held at Madras, not later than the last day of the month of March in every year.

An annual audit is made of the accounts of the society, and the reports of the Auditors submitted at the Annual General Meetings.

Quinquennial valuations, made by a London Actuary, of all the Assets and Liabilities. The next valuation will be made as from 31st December 1870. *Premiums paid on Policies for the whole term of life during any portion of the period of five years immediately preceding that date, will entitle the Holders of such Policies to participate in the surplus of the Society then ascertained to be existing, by rateable deduction from Premiums thereafter becoming payable for the ensuing Quinquennium.*

The returns made to the Policy Holders from the formation of the society in January, 1842, up to June, 1869, inclusive, (in addition to the accumulation of a considerable reserve), have averaged 47 per cent upon the Premiums paid half-yearly.

For further particulars, Forms of Proposal, &c., apply to

ARBUTHNOT & CO.
Madras, January 1870. Secretaries and Treasurers.

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THE undersigned are prepared to Accept Risks and Issue Policies covering Merchandize Goods in Godowns, Warehouses, Dwelling Houses, or other insurable property, on favourable terms.

Apply to

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Bombay, 1st February 1871. Secretaries and Managers

ALLIANCE BRITISH AND FOREIGN LIFE AND FIRE ASSURANCE COMPANY.

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Of an eligible character are accepted at minimun current rates.

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The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorised to decide upon Proposals submitted, to issue Policies, and to settle claims.

The Life Reserve Fund is over

NINETY-FOUR LACS OF RUPEES.

(which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund), being about 30 per cent. of the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

FIVE CRORES OF RUPEES

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CHURCH OF ENGLAND ASSURANCE INSTITUTION.

ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic., Cap. XCII.

CAPITAL—One Million Sterling.

Life Assurances of every description granted.
Retiring Provision combined with Life Assurance.
Free Policies issued which can never altogether lapse through non-payment of Premium.
No extra charge for sea-passage.
Reduction to European rates without Medical examination.
Premium may be paid annually, half-yearly, quarterly, or monthly, as desired.
Parsee and Armenian lives insured.
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Liability of Shareholders Unlimited.

Capital £2,000,000 — Accumulated Funds £3,801,005

Revenue		*Invested Funds.*	
Fire Premiums	£ 836,816	Capital	£ 391,752
Life Premiums	„ 250,039	Life Reserve	„ 1,873,020
Interest	„ 162,690	Reserve Fund	„ 971,410
		Undivided Profit	„ 64,823
	£ 1,249,535		£ 3,301,005

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Policies of Insurance against Fire upon Dwelling Houses and other Buildings in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the Company.

The rate on pucka-built Bungalows situated out-side the Fort of Bombay, or in any part of the Bombay Presidency, is now reduced to (6) six annas per cent. per annum.

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INCORPORATED BY ROYAL CHARTER AND SPECIAL ACTS OF PARLIAMENT.

Paid up Capital		£250,000
Fire Reserve Fund	297,153 10 10	
Fire Premium Reserve	138,514 15 1	
		435,668 5 11
Total Accumulated Funds		2,838,118 18 11
Annual Income from Fire, Life and Investments		801,801 12 9

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THE SOUTHERN INSURANCE COMPANY, (LIMITED.)

REGISTERED CAPITAL—ONE MILLION STERLING.

Paid-up Capital .....£ 100,000
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The undersigned having been appointed Agents, are prepared to grant Policies by Marine Insurance.

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Holloway's Pills and Ointment.—Irritable Bowels.—To be able to arrest the progress of bowel complaints must be a very desirable object: nothing will accomplish this so safely and certainly as Holloway's Ointment well rubbed twice a-day over the abdomen. It has an advantage over every other astringent, since it restrains the purging without interfering with the stomach or liver. On reaching the bowels this urgent soothes their irritated lining, and simultaneously relieves all griping, purging, vomiting, disagreeable eructations, and gives general ease, without danger of checking the diarrhœa too suddenly. In dysentery the same treatment, aided by proper doses of Holloway's Pills, will allay the excessive straining, stop the discharge of slimy matter, and painlessly prevent both ulceration and danger.

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N B —Constituents are reminded that time, trouble, and frequently expense are saved by instructions being made full and complete in the first instance. Where a margin is intended to be given, its limits should be stated.

TRANSIT DEPARTMENT.—THE GLOBE PARCELS EXPRESS undertakes the forwarding of goods and parcels by the quickest, safest, and most economical routes throughout India, Europe, and the World.

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Jewellery	HARRISON & Co	London & Birmingham.
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Lamps, Punkahs,	MADDEN & SON	London.
Lithographic Presses	MACLURE, MACDONALD, MACGREGOR	
Marine Engines	JACKSON & WATKINS	London.
Machinery, Saw Mills, &c	SAML. WORSSAM & Co.	London.
Needles	ABEL MORALL	London.
Printing Presses	HOPKINSON & COPE	London.
Type	V. & J. FIGGINS	London.
Sewing Machines	J. WEIR	London.
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Watches	DENT & Co	London.
Wines	LOWENTHAL & SOLMS	Frankfort.
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Select parcels of Watches, Jewellery, &c., are now on hand. Consignments of choice Wines, Printing Presses, and Inks, Printing Paper, Sewing Machines, &c., are daily expected.

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Bombay, 1st August 1870. Agent.

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BY APPOINTMENT.

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Indian Pianofortes.

Broadwood & Sons' new Cottage 7 Octaves, with three Unisons throughout.
New Cottage Grand, with three Unisons in Tenor and Treble.
New Semi-Grand, ditto ditto ditto ditto ditto.
COLLARD & COLLARD'S Sympathetic Square Semi-Grand 7 Octaves.
Semi-Grand 7 Octaves with three Unisons Treble.
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Sympathetic Pianofortes.

A consignment of the above expected very shortly from Germany. These instruments are made expressly for India, and will be sold at 20 per cent. below the usual price charged for similar Instruments in Calcutta.

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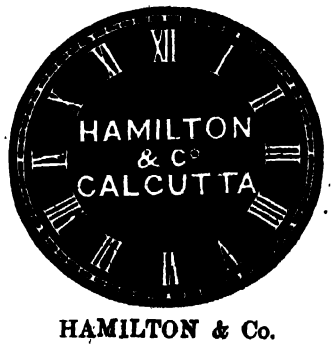
Among the present extensive stock of the above firm will be found the best modern, as well as the most admired classical productions of the best masters. Constituents are respectfully informed that for *immediate* Cash payments the publisher's marked price will be charged for single pieces, and for every six pieces purchased, a seventh one of equal value will be added to the number without additional charge.

C. GOULD,
Calcutta, April 1870. Proprietor.

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IN FINE SILVER, double-bottomed, engine-turned hunting case, of medium size, and with a first-class full plate Lever movement.

Rs. 50 Cash.



Rs. 50 Cash.

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Begs to state that for some years past, their endeavour has been to introduce to their Constituents a good, reliable, English Silver Watch, at a really moderate Price. Owing to recent valuable improvements in the Watch-maker's art, by which the aid of machinery has been brought to bear with marvellous success, they are now enabled to offer the above Watch, which they guarantee to be entirely English-made throughout, at the hitherto unprecedented price of Rs. 50 cash, and the same Watch in Gold Engine-turned hunting case, at Rs. 180 cash.

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Orders respectfully solicited.

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Jewellers and Silversmiths in ordinary to his Excellency Earl Mayo, K. P.,
8, Old Court House Street, Calcutta.

Printed for the Proprietor at the *Perseverance Printing Press*, Bombay.—Published by Messrs. WYMAN & Co., Calcutta.—15th Feb. 1871.

"sumed at home and not sold." We think it was an error, and one that is commonly made in these settlement proceedings. The higher the standard of living upon the farm, the less produce of course will there be for sale.

We were hardly prepared for the admission that the full rent of the Provinces may be estimated at 13 millions; the State demand meanwhile being four. It was the fashion until only the other day, to describe it as a rack-rent of half the *produce*, which Mr. Elliott himself believes to be upwards of 40 millions sterling, and we contend must be very much more.

THE Government at Allahabad is at last addressing itsel in earnest to the preparation of statistics concerning the agriculture of the North-West Provinces. A recent *Government Gazette* gives us a series of elaborate statements concerning the harvest of the famine year 1868-69. The tables seems to have been prepared under the orders of the Board of Revenue at Allahabad, and, as a beginning, they are most welcome. Bombay, Madras, and Bengal now stand alone in their neglect of this most necessary and most elementary work. According to these tables, the harvest of the North-West in 1868-69, was as follows:—

GROSS PRODUCE N. W. PROVINCES 1868-69.

	Acres	*Maunds 82 lbs.*
Rice	2,479,874	16,681,568
Cotton	971,885	1,100,408
Joaree and Bajree	4,302,890	12,855,273
Oil Seeds	475,331	1,923,006
Wheat and Barley	7,257,873	46,345,722
Pulse, gram, &c	1,653,238	6,657,516
Other crops	4,836,423	28,756,941
Kurbee (or Joaree stalk)	1,956,911	24,498,448
Acres...	23,934,425	138,878,882
Add		
Ghazeepore district (particulars not received)	842,000	
Acres...	24,776,425	

Although the year was marked by a very scanty rainfall, it is impossible to regard these figures, in so far as the produce is concerned, as even approximately true. Are we really to believe that the average produce of the land throughout the North-West in the year in question is rightly stated at the following rates?:—

Rice	7 Maunds	or 574 lbs. per acre.
Joaree	$1\frac{1}{6}$ „	or 246 „ „
Oil Seed	4 „	or 328 „ „
Wheat and Barley	6½ „	or 520 „ „
Pulse	4 „	or 328 „ „

Whatever damage may have been done to the khureef crops of rice, joaree, and til, there was no drought we believe to affect materially the rubbee (or wheat) crop either in 1868 or 1869; and yet, according to these returns, the total harvest of the year amounted but to 113,000,000 maunds of food, of which the tables shew 29,000,000 maunds to have been exported, leaving for home consumption 84,000,000 maunds or about 3,000,000 tons. But the people themselves who are about 30,000,000 in number, must at a moderate estimate require 8,000,000 tons of food a year. The granaries must have been "well stocked," indeed, to have tided the people over such a deficiency as this. We find it difficult to suppose that there is not some vast error in the estimate of the yield of wheat. Can it, we say, be true that the *average* yield of wheat and barley in the North-West Provinces in almost an ordinary season is but 520 lbs. per acre? We do not believe it.

The returns of the more valuable crops are given thus:—

Sugar	599,315 acres.
Vegetable	105,420 „
Fruits Trees	169,201 „

Here again we doubt these figures exceedingly, while nothing whatever is said either of indigo, opium, or tea, although we know that there are not less than three to four hundred thousand acres under opium alone in the North-West. Could anything be more perfunctory than the careless jumbling together of the tea, sugar, opium, indigo, jute, tobacco, and other rich cultivation, under such a heading as this—

	Produce.
Other crops ...4,836,423 acres,	...28,755,941 Maunds.

Opium, minutely weighed by the seer, is thus registered as producing on the average 7 maunds per acre. Again, are we to believe that of the 24,000,000 acres of land in the North-West, of which about one-third *(Modern India page 336)* or 8,000,000 are irrigated, there are but 600,000 acres under cultivation with sugar, and 100,000 with garden produce? The Agra district is a dry country west of the Jumna, with less irrigation than most districts of the Provinces, and with the water far from the surface, and yet Mr. Campbell tells us that between 3 and 4 per cent of the land, 20 years ago, was under sugar, indigo, and vegetable cultivation. It may seem ungracious to criticize in this manner the first efforts of the Board of Revenue to supply us with the statistics we have so long desiderated. But let us have *honest* work in their preparation. To be of any worth whatever, statistics must be real and not the semblances of things. It is a feature in these returns that they include for the first time a mention of fodder, as part of the harvest of the land,—

	Acres	*Produce*
Kurbee or Joar stalk ...	1,956,911	... 24,498,448 Maunds.

Are we to understand that this crop was a pure fodder crop, and that the grain was cut down with it for the cattle? It would certainly seem so, from the shape in which the fact is recorded. No mention, however, is made either of grass, or *bhoosa* (wheat straw). To complete these returns we require an estimate of both. When are we to congratulate Madras, Bombay, or Bengal, upon following this North-West example?

THE LAND.

To the Editor of the "Indian Economist."

DEAR SIR,—It is with much painful concern that I have observed how strenuously you urge the almost unlimited taxation of landholders in this country. Why a man who possesses land in this country should be prevented from laying out capital upon it by a prohibitive and exceptional system of taxation laid upon its returns to which no other class is subjected, I am quite unable to see. The only reason apparent, and I fear the true one, is that the immobility of land places the profits derived from the use of it more readily within the grasp of the taxing power than those of other branches of industry. The facility which this mode of raising money presents, recommends it strongly to those in authority, and blinds them to its partiality and oppressive injustice, and the banking and commercial classes readily give it their support, because they see in the unlimited taxation of land an exemption from a portion of their own burdens. These parties assist the press and carry it with them, while the landholders, who are the victims, have neither the knowledge necessary for their defence, nor the power to make themselves heard. The system seems to me as impolitic as it is unjust. Its effect is of course to prohibit the application of capital to land for any purpose that will not yield twice the amount of profit expected from other industries. The theory on which it seems to be based, is that land, from something inherent in its own nature, gives a continually increasing profit to those who work it, independently of the capital and labour employed upon it. This is certainly a fallacy, and a very pernicious one. That land, as an instrument of production, has an inherent value of its own, is quite true; but when once that value has been determined, there is no reason to suppose that its productive power increases except in strict proportion to the capital laid out upon it. In cases in which its abstract value may have been rated too low, it soon, when cultivation is once in progress, becomes impossible to distinguish the portion of the profit derived from such deficiency in the estimate of its intrinsic value from that derived from the outlay of capital; and no attempt to rectify the defect by additional taxation can be made without danger of unduly reducing the legitimate return upon the capital. Of the effect of the periodical assessments so strongly deprecated a few years ago, but now so strenuously supported by a large portion of the press, my own case furnishes an example. I have landed pro-

perty which I greatly desire to improve by laying out money upon it; but I cannot expect a return in the form of increase of rent that will do more than pay me a moderate interest upon it; and with the prospect of that return being cut down in a few years by a new settlement, I cannot venture upon the outlay. Can a system be wise which compels a landowner to avoid the investment of his funds in his own land, and to select other securities in preference? It is exactly the same with the native zemindars. They will buy other land with the money they save, when they can get it at a price that will give them a certain return; but they will lay out nothing in the improvement of the property they already possess. They cannot do so with a new assessment looming in the distance, except when they can seecure a rate of profit rarely to be obtained from any sort of outlay. As long as this system continues, agricultural prosperity will make little progress.

You have said that the people are profoundly content and happy with their leases (settlements?). I believe it is seriously and sadly the reverse. They feel bitterly that they are made the objects of an exceptional system of exaction which keeps them reduced to a mere subsistence, and hampers them in their efforts at improvement as no other class is hampered.

The Government may try to make a contented agricultural class by dispossessing existing proprietors and dividing their estates among the labourers employed to cultivate them, and may for a time succeed; but the success will be but brief, and will end in extending and confirming the dissatisfaction. These new holders, poor and lowly though they be, and happy at first in their new-born rights and possessions will soon fall into the same position, suffer the same grievances, and be the victims of the same discontent as their late masters.

I shall be very glad if anything I have been able to say shall lead you to reconsider the opinion you have expressed, and to look at the subject from a more varied and extended point of view than apparently you have hitherto done. It may be that you have not had the opportunity of testing, by practical experience, the correctness of the theories which have been your guide and by which (excuse me for saying) I think you have been misled.

AN INDIAN LANDLORD.

North West Provinces, January 1871.

NOTE BY THE EDITOR.

The most simple, and perhaps the most effective, reply we can make to our correspondent, is to point out that the total amount the State is exacting from the land of all India is but £20,000,000 sterling a year. Call it rental, or a tax upon rental, or what you please, *that* is the amount of the exaction; and in the main the impost is precisely what it was 20 years ago. But in the interval a great revolution in values has taken place throughout the world, and we have spent £100,000,000 sterling upon railways and £50,000,000 upon roads and works of irrigation in the country, with the general result of seeing the export trade rise from £18,000,000 sterling a year to £70,000,000 Twenty years ago the value of the produce of the soil of India was perhaps £200,000,000 sterling, it is now we suppose not less than £400,000,000; and in these circumstances it is oppression, it seems, for the State to raise the rental. With all respect to our correspondent, we remark that his arguments are familiar to us as "household words." Not one of them will bear sifting.—ED. *I. E.*

SHEWLA; OR SATURATED SOLUTIONS OF SEWAGE.

WE are sorry to see so intelligent a man as Mr. Blaney, whose pamphlet upon *Drainage and Conservancy* ought to have been acknowledged last month, assisting to maintain the delusion of the Bombay community that they cannot afford themselves a supply of pure water. "It is as much as the city can do at "present to pay the interest on the loan incurred on account of "the Vehar waterworks, and although it is true that these "waterworks were badly executed and outrageously financed, the "financial difficulty stares us in the face, and will continue to do "so until this generation has passed away. In considering any "scheme of additional water-supply for Bombay, the limit of "our power to raise water-loans must be remembered. I am "aware that the Health Officer makes his demand for more "water on the grounds of the necessities of public health, but in "this question he occupies the double position of sanitary officer "and Justice of the Peace. Having decided the quantity of "water required for the city in the first capacity, he will be re-"quired to show how it can be provided in the second." We can hardly persuade ourselves that this is Mr. Blaney's writing. Not afford a sufficient supply of pure water! A heavy responsibility rests upon the writers in the local press who have contrived to betray even the intelligence of their city into the belief that the Island cannot afford itself a proper supply of water. One of these writers has discovered that every man should be allowed to drink water out of his own cesspool if he choose to do so; while the other implores some good old Parsee to die and bequeath a fortune to the community to meet the public want. And now we have Mr. Blaney joining these old ladies, and helping to swell their cry. Look at these facts: Bombay numbers 800,000 people, and is the *entrepot* of a trade of thirty millions sterling a year. The place after all its losses, is still exceedingly wealthy, and its standard of living luxurious amongst the wealthy, and exceptionally high amongst the poor. It is difficult to estimate what the annual expenditure of the Island amounts to, but that it is many millions sterling a year is certain. Its bazaar and markets are crowded with productions which prove the unusually high standard of living amongst the people. They have everything in abundance. They deny themselves nothing. The markets are simply superb, and are supplied in the utmost profusion with fish, poultry, meats, fruits, vegetables, and a thousand articles of consumption unknown to the people in the interior of India. But one thing they cannot afford themselves—Water. This great tropical city, the commercial capital of the empire, the geographical capital of Asia—indeed of the old world, can afford itself everything but—Water. The wells and tanks of the place meanwhile are saturated solutions of sewage, to drink which is death.

Now, it has been discovered that when the foundations of the mountains were laid, a vast natural reservoir for the Island was built for it by the hand of God in the neighbouring hills, less than fifty or sixty miles away, a reservoir requiring but a solitary gap to be closed by the hand of man, to convert it into a vast lake capable of supplying the Island for all time with perennial fountains and streams to make it a paradise of the nations. But the people cannot afford it, although the cost of this grand work from first to last is estimated at no more than £1,250,000, or perhaps £1,500,000. As there happens to be no *providential Bakery* in the adjoining hills, the people do, somehow or other, contrive to find about £10,000 a day for their bread, but they positively cannot afford £300 a day for water! Was there ever such drivel forced upon the common sense of a community as counsel!

The total cost of giving the Island a permanent supply of water to meet all wants whatever, would be covered, it is admitted, by an outlay of £2,000,000 sterling. Thus—

Existing debt upon Vehar Works	£350,000
Estimate for Shewla reservoir	£1,650,000
Total	£2,000,000

Mr. Blaney is a sensible man, and we beg him, in Heaven's name, to look at these figures. Five per cent upon this outlay is just £100,000 a year, or £300 a day. We feel almost ashamed to carry the discussion beyond this fact. Look at what this Shewla reservoir would accomplish for the Island. It seems to be overlooked that the supply of water which it would place at the command of the Municipality would bring an immense income with it. The markets of Bombay are so important, that wherever water is to be got in its neighbourhood for the cultivation of fruit or vegetables, the rental of the land becomes enormous. Thus the market garden ground at Parell lets for Rs. 180 per acre. Now Shewla would not merely give Bombay 30 gallons of water per head per day for domestic use, but a vast supply for the irrigation of market gardens along the whole

course of the aqueduct. To our own mind, there is positive guilt in the wanton neglect by a great city like Bombay of so simple and inexpensive, and yet so grand a work, which lies to its very hand inviting accomplishment, for its own benefit first and then as an incentive and example to other cities. It is in the name, not of extravagance but of true economy and of common sense, that we insist upon the work being done. The petty schemes put forward by the engineers for patching up the Vehar supply are the devices of sheer incompetency, the proof of want of clear insight. Though Shewla were to cost five millions instead of one, it is doubtful whether the work should not be done. The man who uses the word "*afford*" in such an association as this is simply an idiot, when the real state of matters has been once pointed out. The Bombay community cannot "*afford*" itself a supply of pure water, although it can afford a supply of everything else in abundance! £10,000 a day for bread, but not £300 for water. The secret of this folly is that the system of municipal taxation is altogether faulty, and requires radical reform. A most important beginning was made two years ago, when the Town Duties Bill was passed in the teeth of the Noodledom of the place. Dr. Blaney feels the municipal shoe pinch him, because cobblers made it, and not workmen. The system of water rates in Bombay is simply a fraud from beginning to end. Six or seven thousand men are made to find water for the whole 800,000, and the burden is of course very heavy. A general water rate, and a trifling increase of the Town Dues, are the right measures to take. Common sense and sound economy alike dictate the reform, and with it will come the Shewla reservoir with the thousand advantages and blessings it will bring the community. If Bombay could ship its publicists and obstructives on board ship, and send them a voyage round the world at the expense of the municipal treasury, it would be a very cheap outlay of public money. "The quack bootmaker is considerable, as corn-cutters can testify—but the quack political doctor!"

EDITORIAL NOTES.

THE Madras papers will, we trust, pardon our saying that they would do well to intimate the regularity with which the daily journals of Bombay publish the weekly returns of their Presidency Bank. Sometimes for weeks together no bank statement whatever appears in the Madras papers, and at others the same stale balance sheet is published day after day for weeks. The official *Gazette* is partly to blame, we observe, for the irregularity, but not wholly.

A LOCAL contemporary states that a Veterinary College is likely to be established as one result of the labours of the Cattle Plague Commission, and that a Chair of Agriculture will probably be added thereto. "This college, it is believed, will be placed under the control of the proposed Agricultural Department;" but where the college is to be formed is not stated.

We doubt if our contemporary is rightly informed. At all events we should think the model farm would be the proper place for the veterinary school.

ACCORDING to the last Administration Report (1869-70) eight hundred and thirty estates were sold in Bengal during the year for Rs. 17,973 arrears of revenue. The estates realised, we are told, Rs. 7,16,519. Of these, 58 estates assessed at Rs. 9,300, were purchased by Government for Rs. 64; while the remaining 772, assessed at Rs. 52,053, were purchased by private individuals for Rs. 7,16,455. The *Indian Daily Examiner* enquires if these sales were *bona fide*, or brought about by the superior holders merely to quash under-tenures? "It seems strange," adds our contemporary, "that estates, a number of which sold for the aggregate sum of Rs. 7,16,455, should be suffered to go to the hammer for Rs. 17,973." The price realized represents, we observe, about 14 years' purchase of the assessment.

THE uncertainty of Indian statistics is so great that it is almost idle to argue from them. According to the last Administration Report from Allahabad, the population of the North-West Provinces is made up as follows:—

Men	10,160,030
Women	9,194,668
Children under 12 years, Male ... 6,018,786	
Female 4,718,414	
	10,732,200.

It is almost impossible to believe that these figures are true. The approaching Census, upon which no pains should be spared, will lay the foundation, we may hope, for solid statistical researches.

WE noticed in our last issue that the acreage under cotton cultivation in the North-West Provinces this season and in Central India is in both cases somewhat wider than in 1869-70. In Madras, on the other hand, there seems to be a considerable falling off, the figure having fallen, according to the official *Gazette*, from 1,285,263 acres in 1869-70 to 1,074,563 acres in the present season 1870-71. It is impossible, however, to place any trust in these figures, as simultaneously with their appearance the Madras Board of Revenue publishes a report, in which the acreage under cotton in 1869-70 is declared to have been 1,604,028 acres, while the Administration Report for 1869-70 just issued, tells us that the area was 1,771,378 acres, exclusive of Malabar and South Canara! Now look at these variations:—

Acreage under Cotton—Madras, 1869-70.

According to last official *Gazette*	1,074,563 acres.
„ to Board of Revenue	1,604,028 „
„ to Administration Report (excluding Malabar and Canara).	1,771,378 „

Commenting upon the Board's returns, a Madras paper says,—"It will be thus seen that the cultivation has about doubled "since 1852; and yet Manchester is not satisfied." If the official *Gazette* is correct, and the Madras Board of Revenue have reported faithfully the cultivation of 1859-60, there has been no increase at all during the ten years.

1859-60	According to Board of Revenue	1,076,658 acres.
1870-71	„ to Official *Gazette*	1,074,563 „

Could anything be more unsatisfactory, or more discreditable, when we remember that our land revenue system gives us such peculiar facilities for obtaining exact information? We do not venture to give an opinion as to the respective claims of these conflicting authorities upon our belief.

"WHAT we really need," says a writer in the *Pioneer*, "as the "foundation of solid improvement to agriculture and the land re- "venue, is a minute and comprehensive investigation by profes- "sional experts of the present actual condition of the land, and "of the cultivating classes, their ways of cultivation, and their "means. We shall then, and then only, discover surely what "help they want, and we suspect that in many provinces it "will be found that they mainly want *money*. However this "may be, we are convinced that all further allotment of the "public funds to industrial development should be preceded "by an exact survey and scrutiny of the *status quo* of things "as they are."

The writer overlooks, we think, that we have already a mass of minute information concerning the agriculture of the country in the Secretariates of India, that simply requires to be sifted and collated and summarised, not by "professional experts" but by men gifted with clear insight—Carlyle's *seers*. How can we reasonably expect to get from mere "professional experts"—for by the term, we suppose, our contemporary means "professional agriculturists"—information so full, so varied, and so minute as we already possess in the Settlement Reports of the country?

Bombay we know possesses reports upon the agriculture of its provinces not to be surpassed for the skill with which they have been drawn—reports 40 and 50 years old which have never been utilized to this hour. And every province of the country has simi-

lar reports buried in the recesses of the record rooms. It will be the business of the new department to disinter these reports at once. Six months of honest work, with a competent staff, would suffice to shew how valuable a mass of information we already possess, while the bringing together of these reports, and the work of comparing and classifying them would result in the decernment of great leading facts for our acceptance and guidance—that we may not for ever be beginning our work anew, repeating the same enquiries and the same errors over and over again. Let us use what we have already in our hands.

We observe that Mr. Blaney in his valuable and interesting pamphlet upon the drainage and conservancy of Indian towns, makes the following quotation from our columns:—The *Indian Economist* of September 10th 1869, says,—"We "have not the smallest doubt of the possibility of raising a very "considerable revenue in India from direct taxes. We have never "doubted the possibility of doing so. What we have doubted "and denied is the possibility of our ever raising a large revenue "in India from indirect taxation, for the reason that the tastes "of the people, and their standard of living, are very simple, and "that the soil itself produces all they want at their own doors."

The comment which Mr. Blaney makes upon this passage is as follows:—"In Bombay about eight or nine lacs of rupees per "annum are derived from octroi duties. The testimony of the "Duke of Argyll is to the following effect: 'It is impossible in "'any country to reach the masses of the population by direct "taxes.' If they are to contribute at all to the expenditure of the "State, it must be through taxes levied upon some articles of "universal consumption. If such taxes are fairly adjusted, a "large revenue can be thus raised, not only with less conscious-"ness on the part of the people, but with less real hardship upon "them than in any other way whatever."

Mr. Blaney has understood neither the *Indian Economist* nor the Duke of Argyll, between whom there is complete accord upon this question. When the Duke of Argyll says that "it is impossible in any country to reach the masses of the population by direct taxes," he means direct taxes after the European model, such as the Income Tax. He does not mean that you cannot reach the masses by a capitation tax. So, if Mr. Blaney will refer again to the *Economist* of 10th September 1869, he will find that we were simply denying the possibility of raising a large revenue in India through the Custom House, because no article of universal consumption passes through it, and affirming that a very considerable revenue might be raised by direct taxes "in the immemorial way of the country," *i.e.*, direct squeezing. Mr. Blaney can hardly have forgotten that Bombay owes its eight or nine lacs of octroi duty largely to ourselves, who pressed them upon the Bench at the cost of much personal obloquy, and the temporary loss of many friends.

The results of the last half year's operations of the three State Banks of India, are as follows:—

	Paid up Capital.	*Half year Profits*	*Dividend*
Bank of Bengal.....	Rs. 2,20,00,000	Rs. 6,81,259	5½ per annum.
„ Madras	„ 56,25,000	„ 2,16,130	7 „
„ Bombay	„ 60,00,000	„ 1,40,707	5 „

The amount of profit undivided, and the reserve funds of each Bank respectively, on the 31st December, were:—

	Undivided Profit.	*Reserve 31st December.*
Bank of Bengal.....	Rs. 70,323	Rs. 15,67,789
„ Madras	„ 25,655	„ 5,62,500
„ Bombay	„ 20,126	„ 4,15,000

The resources of each Bank, and their employment were severally as follows:—

RESOURCES.	*Bank of Bengal* Rs.	*Bank of Madras* Rs.	*Bank of Bombay* Rs.
Capital	2,35,67,000	61,87,500	64,15,000
Government deposits...	3,01,51,000	99,52,000	81,08,000
Private deposits	3,11,84,000	1,15,30,000	2,23,09,000
Bank Post bills, &c.....	3,54,000	11,62,000	13,22,000
	8,52,56,000	2,88,31,500	3,81,54,000

EMPLOYMENT.	Rs.	Rs.	Rs.
Govt. Securities.....	1,16,86,000	3,86,000	9,09,000
Loans on do, ...	56,20,000	24,45,000	19,56,000
Bills discounted.....	1,72,21,000	73,80,000	58,41,000
Cash Balances unemployed.....	5,03,54,000	1,88,66,000	3,00,15,000
	8,48,81,000	2,90,77,000	3,80,27,000

The figures furnish a striking proof of the stagnation of trade in the country. Of the £15,000,000 capital and deposits in their hands, the three banks between them are barely able to invest £3,000,000, and have four-fifths of their resources lying unemployed in their coffers. The wonder is that they are able to declare any dividend at all, and shareholders may be congratulated upon their good fortune. The discount rates of the Bank of Bengal were unchanged throughout the whole six months under review. We cannot but think this state of matters indicates a want of enterprise or insight somewhere or other. Here are £12,000,000 of money lying unemployed in a country destitute of almost every mark of modern civilization, and in the heart of rich and populous cities, not one of which we believe possesses the simple luxury of a swimming bath.

Almost equal uncertainty seems to characterize the Bombay returns, if we may believe a local writer, who says: "The Com-"missioner's average estimate of 60 lbs. per acre would repre-"sent last year's crop of Kattiawar as 79,464 candies, or 158,928 "bales, which, added to the 'amounts realized' in Broach, "Ahmedabad, &c., make a total of 229,872 bales. And yet we "know that 456,370 were received from these districts in that "year, and the residue of Dhollera, Veravul, &c., left behind "at its close was unusually large."

Messrs Robertson, Brothers & Co. simultaneously complain from Dharwar of the Cotton Commissioner's "astounding state-ment" that the production from the Collectorates of Dharwar, Belgaum, and Kulladghee will be only 53,150 bales as calculated greatly to mislead all persons connected with or interested in the trade of these districts. "We are at a loss, they say, "to "understand how the Cotton Commissioner can estimate "a general yield from a healthy crop at the low figure "of 19 lbs. per acre, when in some parts the natives estimate "16, in others 12, and in the worst 4 maunds cuppas "per acre, so that taking a low average of 6 maunds cuppas "we must surely have 56 lbs clean cotton per acre. We "do not know who supplies the Commissioner with his informa-"tion regarding Dharwar, but the source is evidently not a re-"liable one. If the dumbul, mahalkerry, and ryots told the Col-"lector that the rain had increased the disease of kurree-jeegee, "and that the prospects of a much larger crop than last year "were not very great, their object in saying so must have been "to induce him to reduce their income tax or rent."

Our agricultural statistics are at present so unreliable, that it is impossible to build any conclusion upon them whatever. In the meanwhile we give for what they are worth, the latest estimates of the acreage under cotton this season throughout the country:—

North-West Provinces.....	1,247,484 acres.
Central Provinces.....	768,781 „
East Berar	687,010 „
West Berar	802,417 „
Madras	1,074,503 „
Bombay (including Sind and the Native States)	4,020422 „

The Cotton Commissioner affirms the Bombay area to be 545,063 acres below the average of last season. No estimates as yet have been received from the Punjaub. Neither Oudh nor Bengal ever attempt any, nor, indeed, keep any record whatever of the cultivation.

The prices realized at the opium sale of 6th instant were as follows:—

	Chests.	Highest.	Lowest.	Average.	Proceeds.
Behar	2,665	1,165	1,155	1,158-1-0	30,86,250
Benares	1,665	1,140	1,130	1,134-9-3	18,89,071

Prices have been comparatively steady at about these quotations for many months past, and as the estimates of the year were based upon an expectation of 975 Rupees per chest on 49,000 chests, the actuals will thus prove better than the estimates by seventy-five lakhs; and as 52,000 chests are announced for sale during the present year in place of 49,000, opium, in so far as Bengal is concerned, will show favorably in the coming budget. If Sir Richard Temple bases his expectations upon a probable receipt of Rupees 1,050 per chest, which we should think a safe figure, the estimate will stand for the coming year at Rupees 5,46,00,000 instead of the Rupees 4,77,00,000 of last budget. The yield of the Malwa drug, if not quite so favorable, still promises to exceed the estimates. Up to date of 14th instant 33,881 *passes* had been granted during the current financial year which, at 600 Rupees the chest, will exceed the £20,00,000 estimate of the budget. Should the drug come forward as freely during the remaining six weeks of the present year as it did in 1870, there will be 6,000 more passes wanted, and the Malwa actuals will exceed the estimate by 30 or 40 lakhs.

Upon the whole, the financial prospects of the new year are bright, and although we do not ourselves feel, as we have said, at liberty to urge the total abolition of the Income Tax, the fact that the opposition to it is universal and bitter, should have great weight in the eyes of Government. "The true end of legislation," says Edmund Burke, "is to follow, "not to force, public inclination. It would be dreadful, "indeed, if there was any power in the nation capable of "resisting its unanimous desire, or even the desire of any "very great and decided majority of the people. The "people may be deceived in their choice of an object, *but I can* "*scarcely conceive any choice they can make to be so very mischiev-* "*ous as the existence of any human force capable of resisting it.* "When Government and the people differ, Government is gene- "rally in the wrong." So, too, in 1772, when speaking on a Bill respecting the import and export of corn, the profound and eloquent statesman said,—"I give way to the present Bill not "because I approve of the measure in itself, but because I think "it prudent to yield * * * the people will have it so, and "it is not for their representatives to say nay."

These words embody such profound wisdom that we would press them upon Lord Mayo's notice. There can be no doubt whatever that the people are opposed as one man to the Income Tax. Well, whether they are right or wrong is no longer the question. "The proper business of a statesman," says Mr. Buckle, "is to contrive the means by which certain ends may be "effected, leaving to the general voice of the country to deter- "mine what those ends shall be, and shaping his own conduct, "not according to his own principles, but according to the wishes "of the people for whom he legislates, and whom he is bound to "obey."

With whatever limitations we may hold this doctrine in India, the passage embodies a great principle for the statesman's guidance. Feeble and shallow men spend their little force in resisting the popular wish till they find themselves at length compelled to yield in the midst of deserved odium, where a statesman, by prompt and graceful concession, puts himself at the head of the movement, for that guidance and control which are at once granted him by popular acclaim. Lord Mayo has done a wise thing in the issue of the late Financial Resolution. We think he would be well advised were he now, without sinking, or professing to sink, his own convictions, to repeal the Income Tax in deference to what is plainly the universal wish.

SILK.

RAW PRODUCTS IN DHARWAR.

THE following letter has been addressed by Dr. M. M. Mackenzie, Superintendent of Jail, Dharwar, to the Secretary to Government, Revenue Department, Bombay, dated 15th August 1870:—

I have the honor herewith to submit, for the information of His Excellency the Governor in Council, a printed summary of my efforts in sericulture, the utilization of the wild aloe, and to a certain extent also of other plants or shrubs producing fibre; and these experiments, with silk and aloes, date from 1866, but with the other articles only from this and the preceding year.

SILK.

When I first commenced my experiments in silk culture, I had no idea that I would carry them out so extensively; but as I found my efforts rewarded, and success undoubted, I was encouraged to go on with them from year to year; but had I in the outset deemed that such would have been the case, I would have submitted regular detailed reports to Government direct.

2. I now beg to present them in a complete form, brought up to the end of June of this year, and being now convinced by practical experience of the capabilities of this climate for a great remunerative and successful extension of such works, I will leave it with Government or private parties to carry them out to their full extent, but I will retain only a few of the silkworms for the benefit of any who may desire to have them.

3. My previously *reported* experiments date from June 1868 to September 1869, and this last one from October 1869 up to the end of June of this year, giving respectively three trials of ten, six, and eight months.

4. In order to satisfy myself that my former anticipations and deductions were correct, not only as to the actual production of silk, but through care and attention as to the possibility of a gradually increasing yield, I set apart equal quantities of cocoons chosen promiscuously from each experiment, and the results I beg to present in a tabular form, giving the results as per lbs. 100:—

Statement showing Results compared with the previous Experiments.

FIRST EXPERIMENTS DURING 10 MONTHS.

Weight of Cocoons.	Weight of Raw Silk.	Yield per Month.	
		Cocoons.	Raw Silk.
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
88 5 8	5 15 0	8 13 0	0 9 8

SECOND EXPERIMENTS DURING 6 MONTHS.

Weight of Cocoons.	Weight of Raw Silk.	Yield per Month.	
		Cocoons.	Raw Silk.
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
57 5 0	4 15 8	9 8 0	0 13 4

THIRD EXPERIMENTS DURING 8 MONTHS.

Weight of Cocoons.	Weight of Raw Silk.	Yield per Month.	
		Cocoons.	Raw Silk.
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
113 6 12	11 4 12	14 2 0	1 6 9

Statement showing proportionate Results compared with previous Experiments.

First Experiments, 10 months.		Second Experiments, 6 months.		Third Experiments, 8 months.	
Cocoons.	Raw Silk.	Cocoons.	Raw Silk.	Cocoons.	Raw Silk.
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
100 0 0	6 11 0	100 0 0	8 11 0	100 0 0	9 15 0

The above shows a steady increase in each period, the last yielding 3 lbs. 4 oz. over that of the first.

5. As in previous reports, I now also append a statement of the monthly yield for the past eight months, showing a product of 11 lbs. 4 oz. 12 drs. raw silk out of 113 lbs. 6 oz. 12 drs. cocoons, and which, after deduction of convict labor, leaves a profit of Rs. 48-6-0 out of Rs. 90-6-0, or a clear profit of 110 per cent. on the value of the labour; these rates are of course based upon convict labor, which is taken at an average of two annas a day, or 3d. in English money. Of course even with free labor all of it can be carried out by the employment of women and children, except the throwing or throwsting operation, *i. e.*, removing the silk from the cocoons; this individual (and only one is employed in the jail) may be put down at 12 annas, while in the non-working intervals he may well act as general supervisor. The usual labor rates in these districts are, for male adults, from 3½ to 4 annas per day, women 2½ to 3 annas, and for children, from 1 anna to 1½. Carrying the experiments on still further through their bleaching, washing, and dyeing processes, and taking the Hooblee

market rate of dyed and dressed silk at Rs. 18 per pound, it gives a profit, after deducting the convict labour, &c., of Rs. 115-15-6, or 132½ on the outlay.

TABLE No. 1.

Result of Silk Cultivation in the Dharwar Jail from October 1869 to June 1870 inclusive,—eight months.

Months.	Weight of Cocoons. lb.	oz.	dr.	Weight of Raw Silk. lb.	oz.	dr.
October	4	6	4	0	8	8
November	28	5	8	2	14	0
December	1	15	0	0	2	8
January	5	8	0	0	7	4
February	21	5	0	2	10	8
March and April	25	6	0	3	1	8
May	6	1	0	0	10	0
June	20	8	0	0	14	8
Total	113	6	12	11	4	12

TABLE No. 2

Statement showing Results of the above as worked at the Dharwar Jail.

RAW SILK.

	Rs.	A.	P.	Rs.	A.	P.
Value of 11 lbs. 4 oz. 12 drs. Raw silk at Rs. 8 per lb.				90	6	0.
Deduct—						
Convict labor, collecting leaves, feeding worms, &c., 208 aggregate number of days, at 2 annas	26	0	0			
Throwsting paid at Rupees 2 per month, or 24 working days in all	16	0	0			
				42	0	0
Profit on raw silk				Rs. 48	6	0

110 per cent. profit on outlay for labor.

TABLE No. 3

DRESSED AND DYED SILK

	Rs.	A.	P.	Rs.	A.	P.
Value of 11 lbs. 4 ozs. 12 drs. dyed silk, at	203	0	0			
Deduct—						
Loss in weight while bleaching, at 4 ozs. per lb.	50	13	0			
Convict labor, carding, twisting, unwinding 112 aggregate number of days, at 2 annas	14	0	0			
Bleaching and dyeing, at Rs. 2 per lb. (Hoobloe rate)	22	9	0			
				87	6	0
Profit on dyed silk				Rs. 115	15	6

132½ per cent. profit on outlay for labor and loss of weight.

6. If free labor is utilized, the profit on raw silk for the outlay, as will be seen from Table No. 4, will be Rs. 46-6-0, or 105¼ per cent. on outlay for labor.

7. Dyed and dressed silk by free labor will give, as shown by Table No. 5, a profit of Rs. 73-15-6, being at the rate of 57 per cent. on the outlay for labor and loss.

8. It will be observed that while dressed and dyed silk carried on by convicts gives the highest profit, the profit is smaller with free labor, the latter being so much higher than the former as to daily wage.

TABLE No. 4.

Statement showing probable Results of the above worked by free Labor.

RAW SILK.

	Rs.	A.	P.	Rs.	A.	P.
Value of 11 lbs. 4. ozs. 12 drs. raw silk, at Rs. 8 per lb.				90	6	0
Deduct—						
Labor for collecting leaves, feeding worms, &c., 208 aggregate number of days at 2 annas	26	0	0			
Throwsting 24 days, at 12 annas	18	0	0			
				44	0	0
Profit on raw silk				Rs. 46	6	0

105¼ per cent. on the outlay for labor.

TABLE No. 5.

DRESSED AND DYED SILK.

	Rs.	A.	P.	Rs.	A.	P.
Value of 11 lbs. 4. ozs. 12 drs. dyed silk, at Rs. 18 per lb.				203	5	6
Deduct—						
Loss in weight while bleaching, at 4 oz. per lb.	50	13	0			
Labor for carding, unwinding, and twisting, 112 days, at 8 annas	56	0	0			
Bleaching and dyeing, at Rs. 2 per. lb (Hooblee rate)	22	9	0			
				129	6	0
Profit on dyed silk				Rs. 73	15	0

57 per cent. on labor and loss.

9. From the above it will be seen that there would be a profit of 105¼ per cent. on the outlay for wages in the production of raw silk.

10. From this would have to be deducted rent of buildings, machinery, cultivation of the mulberry tree, taxes, &c., and which, if required, I may calculate at a future term.

11. I trust that the foregoing statements will tend to prove that my previous anticipations were correct, viz., that by ordinary care and attention to the mulberry plants, keeping up for the worms a full, healthy, and liberal supply of leaves, and by the proper regulation of the ventilation and temperature of the breeding-rooms, the animals will give an increased yield of good silk, although up to what point further experiments only can determine; much will, I fancy, depend on the species tried.

12. Whether other varieties of the worm will succeed here I know not, as the nature of my position and duties obliged me to be contented with those I have (monthly variety), and which have *never at any time since* 1866 *shown the least tendency to disease or decay.*

13. From my previous observations regarding silk production in not only France, Italy, and Switzerland, but in India, China, and Japan, I am more and more convinced that climatic influence has much to do with the successful rearing of the mulberry, as well as that of the worm in all its stages. I have not yet heard or read of *any* climate in Europe or Asia where some blight or disease did not occasionally attack either the mulberry tree or leaf, and in which extremes of heat, cold, or long-continued damp did not tend to destroy the worm in some period of its growth.

14. The climate of Dharwar is such that all the year throughout it never gives extremes, while the rainfall is spread over almost every month in the year. With such a climate I feel sure that the successful rearing of so delicate an animal as the silkworm would be undoubted, for it is excess of heat, cold, or long-continued damp that has caused the great failures that I have heard or read of in this branch of industry.

15. Should further experiments be made, I would hold out the warning that, if other species of the worm are introduced, they be not mixed up completely with those we now possess, but that a gradual acclimatization be first carried out separately. This will more especially be requisite if other breeds are introduced from a very high latitude, and to the fact of this not being attended to, am I disposed to attribute the great failure of Monsieur De Vecchi's experiments in Mysore a years or so ago (page 16).

16. Finally, while urging that further efforts be made here in sericulture, I do so on the results of my experiments carried over several years, and I found my reasons for this success on the following main points (repeated from page 11), all of which Dharwar possesses in a high degree :—

1. A medium degree of moist tropical heat.
2. A comparatively (for India) slight fall of rain throughout the year, never severe or long-continued in any one month, but spread fairly over almost every month in the year.
3. A slight variation in the temperature, not only by night and day, but all the year throughout.
4. Hot season never excessive or of long continuance.
5. Soil rich black or red, and of good depth.
6. Ample water supply in the event of very slight or capricious rainfall.

The following articles have been manufactured in pure silk, dyed of various colours, and always found a ready sale :—

Thirty-one scarves of various sizes.

Dhoturs for the use of Natives, each 12 × 3½; these have been merely made with some gay silk border on either side.

Cholees for women, half silk and half cotton, usually of a black and red stripe.

17. Ova have at various times been sent *via* the ordinary letter-post and otherwise to Khandeish, Ahmedabad, Commissioner Central Provinces, and to Cochin. At the two former places they hatched, but shortly died, perhaps from climatic changes, or want of proper care, food, &c. In the Central Provinces they have, I hear, succeeded well, and I believe at Cochin also. The hatching of the egg of this species is, however, such a brief and rapid process (eight or nine days) that great expedition in transit is a *sine qua non*, and this we cannot

always insure; much also depends on the season of the year, and the state of the weather while in transit, and when hatching.

Dharwar temperature and rainfall for nine months, from Oct. 1869 *to June* 1870, *continued from page* 12, *Silk Report.*

Months.	Average Maximum.	Average Minimum.	Fall. Ins.	Cts.	Ins.	Cts.
October, 1869	89	69	5	53		
November „	87	60	0	95		
December „	90	63	2	46		
January, 1870	93	64	0	38		
February „	93	68	.....			
March „	99	68	0	22		
April „	100	68	1	29		
May „	8	68	0	55		
June „	92	69	5	45		
Total.....	841	597	16	83		
Average.....	93	66			1	87

Mean of extreme monthly reading for nine months, from October 1869 to June 1870, inclusive.	Mean of extreme Maximum, Medium, and Minimum for the above period.			Fall of Rain.		Average Monthly fall of Rain.	
	Maximum	Medium.	Minimum	Ins	Cts.	Ins.	Cts.
60 o	100 o	80 o	60 o	16	83	1	87

SERICULTURE IN BENGAL.

Read the following communication from Mr. G. DeCristoferis in reply to the remarks of Captain Thos. Hutton, submitted at the last monthly meeting.—

"Permit me to address you a few lines for communication to the Society, in answers to some remarks reflecting on myself, made by Captain T. Hutton in his letter to the Agricultural and Horticultural Society printed in the *Englishman* paper of the 22nd instant.

When I said that "no annual worms will hatch regularly, unless they are submitted to the changes of the four seasons in a *temperate* climate, from the heat of a summer to the cold of a winter below zero," I alluded to the Centigrade not the Fahrenheit. The climate of Mussoorie, ranging from 26 to 82° Fah. ought to be well adapted.

"In saying that the annual eggs of Bengal are kept well protected from the air in earthen pots (which are cool and porous), I was not advocating my own views, but was simply stating a method adapted by the natives of Bengal for the preservation of the annual worms, since perhaps these has been introduced in the country; and I fail to perceive the drift of Captain Hutton's comparison between a man and a silk-worm egg, unless it is meant for witticism.

"Captain Hutton's plan of breeding the worms in a more favourable climate than Bengal, and then distributing both cocoons and eggs to those willing to cultivate them carefully, will do very well for the annual cocoons; but what is most vital and Bengal (where mulberry is cut four or five times during the year), and ought to attract the attention of all practical men, should be the improvement of the monthly or Ponvottine worms *in Bengal itself.* The native method or buying seed cocoons, getting the eggs, and rearing the worms, is full of mistaken notions and practices, and if an experimental silk farm, under intelligent and practical management, should be established in the centre of the cocoon-producing districts of Bengal by the aid of Government and the silk manufacturers, it is certain that good results may be obtained tending to improve the quality of these monthly species by the distribution of the cocoons or eggs produced in the farm."

In connection with the subject of silk, the Secretary next read the following letter from Mr. Charles Brownlow of Cachar, and stated that he had received the cocoons therein referred to, and that they had been divided between Captain Hutton of Mussoorie, the Acclimatization Societies of Melbourne and Sydney, and the Austrian Italian and French Consulates :—

"I beg to advise you of my being about to despatch to your address a box containing 71 Atlas cocoons (live), which I trust you will cause to be distributed to parties likely to make experiments on rearing the silk. You will be the best judge of who will be likely to turn them to account, but I would suggest batches being sent to the Australian, Austrian, and Italian Governments, Captain Hutton, M. Guerin De Menaville, &c.

"I shall shortly send for the Agricultural and Horticultural Society's report, on account of the rearing of the brood in open air, in which process from first to last I met with no misadventure; the worm is evidently very docile and tractable.

"A batch of ten cocoons would be enough for experiment, and would yield at least two or three females, which at the rate of 400 eggs each, and allowing casualties, would consume the foliage of a couple of large trees, if not more.

THE BOMBAY COTTON CROP, 1870-71.

GENERAL REMARKS BY THE COTTON COMMISSIONER.

NORTHERN DIVISION.—Of the Guzerat collectorates, Broach is the only one in which there has been a smaller breadth of land cultivated with cotton this season as compared with the last; but taking them together, an increase is noticeable to the extent of 113,514 acres. In my remarks on the return of cultivation published on the 26th of November last, I observed that the condition of the crop in the above collectorates was generally favourable up to that date. A period of cloudy weather set in soon afer in some of the districts, and slight showers fell in Broach and Surat, causing some injury to the cotton crop, although the heavy rainfall in Surat and the neighbouring districts at the end of December was reported to be rather beneficial to the crop than otherwise. At that time it was anticipated that considerable damage would be occasioned by the boll-worm which had made its appearance in Broach, favoured, it was supposed, by the continuance of cloudy weather, but a subsequent report from Mr. Stormont describes the damage as so very limited in its extent, that there was reason to believe that the earlier exports would generally be much freer from stain than was the case last season. When the late rainstorm passed over Bombay in the middle of January, the weather in the districts of Surat and Broach became cloudy, with every indication of rain, but only a few light showers fell, and the weather has been fine ever since. Notwithstanding the drawbacks abovementioned, the season in the four collectorates of Guzerat may be described as on the whole favourable for cotton; as regards both quantity and quality, a fair average crop may be looked for. It will be seen that the quantity of cotton expected from the above collectorates amounts to 36,146 candies (equal to 72,292 pressed bales,) which on an average gives the very moderate estimate of 45 pounds of clean cotton per acre.

There has been an increase in the area of cotton cultivation in Khandeish amounting to 75,298 acres more than the preceding year. In the return published on the 26th of last November, the increase was stated to be only 70,222 acres; the difference of 5,076 acres, as shown in a statement since received from the Collector, is due to the addition of the cotton area in Inam lands and alienated villages, which was not included in the former return. Since the Collector's remark was recorded on January 14th to the effect that the weather has been fine since November, heavy rain has fallen throughout the district, commencing on that very day, the average rainfall from the 14th to the 16th of January having amounted to as much as 4 inches. The Collector thus describes its effect upon the cotton crop:—"The greater part of the cotton had been picked before the late rain fell. Perhaps about 5 per cent. of it remained in the fields; that of course has been seriously damaged as well as the outside portion of what was stored in the kulles and on the house-tops. The quantity damaged is comparatively small. If it could only be kept separate, the injury would be trifling, but in the present unsatisfactory state of the law, it will be used to adulterate the better kinds of cotton with impunity."

The estimated yield of cotton entered in the present return for Khandeish is equal to about 52 pounds of clean cotton per acre, or nearly double the average quantity expected from the collectorates of Guzerat.

For Nassick no return has yet been received showing the extent of land devoted to cotton this season, and no idea can therefore be formed of the largeness or smallness of the estimate submitted. The statement from which the particulars entered in the present return are taken, exhibit a great difference in the yield for 1869-70 as compared with the return of last year, the estimated yield then being nearly 700 candies more than that now shown. No explanation of this difference has been offered by the Collector, but possibly it may be due to territorial adjustments made when the collectorate was being detached from Khandeish.

SOUTHERN DIVISION.—In the collectorates of the Southern Maratha country, the season has unhappily been on the whole a very unfavourable one. The remark of the Collector of Dharwar that it may turn out better than last year is certainly not very encouraging, considering what a bad season that of 1869-70 also was, and that the out-turn of cotton then realized in Dharwar hardly amounted to one-fourth part of the estimated quantity. A further report received from the Collector regarding the effect of the rain in the middle of January, which appears to have extended also to these districts, states that in the Dumbul Petta (where the Collector was encamped at the time) the mahalkurry and ryots were of opinion "that the rain had not damaged the country crop; but that as much of the New Orleans was suffering from kurree-jee-gee, the rain had done damage, it having

rendered the disease more general and severe than before. Referring to the same period, the first Assistant Collector in charge of Kulladghee writes, under date the 27th January, as follows :—"I was at Moodibehal when the rain fell, and have since been to Hoongoond viâ Tangurjee to Elkul and Heera Mulgaon, and thence to this place (Ameengud), and everywhere the crop seems much injured. The plants, especially the New Orleans, appear to have suffered much from blight. The ryots state that the damage is general." The extent of land sown with cotton this year in Dharwar, Belgaum, and Kulladghee, is less by 358,258 acres than the area of the preceding season, the total estimated yield being 26,575 candies (53,150 pressed bales), equal to only about 19 pounds per acre.

Excessive rain in the month of October had an injurious effect on the cotton crop in the collectorates of Poona, Ahmednuggur, Sholapore, and Sattara. Considerable damage is also reported to have been caused by the rain of January in Poona and Sattara. The total breadth under cotton this season in these four collectorates is 191,309 acres, from which the yield expected is estimated by the Collectors at about 6,531½ candies (13,063 bales), which gives an average of nearly 27 pounds of clean cotton per acre. These figures do not include the cultivation in the Jutt Ilakaha, under the political agency of the Collector of Sattara. For this state a return has lately been received from the Collector, which shows that 11,700 acres have this season been cultivated with indigenous cotton. No estimate of the yield has, however, been offered, but assuming that the effects of the season have been here the same as in other parts of Sattara, the yield may be put down at the same rate, or 21½ pounds of clean cotton per acre, which would give a total yield of 321 candies, equal to 642 pressed bales.

Among the native States, owing to drought at the beginning of the season and excessive rain towards its close, the cotton crop in Akulkote has turned out, as the Political Agent remarks, "almost a complete failure," the expected yield being scarcely one pound of clean cotton per acre.

In Cutch and Pahlunpoor, where the rainfall is reported as insufficient, the estimated yield of clean cotton is equal to 40 pounds per acre ; in Kolhapoor, where the crop is stated to have suffered from excessive rain, the yield is estimated at a quantity averaging 69 pounds per acre ; while in Rewa Kanta where, as the Political Agent remarks, the cotton crop grown with other crops promises favourable results, the estimated out-turn of clean cotton is equal to 108 pounds per acre.

The native States, for which no returns of estimated produce have been received, are the same as those for which no returns of cultivation had been furnished at the date of the publication of the general return of last November, namely Kattiawar, Baroda, and the Mahee Kanta. Since then, however, a statement showing the extent of land under cotton cultivation in Kattiawar has been received from the Political Agent. From this statement it appears that instead of a falling off in the breadth of land under cotton, as supposed in my remarks on the above general return, an increase has taken place in all the districts of Kattiawar except the State of Bantwa, regarding which Colonel Anderson remarks :—"The decrease in the extent of cotton cultivation here is owing to excess of moisture in the early part of the rainy season, which destroyed some crops ; but the prospects of the season are good." On the whole, however, there has been an increase amounting to as much as 136,876 acres, the total acre under cotton being 1,175,205 acres, against 1,038,329 in the preceding year.

From the weekly reports hitherto published it will have been seen that the season in Kattiawar has been in some respects unfavourable for the growth of cotton. Want of rain, the attacks of worms, and a disease in the plant called *chusree*, are among the causes which are stated to have injuriously affected the crop in some of the districts, and the estimates given of the expected yield mention the probable quantity as, on the whole, rather less than three-fourths of an average crop. Calculating the amount of produce in all the districts of Kattiawar according to this estimate, at 45 pounds of clean cotton per acre, which may be said to represent about three-fourths of an average crop, we should have 67,454 candies of cotton, equal to 134,908 pressed bales, as the yield of the whole of that province for 1870-71.

In the continued absence of returns showing the breadth sown with cottton in Baroda and the Mahee Kanta in the present season, we can still only assume that the area is in the same proportion to that of last year as is the rest of the cotton area of the Presidency, of which we are in possession of returns for both years. According to this proportion the cotton area of this season in Baroda and the Mahee Kanta would be 175,201 acres; and as the prospects of the cotton season may be supposed to be the same as in the conterminous districts of Ahmedabad, Kaira, and Broach, the yield would probably be on the average about equal—that is to say, it would amount to about 40 pounds of clean cotton per acre, or altogether 8,939 candies, equal to 17,878 pressed bales.

No return has yet been received for Sind, but from the periodical reports submitted by Mr. Strachan it would appear that the area in that province devoted to cotton this season is hardly less than that of last year, and that the yield in comparison with the produce of past seasons is good in quality and abundant in quantity. The only district in which there has been a falling off is the Dadoo talooka, where the area sown was about 803 acres, while, owing to want of rain, the return of clean cotton is hardly expected to amount to half a maund (40 pounds) per acre. Picking in general was finished some weeks ago, and the cattle turned out into the cotton fields to graze, but in some places a further picking was expected from plants, which having been sown late, had not yet quite matured their pods. With regard to these a report, dated 30th January, has just been received from Mr. Strachan, who states—"Last Monday's frost has, I regret to say, killed all the late green plants. The loss throughout the length and breadth of the collectorate (Hydrabad) will amount to a good many maunds of staple, and though it would have been none of the best quality, it is a loss to the growers, but I hope also a lesson to make them sow earlier, when they have water and weather convenient. Fields sown by the first or second week of June were all safe in this neighbourhood." "The climate of Sind," Mr. Strachan goes on to remark, "is one of extremes. In summer we have a burning sun, and a dry, scorching, dusty wind : in winter we have a strong, cutting north wind, and occasionally frost, with little or no rain throughout the whole year, except in districts along the coast. Our cultivating season is limited from the time the flood of the Indus rises high enough to fill the canals till the time the frost sets in and kills our cotton plants ; so, if the early part of the season be not taken advantage of for sowing the cotton crop, a full return cannot be expected." The main portion of the crop was, however, sown early, and it is expected that the produce when cleaned will amount to between 160 and 180 pounds per acre. The cotton area in Sind last year was 57,733 acres. Taking the same figure for this year, and deducting the area (803 acres) sown with cotton in talooka Dadoo, the total yield at, say, 170 pounds per acre, would amount to 12,345 candies, equal to 24,690 pressed bales, in addition to 41 candies or 82 pressed bales for the talooka abovementioned.

In accordance with what has been stated above, the following may be taken as the total contribution to the cotton trade from the produce of the Bombay Presidency in 1870-71 :—

Northern Division.		
Collectorates of Guzerat ...	36,146	candies.
Khandeish	64,439½	„
Nassick...	379	„
Southern Division.		
Collectorates of Southern Mahratta Country	26,575	candies.
Poona, Ahmednuggur, Sholapore, and Sattara	6,531½	„
Native States.		
Akulkote	10½	candies
Cutch and Phalunpoor	10,249	„
Kolhapoor and other States of Southern Mahratta Country ...	17,683	„
Rewa Kanta	1,060	
Kattiawar	67,454	„
Baroda and Mahee Kanta	8,939	„
Sind	12,386	„
Total	251,852½	candies.

or 503,705 bales of 3½ cwts. each.

This exhibits an increase over the estimate of the anticipated amount of produce for the year 1869-70, which was expected from the collectorates of the Presidency and the adjoining native States, as published in the Supplement to the *Government Gazette*, dated Wednesday, 26th January 1870, and which amounted to 416,514 bales, not including, however, Kattiawar and Baroda, for which no returns had been received. The estimate now presented does not of course include the cotton brought to the Bombay market from the Punjaub, the Berars, and other places, the contributions from which serve to swell the exports from the port of Bombay. G. F. Forbes, Cotton Commissioner.

Bombay, February 8th, 1870.

MINERAL RESOURCES.

COAL IN SOUTH INDIA.

We have been favoured with a copy of the following interesting letter from Dr. Hunter, the Superintendent of the Madras School of Arts, to a Mysore official, regarding the mineral resources of Southern India. What the Doctor says about the indications of coal is at the present time of especial interest :—

Madras, 23rd Dec. 1870.

"I was glad to see your handwriting again, and more espe-

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. II.] CALCUTTA, WEDNESDAY, 15TH MARCH, 1871. No. 8.

Advertisements.

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A. C. GUMPERT,
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Bombay, 2 Ash Lane, 20th Feb. 1871.

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,, Alexandria	39	25		9-10	
,, Messina	45	32		12	
,, Naples	47	33		13	
,, Leghorn	50	34		14	
,, Genoa	50	34		14	
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THIS company having a subscribed Capital of Two Millions and a half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1869, the Life Premium Income, exclusive of re-assured risks, was upwards of 52,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 180,000*l* being upwards of sixty per cent., of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

Rates of Premium.

These are generally lower than the rates of other Offices.
Premiums are received—
1. Annually.
2. Half-yearly, Quarterly, and Monthly.

Examples of with Profit Rates.

CIVIL				MILITARY			
For the Assurance of 1,000l, for the whole Term of Life.							
Age next Birthday.	Annual Premium.	Monthly Premium. Rs. a. p.		Age next Birthday.	Half-yearly Premium. Rs. a. p.	Quarterly Premium. Rs. a. p.	
30	30	3 8 2		35	24 7 0	12 7 3	
40	47	4 3 8		40	27 0 8	13 12 6	
50	62	5 9 3		45	30 10 11	15 10 2	

Examples of without Profit Rates.

CIVIL.				MILITARY.			
Age next Birthday.	Annual Premium	Quarterly Premium. Rs. a. p.		Age next Birthday.	Half-yearly Premium. Rs. a. p.	Monthly Premium Rs. a. p.	
35	38	10 1 1		30	20 12 10	3 9 7	
40	43	11 2 1		40	24 7 0	4 3 8	
45	48	12 11 6		50	31 3 2	5 6 5	

Examples of Short Term Rates.

CIVIL.				MILITARY.			
Age next Birthday.	Annual Premium.	Half-yearly Premium. Rs. a. p.		Age next Birthday.	Quarterly Premium. Rs. a. p.	Monthly Premium. Rs. a. p.	
35	28	14 9 0		45	10 1 1	3 13 11	
40	29	15 1 3		50	11 6 4	3 6 9	

BONUS.

Policy-holders have the option, when their policies are unencumbered, of selecting any of the following:—

Modes of receiving the Bonus declared.

1. By an increase of the sum assured.
2. By a payment in cash
3. By a permanent reduction of future Premiums.

Examples of Bonus declared on Policies effected in 1863, at the Division of Profits, 31st December, 1867.

Age at entry.	Sum Assured. £. s. d.	Bonus Added. £. s. d.	Yearly Rate of Bonus per cent. on Sum Assured. £. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

Surrender Values.

Policies are purchased by this company at an equitable value after payment of Premiums for three years.

Days of Grace.

Thirty days are allowed for the payment of premiums, when they are payable yearly, or half-yearly, and fifteen when quarterly or monthly.

Forfeited policies may be revived at any time within six months, if satisfactory medical evidence of the health of the life be produced (at the expense of the assured) and a fine of one-half per cent. be paid on the sum assured.

Claims.

These are paid *one month* after proof (satisfactory to the directors) of the decease of the lives assured has been furnished to the company, and the rate of exchange will invariably be two shillings sterling per rupee. Should death occur within the days of grace, the policy will still be valid, and the sum assured paid after deduction of the premium. The importance of this last regulation is obvious.

Limits as to Residence and Travelling.

Lives assured at Indian rates, who are not sea-faring persons, are allowed to reside or travel without license, *in any part of the world* provided they do not proceed to any country which is at war.

General Regulations.

The English rate takes effect from the date of departure for Europe from Alexandria or Port Said, and the Indian rate from the date of arrival at either of those places outward bound.

Medical fees are paid by the company. No Entrance Fee or other payment is required of the assured beyond the premium.

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs Bullock Brothers
Bankipore	W. Frazer, Esq., Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal.
Ditto	Bank of Upper India.
Ditto	T. Lucas & Co.
Chittagong	Messrs Bullock Brothers.
Chumparun	James Begg, Esq.
Chumparun Districts	E. C. Lamb, Esq.
Cochin	Pence, Leslie, & Co.
Dalhousie	Walter Adlard, Esq
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs Kelly & Co
Dacca	N. P. Pogose, Esq.
Jhansie	Bazenjee Furdoonjee, Esq.
Kurseong	T. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Walters, Esq., Bank of Bengal.
Lucknow	W. Dickson, Esq., Bank of Bengal.
Ditto	Delhi and London Bank.
Madras	Messrs Arbuthnot & Co.
Meean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nuggore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq.
Purneah	P. H. D. de Dombal, Esq.
Rangoon	Messrs. Bullock Brothers.
Rohilkund Districts	H. Costley, Esq.
Sylhet	E. G. Foley, Esq.
Saugor	J. A. Withall, Esq.
Simla	United Bank of India
Tirhoot	E. Dalgleish, Esq.
Umballa	United Bank of India.
Ditto	Greetham & Co.

Fire Department.

The Fire Premium income of the company, as at 31st December, 1869, exceeded £120,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built, and tiled or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months	6 months	3 months	2 months	1 month
	as.	as.	as.	as.	as.
Private Dwelling Houses	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building.) from	10	7½	5	4	2½
to	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton	16	12	8	7	4
Presses or screw-houses, cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer*.
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,
No. 1, Hare Street, Calcutta, 13th February 1871.
C. H. OGBOURNE, Manager in India.
Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

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The Indian Economist.

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A LAST WORD UPON THE WAR.

PUBLIC opinion is gravitating rapidly towards the conclusion we have expressed from the commencement of the war of the dangers to be apprehended from Prussian ascendancy in Europe. "Notions of right," says even a German journal, "are giving way "more and more to the most brutal policy of force, and diplo- "matic plotting is taking the place of international intercourse." On the whole, says the *New York Tribune*, "it seems very much "the exact truth, that all treaties have become valueless. At "this hour Europe lies helpless in the presence of the army of "Prussia and the indefinite menaces of Russia. The map is to "be made anew, and changes may be preparing that no one "dreamed of when Napoleon blundered into war in July." Even on the simplest question, says another German paper, the *Neue Freie Presse*, "no understanding can be arrived "at between the Cabinets." The same journal reflects bitterly (December) upon the English Ministry:—"Perhaps England, "if she were not ruled by men who have lost every conception of "her former commanding position in Europe, would be the "Power which could bring about a coalition for the purpose of "mediation between the belligerents. But as England will ab- "solutely run no risk, she might as well, for this purpose, have "ceased to exist; and thus one of the essential factors for a "possible restoration of peace is wanting. It is therefore only so "much the more disgraceful that no stop is put to the butchery "which has now become almost senseless, that no hand is moved "to act quickly and decisively in the name of the indignation "which already pervades all enlightened circles in Europe."

The great party represented by the Fortnightly and Contemporary Reviews have been writing in yet stronger terms. "We urge, say Mr. Ludlow, Mr. Harrison, and others, "that the English "Government should call upon that of Prussia to make "peace on reasonable terms, not including the seizure of "French territory. Failing this, in our opinion, England, "without further delay, should join France in her resistance "and declare war against Prussia." They declare Prussia to be a great military monarchy of whose dangerous character and power "we have had abundant proof, threatening by its "pretensions to European peace and fatal by its constitution "to European freedom."

Our only quarrel with all this is that it was not said before. "It takes a long time," says "J. M. M." in the *Bombay Gazette*, "to awaken the British nation, but we are now gradually com- "ing to our senses. We begin to remember that the German "Empire, which has been revived at Versailles, inherited the "evil traditions as well as the titles of Imperial Rome, and was "remarkable, as the annals of Italy can tell, for an overbearing "foreign policy and an insatiate love of conquest. We recall, too, "the history of Prussia for the last two hundred years, and more "especially since her destinies have been guided by a statesman "who knew how to turn the desire of the Germans for unity to "the sole profit of the House of Hohenzollern. We note the "manners of the people, and the fruit of the culture of which "they boast. We see that political and social progress owes "nothing to Prussia, while the vital spark of liberty could not "be extinguished in France even by the Empire. The true ally "of Prussia is not England but Russia; and this Bismarck un- "derstood when he began the intimate connexion between the "two arbitrarily governed Northern Powers, by concluding the "secret treaty which obtained for Russia the active co-operation "of Prussia in putting down the Polish insurrection of "1863. From that time the policy of the two Powers has "been identical, having for its objects, to humble Western "Europe and to make Prussia supreme in Germany and Russia "in the East. All this we are beginning to understand now, "and you hear English Liberals asking one another whether "Lord Palmerston was not, after all, in the right when he took "the alliance with France as the cardinal principle of his foreign "policy, and eagerly acknowledged the French Empire, because "he believed Napoleon would see the advantage of that cordial "agreement between France and England which Louis Philippe's "Ministers thought lightly of. We feel now that we are standing "alone in the world."

When the history of this war comes to be written, the protest of the *Indian Economist* against the course pursued by the English press will, we believe, be more than justified.

It is noticeable that even the *Time* has at last discovered that "the resolution taken by France in this war to defend, or recover "her own position, by the abasement of a formidable rival, "was simply such a determination as would have been adopted "by any State under similar circumstances a century ago; and "that whether the war was made by the French people or the "French Emperor, it was certainly not a war which the world "would have considered wicked or unjustifiable in 1870." It is a reflection upon our character, as a people, that journalism of this order should not merely be tolerated amongst us, but should be influential. The war was an act of "atrocious criminality" in July In December, it is declared to have been a war which any State would have entered upon a century ago, and which no one at that time would have regarded as either unjustifiable or wicked. And by July next, the same journal will be assuring the world, that the war was necessary, and unavoidable, and right. By that time, the fallen Emperor's quotation of Montesquieu's reflection that "not he who declares war, but he who makes it inevitable, is its real author," will be recalled, and accepted, and justified, by the very writers who covered

him with the foulest abuse when he first uttered it. If ever one Power deliberately provoked another into a declaration of war, this guilty Power (Prussia) did so in the present case. The attempt to place a Hohenzollern upon the throne of Spain by a secret *coup-de-main*, in violation of its plighted honor that it would make no such attempt was, as we have pointed out from the first, the real occasion of the war. English journalists have either ignored the provocation altogether, or have insisted that the mere withdrawal of the candidate was a sufficient *amende* to France. Had it been England instead of France, they would have thought differently; for the offence was deliberate, and premeditated, and treacherous. It was an open menace to France, while the intrigue was marked by dishonor and falsehood up to the moment of its betrayal by the Spanish Minister. In similar circumstances, England, we say, would have demanded precisely what France did —an express assurance on the part of the Prussian Court that the intrigue would be abandoned, and not a second time renewed. By refusing to give that assurance, and ostentatiously flouting the refusal in the face of the French Ambassador, the Prussian King made war inevitable; a war which he and his instrument had been secretly preparing for, on a scale which has astonished the world. The guilt of this war belongs not to the French Emperor, who it is now admitted even by the *Times* "shrank from it," but to the very same Power which, by the partition of Poland a century ago, plunged Europe into the bloodshed and confusion that subsequently filled the Continent; and that now by the dismemberment of Denmark, has again lighted a conflagration which will yet wrap the civilized world in flames. English journalists who justify the conduct of this guilty Power, and charge upon the French Emperor the present war, shew simply their want of acquaintance with the past, and want of insight into the present, facts of history.

A CORRESPONDENT ("E.O.") of a local contemporary wants to "know of what crime Germany has been guilty, save that she has "been successful in a life-and-death struggle with France, to "induce English opinion to turn against her now?" The writer himself supplies the answer in the very next sentence of his letter. He says with perfect truthfulness :—

"At first all England was with Germany. It was terrible to "think of France victorious, of all Europe once more turned "into a French camp, with Great Britain isolated, left alone to "cope with the huge military tyranny. That night-mare has "passed away."

Yes, the night-mare has passed away; but while it lasted Englishmen were as unable as "E. O." to understand what was really passing upon the Continent. It seems to be forgotten that this is the third war into which Prussia has plunged the Continent within the short space of seven years. The English papers, until lately, completely ignored the fact that within the six years preceding this last struggle Prussia had plunged into two wars without a pretext of right in either. There was first the Danish war, concerning which the *Edinburgh Reviewers* told us in 1866 that "upon King William "of Prussia and Bismarck rests in this age the first unpro- "voked and wanton shedding of the innocent blood of their own "subjects and countrymen, for no object but their own aggran- "dizement, arrogance, and ambition."

It is impossible to accuse the *Reviewers* of any anti-Prussian prejudices, for they sympathised with the aspirations of the German people for unity. They nevertheless declared the Danish war to have been a most guilty and "wanton shedding of innocent blood." In the war of 1866, the case was even worse. The Prussian people themselves were so alarmed at the guilt of that war, that they gathered together in crowds in the chief cities of Prussia, to wash their hands of all complicity in it. The *Edinburgh Reviewers* again wrote :—"It is now clear "that the determination of William I. and his advisers to keep "under arms a larger body of troops than had served his pre- "decessors was not without an object. They were designed to "attack and plunder his neighbours. The most extraordinary "circumstance in the present situation is, that it has been brought "about not by the military power of France, but by Prussia. "Throughout these transactions, Prussia meant this quarrel, and "has gone to war because, in the opinion of her daring and un- "scrupulous Minister, the time is come to strike a great blow "for the headship of Germany, and to destroy and absorb most "of the smaller States and territories." At the same time, the *Westminster Reviewers* pointed out that "Austrian states- "men counted on the loyalty of the King (the pious William), "and when at last the crisis was found to be rapidly approach- "ing, it was too late to complete the necessary preparations."

Colonel Chesney in his review of the war, pointed out that "the triumphant success of this great military conspiracy "against the existence of her own confederates and others, "could not efface the recollection of the scandalous duplicity and "falsehood on the part of the Prussian Court (the pious King "William) which marked every stage of these transactions."

Colonel Chesney chose the right word when he said that the Prussian Court had engaged in "a great military conspiracy" against public order. In King William's address to his people upon the outbreak of the war, the premeditated nature of the enterprise was openly avowed. The King said :—"In anxious "anticipation of what has now taken place [the war he had "forced upon Austria], I have been forced for years to consider "it as the first duty of my royal office to prepare Prussia's "military resources for a strong development of force."

And yet all this while the aged hypocrite had been making solemn protestations of his friendliness towards Austria, and desires of peace with her. Not a pretence of grievance was there against Austria for the war, nor against Saxony, nor Hanover, nor Baden, nor South Germany. The wrong-doer had secretly prepared for "a great development of force;" and the success of a conspiracy which was marked by every circumstance of falsehood and dishonour, was declared by him to be a token of "the evident favor of God." We have seen no such fanaticism in modern days. Bismarck was as explicit as his master, but a little less refined; and these two men between them have put an end to all peace in Europe for the present. By trampling upon public law, spurning the obligation of treaties, and placing the adult population of Germany in arms under the command of a needy class of nobles devoted to the Court, they for the present hold Europe at their mercy. The late war was the work of these men and of no others. To secure the Empire of Germany, it was necessary to fight France. The Spanish intrigue was therefore engaged in with the full knowledge that it would bring it about, and while the French Emperor was seeking disarmament and even disbanding 90,000 men, our pious King and the Minister of his ambition were manufacturing 3,500 pieces of field artillery in Krupp's foundries, preparing indeed for another "great development of force." The reign of "blood and iron" is now fully set up, while the English press, until lately, was falling down before it and worshipping it.

It is to the credit of the Indian press that it has shewn a different spirit in its out-look upon this war from that of English publicists. In this country, there has been much honest sympathy for France, and just indignation at her adversary. Indian publicists, with an exception here and there, have refused to bow down before the guilty Court which within the short space of seven years, has plunged Europe three times into war, for no purpose whatever but its own aggrandisement, while making impious appeals to the Most High of the purity of its aims, and the righteousness of its cause. A more hateful spectacle has not been witnessed in history. The guilt of unprovoked war is so deadly, that the properly constituted mind instinctively revolts at seeing its prosecution associated with the name of God.

It is observable that already some of the bitterest denouncer of the fallen Emperor are beginning to discover the claims which he has upon our respect. We are reminded by them "of his real- "ly great qualities as an administrator and ruler; and that the "Bourbons, from want of tact or sympathy, will cause the people "to remember the civil government of the Emperor, his public "works, his leanings to the peasantry, and the glory which pre- "ceded his fall. The French, when calmness and the power of

"judging reasonably shall have returned, are not likely to forget "that the Emperor fought hard to keep France in the van of the "world, and as the clouds which now obscure the Emperor's "fame roll away, the system will be blamed, and not the man, and "it will probably come to pass, if the Bourbons show any of their "traditional incapacity to understand the Revolution, that the "Prince Imperial will be accepted as the heir of the principles of "the Revolution."

We have nothing to unsay concerning either the war or the Emperor. We regard both just as we did at the outbreak of the strife. As to Louis Napoleon, France and the world have lost a great statesman through cynical disbelief in him as a *parvenu*. The very mistakes of the man bore a statesman's impress upon them. There was nothing of littleness or of meaness in his failures. The attempt to found under an Austrian Archduke a monarchy of Latin race and faith side by side with the Teutonic Republics of America was a great conception. Does it become Englishmen who were imbued with prejudices so deep in the American war that they declared the success of the North to be impossible, to reproach the French Emperor with the fact that he, in common with all Europe, shared the error? The Emperor believed, as all England did, that the States would break up into several independent Republics; and the idea took possession of his mind that, side by side with these Teutonic Protestant Powers, it was desirable for the world that a Latin kingdom should arise as their counterpoise, and in some respect their exemplar. There was nothing little in the conception, nothing unworthy in it, however mistaken it all was. Had he placed a Bonaparte upon the Mexican throne, we might have taken exception to his course as suggested by family ambition; but to show that towards Austria he had none but generous feelings, he advanced with open hand to words her to make as it were such atonement as he properly could for the war which humanity had forced upon him in 1859. The abuse heaped upon him for the failure of the Mexican expedition was purely cynical. Louis Napoleon basely betrayed, we were told, the Archduke Maximilian, when he bowed to the necessity of declining a contest with a Power which had a million of soldiers under arms ready to march against the small body of French forces in the country. He was guilty of cowardice and treachery for counselling the unfortunate Maximilian to yield to the inexorable logic of events. Such criticism is purely malignant. Again, he was made the object of bitter and incessant denunciation for the occupation of Rome by the French troops. To the Reds we have nothing to say upon the subject; but to Englishmen we may surely point out the peculiarly difficult position which the French Emperor ever occupied towards Rome. That in determining to defend it from the aggressions of the Revolutionists, he was influenced by something of that constitutional tendency towards the support of the weak against the strong, that marked his whole career, we have no doubt whatever; but what Englishmen ever gives due weight to the fact that the French Emperor in his support of Pius IX, simply gave expression to the earnest wishes of the whole Catholic population of the world? We may personally sympathise with Garibaldi and Mazzini, and rejoice to see Rome become once more the secular capital of Italy; but let us be just. A multitude of our fellowmen, probably a hundred millions, look upon the seizure of the temporal dominions of the Pope as sacrilege. Nothing is more certain than that, in the protection he afforded to the aged Pontiff, Louis Napoleon had the approval and sympathies of many times the number of the comparatively small body of men who desired to see Rome secularized. It was no reproach to the Emperor that he protected the Pontiff against the revolutionary forces which sought his overthrow. It was characteristic of the man to do so. It was the wish of more than half Christendom that he should do so, while he exposed himself to the vehement attacks of the Liberal party, and the constant danger of assassination as his reward. Mazzini's fiery denunciations and the indignant declamations of Garibaldi were natural enough, but what just ground has there been for the violent attacks of English Liberals upon him for his course? The French and English press between them have pulled the Empire down, and now stand face to face with the feudal despotism which has its iron heel upon Germany and the grip of its mailed hand upon Europe, and hardly know what to make of the new situation.

BETWEEN four and five months ago, we pointed out that if Prussia were allowed to retain Metz the legitimate influence of France in Europe would be destroyed. The *Times* was simultaneously insisting that the cession should be made. It has at last discovered that the interests of Europe will be fatally compromised by the transfer of the fortress, since Metz lies so close to the heart of France that its occupation by the Prussians will reduce France to a second-rate power. We pointed that out five months ago, but the great English journal seems never to understand events until the opportunity for speaking upon them is lost.

FRENCH FINANCE.

A CORRESPONDENT of the *Economist*, in commenting upon the immediate necessities of French finance, pays a timely and well-merited compliment to our unfortunate neighbours, when he says that "no nation in the world has proved itself to be more "sensitive to its duty as respects monetary obligations than "France. Through good and through bad report, in high prosperity no more than in the lowering clouds of adversity, that "Government has given constant proofs of its firm adherance "to its obligations." The remark is made *apropos* of a rumour that the Bank of France has been directed to make a forced issue of notes to the amount of sixty millions sterling, and that the Government had decreed the further postponement of the obligation to take up commercial bills of exchange until the termination of the war. "These are laws," says the writer "of a "special nature, made on the pressure of imminent danger to the "life of the nation, and therefore not amenable to be tried by "the strict test of financial economy. It is exactly analogous to "an individual at a pinch falling back upon his capital stock to "meet his engagements and keep himself afloat when ordinary "business is suspended and profits are *nil*. We ourselves had "resort to the same expedient, essentially, during the great war "at the beginning of this century; we suspended cash payments, "recovered our financial position, and enabled the Bank of England to resume the high credit which theretofore, and from "that time forth, it has held."

English writers have not always been thus fair to the finance of other nations. It is impossible to recal without some shame the incessant carping with which the financial arrangements of the Americans in their terrible struggle were followed in London, while the insight and skill with which those arrangements upon the whole were conducted, are now universally admitted.

(A different spirit, we trust, will characterize the national criticism upon the financial arrangements of our neighbours in surmounting their embarrassments. The science of finance is nowhere better understood than in Paris, and if a settled Government can but be established, we have no fear of France making shipwreck in this direction. We may recal with advantage in this crisis of the nation's fortunes, a fact concerning English criticism upon their finance, which few persons perhaps in India remember. When the Revolution took place in February 1848, the funds in the Bank of France amounted to 226,000,000 francs. They declined so rapidly that on the 15th of the next month they had fallen to 59,000,000. In this extremity, the Provisional Government came to the rescue of the bank, and on the night of the 15th March, made the notes of the bank legal tender to the extent of 350,000,000 francs. Twelve months afterwards (16th Feb. 1849) the editor of the *Times*, in reviewing this decree, and after adducing many matters of detail to shew how wonderfully beneficial to the nation these proceedings on the part of the Government and of the Bank of France had been, concluded his remarks by saying—"We cannot "do more than present our readers with this brief outline of these "masterly operations; but when it is remembered that they were

"conducted in all the gloom and terror of an unparalleled revo-
"lution, when the Government lay prostrated before the mob,
"and property itself was openly assailed, this narrative of dry
"financial entries assumes the importance and the dignity of an
"heroic resistance to adverse circumstances, and in the very first
"rank of those who rescued France from the jaws of bankruptcy,
"and society itself from dissolution, we place without hesitation
"the patriotic and able conductors of the Bank of France."

The *Times* had forgotten that on the 18th of March 1848, at the time when the decree was passed, it had written as follows :—
"To suppose that the decree of the Provisional Government
"can restore confidence, or, in other words, the nominal value
"of the notes, is ridiculous. . . . . The suspension of cash
"payments by the Bank of France . . . . is the most
"decisive event of the tremendous commercial crisis which at
"this time accompanies and aggravates the political embarrass-
"ments of France. . . . To any one who is at all familiar
"with the commercial habits of the French people, and the
"ordinary resources of the Bank of France, this statement of its
"present condition is of the most distressing kind ; and the
"actual suspension of cash payments at such a time and among
"such a people will produce the worst effects.

Now a lesson of this nature ought not to be lost. As a race we are far too apt to make ourselves the censors and judges of all other people, and of the propriety of their doings. Should the report alluded to by the *Economist* prove to be true, and the French Government decree a large issue of inconvertible notes, we believe it will be justifiable, and that by no other means is the nation so likely quickly to regain prosperity. The objection to such issues on the part of Englishmen generally is founded deeper in prejudice than in sound reason. French financiers will do well to study carefully the financial arrangements at Washington, which carried the United States safely through difficulties which constantly threatened to overwhelm them ; and English critics will do well to maintain the spirit of forbearance which the correspondent of the *Economist* so well illustrates.

LAND REVENUE IN THE PUNJAB.

THE following articles contain matter of so much importance, that we think it desirable to reproduce them in our own leading columns, persuaded that it is *here*, as we so constantly insist that the true solution of our financial embarassments is to be found.—ED. *I. E.*

(Indian Public Opinion.)

We have on various occasions commented on the extraordinary remissness of the Government, as it appears to us, in its dealings with the all-important matter of land revenue in this province. Our complaint is that the existing settlement machinery is so inadequate, or at any rate performs its work in so inadequate a manner, as to entail year by year the loss of many lakhs of revenue, which might be collected without exciting a murmur of discontent, and without in the least degree interfering with the advancing prosperity of the country. The case may be briefly stated thus. The value of land and of the products of land have beyond all question increased within the last few years cent per cent. In the last Punjab Administration Report the selling price of land is stated to have advanced since 1864-65 from Rs.5-8 per acre to 10-12 ; and it is only natural that it should be so. The Punjab, when we annexed it, was a simple bear-garden ; we have given it twenty years of peace, order, and prosperity ; we have replaced the cruel exactions of Sikh rack-renters by a moderate assessment ; we have created a vast demand for every form of agricultural supply, and we have provided good thoroughfares in every direction, by which it may be taken to the most profitable market ; the very institution of property may be said to be the work of our hands. Land is accordingly worth two or three times as much as it was before British occupation, and now that the Sutledge bridge is completed and the Indus Valley line in course of construction, there is every reason to believe that a few years more may see it again doubled in value. Now of all this rapidly increasing wealth the people, by traditional usage, deeply engrained into their habits and opinions, are perfectly prepared to pay something between a half and two-thirds to the Government to whose protection and management the whole is owing. This payment, whatever we may think of its abstract propriety, is sanctioned by immemorial tradition, and is in entire conformity with the notions of the community at large. They and their fathers before them have borne it, and the worst that we could do would be but child's play in comparison to the ruthless exactions of their former rulers. No land tax that we could impose would, it may safely be said, provoke half the heart-burnings and disaffection that are called into existence by such unaccustomed impositions as the Income-tax of last year. Under such circumstances we should expect to find the Government in its financial embarrassments taking all reasonable care that the claims of the State to a legitimate fraction of the enhanced agricultural profits of the country should not be overlooked. So far, however, is this from being the case that, while the most minute and elaborate precautions are adopted for ensuring the regularity and exactness of every branch of judicial procedure, the assessment of land-revenue has been allowed to fall into neglect, and the whole Settlement Department to come to something very like a complete break-down. The consequence is that the settlements in progress are ludicrously disproportionate to the work that has to be done ; old settlements run on simply because new ones cannot be effected, and meanwhile revenue is being thrown away at a rate which must make both the ears of Sir R. Temple to tingle, if indeed any power of tingling remain to them after all the cruel things which they have listened to of late. There are at present, if we read the statistics aright, no less than 16 districts, aggregating some 60 lakhs of revenue, running on at old rates, simply from want of new settlements. Settlements to the extent of 60 lakhs more at least will expire within the next ten years. The theory, of course, is that except for some special cause, new assessments are imposed when the settlement expires, and that the operations of the Settlement Department in some measure keep pace with the expiry of the old settlements. This is, in fact, however, as far as possible from being the case. "During the year 1869-70," the Administration Report informs us, "settlement operations were in progress in Hazara, Montgomery, Dera Ghazee Khan, Peshawur, and parts of Hoshiarpore and Goodaspore." Now the aggregate revenue of the first four of the above places is about 13 lakhs, and the Oomah circle, which contains the parts of the Hoshiarpore and Goordaspore districts referred to, would not, we presume, add very materially to the sum. It appears, accordingly, that with 60 lakhs of expired assessments on hand, and 60 more to expire within the next ten years, the Government only attempts to deal with 13 lakhs, and that in a way which renders it unlikely that even this miserable fraction will be properly reassessed for several years to come. Nor is this all. The prosperous and wealthy districts of Umritsur, Sealkote, and Goodaspore, aggregating 28 lakhs of revenue, Goojeranwallah with 4½, Goojerat with 5½, Lahore with 5 and Kangra with 6¼, have all it appears been resettled within the last few years, at an expense of over seven lakhs ; and, strange to say, with an initial decrease of Rs. 22,582. In the Umritsur Division, even including the canal revenue, the result of the settlement was an immediate decrease of revenue of 18,712 rupees, and though there is a progressive increase which at the end of 15 years will have run the revenue up to 2¼ lakhs, it is hardly conceivable that there must not be something extremely faulty in the principle on which the present assessment can be placed at so very reduced an amount. Of this, however, it is difficult to judge, as the final reports of these districts were, when the last revenue statement was made, either "in embryo, or altogether uncommenced." The result of all this appears to us that there are existing assessments in the most recently settled districts, aggregating some 50 lakhs of rupees as to which the Government has had no opportunity of forming an opinion, owing to the failure of the settlement officials to submit a final report, but as to the soundness and propriety of which the very gravest doubts are entertained, inasmuch as instead of bearing some proportion to the increased resources of the country, there is a positive present diminution of the revenue, and a future increase quite incommensurate with the progress of wealth, and the increased value of land and of agricultural produce.

To this subject, however, we hope to return on a future occasion. At present our case simply is thus. There are 50 lakhs of revenue reassessed, and in all probability wrongly, because far too lowly, as to which no report has, we believe, been submitted to Government, and no sanction, therefore, of course received ; there are 60 lakhs more running on at old rates after the expiry of settlements ; and there are more than 60 more which will require reassessment within the next ten years. Against all this, the Settlement Department had last year 13 lakhs of revenue under Settlement. When we repeat that land has increased 100 per cent. in value within the last five years, and that the general opinion of the district officers is that land revenue might be enhanced throughout the province 25 per cent. on the present rates without appreciably affecting the prosperity of the agriculturist, and without exciting the slightest discontent, our readers will be able to compute for themselves the annual loss of revenue which the present defective machinery of the Settlement Department imposes on the State. The Punjab Government may certainly be richer by a quarter of a million sterling within the next few years, if it only chooses to take the necessary steps ; at present it is in the position of a householder too indolent, or too good-natured, to collect his lawful rents.

(*The Pioneer.*)

GOVERNMENT is allowing all the additional revenue, that such a state of things brings within its reach, to slip through its fingers merely from its reluctance to place the Settlement Department on a proper footing and oblige it to do its work in a proper way. Here, again, there is to be found in full operation the pernicious commixture of executive and judical work; not only are the settlement officials very inadequate in number to the amount of work to be done, but they are by a law peculiar to the province saddled with the disposal of the whole of the civil suits in connection with land in any district which happens to be under settlement; the consequence is that new settlements cannot be prepared with at all the same rapidity as the old ones expire. In 1869-70 out of 221 lakhs of revenue, upwards of 60 lakhs of which was collected under expired settlements, only 320,000 are shown in the imperial returns as being under settlement. In the North-West Provinces during the same period, out of a land revenue of 400 lakhs, no less than 50 lakhs were under re-assessment; settlement operations, revision, or re-assessment were in progress in twenty districts; an increase of land revenue for the current year of 25 lakhs had actually been realized and a total increase of 75 lakhs was expected from the settlements in hand. What we would venture to ask is the reason for following in the Punjab a policy so entirely different to that in force in the North-West? Parts of the former province are no doubt unable to bear heavy assessments, but large portions are extremely fertile; our assessments are known to be about half what the Sikhs exacted; social order, the extension of canals, and the recently completed means of rail communication with the rest of India, have given an extraordinary stimulus to agriculture, and we believe that the universal opinion of district officers acquainted with the subject is that in all expired settlements the assessments might be raised at least 25 per cent. without the least risks of distressing the agriculturist, checking progress, or exciting discontent. The continued neglect of so large a source of revenue, when every rupee is of importance, is one of those strange blunders for which no one in particular holds himself responsible, but which are none the less detrimental to the interest of the State. Within the next ten years there will be at least 130 lakhs of land revenue in the Punjab requiring re-assessment; no sort of adequate machinery for this important work exists; if things go on as at present we shall be losing for the whole of that period an annual sum varying between 15 and 20 lakhs, simply from the insufficiency of the Settlement Department to cope with the duties imposed upon it. Nor is this all. Six or seven rich districts have recently been resettled; the assessment proposed but which, we believe, has not yet been sanctioned or even officially reported to Government, is so totally incommensurate with the increased value of land and general prosperity of the province, as to excite the gravest distrust as to the soundness of the principle on which it has proceeded. Strange to say the Punjab Government has allowed the matter to stand over from year to year, as if the realization of 15 or 20 lakhs of revenue, more or less were a matter of secondary importance, which might advantageously be postponed to a more convenient period. We sincerely trust that the committee will dwell with all the emphasis it deserves on this aspect of the Punjab administration, and that they will throw all the weight of their influence into the scale in favor of any alteration, whatever be the incidental expense which may be necessary for placing the executive generally, and the Settlement Department in particular, on a footing of real efficiency.

RHEA FIBRE. PRIZE—£5,000.

WHILE in charge of the Kangra District some years ago, Major Paske brought to the notice of the local Government that a Mr. Montgomery had established a China-grass plantation on his estate, the Ram Bagh at Kangra. Major Paske seems to have taken great interest in the experiment, foreseeing that if the cultivation extended, and the fibre could but be properly prepared, it would in all likelihood become a staple article of commerce. Want of capital and other difficulties, against which we are told Mr. Montgomery contended with courage and perseverance, at last brought the experiment to a stand-still, and he has since simply cultivated the plant without attempting to extract the fibre. Whatever results may attend the cultivation, to Mr. Montgomery we are assured belongs the credit of having introduced it into India, as his experiments have fully proved that the soil and climate are admirably suited for the cultivation of the plant.

The Government of India at last made inquiries into the culture; and it is now established that the extent of country in India, where the plant can be grown, is practically unlimited. The only obstacle to an extensive trade in the fibre is the want of machinery for separating it and the bark from the stem, and the fibre from the bark; the cost of effecting the separation by manual labour being too great. What is wanted is some machinery, or process, that will turn out a ton of fibre at a cost of not more than £15 per ton. In order to stimulate invention, the Government of India offers in our advertisement columns a prize of £5,000 for any machine, or process, that will secure this end.

When visiting England in January 1870, Major Paske took with him from the Kangra plantation samples of the fibre in its natural state, in different stages of manufacture, and as dyed by the common bazaar dyes of India. The samples were forwarded to Manchester and Liverpool, and exhibited in the Chamber of Commerce at each place respectively. They were inspected by a large number of persons, and excited considerable interest. In Liverpool, the Chamber resolved that the importance of the article could hardly be exaggerated, and decided to call the attention of the Chambers of Leeds and Belfast to the product, notifying to them the fact that the Indian Government were offering prizes for machinery to prepare it for the market. Major Paske tells us that if the fibre can be delivered in England at £40 to £50 a ton, it will become a most important article of commerce, both as a substitute for cotton and for mixture with cotton or silk in the manufacture of textile fabrics on account of the length, the strength, and the soft silky nature of the filament. The excellence and beauty of the fabrics into which it has been manufactured in England have excited much remark. The requirements of the case—in the terms of the Government advertisement—are, as we have said, some machinery or process capable of producing, with the aid of animal, water, or steam-power, a ton of fibre of a quantity which shall average "in value not less than £50 per ton in the English market, at "a total cost, all processes of manufacture and allowance for "wear and tear included, of not more than £15 per ton. The "processes are to be understood to include all the operations "performed, after the cutting and transport of the plant to the "place of manufacture, to the completion of the manufacture of "fibre of the quality above described, and the machinery must "be simple, strong, durable, and cheap, and should be suited for "erection at or near the plantations, as the refuse is very useful "as manure."

All machinery intended for the trial must be brought by the competitors to the Saharunpore Rhea Plantation before the 1st April 1872, to be there worked under their own supervision, or under that of their representatives, for a sufficient length of time to enable the judges to determine whether the conditions have been complied with. The prize machine is to be transferred, if required, to Government at 5 per cent. above cost price; the patent right to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of 5 per cent. on the cost of all machines manufactured under the patent during its currency. "To stimulate invention, the Government offers a prize of £5,000 for the machine that best fulfils the conditions named; and rewards of moderate amount will be given for meritorious inventions, though failing to meet entirely all the conditions named. Owing to the delay that has taken place in maturing these arrangements, the trial is deferred until the 1st April 1872 to afford time for the preparation of machines and their transport to India. Saharunpore has been fixed as the place where the public competition will be held, and where Government will provide steam-power for the machines.

THE PUNJAB TENANCY ACT.

A MONTH or two ago, we remarked that the Punjab Tenancy Act, concerning which there has been so much heated discussion, appeared to be working in a very satisfactory manner. We founded the remark upon a statement in the Administration Report for 1869-70, to the effect that the *tenants* who had lost status under the operation of the recent settlements, had been very active in suing to recover their lost position; while the *proprietors* had been singularly apathetic in availing them

selves of the provisions of the Act enabling them to evict occupancy tenants on payment of compensation, these provisions being very rarely put in force by them. The conclusion we said was irresistible, that the older settlements were more just, and more in accordance with the convictions of the people than the later ones.

In reply to this statement, we are assured that those who are in daily intercourse with the people know the case to be very different. The Act has been so framed, it is said, and is being so worked, that the proprietors feel they can do nothing more than they have done. "All they know is, that what was done "injuriously to their interests, the Calcuttawalla Lord Sahib has "by a new *kanoon* confirmed. The order has gone forth to "restore former things. Government will not have the question "re-opened, will not hear what they have said, and what is the "good of going into court, when Government has set its face "the other way." We are assured that this truly represents what is felt and said in the villages, not by one but by hundreds of all classes. "If the Sirkar does not want it, what is the good of "going into court. We are totally ignorant of this *kanoon*; it is "quite unintelligible to us; it does not represent the ground and "circumstances under which we should bring up our disputes; "expenses of litigation are great; we don't want to eject any-"body who works well with us; but the Government has "totally changed the relations that have existed between us and "those who held land from us as ordinary tenants; and even "if we did sue, Government would only, through its officers, "discourage the litigation that would arise; and perhaps we "might appear as if we were contending against our Govern-"ment." This we are assured is the real explanation of the silence and seeming apathy of the proprietors. It is of course impossible for us at this distance to pronounce upon the accuracy of either story, but we feel bound to give the opponents of the Act full opportunity to express their views as to its working.

In the following letter, therefore, they will speak for themselves:—

To the Editor of the "Indian Economist."

SIR,—Your issue of 15th December contains a brief notice of this Act, in which you state that it appears to be working satisfactorily and smoothly. You further observe that it is a significant fact that whilst under the Act many tenants have sued to regain the status of which they were deprived during the recent settlement operations, the proprietors as a body have been almost wholly silent. From this you infer that the former settlements were more just and more in accordance with the feelings of the people than the present one. This inference, I think, you will be inclined to modify, if you carefully examine the facts on which it is based. You say the silence of the proprietor is very significant. It is so, but it does not necessarily signify that he is contented; he is silent because he feels himself to be utterly helpless. He believes that the orders of the Government to restore the *mouroosee* tenant to his old impregnable position are absolute and he, is supported in this belief by what actually took place in the Punjab. When the Act was first passed, the question arose whether any, or what, correction of the new records was necessary. It was suggested that there was no necessity for any actual alteration; it would be sufficient for any of the old *mouroosees*, when an attempt was made to eject them, to prove that they had been entered as *mouroosee* in the former record. It would then be for the proprietor to prove his case under Section 6 of the Act, and the new record would be found very useful evidence at the trial of what the status of the parties really was. But this suggestion was overruled, and it was ordered that a special officer should be deputed to revise the whole of the tenant entries, restoring the *mouroosees* to their former position in the record. The whole country naturally inferred that they were restored to their former position absolutely. The Punjabi proprietor is not notorious for subtlety of thought, nor is he capable of steering his way with dexterity through the complicated and often contradictory sections of an Act of the Legislature. The Tenancy Act he had probably never seen, unless it may have chanced to be lying on some officer's table. But he did see an officer taking the settlement record of a village (the only literature with which a Punjabi is at all acquainted), and entering in it the restoration of the *mouroosee*. If the officer was benevolent, he might have explained to the proprietor that, although the *mouroosee* was re-instated, yet a suit might be brought to eject him; but whilst this revision was going on, the ordinary courts were forbidden to take up such suits. The only officer competent to try the case, was the very man who had just restored the tenant before the eyes of the proprietor. I have said the mind of the Punjabi is not subtle: he cannot see the profundity of the policy of putting a man up in order to knock him down, and therefore he does not yet comprehend the benefits which he may secure for himself by instituting a suit under a Code which is a model of "simplicity at the cost of exactly one shilling." As I have already stated, the proprietor is silent, not because he is contented but because he is helpless.

Secondly, as regards the satisfactory working of the Act, are we to conclude that a measure is satisfactory because it is not met by insurrection? If so, the Tenancy Act may fairly deserve the epithet. But I think, Sir, you will agree that for a law to work satisfactorily it is necessary for it to be based on intelligible principles; for its provisions to be so clear that they cannot be misunderstood either by the courts or by the people; and for there to be no difficulty in carrying it out. I do not think the Punjab Tenancy Act fulfils any of these conditions. The attempt at a so-called compromise, is illogical without being fair. Its provisions are so obscure that if you can get half a dozen English officers to discuss them, you will find as many interpretations of almost every section of the Act. Without taking up your space by a lengthy criticism, I will merely mention Section 2 which gives the force of agreements to entries in the old record, and Section 7 which provides that there shall be no right of occupancy in the common land of a puttidari village. Did you ever find two men agree as to the meaning of these sections? I have never done so; and yet Section 2 is of more importance than the whole of the rest of the Act. If then, educated Englishmen who have studied carefully the tenancy question, and have followed every Section of the Act through the debate in Council, cannot understand its provisions, what mischief is likely to ensue when its operation is left to tahsildars, that is to native magistrates who have never studied the subject, and have only made themselves acquainted with the Act through the medium of a bad translation? The result is just what might be expected: the decisions of the subordinate courts all over the country, are full of contradictions and absurdities. I could give you instances where the Court has utterly ignored Section 2; others, where it has considered that it means much more than it does; whilst they have nearly all of them united in ignoring the great distinction made by the Act between the two classes of tenants, viz. those entitled to occupancy rights under Section 5, and those who are entitled to them merely because they were formerly recorded *mouroosee*, and who have a merely modified protection by Section 6. In fact the view of the subordinate courts is (1st) that all *mouroosees* are restored absolutely to their former status; (2nd), that they are further entitled to the new privileges conferred by the Act; (3rd), that *all* are entitled equally to privileges which were only intended for a few. You may say if the decision of the lower court is wrong, why does not the man appeal? The answer is, that he does not himself understand the law; that it was with the greatest difficulty he framed his first plaint; even then he did not make himself very intelligible; that the first court was as ignorant as he was, and complicated the matter by a further mass of elaborate nonsense; and that to draw a petition of appeal to upset this judgment is utterly beyond his power. As he does not know the law, he cannot possibly be sure that the lower court judgment is wrong.

The comparative merits of the former and present settlements is a question on which I have no desire to enter. Your opinion on it is merely based on the alleged satisfactory working of the Tenancy Act, and I think I have shewn you that this allegation is scarcely supported by the evidence. In doing so, I have not raised any captious objections or nice points as to which the Act might possibly be misunderstood. I have confined myself to facts that have occurred within my own personal knowledge. I could shew you the record of every case I refer to. I think you will admit the result is scarcely satisfactory.

I have said that the people do not understand the Act. Allow me to remind you that the Secretary of State distinctly ordered that special facilities should be afforded them both of understanding it, and sueing under it. I scarcely think the Government have carried out these orders as they were intended to be carried out. Has the Act been translated into Punjabi, the real vernacular of the people? Have Deputy Commissioners taken every opportunity of explaining its provisions to them? On the contrary, a Government circular was issued to the effect that now the Act was passed, officers were to abstain from discussing its provisions! No doubt the intention of this was to prevent agitation against the principles on which the Act was based, but many officers certainly considered that they were forbidden to explain the meaning of any section of the Act, except when a case came before them judicially. As for facilities for instituting suits, I have already said that whilst the revision was going on, the courts were practically closed; and I will add that although they are now open, there is an impression abroad that the Government has "put its foot down" in favor of the tenants, and undoubtedly as yet the people of this province, either from fear or loyalty, abstain from enforcing in the law courts views opposed to those of the

Executive Government. To thoroughly carry out the instructions of the Secretary of State, something more appears to me necessary. I would suggest that the local Government should, (1st), have the Act translated carefully into Punjabi and distributed freely [illegible] the people; (2nd), enjoin district officers to take every [illegible]ity of explaining its provisions fairly, not only mentioning the rights of the tenant under it, but also those of the proprietor; (3rd), establish special courts, similar to those lately established in Ireland, which would move freely amongst the people and work the Act on uniform principles. I have no hesitation in saying that the present courts are numerically insufficient, and that if they were doubled they would be incompetent, unless they were controlled by an officer capable of understanding and explaining the Act.—I am, Sir, your obedient servant,

PUNJABI.

THE SELECT COMMITTEE.

INDIA has at last obtained what it has so long been demanding—a Committee of Enquiry into the management of its finances. We are informed by telegraph, that it was the Premier himself who moved for the enquiry, and that he wished to appoint a joint Committee of the two Houses. Mr. Gladstone we think was right, but the refusal of the Commons to sit in committee with the Lords, has led to a resolution to confine the enquiry to the lower House. The Peers will now take no part therein whatever. We can hardly suppose that this resolution has been come to from mere pique, but it would be difficult to persuade us that the interests of India were consulted in the exclusion of men like Lord Ellenborough, the Marquis of Salisbury, and Lord Northbrook from the conduct of the enquiry, and we yet hope to see the resolution reversed.

The enquiry will naturally take two great lines or directions. The Committee have to pronounce judgment upon—

(1.)—The skill or incompetency with which the finances of the country have been managed in Calcutta, since the Revolution of 1857.

(2.)—The justice or otherwise of the nature of our financial relations with England.

In point of fact, two great parties will be put upon their trial before the Committee—(1st) the Government of Calcutta, and (2nd) the Government of England; and this fact should be clearly understood at the outset. We are going, we say, to indict the Supreme Government of India, for the character of its finance these ten years past; and the Supreme Government of England, for the injustice with which it has treated this great dependency in its financial relations therewith. We could not we believe, state more clearly the real purposes for which the Committee is appointed. The Supreme Government of India will have to answer before the Committee for its incessant *tampering with the Land Tax*; for the policy embodied in the famous maxim that *India must not borrow*; for its device of *an Income Tax* and of *Export Duties* for the construction of our railways; and for the other evidences it has given of financial incompetency. On the other hand, the Supreme Government of England will have to justify and defend the exactions it has so long been permitted to make upon the Indian Treasury. In this respect, the appointment of the Committee is a ministerial challenge to us to prove our case. The challenge is given, we believe, with perfect sincerity. The question was formally raised for the first time in the House of Commons in 1868, in the course of a debate upon the cost of the Abyssinian war. Nothing could have been more honourable than the general tone of that debate, but it was noticeable chiefly for eliciting from Mr. Gladstone an expression of views strongly adverse to those which *we* have ever urged. Mr. Gladstone said—"I am "inclined very much to share in the feeling—and I think it is a "most laudable and honourable feeling—which is entertained by "my honorable friend the member for Brighton, and by some other "gentlemen in this House, namely, a sentiment of scrupulous "and tender regard to the nature of our relations towards India, "and to the fact that as we alone have the power in our hands, "we are therefore doubly bound to execute it with justice. "If my honorable friend shall think fit to move for an enquiry, "or if the Government should think fit to propose an enquiry—"and, for my part, I am very disposed to believe it might be useful "—into the distribution of the military and naval charges between "England and India under the present arrangements, my "opinion, my strong opinion, is that the result of that inquiry "would be a not inconsiderable addition to the charge of India, "and a not inconsiderable diminution of the charge of England."

Mr. Gladstone is too honest a man to be very consistent, and we are not without hope that the discussion which this statement of his views elicited at the time may have modified them. At any rate, we owe him our acknowledgments for bringing the matter to an issue by the appointment of this Committee. The general nature of our charge against the Government of England is well known. We complain that the tax-payers of *that* country administer as they please the taxes raised in *this* country, and that they have ever done so since there was an English Government in India at all. Now the relations between the two countries being infinite in their ramifications, and the maintenance of those relations costly in the extreme, we might reasonably expect to find exactly what we do find—an infinite number of positive misappropriations of Indian revenue on the part of the mother country, and a spirit of selfishness pervading its entire management. Under such conditions, it were absurd to expect anything else. Well, we are challenged to prove the charge, to substantiate it, by giving special instances of the injustice of which we complain. It would be mere affectation to conceal that it is chiefly our own writings—or harping if you please,—upon the subject, that has brought this enquiry about. For the last twelve or thirteen years we have made every effort to familiarize the public mind with the case to which our own attention was first drawn in 1858 by an admirable pamphlet of Sir George Wingate's upon the financial relations between the two countries. The truth is that the general charge admits of no reply. Thus our readers are all familiar by this time with the story of the wrong inflicted upon India by the East India Stock arrangements of 1834. We did not know until lately that the injustice of the course taken by the Ministry of the day, was denounced in strong terms at the time. In July 1833, the *Westminster Reviewers* commented upon it as follows:—

"There are two very exceptionable points of detail in the "ministerial arrangement. The first of these is the proposition "to give the holders of East India Stock a twenty years lease of "the Government of India * * * The other point refers to the "pecuniary terms given to the holders of East India Stock. A "dividend of 10½ per cent. has been virtually guaranteed to them "in perpetuity, by which (for there is next to nothing received "on the other side) a perpetual burthen has been imposed upon "the people of India equal to £630,000 per annum, or what is "equivalent to increasing by nearly one-third the present territorial debt of India. *The rapid and great advance in the "value of the Stock, since the promulgation of the Governmen "scheme, and to which there is no parallel in any other public se-"curity*, is strong and damning proof of the prodigality of th "Government project. The holders of East India Stock had by "no means so good a claim to a continuation of the dividends "which for forty years they have been paying themselves, as "the holders of the Navy 5 per cents. had to a continuation "of a dividend to that amount. The utmost reach of liberality "ought therefore only to have placed them on an equality with "the latter, and this, although it would not have raised, would "not have depreciated the value of India Stock by the smallest "fraction. The dividend, in fact, instead of being 10½ per cent. "ought only to have been 8 per cent., and this too only for a term "of seven years, at the conclusion of which it ought to have "been reduced to 7 per cent, and after a further term of the "same length, to 6 per cent. This, while it would have been "equivalent to doubling the original Stock of the proprietors, "would have produced a saving to the public [India] in the first "term of £150,000 per annum; in the second term, of £210,000; "and at the third period, when the Indian fund-holder was put "upon an equality with the holders of the 3 per cent. Consols, of "£270,000. In this manner, without placing the holders of Indian "Stock in a worse condition than the holders of any other

"public security, a sum would have been saved far more than "sufficient for carrying on the whole of the Home Administra- "tion of India."

Now the Government of England will have to justify this wrong before the Committee of Enquiry, and to shew that India ought still to continue to suffer from it, for after the lapse of nearly forty years it is not ended yet. The very first item in the Home Charges year after year is a demand for £630,000 on account of this Stock. Calculating interest at 5 per cent., India has already paid £90,000,000 (ninety millions) sterling on account of it, and has to pay £12,000,000 more if we are to wait for the Guarantee Fund to redeem it. England is bound, we say, in conscience, to stop this draft upon the industry of India, and without asking us for any further contribution, to make the Stock a part of her own national debt. This is the smallest measure of the redress she can reasonably make. In the same way must the Committee make enquiry into the justice of throwing upon our shoulders the cost—the entire cost—of the Affghan war. These exactions on the one hand, and the financial arrangement of the Government of India on the other, are the great subjects for the determination of the Committee, and our contemporaries will, we trust, keep both steadily in view. If we fail before the Committee, it is not likely that another opportunity will be afforded us; if we succeed, the Indian Treasury will be relieved of several millions sterling a year of charges improperly included in our accounts.

THE BALANCE SHEETS OF THE PROVINCES—1861-69.

THE total amount levied under the head of land revenue in the Lower Provinces of Bengal during the eight years ending 30th April 1869, and the total expenditure each year upon the civil administration thereof, and purely local works of improvement therein, were respectively as follows :—

	Land Revenue.	*Civil Administration.*	*Public Works.*
	£	£	£
1861-62	4,166,505	4,088,023	755,613
62-63	3,907,644	4,326,406	617,490
63-64	4,051,551	5,009,489	861,659
64-65	3,810,488	5,223,681	811,189
65-66	3,820,285	4,721,610	610,207
66-67	3,682,825	4,210,498	788,563
67-68	3,797,735	5,289,764	916,381
68-69	3,965,730	5,131,415	1,170,411
	£31,202,400	£38,001,000	£816,531,100

Under this head of civil administration, however, are included many charges of a character purely imperial that ought not to have appeared in these accounts at all. We have gone carefully through the period, and find the following charges treated, year after year, as though they were part of the cost of the local administration of these provinces :—

	Marine.	*Opium.*	*Political Assignments.*	*Salt.*
	£	£	£	£
1861-62	93,267	1,434,431	196,783	446,434
62-63	96,213	1,845,080	221,516	240,028
63-64	100,938	2,294,336	223,859	
64-65	262,571	2,363,590	228,670	
65-66	255,553	1,891,012	186,624	
66-67	262 214	1,074,263	239,866	
67-68	250,001	1,676,719	226,545	
68-69	243,000	1,904,000	230,000	

On what principle Bengal is charged with the cost of a marine service which is maintained for the general interests of the Empire, it would be hard to divine ; so also with the cost of the manufacture of opium and salt, the revenues from which are imperial. Excluding these charges, amounting in the aggregate to £18,484,000 from the accounts of the Presidency, we find that the local revenues of the period, and the purely local charges compare, as follows :—

Land Revenue 1861-69		£ 31,202,400
Local Public Works	£ 6,531,000	
Civil Administration	£38,001,000	
Less opium, salt, Marine, &c.	18,484,000	
	£19,517,000	
		£ 26,048,000
Balance		£ 5,154,400

Now this balance represents the contribution which Bengal has made during the period towards the imperial charges of the army, debt, home establishments, &c. To it must be added however a greater or less sum on account of the Salt Tax imposed upon the provinces being somewhat heavier than it is in the rest of India. The duty ought to be made uniform throughout the country.

If we turn to the accounts of the North-West Provinces, or of Madras, or Oudh, and compare them with the accounts of Bengal, we shall see at once how unequal is the pressure of taxation in the country. Take the Oudh accounts first—

	Land Revenue.	*Civil Charges.*	*Public Works.*
	£	£	£
1861-62	1,070,222	539,328	171,321
62-63	1,034,655	583,868	148,891
63-64	1,007,329	564,788	120,666
64-65	1,004,047	483,450	113,197
65-66	1,133,164	485,619	122,297
66-67	1,037,894	481,384	196,235
67-68	1,210,064	525,542	215,379
68-69	1,255,259	551,004	215,166
	£8,734,000	£4,215,000	£1,312,000

In this case, the local accounts are comparatively pure, the expenditure upon imperial objects being confined to an outlay of about £140,000 a year for political assignments under treaty improperly included in the civil charges of the province. The amended balance sheet of the eight years under review will stand as follows :—

Land Revenue 1861-69		£ 8,734,000
Local Public Works	£1,312,000	
Civil charges	£ 4,215,000	
Less Treaty assignments	1,120,000	
	£ 3,095,000	
		£ 4,407,000
Balance		£ 4,327,000

Thus the small province of Oudh, with the great body of its cultivators in a frightful state of indebtedness, and with a population of not more than six or seven millions is mulcted every year by the Imperial Treasury in a sum nearly equivalent to that paid by seven times the number of people in these Lower Provinces. Of course a very great wrong is done to Oudh.

Pursuing the same method impartially with the accounts of the other provinces, we find the results to be equally anomalous and unsatisfactory. The accounts of the North-West Provinces for the period, are as follows :—

	Land Revenue.	*Civil Charges.*	*Public Works (local.)*
	£	£	£
1861-62	4·615,260	1,872,458	640,491
62-63	4,081,237	1,612,424	475,622
63-64	4,048,497	1,533,831	561,274
64-65	4,035,471	1,593,196	641,725
65-66	4,212,491	1,627,193	499,486
66-67	3,817,741	1,613,850	741,346
67-68	4,084,016	1,757,665	746,969
68-69	3,991,958	1,846,322	
	£32,887,000	£13,457,000	£5,305,200

In the civil charges of these provinces are included political allowances under treaty to the extent of about £100,000 a year. Striking them out of the accounts as Imperial, and therefore improperly included in the local budget, the balance sheet for the eight years under review stands as follows :—

Land Revenue 1861-69		£32,887,000
Local Public Works	£ 5,305,200	
Civil Charges	£13,457,000	
Less Treaty allowances, improperly included	„ 800,000	
	£12,657,000	
		£17,962,000
Balance		£14,925,000

So that fifteen millions sterling of purely local revenue went into the Imperial Treasury during these years as the contribution of the 30 millions of people living in the North-West Provinces, while the 40 millions of Bengal contributed from the same source about one-third only of that amount.

The balance sheet of the Bombay Presidency tested in the same way, has occasioned us a good deal of surprise. It stands thus:—

Land Revenue 1861-69		£27,606,000
Local Public Works	£ 9,511,870	
Civil Charges	£28,744,000	
Less properly Imperial Charges	„ 9,200,000	
	£19,544,000	
		£29,055,870

Thus instead of contributing anything from its local revenues to the Imperial Treasury, Bombay would seem to have made a draft thereon for its own purposes to the extent of £1,400,000. We have endeavoured to treat the account with the strictest impartiality, and have therefore excluded from the civil charges of the Presidency the following items as imperial in their character :—

Marine Charges	1861-69	£2,214,000
Political agencies	„	582,000
Assignments under Treaties	„	566,000
Interest on Service Funds	„	745,000

A very onerous item, however, in the civil charges of Bombay, is that which appears every year in the accounts, under the head of "Allowances to district and village officers." The amount varied during the eight years in question from £394,924 in 1861-62 to £282,085 in 1868-69. We have not ventured to deduct this item (amounting in the aggregate to £2,900,000) from the local charges of the Presidency, but the propriety of its appearance there, is open we think to fair question. The charge arose under peculiar circumstances, and it is not by any means clear that Bombay might not fairly claim that it should be regarded as an imperial and not a local charge, and as such included under the head of "Treaty allowances and assignments." In the Proclamation issued by Mr. Elphinstone during the war with the Peishwa in 1818, it was solemnly promised that "all *wuttun* or *inam* lands, established pensions, and annual allowances" enjoyed by the people, should be respected and continued, provided the owners withdrew from the service of Bajee Rao, the collection of whose revenue was in the hands of certain hereditary district and village officers (*wuttundars*). These men in a body forsook the prince upon the appearance of the Proclamation, and claimed the fulfilment of its promises. We have been compelled to substitute our own administrative machinery in their room, while we yet continue to pay them the emoluments of their *wuttuns*, amounting to the very large sum we have pointed out. The circumstances under which Mr. Elphinstone's Proclamation was issued, make the annual recurrence of this charge, we think, more properly an imperial than local liability. When that manifesto was issued, the power of Bajee Rao the Peishwa, was yet unbroken; while its assurances and the reputation of our Government for scrupulous adherence to its engagements, were the most powerful causes which contributed to his ruin. It is hard to say whether the Mahrattas or our own Government attached more importance to the appearance of the manifesto. It was carefully timed upon the fall of Sattara, up to which date the pursuit of the Peishwa had been productive of nothing important, if we except the moral effect of holding him up as a fugitive to the eyes of the country. The repulse at Kirkee and the stand of the Grenadiers at Korygaom, were all the successes of the campaign; and the historian of the war (Grant Duff) distinctly affirms that in the various skirmishes which ensued, no advantageous result had been gained by either party. The truth is, we fought Bajee Rao first with the Proclamation and then with the Sattara family, which most opportunely fell into our hands some ten days after its appearance. The assurances of the Proclamation, and the reinstatement of the Rajah of Sattara, ruined the Peishwa.

Now under these circumstances it is not fair, we think, to Bombay to treat the charge as a liability of the local treasury. It is part of the price paid by the Empire for the overthrow of a rule that had become a curse to its own subjects and full of danger to ourselves. The same proclamation, it will be observed, guaranteed the *inam* or rent free lands of the Deccan to their owners, and the same course of reasoning would apply here also. Bombay lost the power of imposing a fair rent charge upon a very considerable proportion of its land under this proclamation; and in decentralising the finances of the Empire, it would be necessary to bear in mind that this forfeiture was incurred for strictly imperial purposes. Once more, a somewhat large proportion of the expenditure of late years upon Public Works in the Western Presidency may fairly be regarded as imperial in its objects. The truth is that the Bombay balance sheet is a very intricate affair, and would require careful and exhaustive treatment to present it in a perfectly fair light in this comparison.

We pass on to Madras, where no such disturbing elements exist to perplex us, and find the balance sheet of the Presidency stand thus :—

Land Revenue, 1861-69		£32,846,000
Public Works (local)	£ 6,193,000	
Civil Charges	£20,145,000	
Less charges properly Imperial	„ 3,544,000	
	£16,601,000	
		£22,794,000
Contribution to Imperial Treasury		£10,052,000

The only items we have deducted from the civil charges in this case are £2,894,000, the aggregate amount paid during the period under the head of "treaty assignments;" and £650,000 interest on service funds; both charges purely imperial in their nature. The accounts of the Punjab and of the Central Provinces for the same period, are respectively as follows :—

Punjab Accounts 1861-1869.

Land Revenue		£15,180,498
Public Works (local)	£5,138,000	
Civil Charges	£ 9,475,000	
Less charges properly Imperial	£ 960,000	
	£ 8,515,000	
		£13,653,000
Contribution to Imperial Treasury		£ 1,527,498

Central Provinces 1861-69

Land Revenue		£ 4,290,000
Public Works (local)	£ 2,239,000	
Civil Charges	£ 4,284,000	
Less charges properly Imperial	£ 720,000	
	£ 3,564,000	
		£ 5,803,000
Drawn from Imperial Treasury		£ 1,513,000

We have striven to make these accounts up with the strictest impartiality. Burmah, owing to its capitation tax and the heavy export duty upon rice, we have excluded from the comparison. Pending also a more exhaustive treatment of the Bombay accounts, we think it best to exclude them also. The accounts of the other provinces are comparatively simple, and observe what they reveal. The Central Provinces *contribute nothing* whatever to the Imperial Treasury, but make a heavy draft thereon year by year: Bengal almost nothing, when we bear in mind its natural resources and its population; the Punjab a very small amount in comparison with what it ought to pay; while *Madras, the North West Provinces, and Oudh*, between them, keep the empire solvent. In one view, the case stand thus. ;—

	Population.	*Contribution in 8 years.*	*Per head.*
		£	*s. d.*
Bengal	38,000,000	5,154,000	2-8
Punjab	17,600,000	1,527,000	1-9
Oudh	6,500,000	4,327,000	13-4
Madras	26,000,000	10,052,000	7-8
N. W. Provinces	30,000,000	14,925,000	10-0
Central Provinces	9,100,000	1,503,000	(deficit)

It is impossible that figures should more clearly shew the ruinous mistake that has been made in the Central Provinces; a mistake, moreover, which we have pledged ourselves not to change for 30 years to come. Had the finances of the country been decentralized ten years ago, the impossibility of such a settlement would have been seen even by Sir Richard Temple himself.

AMERICAN FINANCE—DECENTRALIZATION.

The national income of the United States is derived mainly from two sources.—(1st) Customs Duties; and (2nd) Indirect taxes upon property, manufactures, and raw produce, the whole of the latter being classed together under the name of Internal Revenue. The estimated income for the fiscal year ending 30th June next, is 393,000,000 dollars, made up in the following way :—

Customs	185,000,000	dollars.
Internal Revenue	175,000,000	„
Land Sales	5,000,000	„
Miscellanea	28,000,000	„

The following official statement in detail of the *Internal Revenue* of the year, with its equivalents in pounds sterling—for which we are indebted to the *Economist*—is of special interest to us in India, on grounds which we shall point out presently :—

	dols.	£	per cent.
Spirits	55,581 599	10,189,960	30·00
Tobacco	31,350,707	5,747,629	16·92
Fermented liquors ..	6,319,126	1,158,506	3·41
Banks and bankers...	4,419,911	810,317	2·38
Gross receipts	6,894,799	1,264,046	3·72
Sales	8,837,394	1,620,188	4·77
Special taxes not otherwise enumerated	9,620,960	1,763,842	5·19
Income	37,775.873	6,925,576	20·39
Legacies	1,672,532	306,640	·90
Successions	1,419,242	260,216	·76
Billiard table, carriages, plate, and watches	907,442	166,386	·48
Passports	22,756	4,172	·01
Gas	2,313,417	424,126	1 24
Other sources	728,135	133,486	·39
Penalties, &c.	827 904	151,781	·44
Stamps	16,544,043	3,033,074	8·93
	185,235,867	33,959,909	100·00

It will be seen that 50 per cent. of this vast sum of £34,000,000 is derived from spirits, tobacco, and fermented liquors, or what *we* call excise duties. Now Indian financiers declare it impossible to obtain a revenue here from tobacco at all, although it is in almost universal consumption by the people. It cannot be taxed, we are told, because it grows at every man's door. It grows in the very same way in America, and yet they do contrive somehow or other to obtain there a revenue of nearly £6,000,000 a year from it. Again, we find the American excise upon spirits and fermented liquors producing between eleven and twelve millions sterling a year, while our own abkarree levied upon a population four times as numerous (and including the excise on opium) yields little more than £2,000,000 sterling. And yet we are all agreed that to tax opium, tobacco, and spirits up to the highest productive limit, is required by sound economy and good morality. The American Government obtains an income of £17,000,000 sterling a year from its excise upon these three articles from a people 38,000,000 in number, while we in India get but £2,000,000 from a population four times as numerous. That our abkarree revenue admits of almost indefinite increase, we entertain no doubt whatever, the consumption of opium, or spirits, being all but universal in many parts of the country.

Of the remaining £16,000,000 of this Internal Revenue of America, £3,000,000 were obtained from stamps, and £7,000,000 from an Income Tax of one shilling in the pound. So hateful, however, is the Income Tax found to be, that all parties have determined to abolish it, and it will be materially reduced in the budget of the present year, as a step to its final abandonment. The admirers of this tax will thus be deprived at last of their stock illustration of its success. The American Income Tax does not descend so low as the English one, while the attempt to levy it in a country like this, where there are no assessable incomes to tax, will we trust if once abandoned never be repeated.

We have frequently stated our belief that our finance administration should be recast upon the American model. By the Constitution of the United States, Congress is empowered to levy and collect taxes, duties, imposts, and "excises for the common defence and general welfare of the States." It is specially enacted, however, that all such duties shall be *uniform throughout the States*. Now this great but simple principle should be adopted in India. As we have frequently pointed out before, taxes that are equal in their pressure throughout the country are marked out, by *that very fact*, as imperial in their nature, and should be treated as such. Such already are the import and export duties of the country, and such are or should be the excise duties upon opium, salt, abkarree, &c. We may federalize, or decentralize, our finances upon the American model we believe with ease, and with nothing but advantage to the country. The key to the American system, which is simplicity itself, may be found in Sections VIII. and X. of the Constitution, and Article X. of the amendments thereto. We shall do a public service, we believe, by producing them in our columns for the study of our financiers.

The sections or such part of them rather as it is necessary to quote here are as follows :—

Section VIII.—Congress shall have power—

I.—To lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defence and general welfare of the United States; *but all duties, imposts and excises shall be uniform throughout the United States.*

We have here a very simple but comprehensive and exact statement of the purposes for which the Imperial Government exists at Washington and our own at Calcutta—(1st) "to pay the debts" and (2nd) "to provide for the common defence and general (as opposed to *local*) welfare of the States." The purposes for which the Imperial Government exists being the common defence and general welfare, it follows, as a logical sequence and just requirement, that the taxes levied for the attainment of these purposes shall be "*uniform throughout the country.*" The Section proceeds to detail with precision, the obligations which fall upon the Imperial Government, under the general terms used in the preamble we have quoted. Having defined the obligations and powers of the Imperial Executive with the utmost simplicity and exactness, the independent powers of the several States are defined negatively with a skill which it is impossible to admire too much. The Constitution was adopted in 1787, and in 1791 Congress, in their first session, proposed and ratified certain amendments, the practical skill of which was probably never surpassed. The tenth amendment was this

Article X.—The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

We have here again the hand of a master workman. No attempt is made jealously to define the powers conferred upon the local Governments. It is the local States which confer power upon the Imperial Government; and all they have not conferred, they are to be understood to have retained. We have here the natural order of things as opposed to the interested devices of power; and the result of all is—the United States. Everything belongs to the local powers except that which had been conferred upon the Imperial Government for the common defence and welfare of all. The Constitution defines with utmost exactness the responsibilities of the Supreme Government and confers full powers upon it for their discharge and then declares all else to be of purely local obligation. Now, what we want in India is decentralization of this order. It will be as well perhaps for us to shew with more fulness the model we propose for imitation.

The powers and prerogatives conferred by the Constitution of the United States upon the Imperial Legislature at Washington, and the powers reserved by the Constitution to the local States, are, we say, worthy of careful study in India, where the great problem of decentralization has to be worked out by ourselves. We approach the question in India under very different circumstances from those in which the Constitution of the United States was framed. *There* power was to be conferred by the people upon a great Central Executive which had to be created for the common defence and general welfare of the

country; here, on the other hand, the problem is how a great existing Central Executive that has hitherto engrossed all power in its hands, may safely divest itself of functions which it is impossible for it to discharge efficiently. The Supreme Government is as anxious to be relieved of the responsibilities improperly devolved upon it, as the Provinces are impatient to assume them. There is no unwillingness we believe to part with authority on the part of the Supreme Council; on the contrary, there is a sincere desire to be relieved of responsibilities which it is seen ought never to have been imposed upon it, and which embarrass and impede it in the discharge of its own proper duties. In these circumstances, the question is simply one of practical statemanship, and it may help us to arrive at valuable conclusions if we can define with accuracy the purposes for which an Imperial Executive really exists in India. The most ardent believer in decentralisation will hardly, we think, go the length of Mr. Bright's recommendation that we should abolish the Governor-General altogether, and divide the country into a dozen independent satrapies owning but one common superior in the Secretary of State. We believe it to be necessary that the Imperial Government should be absolute within the sphere of its own proper responsibilities; and those responsibilities seem to us to be all but indentical with those of the Imperial Legislature at Washington. By Section VIII. of the Constitution of the States, its powers are declared to be as follows:—

Congress shall have power—

1.—To lay and collect taxes, duties, imposts and excises, to pay the debt and provide for the common defence and general welfare of the United States; but all duties, imposts, and excises shall be uniform throughout the United States:

2.—To borrow money on the credit of the United States:

3.—To regulate commerce with foreign nations, and among the several States, and with the Indian tribes:

4.—To establish a uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States:

5.—To coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures:

6.—To provide for the punishment of counterfeiting the securities and current coin of the United States:

7.—To establish post-offices and post-roads:

8.—To promote the progress of science and useful arts, by securing for limited times, to authors and inventors the exclusive right to their respective writings and discoveries:

9.—To constitute tribunals inferior to the Supreme Court:

10.—To define and punish piracies and felonies committed on the high seas, and offences against the law of nations:

11.—To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water:

12.—To raise and support armies; but no appropriation of money to that use shall be for a longer term than two years:

13.—To provide and maintain a navy:

14.—To make rules for the Government and regulation of the land and naval forces:

15.—To provide for calling forth the militia to execute the laws of the Union, suppress insurrection, and repel invasions:

16.—To provide for organising, arming and disciplining militia, and for governing such part of them as may be employed in the services of the United States, reserving to the States respectively the appointment of the officers, and the authority of training the militia according to the discipline prescribed by the Congress:

17.—To exercise exclusive legislation in all cases whatsoever over such district (not exceeding ten miles square) as may by cession of particular States, and the acceptance of Congress, become the seat of the United Government of the States, and to exercise like authority over all places purchased by the consent of the legislature of the State in which the same shall be, for the erection of forts, magazines, arsenals, dockyards and other needful buildings, and:

18.—To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the Government of the United States, or in any department or officer thereof.

Section 10 of the same Article further defines the powers of the Imperial Executive, by the limits which it assigns to those of the several States, and the prohibitions under which it lays them.

1.—No State shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money, emit bills of credit; make anything but gold and silver coin a tender in payment of debts; pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts; or grant any title of nobility.

2.—No State shall, without the consent of the Congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts, laid by any State on imports or exports, shall be for the use of the Treasury of the United States; and all such laws shall be subject to the revision and control of the Congress.

3.—No State shall, without the consent of the Congress, lay any duty of tonnage, keep troops or ship of war in time of peace, enter into any agreement or compact with another State, or with a foreign power, or engage in war, unless actually invaded or in such imminent danger as will not admit of delay.

To the Constitution thus originally framed, a very striking addition was made by the first Congress assembled under it. This addition consists of certain provisions known as the Amendments ratified by the States on the 11th of December 1791, of which the two necessary to be quoted for our purpose are as follows:—

Article IX—The enumeration in the Constitution of certain rights shall not be construed to deny or disparage others retained by the people.

Article X.—The powers not delegated to the United States by the Constitution, nor prohibited by it to the States are reserved to the States respectively, or to the people.

Now it seems to us, that a careful study of these provisions would help us much in India to a solution of the great political problem we have to work out. Let us try to agree amongst ourselves, and to come to an understanding with the Supreme Government, as to what are the proper powers and prerogatives of the Supreme Executive. We doubt if there will be found any wide diversity of opinion at bottom, as to what they really are. The absolute control of the Army and Marine, the Mint, the Post Office, the Imperial lines of Railway and Telegraph, relations with the Native States and with the Home and Foreign Governments, the right to all existing taxes of uniform incidence in the country, and to impose further taxes if necessary under the same conditions will probably exhaust the list. The freedom of the provinces means also the freedom of the Imperial Government to discharge its own proper Imperial duties.

DECENTRALIZATION: IN A FORGOTTEN LIGHT.

MR. BRIGHT'S proposal of 1858 was that instead of a Governor General and an Indian Empire we should have neither the one nor the other, but so many independent presidencies perfectly equal in rank and power. He would treat each Presidency as if it were the only portion of India belonging to us. Its finance, its taxation, its justice, and its Police Departments, as well as its Public Works and Military Departments would be treated precisely as if it were a State having no connection whatever with any other part of India. Instead of an Indian Empire, Mr. Bright would have so many separate dependencies of the Crown, each in direct correspondence with the Secretary of State for India. The advantages which he thinks would spring from this revolution appear to resolve themselves into—(1st) the belief that the independence of the provinces would lead to "a constant rivalry for good" between them, and that (2nd) we should have no Governor so great that they could not control him in England. "You would have in every Presidency a constant "rivalry for good. The Governor of Madras, when his term of "office expired, would be delighted to show that the people of "that Presidency were contented, that the whole Presidency was "advancing in civilization, that roads and all manner of useful "public works were extending, that industry was becoming "more and more a habit of the people, and that the exports and "imports were constantly increasing. The Governors of Bom-"bay and the rest of the Presidencies would be animated by the "same spirit, and so you would have all over India, as I have "said, rivalry for good; you would have placed a check on that "malignant spirit of ambition which has worked so much evil; "you would have no Governor so great that you could not con-"trol him, none who might make war when he pleased; war and "annexation would be greatly checked, if not entirely, prevented; and I do in my conscience believe you would have laid the "foundation for a better and more permanent form of govern-

"ment for India than has ever obtained since it came under the "rule of England."

Mr. Bright did not see that the revolution which he proposed would simply transfer the seat of Empire from India to London. His proposal would not put an end to the Empire; it would simply transfer its seat from Calcutta to London. But if there is one question upon which we are better agreed than another, it is probably this, that India to be wisely governed must be governed in India itself, and not in England. The less interference we have from England, the better. We go all lengths with Mr. Bright in his denunciation of the evils of the present centralized system; we differ only as to the remedy, which we hold to be federation, not independence. The Empire must still exist, and its seat still be here, and not in London. What must cease is the attempt of the Imperial Government to engross and to discharge what are purely local responsibilities, and can only be discharged by local administrations. The service which Mr. Bright has rendered is that he has made the continuance of the present system impossible by his vigorous exposure of its absurdity. "Has it ever happened before" he says, "that any one man governed twenty nations, speaking "twenty different languages, and bound them together in one "great and compact Empire? Look at the making of the laws for "twenty nations speaking twenty languages. Look at the regula- "tions of the police for twenty nations speaking twenty lan- "guages. Look at the question of public works as it affects "twenty nations speaking twenty languages, where there is no "municipal power and no combinations of any kind such as "facilitate the construction of public works in this country. "Inevitably all those duties that devolve on every good govern- "ment must be neglected by the Governor-General of India, "however wise, capable, and honest he may be in the perform- "ance of his duties, because the duties laid upon him are "such as no man now living, or who ever lived, can or could "properly sustain."

Every one feels that reply to this statement is impossible. It only remains that we agree as to the remedy. The remedy which Mr. Bright proposes is that of breaking the Empire up into half a dozen distinct and separate States, completely independent of each other, and simply owning a common allegiance to a power distant half the globe from us. The remedy is proposed in forgetfulness of half the conditions of our existence here. His passionate conception of the reform needed in one direction, has blinded him to the necessity of our simultaneously moving in another and opposite one. *The Empire has yet to be organized in its Imperial character and functions.* We are strangely slow to understand that, whether we will or no, we are the paramount Power in India, and that duties and responsibilities devolve upon us as such, of which we cannot divest ourselves if we would. To adopt Mr. Bright's proposal would be deliberately to abdicate and refuse the position which the course of events has thrust upon us, and from which we can retire only by abandoning the country to anarchy and chaos. Whether we open our eyes to it or not, the so-called Native States of India have already become integral parts of the Queen's Empire of India. Conceal the fact from *him* in any convenient way we like, it is useless to do so from ourselves that even the Nizam has passed from the position of an independent prince into that of a feudatory of the Empire, and that whatever we may have desired or intended, his independence as a ruler is limited by responsibilities which belong to us and of which we cannot divest ourselves. Without forcing the development of things, we are bound to recognize their tendency. A few months ago, we put into Lord Mayo's mouth words which embodied what our own convictions upon the subject have long been. We made Lord Mayo say:—

"As Her Majesty's representative for a few years in this "land, I feel how hopeless it is, overladen and burdened as "I am, that I should be anything to the people of our own "provinces, or to the Native princes of India than a mere "name, and possibly a wrong-doer where I mean and hope to "do right. Would it not be enough that we should under- "take to do here in Calcutta for the Empire what is under- "taken in Washington for the United States? The imperial "work of this Government,—the work of welding the Empire "into a sympathising whole, beating with one heart—an empire "of which our own provinces and the Native States form the "members, as yet lies wholly neglected. Our provinces are "all but in rebellion at our minute interference with their "affairs, while the Native States lie outside the sympa- "thies of the empire altogether, and know nothing of our "beloved Queen, but the grasp laid upon the country by our army. "Gentlemen, the Native princes of India have yet to be conquer- "ed, but in a higher and nobler sense than that of material force. "Do we not antedate the time when good government, not neces- "sarily uniform in detail, but marked by healthy diversities of "independent growth—shall prevail all over the country, the "Native princes emulating our own governments in efforts for the "happiness of the people? How grand is the future which this "prospect opens, but to realize it how plainly is it indispensable "that freedom should be given to all. Freedom in the first place, "to ourselves to do our own proper imperial work; freedom in the "second to every local government to discharge its own respon- "sibilities, without interference from ourselves."

The policy shadowed forth in this passage expresses a higher and truer statesmanship, we believe, than Mr. Bright's remedy. We see what Mr. Bright does not see—that an Empire already exists here, and while Mr. Bright would break it in pieces, we would bind its members more closely together, giving them, however, the complete liberty for which he pleads. The revolution to be accomplished is two-fold—(1) to *divest* the Supreme Government of powers improperly assumed by it; (2) to *invest* it with those responsibilities of empire which, as Paramount Power, devolve upon it, and which it is reluctant to assume. Take in illustration, the late deplorable famine in the Native States of Rajpootana. Every part of the Empire looked to us, and rightly looked to us, to save the famine-stricken tract from the last extremity of death. Instead of accepting the responsibility, and discharging it, and setting aside the Native Executive altogether if necessary, we allowed a million of people to perish whom we might undoubtedly have saved alive, and whom it was our duty to save alive. In all this agitation for decentralization, there is at present complete oversight of the fact that it is as much demanded in the interests of the *Empire* which yet has to be created, as of the *Provinces* which demand to be set free.

BURMAH WASTE LAND RULES.

To the Editor of the "Indian Economist."

SIR,—I regret to find that Burmah never finds a word said for it in your columns. You will confer an everlasting blessing on this country, if you will endeavour to help Burmah out of the difficulties which will surely show themselves hereafter, 50 years hence perhaps, owing to the land settlement system and the deplored introduction of Lord Canning's rules for the grants of waste lands in to the province. Let me deal with the last subject first.

Would you believe, although we have had the province but 18 years, we have been granting away valuable lands of the country to speculators free for 64, 32, 16, and 8 years. 30,000 acres round Rangoon alone are gone. The people ask, and ask naturally, what has become of the Queen's Proclamation, and is Lord Canning's promise a myth? The Queen told the people she would not interfere with their peculiar ancient rights. Lord Canning said those rights should be scrupulously regarded and not ignored. Have we kept faith with the people? Have we carried out the wishes of our Queen and her representative? No, we have not. We are fast depriving the inhabitants of their rights; that portion of the inhabitants too who chiefly assist in swelling the revenue of this beautiful country, while we are filling the pockets of speculators, at the cost of the people, with money collected from them, by tyrannical agents, for grazing ground, firewood, and even the thatch used to cover their little homes. The Queen and her representative gave clear mandates: but the influence of a few grasping speculators has upset their well considered and just orders. The lands of the country, undeveloped—aye, and unknown to more than three-fourths of the officers of the Burmah Commission—are granted away to speculators; officers of the service included. Men in all positions rush for a slice. The poor peasants look on and say, "Is this the result of British rule? Are we

to be deprived of our ancient rights? Told to pay for the produce of our own primeval forests? Our own from time immemorial, but now, taken from us by the great Queen of England in contravention of her promises"—promises which we were told would be fully acted up to."

Burmah, undeveloped, its mineral sources unknown, made over to the mercies of a race of speculators! Is this fair? Our railways have yet to be made (to refuse to make them now is only false economy); the lines will have to pass through private grants, and thousands of pounds will be demanded as compensation where so many pence have not been spent.

As an influential journal, I pray you to use your power to save the country from falling into the hands of speculators In the event of war, and the Government of British Burmah being put on its resources, where will it look for help? It is fast alienating the people from us, by invasion of their ancient rights—rights beloved by the people, guaranteed by the Queen, but ignored by the local Government. What right have we to grant away the lands of the country for 64 years to any body? Waste lands indeed? The cultivator went formerly to what we are pleased to term waste lands, for the supply of all his household wants: firewood, wild vegetables, and fruits; water, thatch, house materials, &c. They have been guaranteed as his property by the Queen, but now an exacting speculator has obtained in many places the whole of this waste land by the mere asking, and charges the people for these commodities. It makes one mad to think that officers could so recklessly give away the property of others, with an amount of nonchalance, which, were it not for the injury it causes to the people, would be laughable. A stroke of the pen in favor of friendly applicants, and away pass the guaranteed rights of the people for ever! Mr. Editor, I know this country well, and I knew the former Chief Commissioner to some extent; he knew the people; would that he were here now to rectify wrongs they are subjected to.

Many officers high in the Commission have, it seems to me, strange views about the rights of the people to the land. Let Lord Mayo satisfy himself as to the working of these grants, in Rangoon particularly; but do not let him be influenced by the reports of the officers who granted away the lands in the first instance, or by reports of an apologetic nature, they may send in. I will not occupy more of your space by commenting on the settlement system. As you remark in your article as to Bengal, in your paper of the 16th October, the people do not want the new settlements; but when, as suggested for this country, a village settlement is proposed, and, strange to say, reported favorably on by some officers, you will not be surprised to hear that the people are strongly opposed to it; and where village settlements have been made, it has not been with the willing concurrence of every member of the community. Common sense should tell one that such a system, where one man's pocket is affected by the dilatoriness of his neighbour, could never be received favourably.

I believe there is now a settlement officer in Rangoon who shews some respect for the rights of the people, knows the disaffection caused by the introduction of the village system, and has matured a plan which will be acceptable to the cultivators. Trusting I have not occupied too much of your space.—I am, Sir, yours faithfully,

Burmah, Nov. 1870. AN ENGLISHMAN.

EDITORIAL NOTES.

IT was our sincere and strong desire that the budget statement would be such as to permit us to speak in its praise—but it is impossible. Sir Richard Temple has lost the finest opportunity Minister ever had of earning the reputation of a statesman. With the House of Commons in Committee upon the great subject he was handling, he stands up in the Council with a long string of figures in his hands, and without touching—literally without touching—a single great principle of finance, or glancing at a single economic fact in the condition of the country, tells off his account with the complacent assurance of a butler handing in his accounts to his master in the belief that the totals are all right. Sir Richard Temple is in the wrong place altogether. It is clear that he would make an admirable assistant to the Finance Minister, to relieve him of the drudgery of the work; but he is about as fit to be Finance Minister himself, as one of the clerks in his office. In memory of the fact that a Committee of the House of Commons is at this moment reviewing the whole conduct of Indian finance since the Mutiny, the string of figures put forward by the Minister as his exposition of the subject, can excite nothing but laughter. In the name of decency let Sir Richard get into some other line. As to criticizing the budget—it is too ridiculous. Let us give it all the praise we can. The figures are all right then we think, and there has been no peculation so far as we can see, Sir Richard has accounted for every thing to the last pie.

We suggest that some more competent member of Council should give an exposition of Government views upon the subject when the budget comes on for debate. The Finance Minister simply humiliates us all.

TAKE in illustration of our complaint against the budget, the economic fact that there seems to be a total stoppage of bullion imports into the country The whole amount delivered for coinage at the Mints during the six months ending 31st December last was—

Calcutta Mint....	By Government	Rs.	1,16,000	
	„ Merchants	„	7,88,000	
				Rs. 9,04,000
Bombay Mint....	By Government	Rs.	1,92,000	
	„ Merchants	„	5,60,000	
				„ 7,52,000
			Total....	16,56,000

Or about £160,000, where for 20 years past it has been millions. But a flow of bullion into India is the normal condition of things, and its suspension unnatural, and when prolonged, indicative of mortal sickness in the country. Our economic condition is such that normally we ought to import, year by year, a fourth of the total bullion yield of the world. The matter is of the gravest possible importance, and would fill the Finance Minister with alarm if he saw its significance.

We remember very well Lord Mayo's able exposition of the economic condition of Ireland in the House of Commons a few years ago, and we want an exposition of the same order now concerning India in presence of this Committee of enquiry—shewing how the measures, changes, reforms, trade, legislation, and wars of the last ten years have affected us—and what the condition of our times suggests and requires.

THE Madras Railway has been completed to Raichore. The first train entered the Raichore station on the 25th ultimo. The Bombay line is to be ready by the 1st April, when there will be through communication between Madras and the Western Capital, with the exception of the passage of the Kistna, to bridge which will take three years.

A HOME journal says, that "the decentralizing Resolution bears "evidence of being an honestly conceived arrangement."

We think so too, and are surprised at the amount of carping with which the measure has been received. When we remember how slow men are to divest themselves of power, and with what speciousness the determination not to yield it is defended, Lord Mayo's Government deserves, it seems to us, nothing but commendation for a resolution which, in the eyes of two-thirds of our contemporaries, is merely one of those "gifts of the gods" of which it is necessary to beware. The spirit in which the Resolution was conceived has been misread.

A CORRESPONDENT writes to us from the Punjab:—"If you wish to increase the land revenue in a really perceptible way, take up as a subject to be perpetually brought before the public and driven into Government the fact that the best, cheapest, and quickest way in which production can be increased is by *irrigation*. It is not by periodical revisions of short settlements in a country where holdings average 4 acres to a tenant, and say 16 acres to a proprietor, and famines are constantly recurring, that we can hope greatly to increase the income of the State from land; but afford facilities for enhancing production by irrigation, and (I say advisedly) we can double the revenue in 10 years. It is this that we should not leave undone. What we need is a complete separation of the Executive from all judicial duties, that our officers may be always about, mixing with the people and arranging the concerns of the great *fisc*, and finding out how the State landlord may improve the country and strengthen the administration. At last we are to have the latter. There is a committee now sitting here to carry this out. As regards the first little is being done. What enormous expenditure! What little

result! How slow the operation of giving *water* to the *land* when hundreds of ways could be devised for doing this quickly and cheaply."

It was inevitable, we suppose, that the state of the Cash balances should entail upon us the usual amount of ignorant criticism upon this subject wherever they are unusually high. It is humiliating however to find a journal like the *Times of India* discoursing upon the subject as follows:—

"There is one fact which alone will suffice to sweep away any and all sophistical pleas Sir Richard Temple may have put forward in defence of his mischievous fiscal policy—that is, the position of the cash balances. These were estimated at the close of the year 1869-70 at £13,644,859; it now appears there was at that time £340,000 more, in the State till; and now they are estimated as likely to stand at £16,012,350 on the last of this month. Here we have a gain of nearly 2½ millions sterling, a fact which condemns the Mayo-Temple levy as uncalled for, and oppressive—at once a political blunder and a mischievous financial step."

The Cash balances have no more to do with the budget, than the cash account of a private firm with its profit and loss account of the year. We should have supposed that this fact was upon a level with the capacity of a school-boy.

We have received a long letter from Dr. Blaney in reply to a somewhat sharp notice in our last issue of the belief of the Bombay community that they cannot afford themselves a supply of pure water. Dr. Blaney invites us to enter upon a discussion concerning the existing water supply of the place compared with that of other cities, the death-rate of the island, its conservancy, its water-rates, and other matters of local interest that could not possibly be treated in these columns, and of which the discussion would be endless with a man of Dr. Blaney's temper. He must be content, so far as we are concerned with the statement that we look upon any man who advises the community that their apathy upon this subject deserves anything but severe reprobation as justly open to every word of the strictures which have so much offended him. It is matter of notoriety that the existing water supply of Bombay is precarious in so far as Vehar is concerned, and a sure source of disease in so far as it depends upon the local tanks and wells. We regard both facts as out of the region of discussion, and when Dr. Blaney appeals to the death-rate of the island in question of either, our answer must be very short. Neither Dr. Blaney nor any one else knows, either what (*a*) the normal death-rate, or (*b*) what the actual death-rate of the island really is, and to argue upon his data would be sheer waste of time.

The Supreme Government is really guilty of elaborate trifling with the question of Public Works expenditure from loans. From the official statement which we give elsewhere, it will be seen that the total expenditure upon reproductive works during the current year, provided by loan, amounts to the magnificent sum of £1,182,000:—

Irrigation Works	...£ 809,300
State Railways	„ 393,500

This is the total outlay of the year throughout the Empire, while we have a class of writers amongst us who are incessantly talking of our "reckless expenditure" and "spend-thrift policy of borrowing." From the year 1855 down to this day, the Government of India has borrowed just £2,260,606 for Public Works, although for the last five years it has professed to be fully convinced of the wisdom and necessity of the course urged upon it, at first and for some years, by ourselves alone, but now by almost the whole press of both countries. The land belongs to the Commonwealth; and because it does so, we should do as every wise landlord with an improveable estate does, borrow money for its improvement on the most favourable terms we can, and look to the increase of the rental to justify and return the expenditure. It is now five years since the Supreme Government formally admitted the wisdom of this course, while so profound is its conviction, that it has borrowed in the interval just £2,260,000 in giving expression thereto, and has spent about half that amount.

A late Treasury return shews that down to the 1st of April last, the following sums of money had been expended on fortifications at home, under the Act of 1860, and subsequents Acts of Parliament:—

Portsmouth	£3,[illegible]
Plymouth	[illegible]
Pembroke	[illegible]
Portland	[illegible]
Gravesend	[illegible]
Chetham	[illegible]
Sheerness	803,174
Dover	[illegible]
Cork	[illegible]
Iron shields, surveys, &c.	[illegible]
	£5,517,[illegible]

Now although this outlay has been spread over ten years, and could hardly be regarded as burdensome by a wealthy country like England, the whole of it has been raised by annuities calculated at 3½ per cent. interest, terminable in April 1885. And yet in India we are compelled to build not merely our fortifications and barracks to house the troops for a century to come, but our railways and telegraphs and reproductive works of all kinds out of taxes. The deadly character of the error arises from the fact that the great want of the country is capital for the promotion of private industry. And we think it sound statesmanship in these circumstances to take money from the pokoets of the people, where it is worth 15 or 20 per cent, for investment in fortifications and barracks, while the capitalists of England are offering, it to us with both hands at 4 per cent. Sir Richard Temple has screwed up his courage to borrow £2,000,000, while it ought to be twenty if we had but the engineers and the skill to spend it aright.

The *Pioneer* appears to hold the same view of the Income tax as ourselves. Writing before the budget statement, our contemporary says:—

"There are good points even in the Income-tax. It is an "attempt at making a class contribute to the expenses of the "empire which all other efforts of taxation have failed to reach. "Provided, therefore, the poor are altogether exempted from its "incidence, and the more affluent mulcted only in the degree "demanded by the clearly-proved exigencies of an equilibrium, "we are prepared to speak with decency and moderation even of "a protracted income-tax."

Our own opinion is very similar. The tax, if confined to the wealthy, might be fairly regarded, we think, as a sort of equivalent paid by the rich to the salt-tax paid by the poor; and the one should be no more onerous than the other. What the salt-tax is to the poor, the Income-tax should be to the rich. For some such reason, no doubt, it is that Government proposes to retain the tax, and but for the universal opposition to it, we think we should say *wisely* proposes to retain it. It is however a very grave matter when once the will of the people has been fully ascertained, for a Government to go deliberately counter to it. The political loss is greater in such a case than the financial gain. Now the expression of public opinion throughout India has been so clear and unmistakeable and, we are sorry to add, so hostile, that were we in Lord Mayo's room, we think we should let the tax go altogether. Whether the people are right or wrong, the tax good or bad, would cease to be the question with us, and we should bow to the popular wish. No Government can properly assume a dictatorship of affairs but under necessity. The whole art of Government is the *leading* public inclination The attempt to force the public will, is justifiable only in the last resort, when the commonwealth is in danger. "The people," says Mr. Burke, "may be deceived in their choice of an object, *but I "can scarcely conceive any choice they can make to be so miscl evous "as the existence of any human force capable of resisting it.*" The question seems to us to have passed out of the region of finance, into that of the higher statesmanship. Because of the attitude of the people, we lose more than we gain by retaining the tax.

"The Supreme Government," says the *Times of India*—"or "by whatever name we may designate the central, imperial "financial authority—*has*, if not 'domains,' certain revenues "which *are* distinctly its own, in trust for all India, ir- "respective of the claims of the provinces within which "they may happen to be raised. The chief of these are "Customs, Salt, and Opium. But *en revanche*, the local "Governments have on their side the most obvious claim to the "land revenue, as the inalienable 'appanage' of the provinces in "which it is raised. It is because of desperate efforts to elude the "acknowledgment, and evade the application of these two leading "principles of federal finance, that the December Resolution "threatens to become such a *fiasco*."

Now we object, and we think fairly, to our bantlings being adopted in this way, by a journal which professes to ignore the existence of their parent while living upon his means. These "two leading principles of federal finance" are the *Indian Economist's* and no other's, and while we are glad to see our contemporary adopt them, we object to their being treated as common property by a journal which professes not to read the

Economist, and yet is a mere reproduction of its ideas from one month's end to another though it is difficult, for us we confess, sometimes to recognise our offspring in the queer raiment in which they are wrapped up and smothered by the kidnapper for fear we presume of their being recognized. The "two leading principles" which our contemporary thus treats as common property are not properly "principles" at all, but simply practical conclusions based upon the obvious fact that taxes of *Imperial* incidence belong to the Imperial Treasury, and taxes of *Local* incidence to the local treasuries. All taxes which are uniform in their weight throughout the Empire belong, we say, to the Imperial Treasury: all taxes of *unequal* weight, and that cannot be equalized, such as the land tax, to the local treasury. We have shewn elsewhere, at length, how this principle it is that controls American finance, and the suggestion that it should be adopted for our guidance in India is not, we beg to say, common property until its source has been acknowledged by our contemporary.

THE same journal is greatly alarmed, we see, lest the "economists" whose spirit, we are told, "was legitimately stirred "up against the waste of land revenue in Bengal and the Central "Provinces, should persuade the Bombay Government" that the "land of that Presidency is not half taxed." These "economists" disregard it seems, "certain off-sets which are too palpable to need repetition." But after all, "the main argument against "them is one of public policy which cannot be overlooked by a "Government which wants to set its house in order upon a sound "basis." It is not clear whether it is the house or the furniture that has to be set upon its legs; but we suppose it is the house, as the writer proceeds to warn us that "to strain the main foundation of our financial system "to the verge of failure, or even serious fluctuation, "would be national ruin." From this jungle of tangled metaphor, the meaning—or what we presume to be the meaning—at last emerges in the following shape:—"As "regards self-interest, the ryot now compares his present state "with that under the former *raj*; but if our policy of light but "certain pressure on the land shall now be reversed, his points of "comparison will be the existing rates with those newly introduced. Then to which side will the balance of his contentment "with British rule incline?"

It is impossible to do more than guess at the meaning, but it seems to be that an enhancement of the land tax will make the ryot less contented than he now is, and that consequently public policy teaches us to keep both the assessment and the ryot as they are. We breathe freely once more, and are glad to be assured that this is the main argument against the doctrines of the "economists." Let us not holloa however, until we are out of the wood. There is another argument, it seems, of great weight; "and that is that in case of the prolonged crisis of an English "war, and ruin to trade, the land is really at present the only "remedy for a temporary and severe emergency. In such a "crisis we cannot attempt new courses in vague hope of their "leading to secure havens. But now it would be most culpable not to carry on that unpleasant, but necessary work of induction and of splitting up the one resource into many (notwithstanding that the many are mainly failures), in order "that the many may be reconstructed into 'the one' on a more "solid and firm basis. We have never sounded the depths of "Indian taxation, nor followed its eddies and byways."

We are fairly gravelled at last. We suppose there is a meaning, but it is too deep for the "economists." The columns of unintelligible writing with which the *Times of India* afflicts its readers is one of the most curious phenomena of the Indian press. The Bombay assessments will have to be doubled and trebled as the leases fall in, if the Presidency is to pay its way.

THE NEW DEPARTMENT.

STATE VIEWS.

General Principles laid down by the Governor-General in Council.

I. FOR many generations to come, the progress of India in wealth and in civilisation must depend on her progress in agriculture. Agricultural products constitute the most important part of our exports; and the future development of Indian commerce will mainly depend on improvement in the quantity and quality of existing agricultural staple, or on the introduction of new products as materials for manufactures, and for use in the industrial arts.

II. Speaking generally, it cannot be denied that Indian agriculture is in a primitive and backward condition, and the Government has not done for its improvement all that it might have done.

III. Experience in all parts of the civilised world shows that there is no branch of industry in which the effects produced by the application of science are more certain or more remarkable. When the light of science has been properly brought to bear upon Indian agriculture, the results will be as great as they have been in Europe.

IV. The duties which in England are performed by a good landlord fall in India, in a great measure, upon the Government. The only Indian landlord who can command the requisite knowledge and capital for the improvement of the land is the State. There is perhaps no country in the world in which the State has so immediate and direct an interest in such questions. The land revenue, which yields twenty millions of our annual income, is derived from that portion of the rent which belongs to the State, and not to individual proprietors.

V. Every measure which can be taken for the improvement of the land, immediately enhances the value of the property of the State, and adds to the public resources without the imposition of any fresh burden on any class of the community.

VI. The means of obtaining agricultural instruction in India are no better now than they were fifteen years ago. In almost all civilised countries, in which the form of Government is centralised, the efforts of the people are aided by the co-operation of a State Department of Agriculture, which works in part directly through its own agency, and in part through agricultural and other societies. The work that is performed by the great agricultural societies of Europe must be performed in India by the Government, or not at all.

Endorsement of these views by H. M.'s Secretary of State.

The relations in which the Government stands to owners and occupiers of land in India is altogether peculiar, and however that relation may be described, it is certain that, with the exception of the permanently-settled provinces of Bengal, the Government has a direct and immediate interest in the improvement of agriculture which is possessed by no Government in Europe

The work of the Department as contemplated by the Governor General in Council.

I. Supervision of the advances of public money (*tuccavee*) for works in the construction of which the assistance of the Government may properly be given to the owners and occupiers of land such as

(1.)—Wells and other works for the storage, supply, or distribution of water for agricultural purposes, and the preparation of land for irrigation;
(2.)—Drainage;
(3.)—The reclaiming of land from rivers;
(4.)—The protection of land from floods;
(5.)—The reclaiming, clearing, and enclosing of waste lands for agricultural purposes;
(6.)—The clearing of land from stones or other obstacles to cultivation.

II. The periodical collection and publication of agricultural statistics to which little attention has hitherto been paid: the knowledge derived from such statistics must form one of the main foundations of measures of improvement.

III. The administration of the forests The forests have hitherto been placed under our Public Works Department. In the absence of any special branch of the administration to supervise the improvement and development of the vegetable productions of the country, the formation of a special Agricultural Department would provide the most suitable means of controlling the forest administration.

IV. The fisheries of India. This is a subject which has hitherto been little cared for, but which appears likely to prove of considerable economic importance.

V. Encouragement to the growth of industries suitable to the people and natural resources of the country

VI. The establishment of a system of industrial education. The preparation of popular treatises in the languages of the country on industrial subjects, and their dissemination among the artizan classes.

VII. Questions of commercial taxation, the statistics of trade, both external and internal; the development of manufacturing industry; the law of patents; the mineral resources of the country; questions relating to the census and to emigration; and all other kindred subjects connected with the development of the material resources of India.

VIII. The improvement of the breeds of horses and cattle, and of other domestic animals. Measures for preventing and allevating the destructive murrains which so frequently occur in the country.

IX. The improvement of Indian cotton, by careful and prolonged experimental cultivation, improvement of other Indian fibres, for which a very large demand might be established in the markets of Europe. The cereals of this country, and by the careful introduction and continued use of selected seed of a superior character, also the oil seeds, the pulses, and other products.

X. The management of the Salt Department and Inland Customs Departments, and hereafter, of some of the other sources of income which are technically called "separate revenue," may fall naturally and properly within the province of the new office which we suppose to constitute.

It is in the branches of the separate revenue that an intelligent and active administration by the Imperial Government might probably lead to great improvements in the income of the State. It is only the Central Government that can readily obtain a knowledge of the various systems under which the revenue is raised in the different provinces of the Empire, and can apply the experience of one province to the improvement of the systems of training in others.

Views of H. M.'s Secretary of State.

(a) The reasons for including the land revenue in the same department with agriculture appear to be conclusive.

(b.) The application of measures for the improvement of agriculture must in the last resort be mainly left to the collectors of districts, and there is no other agency spread over all India which is capable of attending to the matter.

(c.) The Forest Department, now under the Public Works Secretary, would, of course, form part of the proposed branch of the administration, as also all measures for the development of the mineral resources of India, and of the fisheries, to which considerable attention has recently been paid.

(d.) I am, generally, of opinion that the subjects mentioned in the despatch will fall naturally within the purview of the department proposed to be formed.

(e.) Some few, however, such as the "law of patents," and "questions relating to the census and to emigration," seem to me to have no direct or immediate connexion with the general business of the department, and had better probably remain with those departments which they are now attached.

(f.) It may seem that the regulation of the trade of India so far as the Government is concerned, has little to do with the agricultural branch of the department. But it must be remembered that the trade of India is dependent on its exports, and that the exports must in the present and probably long future state of things in that country be provided from its agricultural products.

On a consideration of all the circumstances, I am disposed to think that the Customs revenue should be placed under the control of the department.

(g.) In regard to the minor branches of the miscellaneous revenue (abkaree, stamps, and income tax), they involve few administrative considerations, and require little more than the due collection of amounts fixed by the law. Their supervision might, as it seems to me, be left either with the Finance Department where it now lies, or be transferred to the proposed department, as consideration of convenience might suggest

The Department as proposed by the Governor General in Council.

I. The formation of a separate department of the Government for the care of these great interests ought no longer to be delayed,—a department that would take cognizance of all matters affecting the improvement and development of the agricultural resources of the country.

II. We propose to constitute a Department of Agriculture and Commerce as a separate branch of the Home Department, and to place it under the supervision of a specially qualified officer, to be called Director General of the Department of Agriculture and Commerce.

III. It is clear to us that the Departments of Agriculture and Commerce should be placed under a common head; and the time may come in which it will be found desirable to constitute for this purpose an entirely separate department with a separate Secretariat. For the present, however, we think that a more economical arrangement may be adopted to meet the immediate requirements of the case. This arrangement will involve the necessity of making certain modifications in the existing organization of the Home and Financial Departments.

Endorsement by H. M.'s Secretary of State.

I. I am prepared to express my concurrence with the views expressed by your Lordship in Council, so far as regards the formation of a special department to be charged with the duties mentioned in your despatch, but I am unable to give more than a provisional sanction to the arrangement in the shape in which it is presented to me.

II. The proposed department should be designated the "Department of Revenue, Agriculture, and Commerce."

SILK.

WILD SILK YIELDED IN THE AKYAB DISTRICT.

Agri-Horticultural Society's Proceedings, Calcutta, 23rd January 1871.

READ the following letter from the Deputy Commissioner of Akyab, relative to a species of silk-worm recently discovered in that district :—

"I send by post to your address a parcel containing a specimen in spirits, of a silk-worm lately discovered in the western portion of this district in the vicinity of the Mayoo River; as also some cocoons and some specimens of the leaves of a plant on which the worms were found feeding. *Masara mentacea*, a myrsinaceous shrub not unfrequent in the forests of Eastern Bengal, and throughout the Malayan peninsula.

"As far as I can ascertain at present, the worm is of the species found in Assam, and described as *Phalana Cynthia*; but I shall feel greatly obliged if you will identify the species and let me know what it is.

"The manager of the Poundaubqun tea-estate, who discovered the silk-worm in a wild state, has not given very much information about it. He, however, states that the tree on which it was found was a low shrub, the name of which he could not ascertain. I have been unable to discover any name for the shrub from the Bengalees who live in the vicinity of the place where the worm was discovered.

"The cocoons were found on the tree in the jungle. The cocoons do not appear to have been gathered by the people, or turned to any use. The silk-worm was known to them, not for its quality as such but merely as an article of food. The silk-worm appears to have been considered—at least by some of the hill tribes in the neighbourhood—as rather a delicacy.

"Two of the worms reached me alive. One of them fed voraciously on the leaves of the plant on which it was found, but refused to touch the leaves of the castor oil tree (*Palma Christi*,) which are eagerly eaten by some silk-worms in Burmah.

"Mulberry leaves were not available, and I am therefore unable to state whether the worm would eat them. As far as known, there are not any mulberry trees in the vicinity of the place where the silk-worms were found."

The Secretary mentioned he had sent these cocoons and caterpillar to Captain Hutton, who had obligingly favoured him with the following remarks regarding them :—

"Your caterpillar and the two cocoons from Mr. Ireland, Deputy Commissioner of Akyab, came safe to hand. They belong neither to *Attacus Cynthia*, nor to *Attacus Ricini*, but a species of *Atlas* of which we have two, one the common *Attacus Atlas* found here at Cachar and elsewhere, and the other at Darjeeling known as *Attacus Edwardsi*. The worms of the first feed on *Berberis Asiatica*, and on *Falconeria Insignis*, and one or two other forest trees; the food of the other appears yet to be unknown. To which of these species your specimens belong, cannot be fully determined until the moths come out next summer; but from the small size of the cocoon as compared with that of *Attacus atlas*, from the colour of the silk, and from a certain indefinable something about the larva, I incline to the opinion that the species is *Attacus Edwardsi*, or a new species. The cocoons appear to me to be identical with those sent lately from Cachar by Mr. C. Brownlow, which I also suspect to be *Attacus Edwardsi*; unless, indeed, the small size is to be attributed to insufficient feeding in the house, although the cocoons seem so well formed, and so full of silk, that this seems improbable. The moment the moth appears I will let you know the species."

SERICULTURE IN BENGAL.

THE Secretary submitted the following remarks, from Captain Hutton, in reference to the observations of Mr. DeCristoferis, which were read at the last meeting :—

"In the proceedings of the Society of the 20th December 1870, appeared a letter from Mr. G. DeCristoferis complaining of my having, as he alleges, made some remarks reflecting upon him.

"Mr. DeCristoferis must permit me to deny the soft impeachment, and to assure him that no reflection whatever was intended; but as a faithful recorder of facts relating to sericulture, I was bound to point out for the benefit of others the errors into which Mr. DeCristoferis had *apparently* fallen.

"It was not for me to *guess* that the gentleman alluded to the Centigrade and not the Fahrenheit thermometer, so that the alleged reflection arose altogether out of his careless manner of expressing himself.

"I repeat however *pro bono publico*, that the system adopted by the Natives of Bengal and their imitators for *preserving* the eggs of animals is about the worst that could have been devised, since the circulation of pure free air around the eggs is as essential for the well-being of the future insect as for the well-being of man himself, and this is simply a sober fact and *no* '*witticism*' whatever; if Mr. DeCristoferis cannot recognise this truth, he will never become a thriving sericulturist. Sound sanitary principles are as essential to the preservation of insect health as to man himself, and this is all I intended to point out.

"As to improving the *polyvoltine* species now under domestication in Bengal, it will be perfectly impossible so long as the present system of cultivation is persevered in, for they receive not only poor feeding, but all attention to cleanliness and free ventilation is totally disregarded. Even the climate is inimical, for the worms cannot be reared upon the trees in the open air as nature intended they should be, and as I have done at Mussoorie with the alleged annual *B. textor*, and the *polyvoltine B. sinensis*. Eggs of the latter transmitted to Bengal as soon as deposited, would now reach their destination previous to hatching, and obviate the necessity of establishing a silk farm in Bengal where the same method cannot be pursued.

"In conclusion, I beg leave to express my regret that my remarks should have given offence to Mr. DeCristoferis, to whom I wish every success."

MINERAL RESOURCES.

COAL AND GOLD IN MYSORE.

THE following letter from Dr. Hunter to Dr. Orr at Bangalore has been placed at our disposal :—

"I received your kind letter with the box containing the samples of chlorite, decaying ditto, containing gold, and the other accompanying strata. I have examined them carefully, and have no hesitation in saying that they contain true gold, true coal, and all the minerals which accompany these two sub-

stances with the exception of the sand-stone which I asked for in my letter of the 20th. Along with the gold you have sent chlorite, both compact and earthy, chlorite slate, menachanite in black lumps, and in small grains in the sand (this and chlorite almost invariably accompany gold.) There are also blue quartz and a rotten kind of crumbly quartz in large grains, or crystals which I have seen amongst the strata from the Australian gold-fields. The latter is yellowish white ; yours is bluish grey and green from a little mixture of chlorite. The strata which you have sent along with the coal are also very good clay iron-stone conglomerate, orplum-pudding stone ; (this is often mistaken for a laterite, but it is a true transition conglomerate, very rich both in iron and manganese). I have it in seven or eight of our British coal series from Newcastle, Staffordshire, Coalport, Midlothian, Fife, Lanarkshire and Renfrewshire ; you have also sent along with your specimens of coal, black-band iron, with a vein of quartz. Fibrous black hæmatite which resembles a piece of black petrified wood and portions decaying trap-rocks, all of which are favorable. The coal is very poor shaly stuff, but very like what I have seen as a first thin outcrop. It burns feebly, and emits a bituminous smell, but does not actually catch fire. It smoulders away at a full red heat and leaves a very bulky ash. It is in very thin strata, apparently not more than ½ an inch to three-fourths of an inch in thickness and much discolored with the decaying green chlorite earth. It is also in very small pieces, but this is so far favorable as it is not likely to have been thrown there with all the accompanying hæmatite conglomerates and band iron as these are never exported with coal, though I have seen an occasional lump of iron-stone thrown out of coal bags on the beach. The coal you have sent, however, is poorer than any of those lately received from Colonel Haig from the Tal river, and the Godavery, or the coal from Chanda and the Nerbudda. To determine first, if it occurs *in situ*, over any large surface, I would recommend you to apply to the Mysore Government for sanction to dig one or two holes at distances of twenty or thirty feet from the hole where this was thrown out, and let the coolies dig deeper to see if there are not frequent repetitions of the same strata, for true coal never occurs but in extensive beds, and the first few seams are seldom worth working. If you find any more seams I will come up at once. To enable us to determine the value of the chlorite earth, I wish you would order one ton of it to be sent to the School of Arts. I will get it washed and the gold tested by the Professor of Chemistry, Dr. Percy in London, and Dr. Archer in Edinburgh will be delighted to hear of your discoveries, and if you send me a basket full more of the rough stones already sent, I will get you the true coal formations of England and Scotland in exchange, as they are promised already. You should also send us the lime-stones and sand-stones or slates of the vicinity. They are important."

THE MANDI SALT MINES.

We have taken some little trouble to ascertain the real facts connected with the temporary closure of the Mandi salt mines, and are glad to find that for once, the action of the Government does not, as we are at present informed, appear to have been so injudicious as it seemed at first sight to be.

It appears that long ago the Punjab Government foresaw that these Mandi mines might at some future period interfere seriously with the sale of salt from British mines, and they therefore, in concluding the treaty to which the present Rajah owes the possession of his principality, inserted a stipulation empowering themselves from time to time to regulate the sales at these mines in such manner as they might think proper.

The sales at the time being very limited, and the duty in our own provinces comparatively light, no action was taken on this stipulation, but as time went on and peace and good order replaced the anarchy of the latter portion of the Sikh rule, multiplying facilities for trade and the increase of the duty on salt from British mines to Rs. 3 per maund, increased the temptation to import the duty-free Mandi salt, the sales of this latter went on increasing, until last year the Government found that, whilst they were imposing a heavy income-tax to make, as was supposed, both ends meet, they were throwing away some 3 lakhs of Customs revenue, by allowing cheap Mandi salt that paid no duty to displace within our territories fully a lakh of maunds of salt that paid Government Rs. 3 per maund.

The question was rather a difficult one, because although under the treaty the Government might have closed the mines at Mandi at once, they were very unwilling to do this, for the reason that the sale of this salt to the subjects of the Native State of Bisahir, &c., seemed a perfectly legitimate source of revenue, of which they were anxious not to deprive the rajah. They desired that he should make as much profit out of the mines as possible, provided that no portion of this profit was derived from assisting British subjects to evade our customs laws, and defraud the exchequer.

To put a cordon round the State was, from the nature of the case impracticable—the expense of any such line would have been altogether disproportionate to the gain to be thereby secured. After much consideration it was decided as a preliminary step to requre the rajah to double the selling price of the salt. The objects of this were two-fold—in the first place, the increase of price would greatly restrict the area, within our own territories in which this salt, which is very inferior in quality, could compete with our own duty-paid salt. In the second place, out of the enhanced price so realised, one-fourth was to be made over to Government in part compensation for the loss that it would still sustain by even the diminished import of Mandi salt into its territories, and to provide for the maintenance of a trustworthy European customs officer at the mines, who should register exactly all sales. This latter was perhaps the most important step in the new arrangements. It was undoubted that Government was losing at least 3 lakhs a year by these mines, but it was in a high degree probable that the loss was much greater, and it was from the first intended that should the registers after a year or two's experience show that the increase of price had not materially diminished the export into British territory, further and more stringent measures to prevent this should be adopted.

We heartily sympathize with the rajah should these measures lead to a reduction of his revenues, but we sympathize even more strongly with our own pockets, and we do not doubt that the Government possessing the right to do so by treaty, were not only justified in taking, but bound to take some such measures in regard to the control of the mines, as should prevent a waste of three lakhs of rupees or more yearly, which amount had of course to be made good by us in the shape of income-tax.

Every little helps, and we only wish the Bengal Government would act as promptly as the Punjaub authorities. We understand that nearly three years ago it was officially pointed out to the Government of Bengal that they were losing some lakhs of rupees *net*, by the illicit manufacture of salt in Behar. A formal enquiry was made, elaborate reports submitted and printed, and the thing admitted to be one that *had* to be done, but to this day we believe that nothing further has been heard of the matter, at any rate nothing has been *done*.

To return to Mandi. The rajah not unnaturally raised objections. When a customs officer was deputed to the mines the rajah found a pilgrimage to Hurdwar necessary ; the headmen in charge of the mines declared themselves unable without the rajah's permission to sell salt at the new rates. Buyers came in crowds, quite ready to purchase at these rates, but the managers of the mines would not sell an ounce, they had no orders from the rajah they said, so the mines were closed.

This was the old native plan of closing the shop as an expression of dissatisfaction.

However, a couple of months went by, the rajah found his residence at Hurdwar tedious and returned to his capital. Shortly afterwards taking a reasonable view of the circumstances of the case, issued the necessary instructions and re-opened the mines.

At first of course trade may be expected to be very slack, but it is not believed that in the long run the rajah's revenue will suffer. In the first place, even though the sales diminish, the price will be higher ; in the second place, with a responsible European officer on the spot to check all sales, the *whole* price will now go into the rajah's treasury, instead of one-half thereof being, as heretofore, absorbed by subordinates of various grades.—*Delhi Gazette.*

CULTIVATION OF OPIUM IN CHINA.

The following memorandum on the subject of opium cultivation in China has been prepared in the Financial Department and is published in the *Gazette of India* of February 25, by order of the Governor-General in Council :—

The recent remarkable extension of opium cultivation in China has attracted much attention at the hands both of the Government of India and of the merchants in China interested in the opium trade. A large number of papers bearing on the subject were printed in a collection made in the Financial Department in 1870, and from these and a few other papers the information embodied in this memorandum is collected.

I.—Early Notices.

From the fact that the Chinese having in their language no specific word for opium call it "to," that is "earth" or "dirt," it has been argued that it is not indigenous to their country ; but it should be noticed that the Consul at Canton quotes a Chinese word signifying the poppy plant from which the Chinese now manufacture it.

The earliest notice of opium recorded in the papers is quoted in the 1869 Trade Report from Hankow. It is there said that opium is noticed in a history of Yunnan (the south-western province of China), written in 1736, as being one of the products of Yungchang, a district of that province. It is stated also that a hundred years later, in 1836, a memorial was presented to the Imperial Government praying it to suppress the cultivation of

opium. This memorial had special reference to Yunnan, and it alleged that the yearly produce amounted to several thousand chests.

At that time the cultivation does not appear to have extended beyond Yunnan. Szechuen is the province next to Yunnan on the north, and it seems to be generally agreed that it was to it that the cultivation reached next after Yunnan. The extension must have taken place between 1817, in which year there is reason to believe there was no cultivation in Szechuen, and 1840 when, according to information recorded by a Mr. Gutzlaff in 1848, it was cultivated in no very large quantities in Szechuen. About the same time also it appears to have spread into Kwangs and Kweichow, the two provinces immediately adjacent to Yunnan and Szechuen

II.—From 1848 *till* 1868.

The information recorded in 1848 stated above, does not represent native opium in these provinces as being exceedingly abundant. The Imperial Government was then thoroughly opposed to it, and the local Government and the Mandarins had to be propitiated with bribes, and sometimes apparently did not consent even upon receiving bribes. The popular feeling was also opposed to it, and a man who had fields of opium not unfrequently had them ravaged by the populace.

Certain delegates, deputed in 1869 by the Shanghai Chamber of Commerce to make enquiries about opium cultivation, state in their report that, ten years ago, natives say that in Szechuen all the opium grown was grown in small patches only in an amateur way, as a penalty of death was attached to its regular cultivation! but this "ten years ago," it is plain from the rest of the correspondence, should be interpreted as more nearly twenty, for by 1859 the cultivation was much more extensive than to be merely small patches. A provincial Governor, writing in 1860 or 1861, stated that all the opium consumed in Consu and Shensi, which are away to the north of Szechuen, and are both large provinces, was the product of Yunnan and Szechuen.

A very great increase of cultivation, therefore, must have taken place in these two provinces between 1848 and 1859, and this is specifically stated by the Consul at Canton in 1861. And concurrently with this increase of cultivation, probably indeed as the cause of it, there was a very great improvement in the quality.

The opium which about 1850 had come from these provinces to Canton is described as "coarse and fetid" and therefore very little used, and the reports of 1848, quoted above, say it requires to be mixed with Indian opium to be saleable. On the other hand in 1861, though still inferior to Indian opium, it was to a considerable extent consumed separately, and two samples which the Board of Revenue obtained were equal to Bengal opium. As the Canton Consul writes:—"The flavour is not relished by habitual smokers, among whom a prejudice against it further exists on the score of health. Yet its comparative cheapness recommends it to the lower classes and more especially to the rising generation of smokers." Its price was then half that of foreign, and "as regards the peculiar properties of the drug, an ounce of foreign is considered by smokers equal to two ounces of the native article."

The Chinese had, in fact, stolen a march upon India; for about 1851 the high price of opium, and the growing taste for it, induced them to send persons to India to procure the poppy seed, and to learn the mode of manufacture. From that time poppy cultivation received an impetus in Yunnan and in Kansu, and probably, though it is not so stated, in Szechuen which lies between these two.

At this time, 1859-60, it would appear that the opium produced in these western provinces of China supplied in full the local consumption. The produce of Szechuen and Yunnan was about 5,000 chests per annum, and of this half was consumed within the province itself, and half was sent to Chunsta (?) and to Shensi.

Hankow is the port in China which is nearest to these opium-producing provinces, and it is said that in 1860, while the foreign drug was not imported there at all, 2,000 chests of the native produce were brought, part of it to be consumed there, and part of it to be exported *eastward*.

In that year, 1860, the cultivation reached a maximum, and it now began to fall off. The following change took place in the imports at Hankow:—

Year.	Native drug.	Foreign drug.
1860	2,000	0
1861	1,500	250
1862	800	2,000
1863	500	1,465

and the *export* of native drug in 1863 was only 43 chests.

The cause of this change was two-fold. First, it was owing to the more complete opening of Hankow as a port. Foreign opium was admitted on better terms than it was before, and the line which separated the country consuming native, from the country consuming foreign, produce was driven back. In the second place, there was a real decrease in the cultivation. Rebel bands were marching about and devastating Yunnan and other provinces, and in Szechuen a new governor had come, one Loo, a Cantonese, who was opposed to opium cultivation, and did a great deal to restrict it.

Of the state of the trade in native opium in 1863-64, we have some statistics gathered by the Customs Department in 1864-65. So far as regards Hankow, the statistics have been already given.

From Canton, which is not very far removed from the opium-producing provinces, and is therefore a grand field for the conflict between foreign and native opium, both being able without much difficulty to reach it, we have the information, that in 1863, the quantity disposed of was as follows:—

Yunnan opium	800	Chests.
Kweichow „	400	„
Szechuen „	200	„
Kwangtung „	100	„

Szechuen, it is agreed on all hands, had much more produce than Kweichow, but its export was apparently towards Hankow and the northern provinces, so that at Canton there was a larger import from Kweichow than there was from Szechuen. Kwangtung is the province in which Canton itself is situated, and cultivation spread into it in 1861, seed being brought from Yunnan. The climate, however, is bad, and the produce was not very large. Notwithstanding this large import of opium, 1,500 chests, it is stated that no influence was perceptible on the market for foreign opium. The increase in consumption throughout the region drawing its supplies fron Canton was sufficient to counteract the evil effect of the competition of native opium.

At Shanghai also native opium had made its appearance. Five hundred chests had been disposed of there, having been mostly brought all the way from Szechuen, but the supply produced no perceptible effect in the demand for the foreign drug. The opium was inferior in quality and used only by the poorest people.

Near Amoy a little cultivation had begun, and was spreading; it had sent 50 chests to Amoy in 1860, and these had increased to 500 in 1863.

At none of the other ports was there any considerable consumption of native opium; but there appeared to be some in the interior. Some native marts north of Chefoo were stated to largely consume native opium. A little was cultivated near Kiukiang and consumed where it was cultivated, not being brought to market; a small quantity, 12 chests, were brought to Chinkiang to be sent into the interior.

From Shanghai it was stated that cultivation had recently commenced in Kwangtung (as above stated) and also in Chekiang, within which province Shanghai is, but only in the parts of it, remote from official observation. Enough, however, was cultivated to displace about 20 chests per month of foreign opium sent from Ningpo into the interior.

In 1864, then, the general position of matters was this. The whole of Western China, containing the provinces of Yunnan, Szechuen, Kweichow, Kansu, Shensi, had within 15 years become opium-producing regions. They produced apparently quite enough opium for their own consumption, and we do not know that any foreign opium ever found its way there, but the circumstances are such that the mere absence of knowledge proves little. However, we know that in 1821 the cost of importing foreign opium into Szechuen was so great that opium was there worth twice its weight in silver, and we know that the very high price about 1851 drove the Chinese to set about cultivating for themselves. We know that the quantity of opium proceeding westward through Hankow was exceedingly limited, and we know that to the east of the opium-cultivating provinces the consumption was in a very great measure supplied by Yunnan and Szechuen opium. These facts render it likely that in 1864-65 there was almost no foreign opium imported into Szechuen and the other provinces; and as probably there was very little before, the effect, so far as regards them, was that people who before consumed no opium of any sort now took to native opium.

Although the extent of country is very large over which native opium thus came into use, the effect upon the demand for foreign opium generally would thus be very limited.

It must have been about this time that Jung Bahadoor's expedition mentioned in these papers took place. He marched into China taking with him 200 chests of opium which he expected to sell in Western China, but he found no one would have them, and he was finally obliged to bring them back. The people had become accustomed to the native drug, and no foreign drugs would be received in the market at all.

The line of provinces next to these western ones, Honan, Hupe, Hounan, we have not much information about; we cannot trace our own opium entering them, but we can trace the native opium passing through them. Kwangtung to the south of these gets very little from the western provinces, and has begun to grow a little for itself, but its chief consumption is of foreign opium, and the native opium has as yet only met the increased consumption, and has not at all tended to oust Indian opium.

In the eastern provinces of China the foreign opium has as yet little to fear. In a few inland places, cultivation has been attempt-

ed, but only in a surreptitious manner; and though the native opium has been introduced in the interior, it has hardly appeared at all in the treaty-ports (which not only receive foreign opium for forwardal into the interior, but through which also passes much of the opium which proceeds from one part of the interior to another), nor has it, according to almost unanimous opinion, produced any effect upon the demand for foreign opium.

III.—After 1864.

The mass of information which we have after this date (1864) refers to the position of matters in 1868 and 1869, but in some passages reference is made to events that had occurred between these two dates.

The Viceroy of Szechuen, who had done so much to oppose native cultivation, died in April 1867. For a short time before that event, either his prohibition had become less weighty, or the people had become more obstinate, for cultivation had already for a year or two been slightly increasing; but when he died, the cultivation at one bound regained its former dimensions. Cultivation had also recommenced in Yunnan, where it had previously been interrupted only by the disturbed state of the province. Yunnan had now set up practically as an independent kingdom under a Mahomedan governor.

Mr. Cooper, who travelled in Western China about 1868, stated to the Board of Revenue that the cultivation of the poppy was almost universal in these two provinces, and covered, as he estimated, an extent of 60,000 acres, a figure which, as is plain from the other information, is a large under-estimate. This cultivation had all sprung up within five years. Sir R. Alcock also estimated in February 1869 that two-thirds of Szechuen, and one-third of Yunnan, were under opium cultivation. The Hankow Chamber of Commerce wrote, in the beginning of 1869, that now the whole of Szechuen, and one-third of Yunnan, were under opium cultivation, and they expected that 7,500 chests would be produced that year (April is the gathering time), and that they would receive 2,000 for export eastward; whereas in the previous year they obtained only 142. Mr. Keswick, a Chinese merchant (Jardine, Matheson & Co.), writes that the crop of 1867 was a large one, and that of 1868 was twice as large; and Mr. Gubbay, another merchant (D. Sassoon, Sons, & Co.) writes in November 1869 that Szechuen is now thoroughly under opium cultivation, and that 3,500 chests were produced in 1868, and the crop of 1869 was estimated to be fully 5,000 chests.* The quantity grown in Yunnan appears to exceed that grown in Szechuen; the enquiries of the Shanghai delegates obtained this result, and in the Hankow Report for 1869, the crop of Yunnan is estimated at 20,000 against Szechuen 6,000. The writer of the report, however, in sending in these figures, says that the Yunnan estimate of 20,000, and that of Kweichow 15,000, appear to him to be excessive.

Previously to this great extension of cultivation Yunnan and Szechuen were already independent of any supply of foreign opium, and a writer in the *Englishman* in March 1870, who seems to write with authority, says that in these two provinces the natives will not look at Indian opium; they have sufficient native opium, and think the Indian too strong. The Shanghai delegates also say that, whereas Szechuen used to import opium from the other two provinces, Yunnan and Kweichow, it is now independent of them also. It is stated, however, in a letter from Kiukiang in 1868, December, that foreign opium was still consumed to some small extent in Szechuen itself by people whose means enable them to disregard the difference of cost; and at Hankow, through which passes the Indian opium destined for Szechuen, as well as for other places in Western China, the demand for foreign opium had up till 1867 continually risen though not so much of late years as before.

A Hankow newspaper of about December 1868 sums up the information thus:—

"In Szechuen the opium found a genial soil; the numerous rivers and great internal trade of the region procured for it a ready market, so that now Szechuen opium may be said to supply the entire of the west of China. At Hankow, in comparison with its other imports, that of opium is comparatively insignificant. Hankow, in fact, stands upon the boundary line dividing the districts favouring the foreign from those which prefer the native article. There are even indications that the use of the Szechuen drug is spreading in eastern China."

This extract, compared with other information, appears to be in error only in giving undue importance to Szechuen opium as compared with Yunnan.

The enquiries of the Shanghai delegates give a good idea of the trade in Szechuen opium. They say it is chiefly in the eastern part of the province that the cultivation is extending, and that thence much opium is smuggled into Hounan province, and a good deal also as far as Canton. From other Szechuen districts it is exported by Hankow and other marts to the Hounan province, and to the ports on the Lower Yangtze and on the coast. The Yunnan opium, they say, is consumed in large quantities by the wealthy people of Szechuen, and passes also, though not in large quantities, through Szechuen into Shensi, Shansi, and Kansu.

The Consul at Hankow makes the same statement as to the eastward flow of the Szechuen opium, but it is remarked that he says, it is Szechuen, and not Yunnan opium, that is consumed in Shensi. This statement is more likely the correct one, for it will be observed that the Shanghai delegates make the Yunnan opium reach Shensi through the producing districts of Szechuen; it is unlikely, if this were the case, that Szechuen opium would not go also.

The Consul at Canton, writing in 1869 of the Yunnan opium, says that it is brought into the Kwangtung province, and estimates its import at 75 chests a month, or 900 a year. And the Consul at Hankow makes a statement of similar effect that nearly all the opium produced in Yunnan is consumed in that province, and Kweichow and Kwangtse, so that Yunnan appears to supply the whole south-western quarter, of China, while the Szechuen spreads from the south-western quarter north-eastwards, and eastwards.

The extent of the whole exportation of native opium may be judged of from the quantity of it received in Shanghai alone, a place remote from the producing districts and easily accessible to foreign opium. The Shanghai *Courier* of June 1869 says that large parcels of native opium have been imported and offered at a price much lower than Indian, and the Messrs. Sassoon, Shanghai merchants, estimate the consumption of it at 600 chests per month.

Much of the quantity thus exported is intended for adulteration with the foreign drug.

But during the past few years, not only has the exportation and consumption of Szechuen and Yunnan drug extended, but cultivation has greatly increased also in other parts of China.

Kwangtung did not afford a very favourable soil, and the cultivation there had not very much extended, but supplies were coming into it from Hounan in the north.

In Hounan and Hoope opium was said to be grown over a very large area, though the Shanghai delegates did not consider the produce to be of any commercial importance, by which, it is presumed, they mean that it only creates and supplies a local demand. In fact, the Hankow Consul states that the whole produce of Hounan is only 42 chests and Hoope, as we have seen, derives most of its opium from Szechuen. North of these two come Shensi and Honan, in the former of which there was already a considerable cultivation in 1864. There is still a large area under opium in Shensi, but the produce is of inferior quality; and as Shensi imports native opium to a considerable extent, it is probably not very favourably circumstanced for cultivation. In Honan, the growth of opium is said to be steadily extending. In Kiangsi also the cultivation was increasing, the south-west of the province being the principal cultivating area. And even in Chekiang, the very centre of the eastern cost of China, we are informed that the cultivation was rapidly spreading, and the crop of 1869 exceeded by one-half that of 1868.

In January 1869, a proclamation against opium was put out by the Emperor, and it starts with the statement that opium, commencing in Kansu (the remote and rebellious of districts of Szechen and Yunnan are apparently ignored) and spreading into Shensi and Shansi (where we have already seen it) had recently extended into Honan, Kwangsu, and Shantung, the last two being provinces on the coast of the Yellow Sea, where we have not yet seen it. This edict had very little effect, and the little it had soon passed away. In fact, it is the opinion and action of the local authorities, and not of the imperial, which for the most part rules matters in China; and the fact that the Governors of Kiangsu, Hokwang and Szechuen are all in favour of opium cultivation, and think it might be made a source of imperial revenue, is quite enough to over-ride any imperial edict against it. In fact, it is doubtful if the edict was ever promulgated in Szechuen, at least till very long after it came out.

As regards Shantung, which has just been mentioned as one of the provinces specified in the edict, we have some particular information from the Consul at Chefoo. The production amounted to 100 or 200 chests, and was increasing from year to year. The whole, however, was consumed near the place of production.

No mention has as yet been made of another direction in which the cultivation of opium was extending, for within the past few years a new opium province has started up away in Manchuria and Mongolia, north and north-east of China proper, a region which, like Szechuen, has become an exporting district. A Rev. Mr. Williamson, in 1869, wrote as follows of this part of the empire:—

"A few years ago opium was a stranger to this quarter of the world, but now it is rising with great rapidity into ominous and terrible significance." In some places it had been grown for several years, in other places for only two or three, and in some it was just commencing. The cultivation was more profitable than that of pulse or any gram, in the proportion of 24 to 14. The opium was exported to Pekin and westwards of it.

According to Mr. Keswick, a Hongkong merchant, it passed into Manchuria from Shensi.

*It is 50,000 in the original, but this appears to be a misprint for 5,000. A tremendous increase from 3,500 to 50,000 is almost impossible; and in the Hankow Trade Report for 1869, it is stated that the actual yield in 1869 was 4,235 chests, and the estimate of a full crop for the next year was 6,000.

The Tien-tsinf Consul, writing in 1869, spoke of the vast region of eastern Mongolia and northern and central Manchuria sending down supplies towards Newchwang, the port nearest that part of the country.

The Consul at Newchwang also wrote of this importation and estimated it at 1,300 chests, and a Shanghai firm wrote that the natives of Manchuria were more and more turning their attention to it. But Szechuen opium found its way to the same place also, coming round by Shensi.

IV.—Competition with Indian Opium.

Such then being the extent and direction of the trade in Native opium, it is important to examine how far its introduction has interfered with the trade in Indian opium.

In the western provinces we have seen that almost the whole consumption is of native opium. There never was any but a very limited import of Indian opium to that part of China, and the effect, so far as regards it, probably was only this, that the native opium prevented that extension of importation of Indian opium which we might otherwise reasonably have expected from the more complete opening up of the port of Hankow.

At Canton not much effect had as yet (1869) been produced upon the import of Indian opium, but the Consul wrote that the growth of native opium had increased considerably during the past few years, and bade fair to prove a formidable rival to the Indian production, particularly if increased consumption were to favour improvement in cultivation. As yet there were only germs of a formidable competition ; and native opium had, so far as regards the city itself, been used only to mix with Indian opium.

From Hankow we have valuable information on this head. They point out the recent general increase of cultivation in the west and north, and say that only governmental interference prevents its extension to the sea-board provinces ; they consider the matter only as a question of time, for opium cultivation has taken too firm a hold in the country ever to be repressed. They talk of opium as an import that is likely to diminish, and estimate that other foreign goods will take its place.

From Hankow, we learn in the report for 1869, that since autumn of 1868, native opium had formed a common article of commerce in the market, and the two productions are talked of as rivals, and as being treated as such by the native authorities.

From the Consul at Tien-tsin, we learn that native opium has been increasing, and Malwa (the principal foreign importation) has been decreasing, since 1866. The price also of foreign opium has been decreasing, and the conclusion must be that native is taking the place of Indian opium. Opium smoking is stated to be on the increase, so that it is plain that the increased demand for native opium is the cause of the reduced demand for Indian.

A year later, in the Tien-tsin Report for 1869, the same features are apparent, and the same conclusions are repeated. "From, all I can gather there is no doubt that the consumption of the native drug is increasing considerably, and to the prejudice of the Indian." It is stated also that the trade in Indian opium is beginning to be a losing trade.

From Newchwang the report is different. The consumption of native opium is increasing, especially in the interior, but the importation of foreign opium has not decreased.

The Shanghai *Courier* of 9th June 1869 thus writes:—"Extinction more or less rapid is threatened by the progress of the poppy cultivation in this country." They say that in 1868 there was an unusually successful crop in Western China, and that the Chinese drug almost entirely supplanted the foreign kind in many places formerly supplied from Hankow, and actually made its way to Shanghai where large parcels of it had recently been exposed for sale at a price considerably below that of Indian.

Large quantities of opium (this is still a quotation from the *Courier*) brought from the districts bordering on Manchuria interfere seriously with the market for Indian kinds at Newchwang. In fact native opium is now met with in all the principal marts of Northern China, and while it monopolizes the consumption in many parts of the interior—nearer the coast it is principally used in admixture with Malwa. Malwa has been recently falling in price solely through the competition of native opium. It will ultimately reach a low enough price successfully to compete with native, but meantime there is dangor that the consumers become habituated to native opium.

The Chinese firm above alluded to corroborate these statements in saying that the bulk of the population prefer native opium for its cheapness, and even the rest mix their foreign with native. If this occurs at Shanghai, it may be understood how greatly the import trade generally is affected.

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We have reserved for the last place the opinion of the Shanghai delegates, which is of much more weight than any yet quoted, and which is said by Sir R. Alcock to represent the opinion of all who are most conversant with the subject.

Cultivation, they say, is very profitable, and everywhere it is increasing. Proclamations against it go out from time to time, but fall harmless to the ground. The cultivation is too common a thing to be now put down, and the executive authorities are obliged to shut their eyes to it. Some of the other papers say the same thing, that proclamations have been put out, but that they are practically ineffective.

Consumption of opium is everywhere increasing at a rapid pace, the natural result of the cheapness of the opium ; eight out of every ten men, and five out of every ten women, according to the popular belief, smoke. The higher classes are becoming so alarmed at the spread of the habit that they are beginning, by their example, to discourage it.

Yunnan and Szechuen are favourably situated for communication with the rest of the empire. having water transport to the southern, central, and eastern provinces, and land transport to the northern. And though native drug is inferior in strength and flavour to the imported, its cheapness has enabled it entirely to displace foreign drug in the interior of the country. At Shanghai, after paying all charges, it can be laid down at 70 per cent. of the price of Malwa, before paying any taxes. The cheapness of native drug is the present cause of the exclusion of Malwa, but the taste for native drug once formed will tend to perpetuate the exclusion, even should the economical consideration pass away.

They then show from the figures of importation that the import of Indian opium, up till 1850, rose year by year at a high rate. Up till 1855 it still rose, but after that year it was stationary. But there is so much concurrent testimony to the fact that consumption is increasing year by year, and at a faster rate than it did before 1854, that no other conclusion can be arrived at than that native-grown opium is actually superseding the Indian product.

There is one thing to be observed with reference to this reasoning, namely, that one reason of the supply having remained stationary since 1855 was, that no more was produced in this country, and that there were great difficulties in producing more. The more correct reasoning would have been that the increased demand after 1854-55 not being met by an increased supply, ran up the prices so high as to bring native opium into the market.

V.—Price of Chinese Opium and of Indian.

We may proceed now to collect the information regarding the price, as compared with that of foreign opium, at which native opium can be produced and brought into market.

In the early days of the cultivation, about 1840 to 1848, when large fees had to be paid to bribe the Mandarins, and great risk was incurred in the cultivation, it is stated that it could not be produced under Rs. 1,350 a chest, and by this is apparently meant the price in the producing regions. This statement, however, is perfectly irreconcilable with that of the Consul at Canton, who says that small quantities of the "coarse and fetid" opium then produced were brought there in 1847-48 and sold at a rate equal to Rs. 300 only per chest. This last is probably the more reliable statement of the two. In 1854-55 the price at Canton was over Rs. 700 per chest, and in 1859-60 it was about Rs. 1,300, the difference being probably due in a great measure to improvement in quality.

From the reports obtained in 1864 we obtain the following information as to the prices ruling in the various ports.

At Hankow, which is nearest the seat of opium cultivation, native opium cost 30 per cent. of foreign, but the additional strength of foreign more than made up for this difference. The price of Malwa at Hankow was at that time (judging from the price at other places) about Rs. 1,700, and Patna probably about Rs. 1,600; and native opium must therefore have been about Rs. 1,150. This must have been the cheapest price at which opium could at that time be laid down in Hankow, for as the Indian opium was at that time overcoming the native, it is fair to assume that the native was selling at no artificially raised price.

At Shanghai at the same time the native opium was selling at Rs, 1,125, while Malwa was at Rs. 1,590, and Behar at Rs. 1,500 The Hongkong prices at the same time were Rs. 1,520 for Malwa and Rs. 1,440 for Behar. The native opium at this price was producing no effect in the demand for foreign.

At Canton the price of native opium was Rs. 940 against Patna Rs. 1,190 (?) and Malwa Rs. 1,510, and it was not affecting the demand for foreign opium.

At Newchwang, in 1861, the price of native opium was Rs. 900, and of foreign Rs. 1,800. This price (Rs. 900) seems lower than the prices quoted above as ruling in 1863. The reason was likely this, that native opium was then unknown at Newchwang, and there was hardly any demand for it. This further appears from the fact that the importation of it ceased after 1861 at Newchwang.

At the treaty ports in 1864, therefore, the price of native opium was about two-thirds that of foreign. In the interior foreign cost a little more, as it was sure to have some duties to pay in passing from the ports into the interior while native could reach the interior just as cheaply as it could reach the treaty ports.

We come now to the papers of 1869, and before stating their contents, it may be well to mention that the prices in Hongkong were as follows :—Behar opium during the last half of 1868

and the first half of 1869, was at Rs. 1,420 or so; Malwa during the same time was at Rs. 1,460, except that in the beginning of 1869 it got up to about Rs. 1,500.

From Hankow we learn that the price of opium in the producing districts was about Rs. 690, while Indian opium laid down in Szechuen would cost nearly Rs. 1,950. In Hankow itself native opium cost about Rs. 1,000, while Indian was at about Rs. 1,710 at the end of 1869. A year before they were both cheaper, Rs. 870 and Rs. 1,530 respectively; but the ratio is in both cases nearly the same, native costing about 40 per cent. less than foreign. "At this price," says the Hankow report for 1869, "the importation of foreign opium is considerably short for the last two seasons, but this is not to be wondered at, when every shop-keeper in this and the surrounding districts advertises native drug for sale."

Of Canton we have only general information that foreign opium cost twice as much as native, but was nevertheless preferred by many, and native was in fact used only to mix with foreign. The Consul, writing in May 1869, says that the price of native was about Rs. 900, and at that time the price of foreign must have been Rs. 1,500 at least. At this respective price foreign does not seem to have been ousted at all, for though the Custom House figures showed a great falling off, little can be concluded from that, for it is said in the 1869 report that of the opium imported 92 per cent. comes in surreptitiously. The taste for native opium does not appear to have yet sprung up in Canton.

At Shanghai, where both were largely consumed, native cost Rs. 1,100, Malwa Rs. 1,500, and Patna Rs. 1,300.

At Tient-sin Malwa opium cost Rs. 1,590 or so, and native cost Rs. 1,060 or two-thirds of Malwa. At these prices it was, according to the Consul's opinion, ousting foreign opium. Malwa was slightly cheaper in 1869.

At Newchwang native opium costs Rs. 650 or 700 less than foreign. But foreign must be rather dear in so remote a port, possibly Rs. 1,800.

Up to this point the information as to prices has been taken only from the Consul's and custom officers' reports, and they lead to the conclusion that native opium is produced in western China at a cost of about Rs. 650. When it gets to Hankow the cost, including the various taxes it has paid, is about Rs. 950 and when it gets to the eastern coasts of China, its value is about Rs. 1050 to 1,150. At the treaty ports the price of native is about two-thirds that of foreign, and at these prices they complete on fair terms. At Hankow, where the difference in price is more than one-third in favour of the native, native has the advantage, and in the interior of the country, where native costs the same as it does in the treaty ports, but foreign costs more (having various transit duties to pay), native also has the advantage.

The conclusion of the Shanghai delegates are almost the same as those just stated.

VI.—The quality of Native Opium.

It remains to compare the native and the foreign opium as smokable articles, and here it may be convenient to distinguish the various sorts of Chinese opium by their Chinese names. We may therefore explain that Nantu signifies the opium grown in Yunnan, Chuentu signifies the opium grown in Sezchuen, and Kweichowtu signifies the opium grown in *Kweichow*; the names being in each case taken from those of the producing provinces.

The only opiums about which we need concern ourselves are the three sorts just mentioned, and perhaps also the sort imported from Manchuria. The opium of other places cannot compare with this in quality, and moreover it hardly comes into competition with Indian opium, being consumed only where it is grown.

The manner in which opium is used for smoking must be first stated. The opium is first to be purified, and with this object it is boiled so as to mix with water, then strained, and then boiled down to viscidity. When cool it is fit for smoking. The smoker taking a little of it on a needle-point, kneads it, and burns it a little by occasionally passing it through flame; the object of this process being apparently only still more to dry it. When its consistency is like that of wax it is formed into a cone round the needle, and then the point of the cone being introduced into a hole in the pipe, the needle is withdrawn and the opium is then applied to flame, and inhalation made through the passage left by the withdrawning of the needle.

We have already referred to the great improvement that had taken place in the quality of Chinese opium before 1864. We shall now note what is said about its quality in 1869.

The Canton Consul writes: "Of late it has not been inferior in quality to Malwa, although in flavour it is weaker than the foreign opium, and it is said to be less hurtful to the constitution. The opium-smoking shops use a mixture of 7/10ths foreign and 3/10ths native drug." In 1864 a Canton officer had written that the native opium was hardly used in its pure state, as its grassy taste caused it to be disliked, but this was less perceptible than before, as *attention had been given to the subject.*

In the Consul's report from Kewkiang, the following occurs (Kewkiang being an internal port appears to have good information on the subject):—"The native drug is inferior in quality, bitter to the palate, and deficient in strength and flavour. People accustomed to it prefer it, as though its being weaker they can enjoy it longer without becoming intoxicated." The properties of the foreign drug when prepared are estimated at 30 to 50 per cent. greater than the native. And the foreign drug also gives more of the prepared drug, giving 75 per cent., while Szechuen opium gives 58 to 70 only. The difference in strength is accounted for partly by the fact that the native drug does not burn so well as the foreign. In fact the refuse of the first preparation can be re-boiled and again used.

In the same report it is said that most of what is sold in Hankow or comes further east is used for admixture with foreign, but not more than 33 per cent. can be mixed without its becoming perceptible to a smoker, by which is probably meant, so far perceptible as to be liable to objection, as a detraction from the purity or strength, or flavour of the article.

The Consul at Newchwang writes of native opium, that "good opium yields 90* per cent. of the prepared drug; the second class yields only 70 per cent. The best Indian opium yields only 85 per cent., but the strength and flavour are much superior to those of native growth.

The same gentleman subsequently writes of the opium grown in the north of China—"I am told this is the finest of all the opium produced in China. It sometimes yields full weight of the smokable drug. Malwa I believe yields 80 to 85 per cent. of the pure drug; this ranges somewhat higher, yielding from 85 to 90 per cent. The Chinese opium is not only capable of being smoked twice, but the drug obtained from boiling the ashes is preferable to the first preparation."

The Newchwang report in 1867 talked of this northern opium as "well-flavoured, but deficient in strength."

The China firm from which we have before quoted ranks the opium according to quality, after being boiled, thus—taking Malwa at 75, Yunnan was 50, Szechuen 44·3, Kweichow 43·5.

In the Hankow report for 1869 it is written—"Of the Szechuen drug, that produced in Kuhsien and Peichow approaches nearest to the foreign article, yet it is not so tasty. In Szechuen it is held that one ounce of native drug produces less smokable matter than the same quantity of foreign. It is moreover asserted that the strength of the foreign drug is exhausted by one smoking, whereas the native article stands four or five re-preparations."

The following is taken from the report of the Shanghai delegates:—The quality and strength of Szechuen opium varies according to the district. Fungtoo opium yields 75 per cent. of extract, Foo 70 per cent., Kai 80 per cent. Of Yunnan opium, which it may be remarked realizes in the China market a higher price than Szechuen, and is generally admitted to be the best, they write:—The Nantu yields 80 per cent. of extract, is of finer quality and possesses better medicinal properties than the Szechuen, and is longer in consuming.

In comparing, upon the basis of the information thus given, the native and the foreign opium, the following conclusions seem to be indicated:—

(1.) Chinese opium, in respect of its standard of purity, and of the *nature* of its properties, so far as a smoker is concerned, does not differ from Indian opium.

(2.) Indian opium, however, exhibits these properties in a more marked degree; in other words, it is of great strength and preferable flavour. The preferable flavour is everywhere admitted, and is in every case an element of preference. The greater strength is not so, for many people prefer what is weaker; and the Indian opium is to such people too strong for their taste.

(3.) The additional strength is partly an inherent quality, just as the better flavour is, and it is partly the result of a difference in the capability of consumption. The native opium consumes neither so readily nor so completely as the Indian; not so readily, inasmuch as it takes a longer time to consume; nor so completely, for the ash after the first consumption can be boiled a second time, and the second preparation can be again consumed. This can never be done with Indian. Indian, however, gives, to begin with, a larger proportion of consumable matter than native opium.

Apart, therefore, from the flavour, which is an indisputable advantage possessed by the Indian opium, the difference between the two is the difference between a smaller pleasure spread over a longer time, and a greater pleasure enjoyed during a shorter time.

As to the mere quantity of pleasure contained in the same bulk, if it were possible to make such a comparison, the difference is in favour of Indian opium; that is, if the consumption of the Indian could be so retarded as to make it give out only the same strength as the native, then it would out-last the same quantity of native by a proportion probably not far different from the ratio which the prices ordinarily bear to each other.

* The original says 19, but 90 is clearly meant.

THE BUDGET—1871-72.

(*Abridged by the "Indian Daily News."*)

The Legislative Council of the Government of India met at Government House yesterday, the 9th March, 1871, at 3 P.M.

The following members were present :—His Excellency the Right Hon'ble the Viceroy, (presiding,) His Highness the Maharajah of Jeypore, G.C.S.I., Hon'ble Sir Richard Temple, K.C.S.I., Hon'ble J. Strachey, Hon'ble Mr. Ellis, Hon'ble Fitz-James Stephen, Q.C., Hon'ble Major-General Norman, C.B., Hon'ble the Lieutenant-Governor of Bengal, Colonel the Hon'ble R. Strachey, C.S.I., Hon'ble Mr. Cockerell, Hon'ble Mr. Robinson, Hon'ble Mr. Inglis, Hon'ble T. Cowie, and Hon'ble J. N. Bullen Smith, &c., &c., &c.

Owing to the interest that the delivery of the budget statement invariably excites, and especially upon this as on the last occasion, the ordinary Council chamber was found too small for a large audience, and the Council accordingly met in the Marble Hall of Government House. The number of ladies present, although it was notified that special arrangements had been made for their having an opportunity of hearing the financial statement, was but small. There was a good attendance in the Hall consisting principally of the official and commercial classes. There were also a number of native gentlemen present. The seats were taken early, the proceedings commencing at 3-15 P.M. and ending about 6 P.M. Several persons left the Hall however before the conclusion of Sir Richard's statement.

His Excellency the Viceroy having taken his seat, called upon the Financial Minister to make his annual budget statement.

Sir Richard Temple, in submitting the financial budget of British India, for the official year 1871-72, said that this was the twelfth annual statement presented since the creation of the existing financial system. He would proceed to deal with the figures in the same order as that observed in all previous statements ; namely, first the actuals of 1869-70 ; second, the regular estimate of 1870-71 ; lastly, the budget estimate for 1871-72. He would take the figures from the combined statement in the same manner as he did last year, and would begin with the past year 1869-70. The Council would remember that the regular estimate for that year exhibited an anticipated deficit of income of £625,594, or more than half a million sterling. The actual figures now showed a surplus of £118,668. The receipts of the year were taken in the regular estimate at £50,297,052 ; they have proved to be more by £604,029. This favorable difference in the expenditure arose chiefly in the military accounts and partly also from the amount of unpaid dividends, and from other sources. In a word, the largest difference in the whole account, £315,116, was owing to the favorable financial effect of the military reduction that had been ordered. In the original estimate a large deficit was anticipated on account of the fall of opium and various financial measures were taken to prevent the threatened deficit. The result proved that there was an actual surplus of £118,668. This was owing partly to management and partly to fortune. It seemed to be understood in some quarters that the favourable results just described were not the result of the financial measures introduced, which were absolutely unnecessary. He would declare, for the last time that those measures were both just and necessary, and that there was not any difference of opinion in the Government of India on the subject. He then demonstrated that these measures bettered the account by one million and a half, and it seemed to him that this was as strong a financial justification of these measures, as could be reasonably expected. In some other quarters, again, it was thought that the small surplus had cut away the ground for the increased rate of income-tax in 1870-71. He could admit however nothing of the sort. The condition and prospects of the year 1870-71 must first be considered. The estimate of that year was framed on a data of its own. Even if the actual figures of the year 1869-70 had been known, the prospect of deficit in 1870-71 would have remained. The surplus of one year could not mitigate the prospect of deficit in another.

The receipts were estimated in the budget at £49,479,585 ; they are now estimated at £51,048,900, showing a difference in favor of some £1,569,315. Of this increase the main item was one million under the head of opium. In this last exposition he gave to the Council the reasons why the estimate of opium had been cautiously framed. The improvement of the opium trade in China must have had its causes, one of which was perhaps the indigenous culture of the opium in China itself. However, whatever the real causes were, he was not in a position to explain satisfactorily. All he could say was that the Council was carefully watching every detail ; but it must be added that at the commencement of the year they had no right whatever to reckon on the improvement that has accrued. Therefore this stroke of fortune did not in the least shake his conviction of the prudence with which the estimate was made ; nor did it encourage him to relax the watchfulness and caution necessary in framing the opium estimates for the coming year.

There were some items of increase which required explanation. There was an increase of £92,508 under land revenue, which was owing to considerable improvement in Madras from the realisation of arrears outstanding from previous years of drought. The increase of £141,500 in Customs has accrued at the ports of Calcutta, British Burmah, and Madras, and not at Bombay. The trade in piece-goods, however, was not flourishing, inasmuch as the sale of these goods for the markets in the interior had not been favorable to importers. It was a matter of regret that the increase of revenue did not indicate a corresponding improvement in trade.

The increase of £144,510 in the Post Office was wholly nominal

The increase of £289,226 in miscellaneous receipts arose from a large item of assets of the Ameens' Fund at Bombay being credited to Government. The increase of £166,775 in army receipts was owing to general augmentation under a variety of heads. There were, on the other hand, some instances of diminution, such as the decrease of £105,000 in assessed taxes. This meant that the 3½ income-tax was estimated to yield £2,180,000, and was now estimated to give £2,075,000. The falling off chiefly arises from the circumstances of the tax-paying classes having been less favourable than had been expected. However the out-turn for the year promised to be satisfactory. The Government had constantly observed the complaints that had been made regarding the assessment of the impost, and they had done all in their power to prevent just cause of complaint from arising. They could not hope that such causes would not occur, but it was noteworthy that on a circular being addressed by them to the several local Governments in India, enquiring whether there were any known cases of oppression, they received replies from all of them (except the Government of Bengal) to the effect that no such cases were known. The Government of Bengal, indeed, did transmit a resume of some thirteen cases ; this number is of course a matter for much regret, though relatively it was not large.

Salt, again, showed a decrease of £72,870, which was however counterbalanced by a decrease in the charges of £82,519. Less salt had been manufactured and sold than was expected at the Sambhur Lake in Rajpootana.

Another item of decrease was that of £107,670 in the Mint receipts. Very little bullion had during the year been presented for coinage, owing to the unfavourable state of the exchanges.

A further item of decrease was £129,280 in the forest receipts. This arose from the consumption of timber by the railways having been less than was expected.

The net result was an income of upwards of fifty-one million pounds sterling, exclusive of net railway traffic receipts, which amount if compared with corresponding amounts of previous years, transcend them all, and is the largest revenue ever yet raised in British India.

The ordinary expenditure of the year was estimated in the budget at £49,316,145 ; it is now estimated at £50,051,800, shewing a difference against them of £735,655.

The heavy increase (besides the minor items of increase) of £414,908 in the miscellaneous heading arose chiefly from what was technically called loss by exchange.

A new item would be perceived in the regular estimate which was not entered at all in the budget, namely, that of allotments for provincial services, £200,000. This entry appears for the first time. It relates to the scheme set forth in the Resolution of December last, entrusting to local Governments increased financial control in certain departments. In order that the local Governments may be able to inaugurate this plan successfully, it was found most desirable to give them a special allotment of funds to begin with, in addition to the regular allotment they will receive year by year for the next and subsequent years. It had been decided to make the special allotment from the resources of this year ; and to fix the amount at £200,000, to be distributed rateably among the local Governments.

The increase of £554,659 under the head of army has arisen partly in England and partly in India. The increase in England amounts to £361,859, and in India to £192,800. The increase in England was in overland transport charges, in furlough allowances, and for breech-loading arms. The increase in India was due to the adjustment this year of a large sum on account of the charges for the overland troop transports defrayed in past years in India, which it was thought had been included in the home accounts. But for this arrear adjustment, the net charges for the army in India would have been less than was originally estimated by about £300,000.

The third item of increase was that of £319,517 under guaranteed interest in railway capital less net traffic receipts. This arose from the net traffic receipts having fallen off ; they were estimated at £2,848,470 ; they are now estimated at £2,530,700. This diminution was owing to the decrease of traffic earnings.

So much for the increases. On the other hand, there was a long list of diminutions arising partly from estimates having been prudently framed, partly from savings having been effected ; these range at amounts from £500 to £100,000, and occur under the heads of Interest, Refunds, Land Revenue, Forests, Excise, Assessed Taxes, Customs, Mint, Telegraph, Administrations, Minor Departments, Law and Justice, Police, Marine, Education, Ecclesiastical, Stationery and Printing, Allowances under Trea-

tion. If this series of savings shall be sustained by the actual account, the result will be very satisfactory. The ordinary expenditure for Public Works had been kept well within budget limits. To this had been added an assignment of £40,000 to the trustees of the Indian Museum, for the completion of the building.

The saving of £141,710 under Railways, was chiefly due to delay in taking up land for the Oudh and Rohilkhund line.

Of the extraordinary expenditure £3,062,300, or 3 millions, were estimated to be spent, but only £1,146,500, or about 1 1-7th millions had been actually disbursed. The difference was largely accounted for by the unavoidable delay in prosecuting the State railway works, by reason of the pending questions relating to the guage best suited for adoption. The extraordinary added to the ordinary expenditure made up a total of £51,198,600, or 51 1-5th million.

Such were the figures for the current year 1870-71, so far as they were yet known.

He would remind the Council that the figures of the regular estimate were liable to modification by reason of the facts which may come out in the course of the remaining two or three months. They must not therefore be surprised if the final result of the year differs considerably even from the revised estimate now presented.

In regard to the (perhaps unfortunately) cardinal importance of the revenue to the general finance, it would be advisable to consider what would have been the situation had the opium increase of £1,074,519 not accrued. Why, the consequence would have been that, apart from the exceptional allotments of £200,000 to the local Governments wherewith to begin the provincial service scheme, and of £40,000 to the trustees of the Indian Museum, he should have that day shown a surplus of £162,581, or almost exactly the sum originally estimated, *viz.*, £163,440. This proves the necessity of the financial measures proposed in the last exposition.

When he said this the mind of the Council would revert to the enhancement in the rate of the income-tax. He apprehended that in some quarters it would be held that the present anticipation of a considerable surplus proved that the increased rate of income-tax was after all not necessary, but he could not in the least degree admit such an argument. The matter turned on this question—was the opium estimate in the budget a fair and prudent one according to the knowledge available at the time? If that estimate was fair and prudent, then there was no ground for impugning the justice and necessity of the enhanced income-tax.

He considered that if the opium estimate was proved to have been reasonable, then any attack on the *financial* necessity of the enhanced income-tax for the year must inevitably fail. Now, what were the circumstances under which the opium estimate was framed? It was shown that there had been a heavy fall in the price of Bengal opium; that for a whole year the decline had been almost regular and constant, and that the tendency was still downwards. He would affirm that when the Bengal estimate was produced, it was considered not at all too low, but quite high enough in non-official circles, where practical knowledge was in this respect most available. As regards the Malwa opium, the facts were almost as unfavourable, and he would repeat that without the income-tax at the 3½ per cent. rate, they must have produced a budget with a large deficit; and that therefore the imposition of that tax was a matter of financial necessity at that time

As regards the surplus above shown for the current year, they must remember that it is only anticipated as probable, and not yet actually, realized. It might even yet fail them more or less; but if it shall be fully sustained by the ultimate event it will be most gratifying, and will occur indeed not at all before it is needed.

Before entering into details of the budget for 1871-72, he would draw the attention of the Council to an important modification in the form of the statement for that year. This modification had been made in order to give effect to the financial Resolution by the Government of India of the 14th December last. It will be remembered that by that resolution, an increased degree of control financially was accorded to the several local Governments in India in certain civil branches. It was to be hoped that this concession will give the local Governments an additional interest in the study and the enforcement of economy in expenditure; afford them a just inducement to supplement their local receipts from time to time by methods either most acceptable to the people, or least fraught with popular objection; cause a more complete understanding to arise between the executive authorities and the tax-paying classes respecting the development of fiscal resources; teach the people to take a practical share in provincial finance, and lead them up gradually towards a degree of self-government; and thus conduce to administrative as well as financial improvement. He was sure that the measure was advantageous to the imperial budget of British India.

The Council would perceive that the total amount of allotments for provincial services, as just defined, for all the local Governments together, was set down in the expenditure side of the budget for the coming year at about 4½ millions, which amount he would explain further presently. He would observe that the total sum allotted for provincial services was thus distributed:—

	Receipts surrendered.	Assigned from Imperial Funds.	Total.
	£	£	£
India	9,800	*26,700	36,500
Oudh	14,700	211,300	226,000
Central Provinces ...	24,000	269,600	293,600
Burmah	28,600	276,500	305,100
Bengal	264,600	1,197,900	1,462,700
North-Western Provinces	111,100	635,000	746,100
Punjab	67,400	528,800	596,200
Madras	81,800	752,300	834,100
Bombay	55,300	901,200	956,500
Total ...	657,500	4,799,300	5,456,800

Sir Richard then remarked upon these various allotments and upon the items of which they were severally made up.

He next explained at length the manner in which the regulation of the expenditure in these branches was to be confided to the local Governments subject to certain general conditions. In the Bombay Presidency the matter was still under consideration. In Bengal proper, the local Government was still in communication with the Government of India as to the best way of carrying out this decision. In the North-West Provinces, the Punjab, and Oudh, the local Governments had matured plans for provincial imposts, and bills to carry out these plans would be immediately submitted to the Council.

Sir Richard then proceeded to deal with the figures of the budget for 1871-72.

The receipts were taken at about 49 millions, as compared with the 51 millions of the year about to close. The main heads of receipt closely followed the regular estimate for 1869-70. The total value of the foreign trade was taken at 100½ millions sterling; an improvement was expected for the current year. There was a good prospect as to jute; cotton had fallen off slightly; coffee and indigo were also promising. As regarded the remission of the export duty on rice, he was not prepared in the present state of the finances to propose any change.

The opium estimate was taken at a little more than the amount which was received for the current year, or just over 8 millions gross. The precise number of chests to be sold in 1871-72 depended upon the number of chests which it may be resolved to offer for sale in the calendar year 1872, which again depended upon the out-turn of the crop now about to be gathered. The weather in the opium-growing districts of the Bengal Presidency was reported of late somewhat unfavorable. For the chests of 1871-72, an average price of Rs. 1,075 or £107-10s. per chest has been assumed. The average price per chest in 1870-71 had been Rs. 1,120-8, (£112-1s). The prospects of the present crop in Malwa were reported excellent. For Malwa, the duty being fixed at Rs. 600 a chest, the real point for forecast was the number of chests likly to be exported. 90,000 had been estimated as the total chests for Bengal and Bombay.

Increase in the Forest, Telegraph, and Mint estimates were also noticeable.

There were decreases under the heads of Law and Justice, Police and Education, under the new local scheme.

The Post Office showed a decrease of £29,500.

The new telegraph rates had been so far successful as to cause an increase already of more than 50 per cent. in private telegrams; but it was not a financial success.

He now came to the ordinary expenditure of the year, estimated at about 49 millions, showing a reduction of £1,046,300. This was satisfactory.

There were various small increases under headings relating to the collection of the revenue, such as forests, excise, salt, and opium, which did not arise from any permanent accession to establishments, or such like expenditure.

There were other increases, such as those under Stamps and Stationery, Administration, Agriculture and Commerce, Printing Establishments, &c.

Decreases were shown under the heads of Law and Justice (£535,300), of Police (£2,269,500), of Education (£606,200), of Medical Services (£334,800), of Printing (£284,100), of Public Works, ordinary (£1,575,600).

The rate of exchange taken was 1*s.* 10⅞*d.* for the rupee, giving upon a supply of 9 millions sterling a nominal loss of £494,500.

The new head of allotments for provincial services (£4,799,300) comprised the imperial assignments made upon the basis of the grants of 1870-71, to the several local Governments in India for jails, registration, police, education, &c.

The expenditure for the army was set down at £15,984,000, showing a decrease of £316,000. Of this decrease, £270,000 occurred in India, and £75,500 in England.

A saving of nearly £70,000 by a reduction of five batteries of horse artillery and three garrison batteries had been estimated,

as also a reduction of £100,000, in the expenditure of the native army for the coming year. Public works ordinary expenditure amounted to 2½ millions. The 2½ millions now remaining under the general control of the Government of India consisted of—

Military	£1,012,500
Civil Buildings	150,700
Roads and Communications	115,900
Miscellaneous Public Improvements ...	25,600
Agricultural	454,900
Establishment and tools and plant ...	605,400
Total...	2,365,000

The net amount to be paid on account of guaranteed railway interests was upwards of 1¾ millions.

Sir Richard then dwelt at length on the growth of the gross guaranteed interest.

Besides the ordinary expenditure, there was a proposed expenditure for Public Works extraordinary, of upwards of 3½ millions to be provided for from borrowed funds, bringing up the total expenditure, ordinary and extraordinary, to about 52¾ millions.

The adoption of the comparatively narrow gauge would cause a large saving both in original outlay and in subsequent working charges.

Such, then, were the figures for 1871-72. On a comparison of income with ordinary expenditure, the result was an equilibrium, supported by a small surplus of £93,400. Assessed taxes on the receipt side of the budget for 1871-72 were set down at £600,000, which, as compared with the current year, shows a reduction in this taxation of £1,475,000. This was obtained by lowering the rate of assessment from 6 pies in the rupee, or 3½ per cent., to 2 pies in the rupee, or a fraction over 1 per cent., and by raising the minimum income liable to assessment from 500 Rupees to 750 Rupees; in other words, by exempting incomes below 750 Rupees.

He now passed on to the provision of ways and means, and to the cash balance account.

It was expected to commence the current year (1870-71) with a cash balance of 13½ millions, and to close it with a balance of 10½ millions. On closing the account, however, finally for the previous year, they found an actual cash balance at the commencement of the current year of nearly 14 millions, which improvement was due to the actual account of the previous year turning out more favourable than the regular estimate. It was expected that the current year, after its close, would leave a cash balance of about 16 millions, being 5½ millions better than the first estimate. Throughout the year the cash balances all over India had been very high.

As might be expected under all these circumstances the public credit, as proved by the prices of Government stocks, had, on the whole, been higher during the current year than it had ever stood before.

He would now advert to the loan arrangements for 1871-72.

Sir Richard then drew attention to the fast-growing interest on account of the borrowings of municipalities for reproductive works.

He next noticed certain remarks which had been made regarding the accounts of the Home Treasury of the Government of India which are kept in England. It had been said that the expenditure in England on account of India is incurred without sufficient reference to the authorities in India, and that the detailed accounts of it are not made known in India. This he showed not to be the case by a reference to the *Gazette of India*, in which the account had been regularly published.

He next noticed very briefly several measures which have been adopted in connexion with finance.

These embraced the Presidency Savings Bank at Calcutta and the district Savings Banks, under that name in the Madras and Bombay Presidencies.

The paper currency reserve for raising the limit from four millions to six, which bill had since passed into law, was then dwelt upon.

The money order system in India, in like manner, and the subject of the circulation of the new ten rupee gold pieces, were also noticed at length.

"Such, then, continued Sir Richard, "is the exposition which I have this day to offer. The main points have been—

"That for 1869-70, instead of an anticipated deficit of £625,594 there has been an actual surplus of £118,668;

"That for 1870-71 the surplus estimated in the budget at £163,440 is now estimated at £997,100, or 1 million;

"That this surplus is really due to an unlooked for accession of opium revenue;

"That without this accession of opium revenue there would have been little more than an equilibrium between income and ordinary expenditure;

"That for 1871-72 there is estimated a small surplus of income over ordinary expenditure of £93,400;

"That this estimate is arrived at after a large abatement of the income-tax; the lowest incomes assessable, namely, those between Rs. 750 and 500 being exempted altogether, and the rates for all classes being lowered from 3½ to a fraction above 1 per cent.;

"That this change in the income-tax causes a reduction of 1½ million of direct taxation;

"That the exemption of incomes between 750 and 500 Rupees reduces the total number of persons assessed, 480,000, by fully one-half, and releases 240,000 tax-payers;

"That the ordinary expenditure for the coming year shows a decrease of one million of expenditure as compared with the current year;

"That, subject to certain conditions, an increased financial control has been entrusted to the several local Governments in respect of jails, registration, police, education, roads, other than military, and civil buildings;

"That the grants by the general Treasury for these services have been reduced by £331,038, and that a fixed limit is imposed on the imperial expenditure on these departments;

"That for these provincial services throughout India, allotments have been made of 4¾ millions distributed among the various local Governments;

"That apart from the allotments made to the local Governments, under these provincial services for roads and buildings, the ordinary Public Works grant in India has been brought down to 2½ millions;

"That 3½ millions have been raised by loan in England since my last statement was made, while on a little above one million has been expended on public works extraordinary;

That 3½ millions are proposed to be spent on Public Works extraordinary during the coming year 1871-72, 2½ millions being provided for by loan in England;

"That owing to the improvements in the account of the income and ordinary expenditure of Government, and the temporary diminution of expenditure on Public Works extraordinary, and on construction of the guaranteed railways, the cash balances in India are very high, and that no loan is proposed in this country;

"That during the current year various measures relating to finances have been carried out, such as the coinage of ten rupee and five rupee gold pieces; the legalization of a five rupee note in the paper currency; the introduction of district savings' banks in the interior of the country."

Sir Richard concluded an unusually elaborate address with some remarks upon the financial policy of the Government, upon the distinction preserved between various classes of expenditure, and upon the retrenchments made in the civil and military branches of expenditure.

PUBLIC WORKS—1870-71.

PROVIDED FOR BY LOANS.

Balance brought forward.....		£2,321,132
LOANS RAISED.		
ENGLAND—		
Proceeds of 4 per cent. Stock.....	£2,010,606	
India Loan from the Maharajah Holkar for a State Railway	250,000	
	2,260,606	
Deduct—		
Debt paid in India.....	510,000	
		1,750,606
EXTRAORDINARY RECEIPTS—		
Bombay Municipality	14,800	
Madras East Coast Canals.....	1,000	
Ootacamund Municipality.....	300	
		16,100
		£4,087,838
EXTRAORDINARY EXPENDITURE—		
Irrigation Works, India £808,000		
England ... 1,800		
£809,800		
State Railways, India £300,000		
England..... 73,000		
	373,500	
		1,182,800
LOANS—		
To Calcutta Port Trust	£28,000	
Simla Municipality.....	5,000	
Umritsur Municipality	22,500	
Bombay Port Fund.....	170,100	
Cawnpore Municipality	20,000	
Nagpore Municipality.....	6,000	
Madras Municipality	58,500	
East Coast Canals, Madras	2,600	
Ootacamund Municipality.....	900	
		313,600
		1,496,400
Probable Balance to be carried to Account for 1871-72.		2,591,438
		£4,087,838

BUDGET ESTIMATE,—1871-72.

ENGLAND AND INDIA.

Revenues and Receipts.	Actuals. 1869-70.	Budget Estimate, 1870-71.	Regular Estimate, 1870-71.	Increase.	Decrease.	Budget Estimate, 1871-72.	Budget compared with Regular.
	£	£	£	£	£	£	£
I.—Land Revenue	21,066,929	20,560,892	20,653,400	92,508	...	20,709,700	+56,300
II.—Tributes and Contributions from N. States	765,126	737,073	739,300	2,227	...	730,100	—9,200
III.—Forest	471,590	588,780	459,500	...	129,280	573,400	+113,900
IV.—Excise on Spirits and Drugs	2,255,197	2,285,000	2,357,600	72,600	...	2,351,100	—6,500
V.—Assessed Taxes	1,110,224	2,180,000	2,075,000	...	105,000	600,000	—1,475,000
VI.—Customs	2,429,185	2,416,500	2,558,000	141,500	...	2,556,800	—1,200
VII.—Salt	5,888,707	6,177,370	6,104,500	...	72,870	6,190,000	+85,500
VIII.—Opium	7,951,557	6,922,281	7,996,800	1,074,519	...	8,038,500	+41,700
IX.—Stamps	2,373,844	2,441,508	2,488,900	47,392	...	2,542,100	+53,200
X.—Mint	157,214	139,970	32,300	...	107,670	40,600	+8,300
XI.—Post Office	711,698	750,590	895,100	144,510	...	865,600	—29,500
XII.—Telegraph	257,134	193,006	226,200	33,144	...	245,600	+19,400
XIII.—Law and Justice	828,515	793,292	755,400	...	37,892	466,600	—288,800
Police	287,549	251,966	252,900	934	...	...	—252,900
XIV.—Marine	329,953	265,615	272,100	6,485	...	237,900	—34,200
Education	74,873	78,574	62,200	...	16,374	..	—62,200
XV.—Interest	375,698	365,321	354,700	...	10,621	339,900	—14,800
XVI.—Miscellaneous	1,525,769	737,874	1,027,100	289,226	...	928,300	—98,800
	48,860,762	47,885,662	49,311,000	1,905,045	479,707	47,416,200	—1,894,800
Army	1,082,605	736,225	903,000	166,775	...	819,000	—84,000
Public Works—Ordinary	169,155	117,870	117,600	...	270	109,900	—7,700
Public Works—Irrigation	534,979	462,740	473,600	10,860	...	496,300	+22,700
Railways	253,580	277,088	243,700	...	33,388	257,500	+13,800
Total ...	50,901,081	49,479,585	51,048,900	2,082,680	513,365	§49,098,900	—1,950,000

Expenditure.	Actuals, 1869-70.	Budget Estimate, 1870-71.	Regular Estimate, 1870-71.	Increase.	Decrease.	Budget Estimate, 1871-72.	Budget compared with Regular.
	£	£	£	£	£	£	£
1.—Interest on Funded and Unfunded debt ...	4,982,420	5,300,538	5,295,800	...	4,738	5,372,000	+76,200
2.—Interest on Service Funds and other Accounts...	627,267	514,002	545,500	31,498	...	528,100	—17,400
3.—Refunds and Drawbacks	465,094	400,000	338,600	...	61,400	336,000	—2,600
4.—Land Revenue	2,458,389	2,497,612	2,410,100	...	87,512	2,530,600	+120,500
5.—Forest	313,477	437,540	386,000	...	51,540	451,100	+65,100
6.—Excise on Spirits and Drugs	256,528	288,994	273,300	...	15,694	294,700	+21,400
7.—Assessed Taxes	41,701	59,100	43,700	...	15,400	43,400	—300
8.—Customs...	181,456	189,214	185,000	...	4,214	193,400	+8,400
9.—Salt	391,485	499,019	416,500	...	82,519	462,700	+46,200
10.—Opium	1,820,683	2,013,110	2,065,000	51,890	.	2,102,900	+37,900
11.—Stamps and Stationery	274,160	245,440	243,900	...	1,540	255,500	+11,600
12.—Mint	101,164	95,908	66,600	...	29,308	71,700	+5,100
13.—Post Office	688,483	729,583	775,500	45,917	...	755,100	—20,400
14.—Telegraph	553,401	589,719	537,100	...	52,619	515,500	—21,600
15.—Administration	1,389,875	1,400,601	1,363,000	...	37,601	1,437,200	+74,200
16.—Minor Departments	234,680	239,167	218,900	...	20,267	235,600	+16,700
17.—Law and Justice	2,902,926	3,009,432	2,962,400	...	47,032	2,427,100	—535,300
Police	2,[illegible]5,131	2,319,964	2,269,500	...	50,464	...	—2,269,500
18.—Marine	1,2[illegible]1,571	784,100	733,700	...	50,400	777,800	+44,100
Education	6[illegible]184	680,530	606,200	...	74,330	...	—606,200
19.—Ecclesiastical	16[illegible]083	169,795	153,600	...	16,195	164,900	+11,300
20.—Medical Services	48[illegible]047	503,654	505,200	1,546	..	170,400	—334,800
Printing...	214[illegible]62	222,279	200,500	...	21,779	...	—200,500
21.—Political Agencies	405,[illegible]7	313,675	328,000	14,325	...	299,900	—28,100
22.—Allowances and Assignments under Treaties and Engagements	1,863,61[illegible]	1,787,090	1,729,900	...	57,190	1,720,800	—9,100
23.—Superannuation, Retired and Compassionate Allowances	1,332,515	1,376,253	1,458,900	82,647	...	1,425,700	—33,200
24.—Miscellaneous	1,059,838	985,192	1,400,100	414,908	..	1,192,700	—207,400
25.—Allotments for Provincial Services* ...	..	...	200,000	200,000	...	4,799,300	+4,599,300
	27,561,332	27,651,511	27,712,500	842,731	781,742	28,564,100	+851,600
Army	16,329,739	15,[illegible]45,341	16,300,000	554,659	...	15,984,000	—316,000
Public Works Ordinary	5,034,566	3,[illegible]8,400	3,940,600	...	57,800	2,365,000	—1,575,600
Railways	309,712	[illegible]3,710	222,000	...	141,710	235,500	+13,500
Guaranteed Interest on Railway Capital, Less Net Traffic Receipts ‡	1,547,064	1,557,183	1,876,700	319,517	...	1,856,900	+19,800
	50,782,413	49,316,145	50,051,800	1,716,907	981,252	49,005,500	—1,046,300
Public Works Extraordinary	2,599,614	3,062,[illegible]00	1,146,800	...	1,915,500	3,626,000	+2,479,200
Total ...	53,382,027	52,378,445	51,198,600	1,716,907	2,896,752	52,631,500	+1,432,900
Surplus Excluding P. W. Extraordinary	118,668	163,440	997,100	...	...	93,400	
‡ Guaranteed Interest	4,176,008	4,405,353	4,407,400	...	...	4,638,600	
Net Traffic Receipts...	2,628,944	2,848,170	2,530,700	...	...	2,781,700	
Guaranteed Interest, Less net Traffic Receipts...	1,547,064	1,557,183	1,876,700			1,856,900	

* The following are the Services for which these Allotments are made:—Jails, Registration, Police, Education, Medical Services, Printing, Petty Construction and Repairs (excepting in the Salt and Opium Departments), Roads other than Military, Civil Buildings, and Miscellaneous public Improvements.

Estimated Receipts and Payments in England and India during the year 1870-71.

	Receipts.	England.	India.	Total.		Payments.	England.	India.	Total.
		£	£	£			£	£	£
1.	Opening Balance	2,892,483	13,940,451	16,832,934	11.	Ordinary expenditure	8,302,800	39,872,200	48,175,100
2.	Ordinary Income	209,700	50,839,200	51,048,900	12.	Guaranteed Interest on Railway Capital	4,370,000	37,400	4,407,400
3.	Net Railway Traffic Receipts	..	2,530,700	2,530,700	13.	Extraordinary Expenditure	51,800	1,095,000	1,146,800
4.	Deposits repayable and Advances recovered, &c.	...	13,833,300	13,833,300	14.	Deposits repaid and Advances recoverable, &c.	...	15,526,400	15,526,400
5.	Local Remittances	...	701,000	701,000	15.	Local Remittances	...	631,000	631,000
6.	Remittance Account	129,000	1,458,500	1,587,500	16.	Remittance Account	1,087,800	282,600	1,370,400
7.	Abyssinian Expedition	134,800	10,000	144,800	17.	Abyssinian expedition	800	12,500	13,300
8.	Bills of Exchange and Specie Remittances.	9,000,000	...	9,000,000	18.	Bills of Exchange and Specie Remittances.	...	9,525,000	9,525,000
9.	Railway Capital	6,832,000	...	6,832,000	19.	Railway Capital	5,385,000	1,467,600	6,852,600
0.	Borrowed	2,010,600	4,060,100	6,070,700	20.	Debt paid	..	2,911,500	2,911,500
					21.	Closing Balance	2,010,283	16,012,051	18,022,334
	Total	21,208,583	87,373,251	108,581,834		Total	21,208,583	87,373,251	108,581,834

Abstract of the above showing how the Ways and Means of the year are estimated to be provided.

urplus in ordinary account, including railway transactions	997,100	Cash balance increased	1,189,400
ocal Remittances	70,000	Extraordinary expenditure	1,146,800
emittances	217,100	Bills of Exchange	525,000
byssinian Expedition advances recovered	131,500	Deposits repayable and advances recovered	1,693,100
orrowed	3,159,200	Railway Capital Expenditure in Excess of receipts	20,600
Total	£4,574,900		£4,574,900

EDWARD GAY, Deputy Comptr. Genl. of Accounts.
HUGH SANDEMAN, Offg. Comptroller General of Accounts.
R. B. CHAPMAN, Offg. Secy. to the Govt. of India

Estimated Receipts and Payments in England and India during the year 1871-72.

	Receipts.	England.	India.	Total.		Payments.	England.	India.	Total.
		£	£	£			£	£	£
1.	Opening Balance	2,010,283	16,012,051	18,022,334	11.	Ordinary expenditure	8,124,800	39,023,800	47,148,600
2.	Ordinary Income	163,000	48,935,900	49,098,900	12.	Guaranteed Interest on Railway Capital	4,600,000	38,600	4,638,600
3.	Net Railway Traffic Receipts	...	2,781,700	2,781,700	13.	Extraordinary expenditure	389,500	3,236,500	3,626,000
4.	Deposits re-payable & advances recovered, &c	...	17,876,300	17,876,300	14.	Deposits repaid and Advances recoverable, &c.	...	18,327,900	18,327,900
5.	Local remittances	...	134,600	134,600	15.	Local Remittances	...	162,100	162,100
6.	Remittance Account	74,000	1,411,300	1,485,300	16.	Remittance Account	1,194,700	272,200	1,466,900
7.	Abyssinian Expedition	5,000	5,000	10,000	17.	Bills of Exchange	...	9,000,000	9,000,000
8.	Bills of Exchange	9,000,000	...	9,000,000	18.	Railway Capital	1,985,000	1,834,700	3,819,700
9.	Railway Capital	4,672,000	...	4,672,000	19.	Debt paid	5,000	1,206,800	1,211,800
10.	Borrowed	2,500,000	1,067,000	3,567,000	20.	Closing Balance	2,125,283	15,121,251	17,246,534
	Total	18,424,283	88,223,851	106,648,134		Total	18,424,283	88,223,851	106,648,134

Abstract of the above showing how the Ways and Means of the year are estimated to be provided.

urplus in ordinary account including Railway transactions	£93,400	Extraordinary expenditure	3,626,000
ash balance reduced	775,800		
emittances	18,400	Deposits repayable and advances recovered	451,600
byssinian Expedition advances recovered	10,000		
ailway Capital receipts in excess of expenditure	852,300	Local Remittances	27,500
orrowed	2,355,200		
Total	£4,105,100	Total	£4,105,100

EDWARD GAY, Deputy Comptr. Genl. of Accounts.
HUGH SANDEMAN, Offg. Comptr. Genl. of Accounts.
R. B. CHAPMAN, Offg. Secy. to the Govt. of India.

PUBLIC WORKS—IRRIGATION.

IRRIGATION: EFFECTS IN THE UPPER DOOAB.

THE Upper Dooab was once the paradise of Hindoostan. From the foot of the Himalayas, where Akbar built his summer palace and drew forth the pure mountain torrent like the Jewish law giver, from the desert rocks down to Meerut, Surdhuna, Kotana, Baghput, and Ghazeeabad, the nobles of the Moghul Court had their country seats, their shooting grounds, their mosques, bazars, and walled towns. In this favoured region, with two noble rivers to drain the soil, and sweet water in every well rising to a reasonable distance from the surface, the land brought forth her increase; and, an occasional irruption from the Sikhs excepted, agriculture and prosperity were uninterrupted. This state of things, impaired by the weakness of the Mohammadan Government, was restored in some measure by the adventurers who settled there under the Mahrattas; and it long survived the introduction of European administration after the victorious campaigns of Lake. Ere long however, the old canals of the Emperor were restored, and the lands along the Jumna soon became water-logged by the west of water due to a vicious system of levels, and to the interception of the transverse drainage by which the engineering of nature had been wont to carry off the surface water into the channel of the Jumna. A saline efflorescence appeared upon the fields; fever and enlarged spleens became epidemic. These startling hints, however were not taken. The canal paid, not only as an insurance against famine, to be reasonably employed by the State land-lord when, the rains and springs of nature failed but to be sold across the counter to an increasing population greedy of sudden gain. A second, and still larger canal was next opened at the head waters of the Ganges, so as to do for the eastern borders of the Dooab what had already been done for the west; and optimist administrators and engineers drank each other's healths at Roorkee under the cordial congratulation of that great material reformer, the Marquis of Dalhousie.

How stands the matter now?

"The general excess of irrigation, and its extraordinary excess in the new rice lands, has resulted in raising the spring level, and continuing for a series of years, has gradually converted the formerly dry land between the Ganges and the Jumna, at places of wide extent, into a moist teria land, and now the trees grow there with the large trunks and wide-spread foliage of a damp forest country. The water in the old wells is from 30 to 40 feet in depth. The water holes which used to be dry for many months in the year now always contain water; low land, which used sometimes to be swampy, has now much extended in area, its swampy nature become permanent and crops of a marvellous height and thickness cover the land."

The result of which is, that while there were about nine thousand deaths from malarious fever in 1866, 10 in 1867, and 11 in 1868, the death-roll from this cause alone shewed over twenty-one thousand in the year under review.

If any other proof were needed that this calamity has been created by the injudicious zeal of British officials, it is to be found in the fact that the mortality in the two months of October and November, when the strong sun of that region is drying up the waste surface-water, was over twelve thousand, while in the two dry months of February and March it was only three thousand. These figures include all kinds of death, for the monthly returns are unclassified; but if the steamy months shewed four times as many deaths, from all causes as were shown by the dry months, we may be sure that the proportion would not be less for fever alone. Taking indeed this aspect of the figures as presented for the entire year, it will be found that in the two districts of Saharunpore and Mozuffurnuggur, where this extravagant saturation has been permitted out of an aggregate mortality of thirty-five thousand, no less than twenty thousand were from this one cause! In other words, upwards of sixty per cent. of the deaths were due presumably to causes not only controllable, but actually created by the alacrity of the administration to meet the covetousness of the people. In Dr. Planck's words—"deaths from fever in these districts show a determined tendency to increase as years of differing climate succeed each other." From which we cannot but infer that, as we have shown above, "some special cause must be at work," and he believes "that no remedies against this prevalence will be of permanent benefit, except a lessened amount of irrigation and a better preparation of the sites of centres of population as places of residence for the people." We are happy to observe that these views have been cordially adopted by the Government. In a few straight forward sentences, wholesomely free from the mannerism and vagueness of official verbiage, Mr. Elliot observes that an inquiry is now on foot into the relations of irrigation with drainage, and the sanitary condition of the country. Dr. Planck is requested to aid in the investigation, and "further remarks will be delayed until the results are received."

Let us hope, that the deliberations of the committee, to whom this task has been entrusted, will be thorough, impartial, and productive of action. Then will a great reproach be taken away from the administration of British India, and a new era commence from the measures inaugurated *consule Planco*.

It is when we turn to the head of fever that the most startling proof is found of the need for a thorough and earnest action on the part of the local Government. In 1869 there were about five hundred and thirty thousand registered deaths out of a population of under thirty millions, being about seventeen per thousand against ten recorded in the previous years. Out of this great increase the largest advance was no doubt due to cholera and small-pox; but then these disorders, as we have seen, present certain compensations, the one in its intermittent habits, the other in its known amenability to prophylactic measures. But fever, the number of whose victims rose in the proportion of 24 to 17, seems to be steadily increasing its ravages, and to be allowed to do so without any clear perception of how they are to be checked. And, were it not for the fact that its local distribution shows how much it is due to controllable causes, we hardly know what more awful prospect could be in store for a country than to find such a disorder settling down to permanent and progressive occupation of its soil. Setting aside Bundlekund as a God-forgotten land, where a mephitic virus is breathed out of the lungs of mother earth over which man can only win tardy and uncertain conquests by the spread of tree and crop cultivation, we find in Saharunpore and Mozuffurnuggur alone ample food for the most serious reflection.—*Pioneer*.

SANITATION OF THE UPPER DOOAB.

IT may be remembered that in noticing Dr. Planck's report a few weeks ago, we drew attention to the rapid depopulation that was going on in the districts of Saharunpore and Moozuffurnuggur, and expressed a hope that some remedial measures might result from the proceedings of the mixed Committee then sitting, or just risen, at Meerut.

The papers connected with the subject are now before us, and they fully justify our complaints and, to some extent at least, our hopes. It is clear, on the one hand, that the evil had not been exaggerated. The mortality from malaria, which formerly increased at a slow rate, has continued for the last two years to advance in geometrical progression. The committee have recorded their opinion that "the prostration of the labouring classes from repeated attacks of fever has * * enervated and weakened them to a degree which in frequent instances has interfered with the timely sowing of the winter-crops and the reaping of the autumn harvest." That this new and artificial endemic has been created by causes due to the action of the British Government, the Committee were right not to positively assert, for reasons which we shall presently see; but the tenor of their proceedings, and of the able and earnest note appended to the report by Colonel W. Greathed, is enough to sanction the assumption that this is in fact the case.

The committee have done all that was entrusted them to do. They were instructed in a memorandum by the Lieutenant-Governor, under date the 19th October last, to discuss the subject, with a view of ascertaining "what steps are feasible for maturing a general drainage scheme to benefit both districts;" and so far from stopping short of their instructions they actually went beyond the letter, however, they may have conformed to the spirit of the memorandum, for it is remarkable that the Government of the North-Western Provinces only dropped the faintest hint that irrigation might, by any possibility, have a share in the evils to be inquired into, whereas the proceedings of the Conference and the Chief Engineer's note combine in giving to this cause a most not ceable prominence.

The former document commences in these words:—"Colonel Greathed represents that it is proposed by the Irrigation Department to appoint officers to examine the amount of irrigation in over-irrigated villages, and to reduce it to an extent which shall prevent any water-logging both on the eastern Jumna and Ganges canals." Lower down again we find the Chief Engineer informing the Committee, "that it is under discussion in the Irrigation Department to stop or check irrigation when the water in wells is within ten or twelve feet from the surface in any period of the year;" on which the committee record "their opinion of the extreme importance of this measure." (para. 4.) Appended to these proceedings, as we have said, is a Minute by Colonel Greathed in which the subject is dealt with in detail. Here, after laying out the work for drainage operations, it is added (para. 8)—"It will be necessary in the first instance to examine all villages suspected of being water-logged or over-irrigated, * * to measure their irrigation, and to reduce it where necessary within reasonable compass."

On receipt of these papers the local Government acted with the same promptitude that has characterised all its more recent proceedings. By a Resolution, dated 23rd November, His Honor the Lieutenant Governor recorded "his concurrence in the proposals made by the Chief Engineer for carrying out the objects contemplated by the Conference, and desired that immediate effect might be given to them."

Nor has the Government of India been backward. Wherever the evils shewn can be fairly traced to the action of the Irrigation Department, that department will be charged with the expense of redress. In other cases the remedies will be applied from local funds to be aided by loans, and perhaps by grants, from the Imperial Budget. All this is very satisfactory—by far the most cheering feature being the candour and earnestness displayed by Colonel Greathed, the Chief of the Irrigation Department. Had that department shewn any jealous desire to exonerate itself, and to make use of technical jargon in order to confuse the issues of fact, there is no doubt that serious obstructions might have been raised, which would have deferred the necessary measures for an indefinite time; and time in such a case is not merely money, but human happiness, and health, and life. From the revelations made by Dr. Cutcliffe, and later by Dr. Planck, it is quite evident that the saturation of the Upper Dooab has been rapidly bringing that once-favoured region into the condition of a *terai*, where, as at the foot of the Nepal and Bhootan Hills, a few half-poisoned wretches scrape a precarious subsistence out of the sites of extinct cities, and defend it with difficulty against the wild beasts who share with them the occupation of the ruins.

That this saturation is caused by the Government canals is clear from two considerations. *It cannot be attributed to any other known cause, and it extends with the extent of irrigation.* The way in which this has come about is three-fold. The canals when out of soil, form a bank which intercepts the natural outfall of the country. They likewise, whatever be their level, silt up and damage the drainage channels, while by percolation they raise the water-table of the surrounding lands and fill the wells with water charged with organic and mineral impurities. And, lastly, from vices in the system of distribution, they furnish inducements to the cultivators to waste the water and "slop" it about the lower levels, while the uplands continue insufficiently watered, or perhaps entirely dry.

In the two former classes of evil, long and careful engineering operations will be needed before we can congratulate the public of those parts upon the attainment of a perfect cure; in the meantime, the papers before us show that the work is beginning in the right way. But for the last no suggestion is yet known to have been made. To Colonel Strachey and his gifted brother —the consistent and reasonable promoters of all sound material reform—we must now look to prevent the great blessing of irrigation from being turned into a curse. Let the pressure which it desires and expects be put upon the local Government, and its conduct up to the present point affords hopeful omens that some strenuous effort will be made. The object should be to introduce such a method of supply as shall make it the direct interest of the agriculturists to take as little water as may consist with true farming, instead of, as now, rivalling each other in corrupting the lower canal officials, that each may get more than his neighbour. Until this is done, it is obvious to any one who will attentively study the medical reports, that our brothers' blood will continue to cry against us out of the ground.—*Pioneer.*

PUBLIC WORKS—RAILWAYS.

OPENING OF THE OOMRAWATTEE SECOND STATE RAILWAY.

"FAIR OOMRAWATTEE," decked in her holiday attire and with her flowing snowy-white cotton locks waving in the breeze, was a sight well worth the witnessing on Thursday last, the 16th ultimo. On that auspicious day the fair city was wedded by bonds of iron to our western capital, or in other words, the branch line of railway which connects the cotton capital of the Berars with the main line of the G. I. P. R., has been successfully opened. This large and important cotton mart had long felt the want of proper communication. It is owing chiefly to the untiring energy of Mr. Carnac, Cotton Commissioner of the Central Provinces and Berars, ably backed up by the zeal of Colonel Nembhard, the Commissioner of East Berar, that this desideratum has now been supplied. At 11 o'clock on the 16th, a large number of European and Native gentlemen assembled in a field adjacent to the Mofussil Press and Ginning Co.'s factories, which is the site fixed for the railway terminus. The Oomrawattee police force, under their Superintendent, here formed a guard of honor. When the key was placed in its proper position by the Superintending Engineer, Hyderabad P. W. D., he delivered a beautifully got-up hammer to the Commissioner of East Berar, Colonel Nembhard, who, with two smart strokes, drove the key home, and the deed was done. The train then passed on to the station-site, and the Commissioner declared the line open. Three hearty cheers were then given for the Queen and the successful accomplishment of the affair. The police guard at the same time ordered arms and saluted the passing train. Almost all the European gentlemen present, and many of the Natives, were then invited to enter the train, which, with its heavy freight, traversed the whole line to Budnaira junction and back speedily and safely. A number of fog signals which were laid on the line exploded, on the train starting, with delightful regularity.

That part of the ceremonial having been successfully concluded, upwards of fifty gentlemen repaired to the sudder station Cutcherry, where a splendid luncheon was laid out for them. Ample justice was done by one and all to the good things supplied without stint. Many ladies from Oomrawattee and the out-stations graced the table with their presence.

PROPOSALS RELATIVE TO THE LOCATION OF THE CARWAR RAILWAY.

Extract from a letter from Major E. C. S. Williams, R.E., Deputy Secretary to the Government of India P. W. Dept., to the Secretary to the Government of Bombay P. W. Dept., Railway Branch, dated 17th January 1870.

REFERRING to my telegram* of the 3rd instant, and to your letter No. 2173, dated the 18th November 1869, and Secretary of State's despatch to the Government of Bombay, No. 47, of the 4th idem, I am directed to state that, under the present circumstances of the case, the Government of India considers it best that the Government of Bombay should at once order the commencement of the surveys it thinks necessary to complete the information which is required to admit of a final conclusion being come to on the location of the line of railway from Carwar towards Hooblee.

* * * * * *

I am to add that the Government of India has very little doubt that this line should be on a narrow gauge, and the survey should therefore contemplate such a line, and be suited to the narrower formation, which would in that case be sufficient, and the sharper curves which with the use of bogie trucks may be adopted. The Government of India would further be disposed to regard a ruling gradient of 1 in 40 as quite sufficiently good for locomotive power, and the question of adopting steep inclines with fixed engines at the Ghats should be carefully considered as suggested by Colonel Trevor. A very large traffic can certainly be worked in this way without difficulty. It is supposed that the heavy traffic will chiefly be down the incline, so that the objection to their being somewhat steep is much lessened.

The Government of India considers, on the information now before it, that the system of railways in the southern portions of the Deccan, extending even to Bangalore, should all be on a narrow gauge; and having in view the eventual development of such a system of lines, it seems desirable to locate the Ghat section in the way likely to be most suitable and convenient for the whole system rather than for any mere communication to Hooblee, or any other specific locality. The engineers should therefore generally consider, in connexion with the present enquiry, what might probably be the direction of such lines in the vicinity of the junction at Hooblee or elsewhere.

It should be borne in mind that the first essential in the preparation of this project is that it shall be shown to be financially successful. If the goods likely to be carried at the rates that could properly be charged are not likely to cover the necessary outlay and interest on capital in a reasonable time, the Government of India could not assent to the prosecution of the work at present. There can be little doubt that a far better prospect of financial success will be obtained by a narrow gauge line than a broad one in this case. Under any circumstances, however, the works both on the Ghat and on the lines in the Deccan leading to it will be heavy, and the cost of a narrow gauge line will probably be much less than that of a broad gauge, provided the system of a narrow gauge line is extended, as the Government of India has no doubt it should be, into the cotton-producing districts, for which Carwar is to be the outlet, the question of break of gauge will not in practice arise as regards the essential traffic to be dealt with.

On the whole, the Government of India is disposed to assent to the views indicated in paras. 17 and 35 of Colonel Trevor's report on the subject of the line best calculated to serve the interests of the cotton trade, and on the question of hauling the traffic over the Canara Ghats by means of fixed engines; and to regard with favour Major Goodfellow's proposal for carrying the line by the south, instead of the north bank of the Gungavelly River, the requirements of the Hooblee and Dharwar being met by a transverse line of railway to the north, which might be eventually extended to Belgaum, Kolapoor and Sattara, so as to join the Great Indian Peninsula Railway at some suitable point east of Poona. The line from Bunkapoor towards Guduk might be made to serve for a junction with Bellary, and a line to the south from Bunkapoor could connect the Carwar line with Mysore.

Colonel Trevor's conclusions in para. 41 of his report that the line from Sholapore to Bunkapoor would be a more remunerative undertaking for Government, and more advantage to the general public, but would not be as beneficial to the cotton interest as a railway from the cotton districts to Carwar,

* Arrange at once for completion of survey for railway from Carwar to Hooblee or other suitable place to be carried out under Bombay Government. Works to be suited to a narrow gauge. This arranged in communication with Governor of Bombay."

do not seem to be based on a sufficiently large view of the question. No doubt if the only question were a single line to join Hoobloe or Bunkapoor, with the sea on one side, and the Great Indian Peninsula Railway at Sholapoor on the other, the conclusion of Colonel Trevor that the latter is preferable in view of the general convenience of the community, irrespective of the cotton trade, may be sustained. But it does not seem right to the Government of India to deal with the question in this partial manner, and the future extension of lines in connexion with the approach to the harbour of Carwar is an essential consideration.

Having overcome the expected difficulties of the Ghat, it is manifest that a new highway for the export by sea of all produce from the centre of the Indian Peninsula is given, and it is in this light that the new line of railway should be chiefly viewed, and not as a mere local convenience.

In conclusion, I am directed to communicate for information copy of a memorandum, in which are embodied the general views of the Government of India on the subject of the character of the new lines of railway to be carried out by the State.

From Col. M. K. Kennedy, R.E., Secretary to the Government of Bombay, Railway Department, to the Officiating Secretary to the Government of India, P. W. Dept., dated 5th December 1870.

With reference to your No. 100, of the 17th January last, I am directed to submit, for the information of the Government of India, the result of last season's work on the location of the Carwar railway, and of the conclusions which have been arrived at therefrom by this Government. The operations of the survey parties were principally confined to the endeavour to obtain a better line than Mr. Buchanan's by the Arbyle Ghat route, and to obtain a new line by the Wuddy Ghat, as suggested in para. 7 of letter from the Government of India under reply.

Mr. Shaw also examined the Kyga Ghat, and country below the Barbully; but finding the country above and below the former would require heavier works than by the Arbyle route, that in the latter there would be a very difficult ascent to make, and that in both cases the line would run into Carwar in a most inconvenient manner, did not consider it worth while to prosecute the surveys of these passes. In this conclusion this Government concur.

On the Arbyle line the trace below the Ghat has been much improved. The principal point to ascertain, however, was the respective merits of the Arbyle and Wuddy Ghats, and the following data have been obtained, from which a comparison can be made:—

	Arbyle Ghat. M.	Chs	Wuddy. M.	Chs
Total length is ...	9	48	10	54
Rise of ...	1,291 feet...		1,432 feet.	
Average grade ...	1 in 39		1 in. 39	
	Chs.	L.	Chs.	L.
Gradients ... 1 in 30	173	36	134	0
1 in 31	...	...	128	75
1 in 32	...	...	38	50
1 in 33	110	5	...	...
1 in 35	254	20	260	35
1 in 38	...	...	92	65
1 in 39	...	...	52	40
1 in 40	42	35	...	...
1 in 50	17	10	...	...
1 in 60	2	0	...	...
1 in 70	109	25	...	...
1 in 104	...	...	62	...
Level	46	27	26	55
1 in 431	20	...	58	80

The respective length of grades, therefore, of 1 in 40 and under, are on Arbyle 580 chains, Wuddy 707 chains.

The largest continuous heavy grade of 1 in 35, and under, is on—

	Arbyle. 222 Chs.	Wuddy. 492 Chs.
Earth-work ...		
Ballast		
Retaining walls ...	In favour ...	
Permanent way ...		
Bridges and Culverts		
Rock ...		
Tunnelling ...	... In favour of	
Viaducts ...		

		None	1 Gungawully.
Principal Bridges at 10 feet and over are.	Five 10 feet.	...	Ten 10 feet.
	One 20 „	...	Two 15 „ semi.
	Two 30 „	...	Three 40 „
	...	...	One 30 „
	...	...	One 50 „
	One 60 „ G.	...	One 60 „
Total running feet of waterway, including culverts (not Gungawully) ...		473	628

Accepting Mr. Shaw's quantities on the two Ghats, but adopting higher rates in some instances than those given by him, the respective cost will be as follows:—

Arbyle.

	Rs.
975, 906 C. yds. Earth-work, 9½ as. ...	5,64,194
9 M. 48 chains Ballast, Rs. 7,000	67,200
Bridges, Culverts ...	2,06,298
16,119 Cubic yards Rock-cutting, Rs. 2-12-0. ...	44,327
2,046 L. yds. retaining walls, Rs. 50 ...	1,02,300
9 Miles 48 chains permanent way, Rs. 20,000 ...	1,92,000
88 L. yds. tunnel, Rs. 274 ...	24,112
Total...	12,06,428
Add 10 per cent. contingencies...	1,20,042
	13,20,470

Wuddy.

	Rs.
1,029,356 C. yds. earth-work, at 9½ as. ...	5,93,840
10 M. 54 Chs. Ballast, at Rs. 7,000 ...	74,725
Bridges, Culverts ...	4,18,100
Laterite, 24,248, at Rs. 1. ...	24,248
2,640 L. yds. retaining walls, at Rs. 50 ...	1,32,000
10 M. 54 chains permanent way, at Rs. 20,000	2,13,500
Gungawully, 10 spans of 90 feet, at Rs 400 a running foot	3,60,000
Total...	18,16,413
Add 10 per cent. contingencies ...	1,81,641
	19,98,054
	13,20,470
Difference in favour of Arbyle ...	6,77,584

Say, with extra length of fencing, side ditches, &c., 7 lakhs.

The principal points that were urged in favour of the Wuddy over the Arbyle were as follows:—

1st.—That it would probably prove more healthy.

2nd.—That an easier and cheaper line would be obtained.

3rd.—That it would be preferable for the cotton trade to take the line to Guduk via Sirci and Bunkapoor, than via Yellapoor and Hoobloe.

With regard to the 1st point, Mr. Shaw reports that "at the conclusion of the Wuddy Ghat survey on the 12th June, out of a survey party of 7 Europeans and 3 Natives, 6 Europeans and 2 Natives were sick, and the coolies also suffered severely."

With regard to the 2nd point, actual survey has shown that an easier and cheaper line is obtainable by the Arbyle line, which also avoids an expensive crossing over the Gungawully river, and has the advantage of a made road in close proximity the whole way.

With regard to the third point, the Government of India having declared the line to Carwar down the Ghat was to be regarded not as a local convenience, but as an outlet to a new seaport of the product of the centre of the Indian Peninsula, and having also stated that lines are to branch off from it to north to Belgaum, Kolapoor, &c., to the south to Bangalore, and to the coast to Bellary, it is obviously desirable that a large centre of trade, likely Hoobloe, should be selected as the converging point of these several lines instead of a small village like Bunkapoor. A line from Bunkapoor to Guduk would run for half its length through Native States, while a line from Hoobloe to that town would pass exclusively through British territory; and it does not appear that the former, as regards the cotton traffic, would have any advantage over the latter.

The above points having been taken into consideration, this Government have finally determined in favour of the Arbyle Ghat route, and Mr. Shaw has been directed to complete the survey from Carwar to Guduk, laying out the line between Yellapoor and Hoobloe, with a view to a branch to Bunkapoor.

The result of the changes on the Arbyle Ghat route may be summed up as follows:—

1st.—The length of the railway has been increased from 55½ to 61¼ miles.

2nd.—The ruling gradient on the Ghat is now 1 in 30, instead of 1 in 17.

3rd.—The ruling gradient on the remainder of the line has been lowered from 1 in 60 to 1 in 85.

4th.—The curves have been sharpened from a minimum radius of 12 to 4½ chains.

5th.—The length of the tunnelling has been reduced from 3,019 to 398 lineal yards.

6th.—The average depth of earth-work is now 9, instead of 10½ feet.

7th.—The cost of carrying out the work is reduced by about 10 per cent.

The mileage cost of a 3 feet 6 inch gauge railway, with curves of minimum radius of 4½ chains, as far as it can now be arrived at, will probably be £10,000. It is probable that this average may be still further reduced by a reduction of the gauge to 2 feet 9 inches, by reducing the curves to a minimum of

3 chains, and by the extensions proposed over the easier country above the Ghats.

In para. 25 of Colonel Trevor's printed report, the net profits are calculated at Rs. 6,000 per mile, without taking into account the indirect profits alluded to in his para. 26. It is therefore considered that the financial prospects of the line are sufficiently encouraging to render the active prosecution and completion of the survey both advisable and important.

From Major E. C. S. Williams, R.E., Depy. Secy. to the Govt. of India, P. W. Dept., to the Secy. to the Govt. of Bombay, P. W. Dept., Railway Branch, dated 13th January 1871.

I am directed to acknowledge the receipt of your letter No. 1586, dated the 5th December last, summarising the results of the last season's surveys of the alternative routes for the railway from Carwar to the Deccan near Dharwar, and intimating that the Government of Bombay prefer the Arbyle Ghat route, and have issued instructions for the completion of the survey from Carwar to Guduk, the line between Yellapoor and Hooblee being laid out with a view to a branch at Bunkapoor.

The previous reports submitted to the Government of India leave little room for doubt that Hooblee with its 50,000 inhabitants, probably the most populous town in the Deccan south of Poona, and the centre of a large and valuable trade, should be on any line of railway constructed in this district. Dharwar with its 30,000 inhabitants also has strong, though secondary, claims. Bunkapoor is a large village, but a place of no trade. The best New Orleans cotton is grown in its vicinity, but the growers find their market at Coompta and not at Bunkapoor, which, equally with Hooblee and Dharwar, is on the margin of the cotton-field. Some extension into the heart of the cotton-field, perhaps to Guduk, may, therefore, be proper, but the alignment of an eastern extension should not be made without reference to a future connection with the Madras Railway system.

The north and south line of the Southern Mahratta Railway will probably pass from Mysore through Bunkapoor, Hooblee, and Dharwar. Wherever, then, the point of junction with the Carwar line may be, Bunkapoor, as well as Hooblee, will, sooner or later, be included within the railway system, and it is important that the least amount of line in the aggregate shall be constructed. In this view the minor proposal of the Bombay Government to deflect towards Turrus the line between Yellapoor and Hooblee commends itself for adoption as an advantageous deviation from the direct line via the Arbyle Ghat, the general conclusion of the Bombay Government in favour of which is accepted by the Governor-General in Council, in so far as the information placed before the Government of India allows of an independent judgment of the merits of the two lines.

The question as to the method of working by a fixed incline and what Ghat is best suited for that, is not touched upon, but the ascent to the top of the Wuddy is 141 feet higher than to the summit of the Arbyle Ghat. The former is upwards of 1 mile longer, and has 1½ mile more of gradients under 1/40. The terminus inland, whether Bunkapoor or Hooblee, is, however, considerably higher than the summit of either Ghat, so that this concentration of ascent by the Wuddy Ghat might, other things being equal, prove an advantage. The Government of India would wish to see the sections last run by the Arbyle and Wuddy Ghats, the former via Yellapoor, the latter via Sirci and Bunkapoor, and I am directed to request that they may be forwarded.

BENGAL FISHERIES.

We understand that an important economical question has been raised with regard to Indian fisheries. In a fluvial province like lower Bengal, fish is one of the most valuable resources of the country. It is, in fact, almost the only animal food which the religious prejudices of the higher ranks, and the poverty of the lower classes, have left within the reach of the Hindoo. Beef and fowls he cannot touch; mutton or goat flesh is beyond the income of nine out of every ten families in the province. Yet a rice-eating people requires in a special degree some condiment consisting of animal food. From the days of Homer, the vegetarian peasantry of Southern Europe have seasoned their farinaceous diet with salt fish. In Bengal, every rivulet, water-channel, tank, and marsh, is made to contribute its quota of minnows or prawns, and a scarcity of fish tells very severely upon the health and strength of the husbandmen in any district in which it takes place.

Yet it seems indubitable that Bengal is now threatened with a permanent fish famine. No province seems so capable of defying mismanagement and reckless slaughter of the finny tribes, consisting, as it does, of three great deltas, each of which spreads out an endless network of rivers, channels, marshes, and lakes. There is, in the first place, the delta of the Brahmaputra, with its feeders from the Assam and the Cachar valleys, and their innumerable bifurcations and lake-like swamps. There the population is still comparatively sparse, and the supply of fish unlimited. Proceeding westward to the Gangetic delta, we find the tanks and water-courses less fruitful, the larger fish exhausted, and the fishermen compelled to have recourse to a smaller mesh net in order to earn a livelihood. We speak at present of those castes who fish, not from boats, but on the banks of rivers and tanks; in short, within their depth. In the western districts of Bengal, the change becomes more and more marked, and miserable minnows form the peasants' staple supply of fish. But it is in the third delta, that of the Mahanadi, in which the evil attains its climax. The Mahanadi and its distributaries have recently been examined by a specially qualified officer, and the result leaves no doubt that Orissa is now practically being denuded of wholesome fish. The tanks, swamps, and minor channels, have lost all their larger varieties, and the fishermen now live by catching the small fry of the large estuary fishes. These fishes come inland to spawn, and no sooner are the eggs hatched then the miserable little swarms are caught by the all-devouring Uriya net. As the fish famine becomes more and more severe, the fishermen go on decreasing the size of the mesh of their nets, until at length nothing can escape them. In this way, millions of small fry are massacred every month, each one of which, had it been allowed to find its way down into the estuary, would have grown into a fine fish, and returned in due course, according to the laws of its nature, to the inland streams.

Many of these facts have long been known to Indian naturalists. The question is, how to remedy the evil? The damage proceeds in some districts from causes within the control of Government. Irrigation weirs, unless furnished with adequate machinery, prevent the access of the fish to the upper parts of the rivers; and, as a matter of fact, in the next delta down the coast, that of the Godavery, many fine fisheries were thus destroyed. This deficiency has now been remedied, and Surgeon Day's inexpensive system of fish ladders has rendered irrigation absolutely innocuous to the fish. In Orissa the great weirs or anicuts are furnished with flood-gates, which furnish a free passage for the finny tribes. Care ought to be taken however that these passages are kept open, and not turned into vast traps, at each side of which the fishermen lurk for their prey. But the only real remedies for the wholesale destruction of fish are unfortunately of a much less simple character. Three different systems have been proposed. The first is that Government should resume the fisheries, and either grant them or let them out to individual persons or communities, whose self-interest would thus be enlisted in maintaining the value of their individual fisheries, and in preventing the wholesale extermination of the fish. The fishing castes are perfectly alive to the damage which the destruction of the small fry causes; and in the Madras districts, where the fisheries have thus been let out, each little community is most vigilant in preserving the value of its fishery farm. Such a scheme however would involve an amount of Government interference which could not be conveniently ventured upon in Bengal.

The second remedy is the enforcing of close seasons. No doubt the small fry of the larger fishes could be protected in this way; but this, too, would necessitate a great deal of vexatious intermeddling with what the people have always been accustomed to consider as one of their rights. Nor would it be possible to effect much good by this means, unless the close season was extended over a very large part of the year. To protect even a single fish, certainly the most valuable one—the hilsa—the close season would have to extend over an aggregate of nine months in the different presidencies. The hilsa breeds at different seasons in the northern rivers and the southern ones, and again at different seasons in the rivers of eastern and of western India. Putting together all the different months in which the small fry would require protection in the various provinces, an aggregate of nine has been ascertained to be required. If efforts were also made to protect the other varieties of valuable fish, the close season would be still further extended. Nor have we at present a sufficient knowledge of the habits of Indian fishes to be able safely to say when the close season should begin, and when it should end, in each separate district. We only know that the close season would have to be fixed during different months in different parts of the country, and the remedy would involve a very great hardship among the fisher castes, who would thus be thrown out of work during several months of each year.

The third and most practicable scheme appears to consist in the regulation of the size of the meshes of the nets. Wherever fish is scarce, the mesh is decreased, so as to catch what was formerly allowed to escape. The fishermen of Orissa complain that, as they have contracted the size of the mesh, the fisheries have become less productive, and their fortunes have declined. In truth, the one is a corollary of the other. As the large fish disappear, the fishermen try to eke out their livelihood by catching the small fry, and, once the massacre of the small fry begins, the total extermination of the large varieties is only a question of time. The size of the mesh is most carefully regulated in England, and the small fry are protected by severe penal restrictions. We propose on a subsequent morning to consider how far such a system could be safely applied in India. Meanwhile, the facts before us leave no doubt that both Orissa and Bengal are being drained of one of the most important of their natural resources.

PRICES OF FOOD THROUGHOUT INDIA.—IN SO MANY SEERS $2\frac{3}{36}$ lbs. PER RUPEE.

BENGAL. (Rice the staple food.)		Rice.	Wheat.	Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27	19½	"	"
	Bancoorah	27	18½	"	"
	Beerbhoom	21	20	"	"
	Hooghly	19	19	"	"
	Howrah	19	15	"	"
	Midnapore	26	10	"	"
Orissa "	Balasore	34	13	"	"
	Cuttack	26	13	"	"
	Pooree	31½	10½	"	"
Assam "	Durrung	21	8	"	"
	Goalparah	17	32	"	"
	Kamroop	20	13	"	"
	Luckimpore	13	13	"	"
	Nowgong	16		"	"
	Seebsangor	16	10	"	"
Dacca "	Dacca	22	11	"	"
	Backergunge	22	13	"	"
	Furreedpore	22	18	"	"
	Mymensing	24	18	"	"
	Sylhet	26	8	"	"
	Cachar	26½	12½	"	"
Patna "	Patna	23	25	"	"
	Gya	23	23	"	"
	Chumparum	25	24	"	"
	Sarun	22	22	"	"
	Shahabad	24	22	"	"
	Tirhoot	24	22	"	"
Bhaugalpore "	Bhaugalpore	30	29	"	"
	Monghyr	26	26	"	"
	Purneah	30	20	"	"
Sonthal Pergns.	Godda	38	14	"	"
	Nya Doomkah	32	16	"	"
	Rajmehal	30	32	"	"
	Deoghur	28	20	"	"
Presidency "	Calcutta	...	...	"	"
	Nuddea	23	20	"	"
	Jessore	25	15	"	"
	24 Pergunahs	21	10	"	"
Rajshahye "	Rajshahye	27	18	"	"
	Bograh	34	15	"	"
	Dinapore	36	18	"	"
	Maldah	30	25	"	"
	Morshedabad	20	27	"	"
	Pubna	20	20	"	"
	Rungpore	31	18	"	"
Chota Nagpore "	Lohardugga	27	14	"	"
	Hazareebagh	24	20	"	"
	Manbhoom	32	15	"	"
	Singhbhoom	48	18	"	"
Chittagong "	Chittagong	22	10½	"	"
	Bulloah	25	...	"	"
	Tipperah	26	14	"	"

NORTH WESTERN PROVINCES (Wheat and Joaree the staple food.)		Rice.	Wheat.	Joaree.	Bajra
Meerut Division.	Sohra Dhoon	16	13	34	31
	Saharunpore				
	Moozuffernugger				
	Meerut				
Kumaon "	Boolundshuhur	15	18	...	...
	Kumaon				
Rohilkund "	Gurhwal	19	25	24	32
	Bijnour				
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
Agra "	Terai Pergunahs	17	24	2	27
	Muttra				
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
Jhansie "	Etah	13	20	34	24
	Jaloun				
	Jhansie				
Allahabad "	Lullutpore	17	20	24	23
	Cawnpore				
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
Benares "	Jounpore	17	18	21	22
	Goruckpore				
	Bustee				
	Azimgurh				
	Mirzapore				
	Benares				
Ajmere "	Ghazeepore	8	14	22	18
	Ajmere				

OUDH, 31st January. Wheat and Joaree the staples.		Rice.	Wheat.	Joaree.	Bajra
Lucknow "	Lucknow	18	22	26	25
	Ooras				
	Baraburkee				
Seetapoor "	Seetapoor	20	26	31	31
	Hurdui				
	Kheree				
Fyzabad "	Fyzabad	21	25	29	23
	Baraich				
	Gondah				
Roy Bareilly "	Roy Bareilly	19	20	26	23
	Suttapoor				
	Pertabghur				

PUNJAB, January. (Wheat and Joaree the staples)		Rice.	Wheat.	Joaree.	Bajree.
Delhi Division.	Delhi	9	20	27	26
	Gurgaon				
	Kurnal				
Hissar.	Hissar	15	17	27	24
	Rohtuk				
	Sirsa				
Amballa.	Amballa	14	23	37	29
	Ludianah				
	Simla				
Jullundhur.	Jullundhur	14½	23	35	29
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	9½	19	27	33
	Syalkot				
	Gurdaspore				
Lahore.	Lahore	13	18½	26	23
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	9	16	23	20
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	16	23	21
	Jhung				
	Montgomery				
	Mozaffnuggur				
Deera I. Khan.	Deera I. Khan	6½	14½	23	19
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	6	13½	20½	18
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree the staple food.)		Rice	Wheat	Joaree
Nagpore.	Nagpore	15	15	23
	Bhundara			
	Chanda			
	Wurdah			
	Balaghat			
Jubbulpore.	Jubbulpore	16	19	31
	Saugor			
	Dumoh			
	Mundla			
	Seonee			
Nerbudda	Baitool	12	15	22
	Hoshungabad			
	Chindwara			
	Nursingpore			
	Nimar			
Fhuttehgurg.	Raepore	3	23	..
	Belaspore			
	Sumbulpore			
Upper Godavery.	Seroncha			

Seers per Rupee

MADRAS. Rice and Cholum (Joaree) the staple food.		Rice	Joaree
Northern Section.	Ganjam	243	236
	Vizagapatam	204	146
	Godavery	214	120
	Kistna	304	192
	Nellore	305	186
Ceded Districts.	Cuddapah	382	183
	Bellary	370	143
	Kurnool	392	184
East Centre	Madras	423	196
	North Arcot	235	122
	South Arcot	236	116
Sauvery.	Tanjore	235	117
	Trichinopoly	244	114
Southern Section.	Madura	347	143
	Tinnevelly	409	231
West Centre.	Goimbatore	367	185
	Neilgherriees	533	278
	Salem	...	...
West.	South Canara	333	...
	Malabar	351	..

Quotations are—so many Rupees per Garce = 3960 lbs.

BOMBAY PRESIDENCY. Rice, Bajree, and Joaree the staples.		Rice	Joaree
Northern Division.	Ahmedabad	Rs. 4	Rs. 2½
	Kaira	3½	2½
	Surat	3½	3½
	Tannah		
Southern Division.	Poonah	3½	2½
	Ahmednuggur		
	Kulladghee	3½	1½
	Rutnagherry	3	
	Belgaum	3	1½
	Dharwar	3	1½
	Sattara	4	2½
	Carwar		2½
Sindh	Kurrachee		2½
	Hyderabad		2½
	Sukkur	3	2½

Rupees per Maund of 82 lbs.

BURMAH. Rice, the staple.		
Arakan.	Arakan	No Returns
	Ramree	
	Sandoway	
	Northern Arakan	
Pegu.	Rangoon	"
	Bassein	
	Myanoung	
	Promo	
	Tounghoo	
Tenasserim	Amherst	"
	Tavoy	
	Mergui	
	Shevegyeen	

THE PUBLIC REVENUE AND EXPENDITURE.

Revenue and Expenditure of the Government of India for the first *nine* months of the year 1870-71, as compared with the corresponding period of 1869-70.

Revenues and Receipts.	April to Nov. 1869.	April to Nov. 1870.	Increase.	Decrease.
	£	£	£	£
Land Revenue	12,336,400a	12,378,230a	41,830	...
Tributes, &c., from Native States	450,440	530,196	73,756	...
Forest	276,233	247,164	...	29,069
Excise on Spirits and Drugs	1,623,767	1,733,006	109,239	...
Assessed Taxes	638,177b	1,404,103b	765,926	...
Customs	1,665,645	1,840,584	174,939	...
Salt	4,154,140	4,466,221	312,081	...
Opium	5,935,125	5,930,752	...	4,373
Stamps	1,673,408	666,058	...	1,007,350
Mint	123,331	27,079	...	96,252
Post Office	489,635	622,069	132,434	...
Telegraph	130,897	177,023	46,126	...
Law and Justice	697,848	1,839,500	1,141,652	...
Police	201,162	191,703	...	9,459
Marine	128,425	174,057	45,632	...
Education	59,160	49,252	...	9,908
Interest	257,899	222,710	...	35,189
Miscellaneous	596,342	436,232	...	160,110
Total	31,444,034	32,935,939	2,843,615	1,351,710
	From April to	Nov. only.		
Army Miscellaneous	603,295	550, 405	...	52,890
Public Works Ordinary. Miscellaneous Receipts	95,385	88,883	..	6,502
Public Works Ordinary. Railway Exchange, Gain	296,245	92,785	...	203,460
Public Works Ordinary. State Railways Traffic Receipts	6,690	3,543	...	3,147
Do. Extraordinary do Capital Account	...	2,875	2,875c	...
Total Revenues ...£	32,445,649	33,674,430	2,846,490	1,617,709

Expenditure.	April to Dec. 1869.	April to Dec. 1870.	Increase.	Decrease.
	£	£	£	£
Interest on Funded and Unfunded Debt	1,981,158	2,103,937	122,784	...
Interest on Service Funds and other Accounts	382,654	349,441	* ...	33,213
Refunds and Drawbacks	267,697*	255,129*	...	12,568
Land Revenue	1,683,230	1,668,215	...	15,015
Forest	208,986	272,058	63,072	...
Excise on Spirits and Drugs	177,173	226,570	49,397	...
Assessed Taxes	28,364	32,468	4,104	...
Customs	136,335	138,728	2,393	...
Salt	291,424	273,772	...	17,652
Opium	1,491,947	1,706,309	214,362	...
Stamps	75,670	42,784	...	32,886
Mint	64,820	44,210	...	20,610
Post Office	488,603	473,174	...	15,429
Telegraph	292,893	230,770	...	62,123
Administration	868,486	844,683	...	23,803
Minor Departments	157,559	148,441	...	9,118
Law and Justice	2,111,814	2,176,500	64,686	...
Police	1,789,573	1,667,404	...	122,169
Marine	312,502	279,939	...	32,563
Education	464,510	437,099	...	27,411
Ecclesiastical	119,395	113,062	...	6,333
Medical Services	335,982	354,883	18,901	...
Stationery and Printing	179,386	165,158	...	14,228
Political Agencies	284,362	191,505	...	92,857
Allowances, &c., under Treaties & Engagements.	949,122	972,138	23,016	...
Miscellaneous	484,357	616,007	131,650	...
Superannuation, &c., Allowances	494,075	523,988	29,913	...
Total	16,122,072	16,308,372	724,278	537,978
	From April to	Novem- ber only.		
Army	8,329,035	7,811,341	...	517,694
Public Works Ordinary. Public Works Railways Guaranteed.	3,604,309	2,218,624	...	1,385,685
Public Works Ordinary. Railway Exchange, Loss.	44,141	55,019	10,878	...
Public Works Ordinary. State Railways	213,223	84,195	...	129,028
Do. Extraordinary—Irrigation, &c.	2,785	4,965	2,180	...
State Railways	599,231	416,496	...	182,735
Total Expenditure...£	19,107	143,534	124,427	...
	28,933,903	27,042,546	861,763	2,753,120

a Includes Irrigation receipts in the Public Works Department up to November only.

*(b) Includes Income Tax realized in the Military and Public Works Departments up to November only.

* Includes Refunds in the Military and Public Works Department up to November only.

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 28th day of February 1871.

Date.	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1870.							
15th December...	27,82,760	15,02,500	20,79,100	55,77,700	22,46,500	2,69,59,000	4,11,47,560
31st December...	27,12,550	14,75,060	20,22,000	54,09,300	22,61,000	2,71,76,000	4,10,55,910
1871.							
22nd February...	26,83,030	14,20,620	20,77,100	51,41,200	19,21,000	3,14,63,000	4,47,05,950
28th February...	26,37,490	13,94,200	21,30,350	49,97,300	19,17,000	3,19,70,000	4,50,46,340

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Retired by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
31st Jan., 1871...	Calcutta	3,93,17,370	1,67,020	3,91,50,350	*1,26,86,796	35,08,488	3,12,495	1,42,42,231	3,07,50,010
Ditto ...	Madras	1,00,12,610	10,69,180	89,43,430	57,48,316	...	...	17,28,404	74,76,720
Ditto ...	Bombay	4,38,83,460	46,99,220	3,91,84,240	2,67,87,238	16,15,371	...	1,31,49,861	4,15,52,470
Ditto ...	Allahabad ..	94,46,110	28,69,960	65,76,150	72,32,669	...	...	11,03,291	83,35,960
Ditto ...	Lahore	67,39,380	31,03,190	36,36,190	54,35,783	...	...	7,00,037	61,35,820
Ditto	Calicut	16,27,870	6,54,410	9,73,460	13,11,161	...	...	1,00,059	14,11,220
Ditto ...	Trichinopoly	21,09,480	17,06,430	4,03,050	17,86,891	...	...	1,00,059	18,86,950
Ditto ...	Vizagapatam ...	5,45,340	2,01,330	3,44,010	3,17,821	.	...	1,00,059	4,17,880
Ditto ..	Nagpore	34,81,080	1,00,300	32,80,780	27,38,898	...	...	5,47,902	32,86,800
Ditto ...	Kurrachee	47,32,290	22,35,980	24,96,310	41,97,454	..	.	5,00,106	46,97,560
Ditto ...	Akola	26,83,930	1,18,730	25,65,200	16,01,780	...	...	...	16,01,780
	Total ...	12,44,78,920	1,69,25,750	10,75,53,170	6,98,44,807	51,23,859	3,12,495	3,22,72,009	10,75,53,170

SILVER received and coined in the MINTS OF CALCUTTA, MADRAS, and BOMBAY, 1870-71.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
July	1,201	2,722	9,30,351	...	3,594	...	88	1,03,558	26,51,675
August	66,565	2,020	...	...	644	...		43,631	11,23,536
September	39,122	3,28,445	...	...	...	...	40,524	49,655	3,28,585
October	8,487	2,12,373	...	...	8,903	...	8,241	1,09,213	1,53,625
November	520	59,349	...	...	3,806	...	1,44,504	92,117	...
December	2,600	1,81,929	...	...	...	...	...	1,61,541	...

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1870-71 contrasted with previous Years.

	July.	August.	October.	November.	December.	Jan. 1871.
	Rs.	Rs.	Rs.	Rs	Rs.	Rs.
Government of India	1,52,43,515	1,36,15[illegible]5	1,47,55,373	1,83,59,723	1,99,80,320	2,84,18,697
Bengal	1,23,40,473	1,12,23,[illegible]7	1,28,20,478	1,21,74,892	1,38,42,355	1,75,89,650
British Burmah	28,44,725	32,10,[illegible]0	41,59,849	36,45,337	31,82,587	21,54,993
North-Western Povinces	2,39,69,426	2,14,98,0[illegible]	1,52,06,179	1,96,74,077	2,34,78,368	2,66,91,640
Oudh	62,19,612	53,75,64[illegible]	36,55,325	47,42,276	58,39,690	65,27,100
Punjab	1,17,81,232	1,08,05,965	83,31,333	92,46,874	1,11,23,599	1,11,97,672
Bombay	3,05,03,255	2,35,10,012[illegible]	1,83,78,618	1,83,67,631	1,79,41,554	2,36,81,651
Central Provinces	63,53,106	61,53,053	56,31,696	56,52,447	61,08,760	78,77,193
Madras	3,07,95,845	2,75,09,862	2,43,76,457	2,56,50,415	2,69,76,113	2,85,61,842
	14,00,50,689	12,29,02,765	10,73,15,338	11,75,13,372	12,84,73,346	15,27,03,438
The same month 1868-69	11,00,92,380	9,63,10,342	[illegible],89,69,348	7,15,22,402	8,01,62,355	87,68,640
Ditto 1869-70	10,94,54,805	10,02,49,204	[illegible],04,14,121	8,14,11,652	977,02,951	11,83,90,970

THE BANK OF BENGAL.

Statement of Affairs.	28th Feb. 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 3
Reserve Fund	15,66,639 7 3
General Treasury Balance at Head Office ...	4,36,01,569 11 4
Ditto ditto at Branches...	1,56,63,316 4 1
Other Deposits at Head Office and Branches ...	3,25,32,095 5 6
Bank Post Bills, &c.	4,81,940 6 9
Sundries	6,05,920 6 9
Total Rs. ...	10,22,41,564 13 6
Assets.	
Government Securities	1,24,26,633 12 0
Loans on Government Securities at Head Office and Branches	56,49,161 3 9
Accounts of Credit on do. do. ...	23,27,147 6 0
Mercantile Bills discounted at do. ...	1,96,58,076 14 0
Dead Stock	11,80,234 7 10
Stamps	14,654 2 0
Balances with other Banks	5,09,075 6 0
Sundries	1,73,181 5 1
Cash ... Currency Notes at Head Office ...	2,27,37,304 4 9
Cash and Currency Notes at Branches	3,75,66,046 0 1
Total Rs. ...	10,22,41,564 13 6

THE NEW BANK OF BOMBAY.

Statement of Affairs.	25th Feb. 1871.
Liabilities.	Rs. A. P
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital ...	10,00,000 0 0
General Treasury Balance	64,10,546 0 0
Deposits at Head Office	2,12,76,991 0 0
Deposits at Branches	41,64,323 0 0
Bank Post Bills outstanding	10,31,205 0 0
Reserve	14,15,000 0 0
Undrawn Cash Credits	5,48,374 0 0
Total Rs. ...	3,98,39,542 0 0
Assets.	
Government Securities	17,95,817 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	11,00,640 0 0
Credit Accounts do do. on Gov. Sec. ...	8,529 0 0
Bills discounted and purchased at do. ...	74,46,511 0 0
Dead Stock and Less written off	4,84,152 0 0
Stamps	6,544 0 0
Balance with Agents and Correspondents ...	10,29,651 0 0
Overdrafts	9,202 0 0
Government Reserve Cash	... ...
Cash and Currency Notes at Head Office ...	2,49,86,204 0 0
Do do. at Branches...	... ..
Bullion at H. O. and Branches ...	7,98,005 0 0
Total Rs. ...	3,98,39,542 0 0

THE BANK OF MADRAS.

Statement of Affairs.	25th Feb. 1871.
Liabilities.	Rs. A. P.
Capital	56,25,000 0 0
Public Deposits at Head Office	56,02,020 2 9
Do. at Branches	43,19,751 8 8
Other deposits at Head Office and Branches ...	1,14,89,118 4 4
Cash Credits undrawn at do.	2,54,502 6 4
Post Bills	1,51,560 5 7
Reserve Fund	5,62,500 0 0
Rest	1,02,822 5 0
Total Rs...	2,80,07,275 0 8
Assets.	
Silver and Notes at Head Office	30,65,391 1 8
Silver and Notes at Branches	97,27,379 9 1
Government Securities	8,83,710 0 0
Government Reserve—Cash	31,02,020 2 9
Securities	....
Loans at Head Office and Branches ...	17,65,293 3 0
Accounts of Credit at Head Office and Branches	7,07,610 0 0
Mercantile Bills discounted at Head Office and Branches	64,90,081 3 0
Dead Stock at Head Office and Branches ...	2,54,565 2 11
Bills of Exchange do.	16,38,610 10 8
Due by other Banks	3,72,614 0 0
Total Rs...	2,80,07,275 0 8

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54.	4 per cent. Loan. of 1824-25.	of 1828-29.	of 1832-33	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	4½ per cent. of 1856-57.	Transfer Loan dated 15th July 1870.	5 per cent. P. W of 1854-55.	of 1856-57.	5½ per cent. Loan of 1859-60	5 per cent. Debentures for 2 years Repayable Jan. 1869.	2 years 4½ per cent Transfer. Loan.	3 years. Repayable Jan. 1870.	3 years. 4½ per cent Transfer Loan.	5 years. Repayable June 1872.	10 years. Repayable June 1877.	15 years. Repayable June 1877.	Total Amount.
30th June 1870....	53,100	34,133	2,146	20,82,134	40,06,600	1,51,02,600	1,39,82,900	1,39,72,500	14,500	46,22,700	3,03,700	5,74,02,900	4,29,28,600	.....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	34,04,000	16,40,12,713
30th July 1870....	53,100	34,133	2,773	20,60,480	41,11,800	1,49,64,900	1,22,64,000	1,52,05,600	14,500	46,50,900	2,52,700	5,69,16,600	4,32,06,800	.....	60,000	1,65,000	12,07,000	33,08,000	33,60,000	33,14,000	16,50,92,236
31st August 1870.	53,100	34,133	2,773	20,60,480	41,14,200	1,50,24,400	1,23,05,700	1,65,85,700	14,500	47,21,500	2,46,200	5,76,46,500	4,41,02,800	.....	...	1,65,000	13,50,000	33,08,000	23,60,000	32,04,000	16,52,98,986
30th Sept. 1870...	53,100	34,133	2,347	20,54,614	42,06,200	1,51,31,600	1,24,03,300	1,72,67,700	14,500	47,94,500	2,25,100	5,84,23,000	4,52,18,300	.....	..	1,65,000	12,90,000	33,58,000	33,60,000	36,00,000	17,16,01,396
31st Oct. 1870....	53,100	34,133	2,347	20,54,614	42,11,700	1,53,35,300	1,24,27,600	1,83,32,400	14,500	48,05,000	2,03,300	5,87,81,000	4,63,50,000	.....	...	1,65,000	18,60,000	33,58,000	34,15,000	36,16,000	17,50,18,994
30th Nov. 1870 ...	53,100	34,133	2,347	20,52,908	42,62,900	1,53,63,100	1,25,12,000	1,88,67,600	14,500	48,29,500	1,35,700	5,92,13,300	4,76,20,000	.. ...	...	1,65,000	.....	33,63,000	34,16,000	36,19,000	17,73,74,238
31st Dec. 1870....	53,100	34,133	2,347	19,59,468	41,43,100	1,52,55,100	1,23,79,800	1,83,26,100	14,500	48,78,100	87,700	5,96,27,700	4,88,75,900	.....		33,63,000		.....	33,46,000	36,43,000	17,80,14,048
28th Feb. 1871 ...	53,100	34,133	2,347	19,58,935	41,45,000	1,52,22,200	1,23,95,000	1,84,22,500	14,500	48,84,500	82,700	5,99,10,100	4,86,76,300	.....	....	1,65,000	18,60,000	33,87,000	33,46,000	36,81,000	17,82,40,315

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Divid.	Quotations.
Banks			
Agra Bank, Limited, A.	£10	1½ p. c.	100 a 112
Ditto, new contributory A.	10	.....	100
Ditto B. Shares	415	.....	....
Agra Savings' Bank	100	.....	130 a 130
Allahabad Bank, Limited	100	5 p. c.	100 a 102
Bank of Bengal	1000	2½ p. c.	1390 1390-1390
Bank of Calcutta, Limited, A.	38½	3 p. c.	20
Ditto ditto B.	50	3 p. c.	20 a 25
Bank of Upper India	50	6 p. c.	61 a 62
Delhi and London Bank, Limited	250	1½ p. c.	140 a 145
Mussoorie Savings' Bank	100	6 p. c.	135 a 140
National Bank of India	£124	2½ p. c.	108 a 109
Oudh and United Service, Limited	100	*nil.*	*in liqdn.*
Punjaub Bank, Limited	100	½ p. c.	80 a 80
Simla Bank, Limited	500	6 p. c.	145 a 550
Uncov. Ser. Bank (Agra)	100	4 p. c.	90 a 95
United Bank of India	100	5 p. c.	90 a 91
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	*nil.*	390 a 400
Ditto ditto	200	*nil.*	80 a 82
Bengal Coal Co., Limited	1000	5 p. c.	1440 a 1450
Bonded Warehouse	445	20 p. sh.	530 a 535
Brunton's Press Co., Limited	300	4 p. c.	170 a 175
Burdwan Stone Co., Limited	100	5 p. c.	8 a 12
Calcutta Docking Co., Limited	700	*nil.*	270 a 280
Ditto New ½ Shares	350	*nil.*	135 a 140
Delhi Railway Co.	218-2-10	2½ p. c.	228 a 230
Eastern Bengal Indigo Co.	100	*nil.*	24 a 25
Eastern Bengal Railway	218-2-10	2½ p. c.	235 a 236
Eastern Steam Tug Co., Limited	250	*nil.*	100 a 125
East India Railway Co.	18-2-10	2½ p. c.	248 a 250
Equitable Coal Co., Limited	250	5 p. c.	220 a 222½
Goosery Cotton Mills Co.	200	5 p. c.	208 a 210
Gourepore Co., Limited	1000	6 p. c.	1250 a 1300
Ditto ½ Share	125	.....	102 a 103
Great Eastern Hotel Co	250	2 p. c.	160
Howrah Docking Co., Limited	500	*nil.*	150 a 160
India General S. N. Co	1000	2 p. c.	340 a 350
Ditto ditto, ½	500	2 p. c.	170 a 175
Ditto ditto, ¼	250	2 p. c.	80 a 82½
Landing and Shipping Co.	100	7 p. c.	48 a 49
Nanmyth's Pat Press Co.	500	2½ p. c.	700 a
Oriental Gas Co.	£5	½ p. c.	65 a 70
Ditto (Contributory)	£1	½ p. c.	13 a 14
Oudh and Rohilcund Railway	£10	2½ p. c.	10s
Port Canning Land Co.	1400	*nil.*	270 a 280-275
Punjab Railway Co.	£20	2½ p. c.	228 a 230
R. Scott Thomson & Co.	250	3 p. c.	215 a 220
Tirhoot Indigo Limited	200	*nil.*	50 a 52-51-50
Tea Companies.		*Yearly.*	
Assam Tea Company	100	6 p. c.	210 a 212
Bengal Tea Co., Limited	100	5 p. c.	40 a 45
Ditto (Contributory)	60	5 p. c.	18 a 20
Bonnauth Tea Co., Limited	200	*nil.*	145 a 150
Ditto (Contributory)	50	*nil.*	30 a 35
Central Cachar Tea Co.	200	2 p. c.	55 a 58
Dehing Tea Co., Limited	85	*nil.*	14 a 15
Dehra Doon Tea Co., Limited	100	*nil.*	10 a 12
Durrung Tea Co., Limited	100	*nil.*	30 a 31
Eastern Cachar Tea Co.	100	8 p. c.	92 a 93
East India Tea Co., Limited	100	*nil.*	25 a 26
Jellalpore Cachar Tea Co.	250	6 p. c.	260 a 270
Kunchanpore Tea Co., Limited	1000	*nil.*	*nominal.*
Ditto (Contributory)	375	*nil.*	*nominal.*
Kursseong and Darjeeling Tea Co	250	2 p. c.	62 a 62
Ditto (Contributory)	200	2 p. c.	43 a 43
Kuttal Tea Co., Limited	...	.....	..
Lower Assam Tea Co., Limited	50	*nil.*	*nominal.*
Monacherra Tea Co., Limited	90	*nil.*	20 a 22
Moran Tea Co., Limited	75	*nil.*	*nominal.*
Muddenhaut Tea Co., Limited	250	*nil.*	*par.*
Muttuck Tea Co., Limited	125	*nil.*	40 a
New Golah Ghat Tea Co.	£10	.	100 a 101
New Mutual Tea Co.	30	15 p. c.	70 a 72
Punkabaree Tea Co., Limited	100	*nil.*	10 a 20
Soom Tea Co., Limited	100	*nil.*	30 a 35
Tuckvar Tea Co., Limited	200	*nil.*	30 a 40
Upper Assam Tea Co., Limited	100	*nil.*	10 a 12
Victoria Tea Co., Limited	58	*nil.*	*nominal.*

BOMBAY SHARE LIST.

Bank.	Shares.	Nomnl. Value per Sh.	Paid up.	Last Div'd.	Rate Share.
		Rs.	Rs.	per an.	Rs.
Agra Bank	100,000	100	*all*	3 *pr. ct.*	96
Bank of Bengal	22,000	1,000	*all*	9 *pr. ct.*	1,375
Bank of Bombay (New)	10,000	500	*all*	6 *pr. ct.*	601½
,, 2nd Rev. issue	10,000	500	100	6 *do.*	101½
Bank of Madras	5,280	1,000	*all*	12 *pr. ct.*	1,500
Chartered Mercantile of L. L. and China	30,000	250	*all*	6 *pr. ct.*	250
Chartered Bk. of I. & C.	40,000	200	*nil*	*nil*	150
National Bank of India	37,096	250	125	5 *pr. ct.*	110
Oriental Bank	10,000	250	*all*	12 *do.*	440
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	...	£20	218-3-0	*pr. ct.*	237
Do New £20 shares	...	20	109-1-5	*do.*	126
Bombay, B & C. I. R Co.	...	100	1,000	*do.*	1,100
Do. New shares	...	118	106-5-1	*do.*	200
Land Companies.					
Elphinstone Land	10,800	1,000	*all*	30	
Ditto New Issue	10,800	1,000	650	11-14	
Frere Land	8,000	150	*all*		152
Mazagon Land and R	750	2,000	2,000	*nil.*	065
Port Canning	4,000	2,000	1,400	*nil*	275
Colaba Company	4,000	3,000	*all*	70	1,610
Press Companies					
Akbar Cotton Press Co.	150	5,000	2,850	250 *p. s.*	2,360
Albert Press Company, Kurrachee	200	2,000	1,100	75 *do.*	775
Alexandra Press Co.	250	3,000	850	*nil*	470
Apollo Press Co.	150	12,000	11,000	200 *do.*	7,200
Bombay Press Co.	200	2,000	*all*	265 *do.*	2,200
Ditto (New)	200	500	*all*	66¾ *do.*	583
Colaba Press Co.	500	1,880	*all*	800	5,800
East India Press Co	350	2,000	*all*	....	3,500
Fort Press Co.	150	8,500	*all*	1,000	9,750
Framjee Cowasjee Press	200	2,000	1,800	....	975
Hydraulic Press Co.	200	6,000	*all*	*nil.*	2,500
Kurrachee Press Co.	1,000	5,000	2,000	120 *p. s.*	925
Mofussil Press & G Co.	2,000	400	350	35 ,, ,,	455
Prince of Wales Press Co.	125	2,500	*all*	350 ,, ,,	2,350
Victoria Press, Madras	220	2,000	750	75 ,, ,,	1,000
Spinning & Weaving Cos.					
Albert Mills Company	400	2,000	1,700	50	1,325
Alliance Spinning Co.	500	2,500	*all*	200 *p. s.*	2,475
Bombay	100	5,500	*all*	.....	3,000
Bombay United	300	1,000	*all*	25	930
Broach Mills	1,600	150	150	....	200
Do. New	300	150	50	....	..
Dhurumsey Spinning	800	5,000	*all*	....	2,400
Great Eastern	750	2,000	*all*	150 *p. s.*	1,830
Manockjee Petit's	2,500	1,000	*all*	80 ,,	1,075
Oriental	800	2,500	*all*	80 ,,	2,400
Royal	600	2,500	2,300	....	1,725
Shipping Company.					
Bombay Shipping Co.	1,000	5,000	3,500	1,800	..
Miscellaneous.					
Mechanics' Building Co	1,000	50	*all*	5 *p. ct.*	30
Kurrachee Landing and Shipping Co,	500	2,000	300	21 *p. s.*	170
Treacher and Company	2,000	500	*all*	25 *p. s.*	415

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs.	Rs. exd.
Bank of Bombay	*Jan. '66*	200	500	75	20
Bank of China	..	4,000	95	10½	1
Bombay Presidency Bank	*Aug. '67*	40,000	250	.....	
Bombay T. and B Association	*Sept. '67*	20,000	200	35	6
Brokers' Banking Co.	*Sept. '67*	20,000	200	40	15
Central Bank	*Mar. '66*	40,000	250	2	1
East India Bank	..	25,000		..	14
Indian Peninsula Bank	*Feb. '67*	25,000	200	13	1
Royal Bank of India	*May. '67*	50,000	200	68½	5
Old Financial	*Apr. '67*	30,000	130	7½	1
Companies.					
Back Bay Reclamation Co.	*Nov '66*	1,000	5,200	2,375	95
Bombay, and Bengal S. S.	..	802	3,500	2,410	10
Victoria Spinning Co.	..	55	5,000	5,000	2,100	10

EXCHANGE ON LONDON.

	Calcutta.
	s. d.
Bank Bills, at 6 months' sight	1-11 *to* 1s 11½
Do. at 3 months' sight	1-10½
Do. on demand, ditto	1-10½
Credit Bills (1st Class) at 6 months' sight	1-11½
Documentary Bills at 6 months' sight	11-1 *to* 1 11 3 16

BANK RATE OF DISCOUNT.

	per cent.
Discount on Private Bills and Notes	5 *to* 6
Ditto on Acceptance of Local Banks	5 *to* 6
Int. on Loans on Security of Govt. Paper	4½

GOVERNMENT SECURITIES.

	Calcutta.	Bombay.
Five-and-a-half per cent.	113½	113½
Five per cent.	106½	106½
Four & half per cent. (Public Works Loan)	107½	106½
15 years' Debenture Loans	110	103
10 years do. do.	108½	108
15 years' do. do.	103	103
Six per cent. Municipal Loans	110	113

THE FREIGHT MARKET.

CALCUTTA.

London	*Cotton*	£2 0s. 0d.
	Cases	£2 0s. 0d. *to* £2 15s. 0d.
	Seeds	£2 1?s. 0d.
Liverpool	*Iron Ship Cotton*	£1 12s. 6d. *to* £1 17s. 6d.
	Wooden Ships	£0 10s. 0d. *to* £1 15s. 0d.
	Myrabolans & Cox bills	£1 5s. 0d. *to* £0 12s. 6d.
	Seeds	£1 15s. 0d. *to* £1 0s. 9d.
Havre	*Cotton*	£2 5s. 0d. *to* £2 10s. *Nominal*
	Coffee	*Nominal*
Overland Steamers		£4 10s. 0d. *to* £5 0s. 0d.
Liverpool via Suez Canal		£3 5s. 0d.
China	*Steamer Cotton*	Rs. 6 *per bale.*
	Opium	Rs. 25 *to* 30 *per chest.*
	Sailing Ships	*Nominal*
Calcutta	*Salt*	Rs. 2 0 *to* 3 0 0
Calcutta to Bombay		Rs. 13 *to* 14 *and Calcutta Port charges*
Mauritius		8 *annas. per bag nominal.*

per ton

BOMBAY.

For Liverpool—		
	Iron Ships	£2 10s. 0d.
	Wooden Ships	£2 8s. 0d.
For London—		
	Cotton	£2 15s. 0d.
	Seeds	£2 5s. 0d.
	P. & O. Steamer	£3 5s. 0d. *to* 3-12 0
	B. & B. Steamer	£3 10 0 *to* 3-12 0
For China—		
	Cotton—Steamer	Rs. 10 *per bale.*
	Opium—Steamer Hong Kong	Rs. 25 @ 30 *per chest.*

per ton.

INDIAN SECURITIES.—LONDON.

Shares	Paid.	Indian Railways.	Closing Prices January 26.	Closing Prices February 2.
st.	100	Bombay, Baroda and Central India (gua. 5 per ct.)	103 to 104	103 to 10
20	2	Ditto Ext. do. ins. at 12s pm.	par to 1 prem	par to 1 prem
20		Do. do.		
st.	100	Eastern Bengal (gua. 5 p. ct.)	101 to 104	103 to 104
st.	100	East Indian (gua 5 p. ct.)	109½ to 110½	109½ to 110½
st.	100	Gt. Ind. Peninsula (g. 5 p. ct.)	105½ to 106½	105 to 106
20	12	Ditto, New (gua. 5 p. ct.)	¾ to 1¼ prem.	¾ to 1¼ prem.
20	6	Ditto, New (gua. 5 p. ct.)	¾ to 1¼ prem.	¾ to 1¼ prem.
st.	100	Carnatic (L), gua. 5 p. c.	100½ to 101½	100½ to 101½
20	42s	Ditto, ditto issued at 12s pm	¼ dis. to ¼ prem.	par. to ¼ prem.
st.	all	Ditto, 4 per c. deb.stk	87 to 89	87 to 89
st.	100	Gt. South of India (g. 5 p. c.)	103 to 104	103 to 104
st.	100	Ditto (4½ per cent)	95 to 97	96 to 98
st.	100	Madras (guar. 5 per cent)	103 to 104	103 to 104
st.	100	Ditto, (4½ per cent)	96 to 98	96 to 98
st.	100	Ditto, (4½ per cent)	92 to 94	92 to 94
—	—	Ditto	— —	— —
st.	100	Oude & Rohilkund (g. 5 p. ct.)	100½ to 101½	101 to 102
10	4	Ditto, shares ditto	par to ¼ prem.	par. to ¼ prem.
st.	—	Ditto ditto ditto	— —	— —
st.	—	Ditto Nulhatee	— —	— —
st.	100	Scinde (gua. 5 per cent.)	101 to 102	101 to 102
st.	100	Ditto, Delhi (gua. 5 p. c.)	101 to 102½	101 to 102
—	—	Ditto, ditto (gua. 5 p. c.)	— —	— —
st.	100	Ditto, Punjaub (gua. 5 p. c.)	101 to 102	101 to 102
st.	—	Do. Ind. St. Flo. (g. 5 p. c.)	— —	— —

Indian Govt. Securities.	Closing Prices January 26.	Closing Prices February 2.
Indian Stock 10½ per cent.....April 1874	204½ to 205½	204½ to 205½
Ditto. for Account	— —	— —
Ditto 5 per Cent.....July 1880	110½ to 110¾	110½ to 110¾
Ditto 4 per Cent.....Oct. 1858	101½ to 102½	102
India Enfaced Paper 4 per Cent.....	90 to 90½	90½
Ditto 5 per Cent.....Jan. 1872	98½ to 99½	98½
Ditto 5½ per Cent .... May 1879	106 to 106½	106 to 106½
Ditto 5 per Cent. Rupee Deben.1872	90 to 92	to 92
Ditto ditto 1877	107	107
India Debentures, 5 per Cent...Aug.1873	103½ to 103¾	103½
India Bonds, 4 per Cent £1,000	27s. prem.	27s. prem

Amt. of Share.	Paid.	Miscellaneous.	Closing Prices, January 26.	Closing Prices, February 2.
5	all	Bombay Gas (Limited)	6½ to 7	6½ to 7
5	4	Ditto New	1½ to 1¾ prem	1½ to 1¾ prem.
20	10	Ceylon Co., Limited	4 to 3½ dis.	3¾ to 3½ dis.
20	5	Ditto, A Shares	3½ to 3 dis.	3¼ to 3 dis.
50	7	East India Land Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis.
st.	100	Madras Irrigation & Canal (guar. 5 per cent. by the Indian Government	100 to 102	100 to 102
1	7s.	Nurbudda Coal and Iron (Ld.)	1/16 dis. to 1/16 prem	1/16 dis. to 1/16 prem
5	all	Oriental Gas (Limited)	7¾ to 8¼	7¾ to 8¼
5	2½	Ditto New	1 to 1¼ prem.	1¼ to 1¾ prem.
50	all	P. and O. Steam Company	45 to 47	45 to 47
50	10	Ditto, New, 1867	3 to 2 dis.	3¼ to 2¾ dis.

Amt. of Share.	Paid.	Joint Stock Banks.	Closing Prices, January 26.	Closing Prices, February 2.
10	all	Agra Limited, A	8 to 8¼	8¼ to 9
10	—	Do., do. B	— —	— —
20	all	Char. of India, Aus, & China.	13½ to 14½	14 to 15
25	all	Chartered Mer. of India, London and China	20 to 22	21 to 23
20	all	Eng. Scot. and Aust Chart.	16½ to 17½	16½ to 17½
20	4	Land Mort. Bank of India, Ld.	3¾ to 3½ dis.	3¾ to 3¼ dis.
100	all	Do. 5 per cent. Debentures 1864 for 30 years	82 to 85	83 to 86
25	all	Oriental Bank Corporation	41 to 42	41½ to 42½

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council.

Debenture Capital.	Rate.	Company.	Closing Prices, January 26.	Closing Prices, February 2.
£231,595	5	Bombay, Baroda, and Central India	103 to 104	102 to 104
881,700	5	Ditto ditto	102 to 104	102 to 104
100,000	4½	Ditto ditto	98 to 100	98 to 100
1,292,400	5	East Indian	108 to 110	108 to 110
1,806,300	5	Ditto	108 to 110	108 to 110
1,000,000	4½	Ditto*	99 to 101	99 to 101
440,000	4½	Ditto*	98 to 100	98 to 100
—	5	Eastern Bengal	100 to 102	100 to 102
1,968,600	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto	103 to 104	103 to 104
—	—	Ditto		
175,500	5	Great Southern of India	101 to 103	101 to 103
100,000	4½	Ditto	98 to 100	98 to 100
916,000	5	Madras	102 to 104	102 to 104
499,800	5	Ditto	102 to 104	102 to 104
20,000	5	Oude & Rohilkund (Lm)	100 to 102	100 to 102

* Transferable by endorsement, without stamp.

GOLD AND SILVER

	Per Ounce.
Foreign Gold in Bars	£3 17s. 9d.
Silver in Bars (standard)	5s. 0½d.
Mexican Dollars	4s. 10½d.

EXCHANGE.

Banks Drawing rates on Calcutta	at 60 days' sight. 1s 10½d. to 1s 0½d.
Ditto on Bombay	1s. 10½d. to 1s 0½d.

Advertisements.

JOSEPH GILLOTT'S CELEBRATED STEEL PENS

SOLD

BY ALL DEALERS THROUGHOUT THE WORLD.

Established in 1820.

C. LAZARUS & Co., CALCUTTA.

(Incorporated with Shearwood & Co.)

CABINET MAKERS, Upholsterers, Billiard and Bagatelle Table Manufacturers, by appointment, to His Excellency the Right Hon'ble EARL OF MAYO, K.,G.C.S.I., Viceroy & Governor General of India, and to His Royal Highness the DUKE OF EDINBURGH, K.G.K.T., G.C.I. Importers, Appraisers, House and Land Agents, General Furnishing Contractors, *56. 59, 60 & 61, Bentinck Street, Calcutta.*

SOLE AGENTS IN INDIA FOR SEDLEY'S PATENT BRIDGES.

C. LAZARUS & Co., sensible of the very liberal support extended to their Establishment during the past *fifty years*, desire on this occasion to return to their friends and patrons their most sincere thanks. To merit a continuance of that esteemed patronage will C. Lazarus & Co. beg to state, at all times be their studious endeavour; nor will they be wanting in any respect to maintain that uniform excellence of workmanship, combined with economic charges, with which their establishment has hitherto been identified.

BILLIARD TABLES

C. LAZARUS & Co., as Manufacturers, invite particular attention to their large stock of full-size Billiard Tables, the cushions of which are constructed on an entirely new principle, similar to those supplied by C. L. and Co. and now in use at the Bengal Club, and in almost of the clubs and messes of the three Presidencies.

CONSEQUENT on the numerous applications that C. LAZARUS & Co., have lately had from parties residing at a distance from Calcutta to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the old Cushions to Calcutta for that purpose is attended with great delay, thereby occasioning much inconvenience, C. L., & Co., have been induced to keep a stock of Cushions on their new principle always on hand, which can be fitted to any Table, the accurate length and width of the slate. Bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

JAQUES', BURROUGHES', WATT'S & THURSTON'S BILLIARD & POOL BALLS,

Billiard cloth, cues, Billiard and Pool Marking boards, Tips, Chalk, India-rubber Strips for cushions and every requisite for the Billiard Table. Billiard cushions renovated. Billiard Tables repaired and re-cushioned on the new principle, thereby making an old table as good as new.

B. B. B

In accordance with their established practice of introducing novelties to the Indian public, C. Lazarus & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusements by importing the popular B. B. B. Tables. The peculiarity of these is that on the *one* table the favourite games of Billiards, Battue, and Bagatelle may be played, thus affording a *pleasing variety* of amusement concentrated on a single board at little more than the cost of one. Anticipating that the demand for these tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

CARR BROTHERS,

CIVIL, NAVAL, AND MILITARY TAILORS, AND GENERAL OUTFITTERS.

17, CHURCH STREET, BOMBAY.

46, Edgware Road, London. 8, Old Court House, Calcutta.

Waterproof Clothing

Ex Godavery.

F. HARLEY & Co.

Waterproof Military Ground Sheets,

REGULATION SIZE.

F. HARLEY & Co.

Patent Improved Tarpaulins of Sizes

ALWAYS IN STOCK.

F. HARLEY & Co.

Improved Patent Tarpaulins.

PREPARED ON ENGLISH CANVAS ONLY; guaranteed Free from Adhesiveness either in Sun or Rain; finished expressly for use in hot climates: no Tarred matter is used in our composition, which is perfectly pliable, and free of all spontaneously combustible matter. Our tarpaulins with ordinary usage will last for years. The Arsenal Fort William, has tested and found them all that we describe, and, in addition, proof against Damp and White Ants

Assorted sizes always in stock.

All Tarpaulins made by us are branded

F. HARLEY & Co., Makers, Calcutta.

PURE OXIDE OF IRON PAINT.

USED BY H. M.'s DOCKYARD, THE MUNICIPALITY, THE G. I P. AND B. B. & C. I. Railways, Contractors, the P. & O. Co., and E. I. S. N. Co., &c., &c.

The best and cheapest paint to be obtained in the market. It is *peculiarly* adapted for iron work of all descriptions. Apply to

11, Hummum Street, Bombay. C. F. MITCHELL & Co.

THE INDIAN LIFE ASSURANCE COMPANY (*Limited.*)

REGISTERED UNDER ACT X. OF 1866.

Head Office—MEERUT.

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W. Hobson, Esq. ... ... ,, *Muscoorie Saving's Bank.*
J. C. Parry, Esq. ... ... *Late Genl. Manager, Delhi & London Bank*
F. Peterson, Esq. ... ... *Manager, Simla Bank Corporation.*
C. W. Stowell, Esq. ... ... ,, *Uncovenanted Service Bank*
E. Warner, Esq. ... ... *Barrister-at-Law.*
Sheikh Eliahee Bux ... ...

MEDICAL ADVISER.

William Moir, Esq., M.B., Civil Surgeon, Meerut.

SECRETARY.

D. Lancaster, Esq.

This Company was formed towards the end of 1869, and has already received substantial patronage from the public.

The object for which it was established with a full direction in India was to secure the Indian public against a repetition of such heavy losses as have recently been sustained by the collapse of certain Assurance Offices in England, where the entire management of those institutions was located.

Security.—To ensure absolute security, the funds of the company are invested *only* in Government securities. The company is strictly prohibited from making advances on house or landed property or on stocks, shares or obligations of any company whatever, though such advances are usually extensively made by other Assurance companies.

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the assured. Policies are also granted for short terms from one to ten years at moderate rates.

The Proposal Form is simple in its terms and the *conditions* of the *policies* are liberal, all *unnecessary restrictions having been removed.*

The rates of premium are made as moderate as is consistent with *complete security* of the assured.

Advantages of Assurance.—It secures by a small monthly, quarterly, half-yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage. It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the borrowers' property from claims and sureties from loss.

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscriber loses the benefit of all he has paid, whereas in the case of a policy it still ensures and may be made available for any other purpose.

Forms of Proposal, tables of rates, and all further information may be obtained by letter or on application to any of the Agents or to the Secretary.

ANNUAL PREMIUMS.

Required for an assurance of Rs. 1,000 for the whole term of life.

Age	Civilians.				Military and Naval			
	Without Profits.		With Profits.		Without Profits.		With Profits.	
	Rs	As.	Rs.	As.	Rs	As.	Rs	As.
20	31	0	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	3	50	15	57	11
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

D. LANCASTER,
Meerut, 12th November 1870. *Secretary.*

IMPORTANT REDUCTION IN THE RATES OF FIRE INSURANCE.

NATIVE LIVES INSURED ON EQUAL TERMS WITH EUROPEANS.

ENGLISH ASSURANCE COMPANY FIRE AND LIFE.

Capital £ 500,000

Head Offices, Palmerston Buildings, Bishopsgate Street, London, with branches at Liverpool, Manchester, Glasgow, Dublin, Southampton, Hamburg Antwerp, Brussels, Rotterdam, Melbourne, and Bombay.

The Life Department

Offers the following advantages:—

I.—Moderate premiums.
II.—One calendar month's grace allowed for renewal.
III.—Liberal provision for non-forfeiture of Policies.
IV.—Fixed surrender value after 3 years.
V.—Freedom from unnecessary restrictions as to foreign residence and travelling.
VI.—*Unconditional* reduction to English rates on return of the assured to Europe.
VII.—Military men holding civil appointments reduced to civilian rates.
VIII.—*Eighty per cent.* of the profits divided among the assured in the participating scale.
IX.—No partnership liability whatsoever.
X.—Medical fees and stamps paid for by the company unless the amount be less than Rs. 2,500.
XI.—No charge for assignments.
XII.—Prompt settlement of claims.

Fire Department.

Owing to the company being free from combination, policies are granted covering property in all parts of the Presidency, at some 25 to 50 per cent. below the rates of other offices in Bombay.

Floating policies renewed and all reasonable clauses of other companies adopted. Claims settled promptly.

For further particulars, prospectuses, &c., apply to

HILL, POLLOCK & Co.,
Sassoon's Buildings, Elphinstone Circle, Bombay. Agents.

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782,

UNLIMITED.

The importance of this company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 9,000,000*l.* sterling as losses under insured risks and without a single call on its proprietors whose liability is unlimited.

The undersigned are authorised to issue policies in Bombay and the Mofussil at the tariff rates of all the old established company, which are as low as the nature of the risks can justify.

The rates on bungalows in the Mofussil, and residences, offices, and godowns in Elphinstone Circle, have been lately much reduced. Particulars on application at the Agency office.

A. C. BRICE & Co.,
No. 6, Rampart Row, Bombay, 1870. Agents.

THE MADRAS EQUITABLE ASSURANCE SOCIETY.

Successor to Madras Laudable Society, Established in 1829.

Regulated by Act No. 6 of 1869, of the Legislative Council of Fort Saint George.

HEAD OFFICE IN MADRAS AND NO BRANCHES.

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ACTING MEDICAL EXAMINER.

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SECRETARIES AND TREASURERS.

Messrs. ARBUTHNOT & Co.

The *chief characteristics of this Society are:*

Claims paid immediately after satisfactory proof of death.

Announcement of death in the *Fort Saint George Gazette*, sufficient in the case of the members of the civil and military services.

Medical fees paid by the society on all proposals.

Mutual assurance.

Policies for a term of years issued at reduced rates, without participation in surpluses.

Premiums payable half yearly, on 1st January and 1st July.

Policies issued free of charge for stamp duty.

Assurants may reside in any part of the world, so long as they continue to pay the original rate of premium stipulated in their policies.

This society being founded on the sound principle of mutual assurance, divides all its surpluses, or so much thereof as the Directors deem expedient, amongst the members or life policy-holders, by deductions from premiums, and does not work for the benefit of a separate proprietary body.

The members of the society consist of all persons who hold policies of assurance, upon their own lives, or upon the lives of others, for the duration of life.

The Directors must be residents at Madras, and are elected by the members.

The society's funds can be invested only in securities of the Government of India, or in securities, the interest of which is guaranteed by the Government of India, or by the Secretary of State for India in Council.

All investments are made in the joint names of three of the Directors.

Annual General Meetings of the members are held at Madras, not later than the last day of the month of March in every year.

An annual audit is made of the accounts of the society, and the reports of the auditors submitted at the Annual General Meetings.

Quinquennial valuations, made by a London Actuary, of all the assets and liabilities. The next valuation will be made as from 31st December 1870. *Premiums paid on policies for the whole term of life during any portion of the period of five years immediately preceding that date, will entitle the holders of such policies to participate in the surplus of the society then ascertained to be existing, by rateable deduction from premiums thereafter becoming payable for the ensuing quinquennium.*

The returns made to the policy-holders from the formation of the society in January, 1842, up to June, 1869, inclusive, (in addition to the accumulation of a considerable reserve), have averaged 47 per cent upon the premiums paid half-yearly.

For further particulars, forms of proposal, &c., apply to

ARBUTHNOT & CO.
Madras, January 1870 Secretaries and Treasurers.

THE BOMBAY FIRE INSURANCE COMPANY (LIMITED.)

THE undersigned are prepared to accept risks and issue policies covering merchandize, goods in godowns, warehouses, dwelling houses, or other insurable property, on favourable terms.

Apply to FORBES & Co.,
Bombay, 1st February 1871. Secretaries and Managers

SUN FIRE OFFICE.

ESTABLISHED 1710.

Policies opened on warehouses and shops, merchandise, dwellings, household furniture, and other insurable property, in Bombay and the Mofussil, at current rates by

Bombay 1871. PEEL, CASSELS, & Co., Agents.

ALLIANCE BRITISH AND FOREIGN LIFE AND FIRE ASSURANCE COMPANY.

ESTABLISHED 1824.

CHIEF OFFICE:
Bartholomew Lane, Bank, London, E. C.

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PRESIDENT Sir Moses Montefiore, Bart., F.R.S.

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Charles George Barnett, Esq. (Barnett, Hoare, Hanbury, and Lloyd)
George Henry Barnett, Esq. Glympton Park.
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AUDITORS.

Lord Richard Grosvenor, M.P.
Hugh Colin Smith, Esq
Richard Hoare, Esq.

FIRE RISKS.

Of an eligible character are accepted at minimum current rates.

LIFE DEPARTMENT.

The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorized to decide upon Proposals submitted, to issue Policies, and to settle claims.

The Life Reserve Fund is over

NINETY-FOUR LACS OF RUPEES.

(which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund), being about 30 per cent. of the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

FIVE CRORES OF RUPEES

combined with the personal responsibility of a numerous body of wealthy Proprietors. For detailed Prospectuses, Forms of Proposal, &c. apply to

REMINGTON & Co.,
Agents for the Presidency of Bombay.

CHURCH OF ENGLAND ASSURANCE INSTITUTION.

ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic., Cap. XCII.

CAPITAL—One Million Sterling.

Life Assurances of every description granted.
Retiring provision combined with Life Assurance
Free Policies issued which can never altogether lapse through non-payment of Premium.
No extra charge for sea-passage
Reduction to European rates without Medical examination.
Premium may be paid annually, half yearly quarterly, or monthly, as desired
Parsee and Armenian lives insured.
For detailed Prospectus, &c. apply to

REMINGTON & Co., Agents.

Bombay, 12th July 1870.

LIVERPOOL, LONDON AND GLOBE INSURANCE COMPANY

Liability of Shareholders Unlimited

Capital £2 000 000 — Accumulated Funds £3,301,005

Revenue		*Invested Funds*	
Fire Premiums	£ 836 816	Capital	£ 391,752
Life Premiums ..	,, 250,039	Life Reserve ..	,, 1 873,020
Interest	,, 162,680	Reserve Fund . .	971,410
		Undivided Profit	64,823
	R 1,249,535		R 3,301,005

Fire Department

Policies of Insurance against fire upon dwelling houses and other buildings in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the company

The rate on pucka built bungalows situated out side the Fort of Bombay or in any part of the Bombay Presidency is now reduced to (6) six annas per cent. per annum

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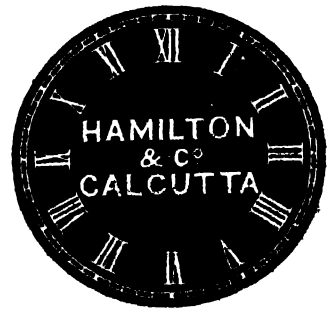
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soils for cultivation as the superior ones become fully occupied, takes place from the demand for food therein. The best lands in general get cultivated first, and then the inferior ones; and the different return they yield to the same wages, management, and capital is the measure of the natural rent in every case.

Now let us suppose that the owner of Farm No. 1 is a good-natured, Quixotic, sort of fellow, who, instead of taking the full 300 Rupees of rent which the farm yields, abandons one-half of it to the farmer. And let us suppose that the farmer is indebted to a capitalist for means of working the farm and is completely in his hands—what will happen? If the capitalist is an Indian sowkar, the 150 Rupees of rent which the owner in his good nature has abandoned, will simply find its way into the sowkar's pocket. Now this is precisely what is going on in Oudh and the North-West Provinces, and in many other parts of India at this moment. The State considerately (*Quixotically* is the proper word) has lowered the rental to which the Commonwealth is entitled to one-half the just claim; and the sowkar at once takes it in the shape of 60, 70, 100 per cent. interest for his so-called advances to the ryot. The ryot must live, it would not pay the sowkar to kill him, for he is the goose that lays the golden egg; but every rupee the State leaves in his hands beyond the cost of starvation allowances the sowkar appropriates. By lowering the assessment we simply enrich the sowkar; for what we abandon as *rent* he takes as *interest*. It is necessary to discern the situation clearly, when the remedy may perhaps dawn upon us.

We should deem it an insult to our readers were we to apologize for again remarking what is too often overlooked, we believe—that the Scriptures, though not teaching political science dogmatically, do nevertheless contain very striking examples of political wisdom, and for the purpose, as we can hardly doubt, of suggesting the course that should be taken by rulers and statesmen in similar circumstances. Thus the merely personal narrative as it seems to the superficial reader of Joseph's history when carefully studied will be seen to contain within it the history of a great and successful revolution made in the fiscal system of a civilized people by a ruler whom the history requires us to believe effected this revolution under the guidance of Divine wisdom. It contains also a very precise account of the steps taken by him under this guidance to carry the people safely through what was probably the most dreadful famine the world ever witnessed—a failure of seven successive harvests.

At all events our own conviction is profound, that the revolution made 3,500 years ago in Egypt by the young and inspired Hebrew minister was suggested to him by Divine wisdom, and with these views its study becomes to us a subject of deep and peculiar interest. The minister availed himself of the desperate condition of the people to obtain a State proprietorship in the soil. The moderation with which the claim was asserted is seen in the giving back of the land to the people, burdened simply with the condition that a fifth part of the produce should belong to the State. If we assume, as there is strong reason to do, that the rental of Egypt was at least a third of the produce, the State demand of one-fifth would leave two-fifths or 40 per cent. of the rental for private proprietorship in the land. In other words the division would stand thus:—

Division of gross produce.

The Cultivator.....	10-15ths = 66 per cent.
The State	3-15ths = 20 ,,
The Proprietor	2-15ths = 14 ,,
	100 per cent.

Division of rentals (net produce.)

The State	3-5ths = 60 per cent.
The Proprietor	2-5ths = 40 ,,
	100 per cent.

Now this is what we would see aimed at in India. It is a calumny to say that the *Indian Economist* demands the sweat of the ryots' brow. We demand what the Egyptian minister took from the land. We would not destroy private proprietorship in the soil; but we protest against abandoning the rights of the Commonwealth thereto. We believe that the State might appropriate in India 3-5ths (60 per cent.) of the rental with nothing but advantage to all classes. We therefore hold the lowering of the State claim in the North-West to one-half the rental, while formerly it was two-thirds to have been a needless sacrifice, knowing, as we do, that the rental in these settlement proceedings is over-estimated below its real amount. In the Central Provinces we have abandoned *all*, or nearly all, to the malgoozar—a private proprietor whom we have ourselves created. Were the State taking a fifth, or even a *tenth* of the produce of the land, we should not know what embarrassment means. We take a fifteenth, or twentieth, and the mere money-lender, where there is no malgoozar, at once seizes what the State leaves. Every step we recede the sowkar moves forward, until the ryot and the State are starved, while the malgoozar and the sowkar take the produce. There is no wisdom, no insight, no statesmanship, in such proceedings, and the burden of our protest must still be what it has so long been. In our next issue we propose to deal more closely with the question of the ryots' indebtedness.

THE LAND TAX IN FRANCE.

The facts and figures given in the subjoined account of the origin and nature of the land tax in France are taken mainly, but not entirely, from the *Enquête Agricole*, or inquiry into the condition and the needs of French agriculture which was made in 1866 under the orders of Napoleon III.

A high land-tax usually *connotes* a powerful Government, either of a despotic autocrat, or of a civilised democracy; for the land-owing interest is always strong enough and united enough to prevent feeble rulers from demanding a large share of the rent. Thus in Asia, under irresistible military governments, the land tax has existed from time immemorial. In Western Europe it is quite a modern source of Crown revenue, and as such it dates usually from the dissolution of feudal independence. The English landlords effected as is well known a sort of permanent assessment of the tax at the end of the 18th century, when their influence was paramount. In France, during the same century, matters had turned out much worse for the people; because there a despotic monarch was heaping arbitrary taxes upon the land, over and above what the *Seigneurs* had always demanded as feudal rights. The French nobles were strong enough to keep themselves from taxation; but they abandoned their peasantry to the mercy of the *fisc*; and hence had come to pass, in the most enlightened country in the world, one of the most indefensible systems of taxing agriculture that has ever been methodically practised. India was at its lowest ebb of misrule in the middle of the 18th century; but no *ryot* of Oude, or Mysore, would then have exchanged conditions of tenure with a co-temporary peasant in the backward provinces of France.

The French cultivator was pursued with every kind of fiscal demand, direct and indirect. He paid a rating on his holding, an income-tax, a house (or hearth) tax, stamp duties, tolls, octroi, customs, and the *gabelle*,* a severe salt duty which caused many a provincial *emeute*. The preservation of game (not only hares and pheasants, but deer, wild boars, and wolves) was a dreadful scourge, and probably did quite as much damage as the Pindarees did to Central India. Beside all these royal imposts, the feudal rents and services were crushing wherever they had survived in full force. The mere list of them is appalling. Moreover, the peasant had to maintain all the provincial roads, to keep up the local militia, and (lastly) to pay about 100 millions of francs in ecclesiastical tithes. Here we have taxation of land at its worst extreme. No wonder that Arthur Young, the Suffolk farmer, was aghast at the state of French agriculture in 1789.

But the National Assembly swept away in one night the whole ancient regime of land, its imposts, and its tenures, tithes, feudal rents and privileges, manorial rights, game laws, and [illegible]; all disappeared. From that era dates the *Impôt*

* The word is not English in origin. It is the Arabic *Kabyle* (tribute) [illegible] originally the tribute paid by a [illegible]

Foncier, or land tax proper of France; for though the Revolutionists very speedily stripped the Church and the nobles, they were none the more inclined to relieve landowners. The old French Government got about seven millions sterling out of the land; the new Government calculated that the land might pay thirteen millions, now that the priests and nobles had been choked off. So for 1790 they laid on 300 millions of francs taking 240 millions as the fixed assessment and 60 millions as a kind of extraordinary rate; and it is curious to note that just about this time the British landlords were passing a law to settle *their* land-tax permanently at a low rate *upon a valuation of their estates made in* 1692.

The French democratic assessment was too high. No survey had been made, and the rating was made by lumps upon departments according to previous valuations; and in 1796, when the issue of *assignats* had driven coin out of the country, the settlement "broke down," as we should say in India. Some idea of making a new *cadastre*, or survey valuation, had been entertained, but the cost was estimated (1779) at 83 million francs, for which price it might be completed in 18 years. No French Government has ever been able to find time or money for this fresh *cadastre*; and probably this is one of the main reasons why the land-tax has gone on steadily falling. Between 1797 and 1799, 51 millions of francs were remitted; and the diminution went on until in 1821 the Treasury had abandoned 85½ millions of the original demand fixed on the land in 1790. Between 1851 and 1856 the land tax increased by 9 millions of francs; but this rise came from land taken up for building, which was charged at a special rate, and two-thirds of it derived from the spread of towns. The revenue from lands not built over increased to no appreciable degree.

On the other hand, taking the returns of the gross rental yielded by the French soil, we find it estimated at 1,355 millions in 1790. In 1862 it had risen to 3,216 millions (francs), so that it had nearly tripled in the same period, which saw the land-tax diminished by one-third. We must not forget, however, that in France, as in England, the local rates and taxes on land have been augmenting rapidly during the century. They amounted to more than 130 millions in France in 1866; though it is asserted that on the whole the enhancement of local taxation only just balances the diminution of the imperial land revenue. Thus the demand by the State upon the rental of France has not been raised since it was first regularly made in the last century on behalf of the public needs. It has remained stationary throughout seventy years of such prosperity and profit from agriculture as had never been known before. This conclusion, when demonstrated by the figures of the Inquiry Committee, somewhat disconcerted those French agriculturists whose main grievance had been the supposed piling up of taxes on the land. It turned out that whatever pinch they really felt was caused by unequal distribution of the impost. But here again came the question of a new *cadastre*, which neither the State nor the landowner will face. Moreover, the departments which are lightly assessed, oppose, as a matter of course, any change at all; and the Committee thinks that it would be an endless path to set out upon, full of thorns and stumbling blocks.

Let us now take the land-tax in Great Britain. We need not go back further in the history of the English land-tax, than the year 1692, when it first became one of the recognized settled sources of the Crown revenues. From that date the demand was never intermitted; until in 1796 the land-holding House of Commons *fixed* the assessment at four shillings in the pound on a valuation of estates made in 1692. The actual charge now (1866) amounts to four pence in the pound of the rental according to the valuation of the present day. To this must be added the Church Rates, Poor Rates, and County Rates, with the property and Income-tax, so that the total incidence of direct taxation upon the land is calculated to be about 3*s.* 6*d.* in the pound sterling. Besides all this there is the Tithe, where it has not been redeemed, which, on an average, amounts by itself to four shillings in the pound of rental.

In Scotland the land and property taxes are the same as in England. The land also pays rates for the parish, the poor and the country, with Stipends instead of Tithes, and a cess of ½ per cent for the schoolmaster. These local cesses, as we should call them in India, are 9½ per cent in the rental. In Ireland the land-tax proper for the Imperial Treasury does not exist; though profits from land are assessed to the Income-tax, the Tithe and local rates are paid. The Poor Rate alone amounts to 5 per cent. for all Ireland. The Tithe has probably been lightened since the Irish Church Bill passed into law. As for indirect taxes on agriculture in Great Britain, there is the Malt-tax, and the Stamp Fees on transfer of land, and the Succession-taxes. The enormous blackmail exacted by barristers and attorneys upon every kind of conveyance of real property must also be taken into account.

OUR EXCISE—III.

The *Times* of last month has some remarks upon Turkish finance from which we make the following extract:—

"In Turkey the present amount of taxation is only equal to a little over 10*s.* per head, a sum far less than in most countries in Europe. The Empire may not perhaps be able to support the same amount of taxation as England and France, but it could, at all events, bear double its present imposts. Considerable augmentation might be made on the duty on tobacco, which is an article most suitable for taxation. Tobacco gives a revenue of 4,000,000*l.* in Italy, of 6,000,000*l.* in the United Kingdom, and of 10,000,000*l.* in France. In Turkey it only produces about 450,000*l.* a year; and this in spite of the fact that in this country almost all, even women, smoke. Spirits are, again, articles appropriate for increase of taxation. While they supply every State in Europe with a considerable income, here they only give 200,000*l.* a year, although the consumption is great both among Christian and Mussulman populations—the latter setting very often the Koran's prohibition at defiance."

The point worth notice is—that the administration of the Excise in Turkey, though it appears bad enough to the *Times*, would be thought very decent management as judged by results in India. Our Finance Minister would be very glad indeed to get 45 lacs from tobacco duty, but shrinks from laying on any duty at all; though one would have thought that the inconveniences, drawbacks, and unpopularity of such a tax would be quite as great among the Turks who all grow tobacco, and all consume it, as among the Hindoos. The truth is that even an ill-regulated tobacco duty, collected with politic laxity, would yield a million sterling in India, and we shall some day look back with astonishment at the inconsistency of a Government which strains at such a gnat, and yet swallows the camel of an Income-tax.

Then as to Spirits, the *Times'* correspondent evidently thinks 20 lacs of revenue far too small. Yet the whole Turkish Empire, so far as we can make out, does not contain a population of 20 millions excluding Egypt, and of these there are 12 million Mussalmans, teetotallers by profession if not practice. If we look to India we find that the Punjab only realizes 7½ lacs on Spirits and Opium together from 17½ millions of people, and that the revenue is falling, at which phenomena the Lieutenant Governor, in reviewing the last annual report, has "expressed his surprise." In the North-West Provinces 13½ lacs of Rupees are obtained from the liquor and opium consumption of 30 millions. We believe that in the last ten or twelve years the country has lost an enormous amount of most legitimate revenue by hasty and inconsiderate introduction of the Still Head Duty System; forgetting that such a system, if it must be adopted, can only be successfully maintained by incessant vigilance and attention.

THE BOMBAY TAX ON FESTIVITIES.

The Government of Bombay proposes to supplement the Imperial grants allotted to it for Civil Charges by an approach to something like a marriage tax, namely, a tax on festivals. The statement of Objects and Reasons run as follows;

"The Bill is intended to impose a duty on feasts where the number of persons assembled is one hundred or more. The rate of duty is rupees ten per hundred guests. Considering the prominence of large and expensive entertainments in the customary life of all classes and castes of people in India, it is believed that the proceeds of the proposed tax will be large. The amount of duty is small,

and inappreciable among the heavier items of expense incurred at marriages and other festivities and ceremonies. The duty only falls upon such individuals as have the ability to pay and the desire to spend; while from the nature of the occasions on which the duty will be leviable there will be little inducement or opportunity of evading it."

Such a tax cannot possibly, we fear, prove productive. There is no objection to it in principle; but it would have been far better to have tried a marriage tax. It is incumbent upon the Hindoo to marry, and while a tax upon marriages might be inadvisable in our own country, where, from a variety of causes marriage is far from being as universal as it should be, here the case is altogether different. The people all marry; and the ceremony is attended in general with very lavish expenditure. It is a common thing for them to spend such extravagant sums upon the marriage of their children as to plunge them into debt for years. It has been frequently represented to Government that a marriage tax would be one of the best forms of taxation we could adopt. It has the recommendation of being an old Mahomedan tax, and is strictly in accordance with the traditions of the people. The tax should be a graduated one, and the people allowed to assess themselves on what scale they please. By allowing them to declare their own rank in life, we should have an indirect but powerful and legitimate stimulus to the productiveness of the tax. It would be well probably to divide the people into six or eight or more classes. The certificate of the *Sirkar*—and we all know what value the people attach to such instruments—would give a sort of status to the parties to the marriage. The certificates might even be a work of art, and for the higher classes might be upon vellum or satin illuminated. The fee in such cases might be as high as 500 Rupees, or even more. *The only precaution needed is that the people should be allowed to assign their own rank to themselves.* If a wealthy man chose to take the lowest certificate issued, say 2 Rupees, he could do so, but he would not parade it at the marriage. We are strongly persuaded that such a tax would be successful; it is free from every feature of oppression, and would fall equally upon every part of the population. We are not sure that these "marriage certificates" would not come to be looked upon as a State favour, perhaps as a patent of nobility. There would be no possibility of evading the tax, while the notion would very soon develop itself that marriage was not altogether valid without the Sirkar's certificate. We do not venture to estimate what such a tax would produce, but that it would be paid cheerfully, and yield a larger revenue than any form of income-tax we could devise, we have little doubt. The Emperor Akbar's tax was graduated from 500 Rupees down to three; ours should probably be from 500 down to about 2 Rupees. These are matters of mere detail.

THE DEFICIT.

STOPPAGE OF BULLION.

We noticed in our last issue the unpleasant fact that there appears to be a total stoppage of bullion imports into the country, while our economic condition is such that we ought steadily to absorb about one-fourth of the total yield of the world. We pointed out that a flow of bullion into India was the normal condition of things, and that any prolonged suspension of the flow was abnormal and indicative of mortal sickness in the country. Were Sir Richard Temple alive to the real significance of the fact we are noticing, it would fill him with alarm. He has apparently no conception of what it means, for the only reflection it suggests to him is that it will interfere with the Mint receipts!

In presence of an economic fact demanding the most careful consideration, because suggestive of very alarming conclusions, the Finance Minister can see nothing therein but that "the Mints are in a condition of enforced inaction." As reasonably might a physician, in view of the symptoms of mortal sickness in his patient, lament the man's inability to work. A competent Finance Minister would have felt bound to look the unpleasant fact fully in the face, and to point out fearlessly that the arrest of these imports is due to the Secretary of State's drafts upon India more than to all other causes put together. It is the vital necessity of these imports to the country, and the fact that it is the Home expenses of the Government which is the principal cause of arresting them, that makes a jealous scrutiny of those charges so imperative a duty upon the Finance Department. Observe now the way in which the head of that department deals with this vitally important matter—

"It has been said that the expenditure in England on account of India is incurred without sufficient reference to the authorities in India, and that the detailed accounts of it are not made known in India. Now I showed in my last exposition that by far the greatest part of the expenditure is really incurred either under rules proposed by the Government of India, or upon requisition made by the Government of India. So far we ourselves must accept a very large share of the responsibility. There are some exceptions to this, but they are not considerable."

A more disingenuous apology for wrong-doing was never made by a minister occupying so responsible a trust as the Finance Minister of India. Sir Richard Temple was under no necessity of saying a word upon the subject if he lacked the courage to state an unpleasant truth. But that in presence of a Committee of the House of Commons sitting to enquire into the justice of Indian complaints against these charges; and in view of the righteous stand made on behalf of the country by Mr. Laing and others of his predecessors; and the fact that these charges have at last arrested all imports of bullion into the country—there is a moral cowardice, if not real treachery, in this ostentatious repudiation of the nation's claim that moves our deep indignation. Does Sir Richard Temple dare to justify, for instance, as "inconsiderable," the continued exaction year after year of £650,000 for East India Stock dividends?

We have striven hard to preserve some faith in Sir Richard, but we fear his enemies describe him more truly than our wishes have ever done. A more unworthy betrayal of a great national cause was never made. There is only one possible excuse for the Minister, which is—that he really does not understand the effect of these charges, or their influence upon our bullion imports. In other words, he is unfit for the position he holds; and if he will not resign should be removed, and sent where his undoubted energy and administrative abilities would find their proper sphere.

The Press and Parliament of England have been commenting for years upon what they call the *normal* condition of Indian finance (chronic deficit), and the *abnormal* flow of bullion to the East. But the normal condition of Indian finance is not one of deficit. There has been no deficit in the Indian revenue for many years, but, on the other hand, a large annual surplus. The Indian balance-sheet is presented to the world in a shape so arbitrary that it would seem to be the purpose of our financiers to destroy the credit of the Indian Government. "India must not borrow." That is the summary of all financial wisdom in our management of her finances. Those great public works which in other lands are constructed out of loans, the people of India are forced to construct out of income-taxes, taxes on produce, and we know not what else. Even her railways has India been forced to construct very largely out of taxes. The popular belief is that the railways of India have been constructed out of English capital. The *fact* is that 25 per cent. of the outlay has come from the Indian Exchequer. The Indian Treasury has advanced down to the present time £25,000,000 for guaranted interest, cost of land, exchange, supervision, &c. Instead of only £85,000,000 sterling (the subscribed capital), the Indian railway system has cost about £100,000,000. In the same way an immense expenditure has been made upon the telegraphs of the country, upon roads, banks, canals, &c., while the whole has been jumbled together in one huge item year after year, and treated as a *normal* charge upon the Indian revenue. What wonder that there has been an apparent deficit, since it depends purely upon the caprice of the Minister whether the balance-sheet shall show a deficit of one million or five? One of the first reforms demanded in Indian finance is the total separation of the public works expenditure from the annual balance-sheet of the Empire.

So with reference to what is called "the abnormal flow of

bullion to the East," that flow is the most normal thing in the world. It is the *suspension* of the flow which is abnormal, and which wrought such ruin to the country during the first eighty years of our rule. A steady supply of the precious metals is vital to India, because her currency is all but purely metallic, and she has no silver mines within her territories. She has been called "the sink of the precious metals" from Pliny downwards; but it is overlooked that she is the *natural* sink of them. Being more distant from the sources of supply than Europe, the silver she receives comes to her laden with the expenses of a long transport, and it is thus impossible for her to export it back to Europe any more than piece goods, but at heavy loss. The prosperity or decline of the country may be gauged by merely looking at her imports and exports of bullion. The population supplied with silver through the import gates of Calcutta, Madras, Bombay, and Kurrachee, is not less than 200,000,000. Now if we leave China out of the account, because she supplies herself from her own mine, India ought to import year by year at least one-fourth of the production of the gold and silver mines of the world as her constant share thereof. In view of her currency requirements, the hoarding propensities of her people, and the national custom of wearing ornaments on the person, we might reasonably expect that she would absorb *more* than one-fourth of the annual supply. What, then, have her importations really been since the beginning of our empire a century ago?

From the year 1757 *down to the year* 1780, *there was a total suspension of all imports of silver whatever.*

Dependent upon the supply of silver, she had been drawing from Europe in exchange for the manufactures and produce carried away by the English, Dutch, and French, she suddenly found those exports swallowed up by the exigencies, or the greed, of her new masters and the rapacity of their servants. With a wasting and ever-narrowing currency, this new rule was simply garrotting her. The discreditable fact is that we did not do this ignorantly. The *Ninth Report of* 1783; Dow in his *Introduction*; and the servants of the Company themselves, pointed out the ruin that was being wrought in terms so vigorous that it is amazing they received so little attention. The *Commons Report* declared that the Company had set up "a species of trade, if such it may be called, by which it is impossible "that India should not be radically and irretrievably ruined"; Dow showed, at length, that we had not merely stopped all flow of specie into the country, but had caused a direct export of five millions sterling within ten years of acquiring the Dewannee. Now this ruinous process of depletion fell upon a country whose resources were exhausted by the anarchy which preceded our rule, when Mogul and Mahratta armies desolated its provinces. So prostrate had Bengal become by the year 1780, that the Earl of Minto declared "one-third of it had become jungle." From 1781 to 1800 the imports of bullion were next to nothing, and from 1757 down to the year 1817, a period of sixty years, during which the imports ought to have been 120,000,000*l.* to 150,000,000*l.* sterling, they did not amount to one-fifth of that sum; in other words not to half a-million sterling a year.

We pause at the year 1817, as it is necessary to make a close review of the returns of the half century that has since elapsed. The year 1817-18 witnessed the overthrow of the Peishwa, and with the annexation of his dominions, the virtual rise of the Western Presidency. The country was at this time slowly recovering from the state of "metallic exhaustion" which we have described, and was beginning to import silver freely. At this crisis, we annexed the dominions of the Peishwa, and at once imposed upon his territory the system of taking the land revenue *in money* where previously it had been taken *in kind*. In a country already suffering severely from a restricted currency, we made this change without an inkling of the ruin it would work. We threw ten times the amount of work upon the Mahratta currency which it had ever before been called to do, and as the result, an immense fall ensued in the value of all produce together. The staple products of the land were simply coarse food grains. Observe the course of prices:—

Average prices 1817 *to* 1849.

	Bajra.	*Joaree.*
1817 to 1822	17 seers	20 seers per rupee
1837 „ 1845	28 „	34 „ „
1847 „ 1849	35 „	42 „ „

Thus, in the first thirty years of our rule, the old Mahratta assessment of one-fourth had mounted up simply by the rise in prices to "that rack-rent of half," the produce of which there has been so much said without any understanding of its real cause. Its cause was not the nature of the land tenure, but that our exactions as foreign rulers prevented that import of silver which was necessary to the people's well-being. Coincident with this fall in the value of the staple products of the country a still heavier fall took place unfortunately in the value of the one article of export which Western India grew; we mean cotton. Look at these figures:—

Price of Indian cotton at Liverpool—1816 to 1845.

1816	14d.
1820	10d.
1825	10d.
1835	9d.
1840	5d.
1845	3½d.

Now the result of this combined fall, and of our growing demand for Home Charges, was that with a cry for silver increasing in urgency every year, the import which had risen as high as 3,800,000*l.* a year during the five years which preceded the fall of the Peishwa, began once more to contract, and the country as a consequence to enter upon long, gloomy, years of deterioration and suffering. The period of deepest depression was about the year 1847, throughout the whole country. We are now upon the threshold of the revolution. From the year 1847 the imports of silver became steady, and upon the outbreak of the Russian War immense. Look at the figures:—

Nett Imports of Bullion. All India.

	Average.
1844-5 to 1848-9	£1,750,000 a-year.
1849-50 „ 1854-5	3,950,000 „
The Russian War—	
1855-6 to 1856-7	11,980,000 „
The Mutiny, Suspension of the Home Charges, and Import of Railway Capital.—	
1857-8 *to* 1860-1	15,000,000 „
The American War—	
1861-2 *to* 1865-6	20,000,000 „
Close of the American War and resumption of the Home Charges—	
July to December 1870	*Nil* „

Upon the right interpretation of these figures depends the prosperity of India. The revolution which has taken place in the country since 1847, its unprecedented prosperity has been brought about, not by any statesmanship of ours. What then have been the causes of this vast, this stupendous change? They lie upon the very surface of the figures we have given. The revolution is due to two facts, in the *first* place to the enormous expansion that has taken place since 1847 in Indian exports; and in the *second*, to the fact that for the last 20 years we have virtually suspended the *Home Charges* altogether, having met the drain by loans in London, as we shall explain in our next issue.

INDIA MAY NOT BORROW.

THE budget statement has but one single point in it that is really valuable or worth recalling. In almost its last sentence Sir Richard Temple makes what claims to be an announcement of the *policy* which the Supreme Government has definitely adopted concerning the Public Works expenditure of the Empire. We have endeavoured for years to discover what that policy is, and we at last get a statement of it from the lips of Sir Richard Temple. The passage is too important to be paraphrased, and must be given in the words of the Minister himself:—

"We have maintained a strict distinction as to what expenditure shall, and what shall not, be considered extraordinary to be provided for by loan. All expenditure, however beneficial, not yielding a direct pecuniary return, has been classed as ordinary expenditure. We have resolved that, so far as may be possible, the

whole of the ordinary expenditure of each year shall be defrayed from the revenues of that year. We have jealously guarded against everything that might tend to shift the burden of these just charges from the present to the future. We have steadily refrained from providing by loan for any branch of ordinary expenditure or for any public works not yielding a direct pecuniary return. We have even refused to entertain proposals for temporary or terminable loans for such purposes. In preference to any such course, the alternative of enhancing the existing taxation has been adopted."

Are we to regard this statement as an authoritative exposition of the policy of the Government? If we are to do so, it is desirable we think that the fact should be officially confirmed. Is it, we say, the definite, settled determination of the Government that it will entertain no proposal to borrow money in any form for works that do not yield a *direct pecuniary return?* The public has a right to be exactly informed upon the matter, and as the course followed of late years is in accordance with Sir Richard Temple's express and formal statement, the Government must not blame us if from this day forward we assume that this is its policy. The disclosure is as opportune as it is positive, and marks a new stage of the discussion. Ten years ago, Mr. Wilson laid down just as positively the policy of the Supreme Government of that day in the now famous axiom that *India must not borrow at all.* Five years later, the government of Sir John Lawrence, when public opinion had become too strong for it, formally withdrew from the position. In spite of its formal disavowal, however, the policy of the State was practically unchanged. An immense outlay upon Public Works was budgetted for year after year, and the whole burden of it thrown upon the *taxes.* All this while the practice of the Government was ostentatiously at issue with its professed conversion to sounder principles. At last, and under the pressure of severe embarrassment, the Government gave tardy and timid expression to its new views, by opening the Public Works loan of £2,000,000 in 1869, of which about one-half seems has been expended. Thus, five years after the date of its professed conversion to a belief in the wisdom of borrowing money for Public Works, Sir Richard Temple tells us that the conversion was partial only; and for the first time, the Government avows openly what the limits of its conversion are. Nothing could be more opportune, we say, or important, for we can now arraign Government before the Committee of Enquiry, without a loophole existing for its escape.

The refusal to allow the country to borrow money for its Public Works lest the foreign capitalist should eventually lose it, will by-and-bye come to be regarded with shame and astonishment. Under these pretences of concern for the capitalist, there simply lurks the remembrance that as English statesman have had the finances of India completely at their mercy and under their control, it is necessary to maintain the credit of the country at all hazards, even though we garotte all private enterprize therein, in the struggle to maintain it. This attitude of the Government is at once so mean, so cowardly, and so selfish, as to provoke the intensest indignation. There is no country in the world that stands so much in need of capital, or that may borrow it with so much propriety, as this.

Possessed of a great territorial estate in the land, the capitalized value of which it is impossible to estimate without seeming to be extravagant, the country is for all purposes of the argument free of debt altogether. While every other nation depends almost wholly upon taxes for its revenue, and has its resources already deeply pledged by existing debt, India has virtually no debt at all, while it derives two-thirds of its annual income from property in the soil, and a tribute upon the Chinese. If India may not borrow for her Public Works, it is an outrage upon common decency for England, or for any other nation, to do so. Look at the following table of the debt of other countries per head of population :—

United Kingdom	£27	16	0	per head of population
France	32	0	0	,, ,,
Holland	13	1	4	,, ,,
United States	17	15	5	,, ,,
Portugal	9	11	6	,, ,,
Austria	6	14	10	,, ,,
Italy	7	19	5	,, ,,
Switzerland	10	4	6	,, ,,
Greece	9	15	5	,, ,,

It is needless to continue the list. These nations are all dependent upon taxes for their annual revenues, and their revenues all pledged years deep by debt. Look now at the debt of India—

British India .. .. 13s. 4d. per head of population.

In *this* case there is no debt at all, while the State possesses in the rental of the soil, and the opium revenue, a property the capitalized value of which (the land being now at its minimum) is not less than £1,000,000,000 sterling. Against the existing small debt, moreover, the State owns a mass of real property in the country worth not less than the amount of it twice over, besides a Cash balance at home and in India of nearly £20,000,000. And this country of all others may not borrow, lest the men who insist upon guiding our finances, while repudiating all responsibility for the result, should at some future time, and in the remotest possible contingency, be called upon to justify what no one asks them to do, and in doing which they disclaim all responsibility. The position is simply an infamy.

EDITORIAL NOTES.

THE Income-tax has been reduced from 3½ per cent. to a fraction above one per cent., and all incomes below Rs. 750 per annum are exempted. The new schedule of duties is :—

Persons whose annual income shall be assessed at not less than Rs.	but at less than	Rs.		Rs. as. p.
750		1,000	shall pay	9 0 0
Ditto ... 1,000	,,	1,500	,, ...	13 0 0
Ditto ... 1,500	,,	2,000	,, ...	18 0 0
Ditto .. 2,000	,,	...	,, two pies in the rupee	

The tax can hardly prove oppressive in its new shape ; but the hostility to it in *any* shape is so great that its retention is a very doubtfully wise step.

THE London *Economist* has discovered at last that "in the "matter of the *Alabama* claims strict legality is probably on "the side of the Union, but that it is most difficult to make "any concession without appearing to alter our municipal legis- "lation under pressure." We have never held but one opinion upon this question. When Bombay was expecting the *Alabama* in harbour in 1864, they proposed to give Captain Semmes a banquet at the Byculla Club. We warned them that as soon as the war terminated, the American Government would certainly present the nation with a bill for the depredations of this man, and that it would be necessary to pay it, in our own interests. The idea was scouted as un-English, but the nation is now preparing to pay the bill.

WE are indebted to a correspondent in Burmah for the following account of the Burmah *basket*:—The standard basket measures contain 2218·19 cubic inches, and contains of cleaned rice lbs. 62 ; cargo rice lbs. 57½; and paddy lbs. 48½. The following are its component parts :—

		1 Pint	or	Goowzah	1¼ lbs.	Weight in pure water.
2 Pints	= 1	Quart	„ ½	Pyee	2½ „	
2 Quarts	= ½	Gallon	„	Pyee	5 „	
4 do	= 1	do	„	Tsaroot	10 „	
2 Gallons	= 1	Peck	„	Tsate	20 „	
4 do	= 2	do	„	Akyab basket...	40 „	
8 do	= 1	Bushel	„	Tin or basket...	80 „	

This "tin," or basket, or bushel, is used all over Burmah but varies slightly, the standard not being enforced except in Government bazaars.

"ON the whole," says the *Pioneer*, "we believe that England "(in the matter of the Russian circular) would have come off "with flying colours and without a shot fired, if she had turned "sharp round on Russia, and threatened to blow out of the "water any Muscovite ship that should enter the Black Sea in "breach of treaty."

We are very much of the same belief. We hold war in as much abhorrence as any ; but the way to prevent war by a great nation like our own, is to show an example of perfect uprightness ourselves, and to throw the whole weight of the country at once upon *the right side*, whenever

peace is endangered by the bad conduct of others. The smooth-tongued language of diplomacy is altogether misplaced, when dealing with open and defiant wrong-doing.

Mr. Grant Duff, in the speech which he delivered the other day in the House of Commons, estimates, we observe, the total income of British India at £500 millions a year :—

"In England you have a comparatively wealthy population. The income of the United Kingdom has, I believe, been guessed at 800 millions per annum. The income of British India has been guessed at 300 millions per annum. That gives well on to £30 per annum as the income of every person in the United Kingdom, and only £2 per annum as the income of every person in British India."

The speaker did well to characterize the estimate as a *guess*. The income of British India must be greatly in excess of the sum stated. The averaged price of food in the country for years past has not been less than 20 seers the rupee ; a simple calculation suffices to show that with food at these rates the people could not exist upon the sum stated.

The total amount of money in the hands of Government on the 31st January seems to have been as follows :—

Cash Balances.....	Rs.	15,27,03,438
Metallic Currency Reserve.....	„	7,52,81,161
	Rs.	22,79,84,599

Nearly twenty-three millions sterling. The total amount of notes in circulation on the same date was Rs. 10,75,53,170, or about eleven millions sterling. Now the cash balances form a sort of *second* line of defence against any possible run upon the Currency Department ; the reserve in Government securities being the *third* line. This reserve according to the latest returns was but Rs. 3,22,72,000, and might surely be safely increased. Instead of reducing the cash balances to the limit of ten millions, let them stand as they are, but let Government double the amount of its investment on currency account, and make the reserve £7,000,000 instead of £3,000,000. It is surely most wasteful for a Government like that of India to keep £23,000,000 of money idle in this way. We should either increase the reserve of the Currency Department, or invest four millions of the cash balances in public securities. To be borrowing moreover, in London at indefinite loss, when the cash balances and Currency Department hold millions in excess of what public safety requires, is not economy, whatever else it may be.

The *Times of India*, in reply to the complaint that it had appropriated from our columns without acknowledgment what it calls "the two leading principles of federal finance," declares that it did not take them from the *Indian Economist*, but from *India as it May Be*, published nearly 20 years ago. But the passage adduced from Mr. Campbell's book does not bear out the statement. We should not notice the matter however, but that the writer makes the following retort :—

"This claim for sole originality in dealing with public questions, and this assertion of patent proprietorship in financial exposition, comes with the worst possible grace from a writer who a few weeks back (as we noticed from an extract in our daily contemporary) put forward as a "discovery" of his own, and which had cost him extraordinary labour, a gross plagiarism adopted from a minute by Mr. Dampier, recently Revenue Secretary to the Bengal Government."

If such a charge has been preferred against us, we have never seen it, and as we have never had the pleasure of reading a minute of Mr. Dampier's upon any subject, so far as we remember, it is hard to see how we could have borrowed anything from him. The *Times of India* is a signal offender against this journal. It never quotes us, and yet lives upon us, and is the only journal in the country that deals so unhandsomely with a contemporary.

A complimentary reference to the Editor of this journal made by Colonel Strachey towards the close of his very able speech in Council upon the subject of Customs duties, has led to a discussion as to the real originator of the idea that it is our true policy in India to abolish such duties altogether. The *Indian Daily News* claims the suggestion as the Hon'ble Mr. Strachey's, while the *Times of India* declares it to be Mr. George Campbell's. The truth is the suggestion is a very old one indeed, and the only merit which the Editor of this journal can lay claim to in connection therewith, is the same as that which belongs to him in connection with some other reforms. He has familiarized the public mind with them, and fastened them as articles of belief therein where formerly they were mere casual notions. What is so unworthy on the part of the *Times of India* is this : that while every distinctive doctrine with which the journal is associated has been derived from the Editor of the *Indian Economist*, and from him only, it takes studious and almost ludicrous pains to attribute them to others, or to pass them off as its own. It will give the credit of them to any and every one rather than to the writer who has the merit of having demonstrated what may or may not have been suggested before. For ourselves we have never taken the trouble to enquire whence the suggestions may have originally come. We have striven to make what we believed to be *true* opinions prevail, and in doing so persistently have come to be identified with them as our own. It would be affectation to profess to conceal from ourselves that we have had more to do with the formation of public opinion in India in the last few years than any other of its publicists. The *Times of India* ought to have said this for us. "A prophet is not without honor save in his own country, and in his father's house."

In winding up the late debates in the Supreme Council, Lord Mayo very properly noticed the extravagant statements constantly put forward as to the weight of taxation in the country ; whereas the large revenues which we derive from land and opium, enable us to dispense with taxation almost wholly.

"As a matter of fact," said Lord Mayo, "are the people of India "heavily taxed ? I have made from reliable documents a com- "parative statement of the incidence of Imperial taxation in "India, and in some European States, England excluded. I have "deducted from the resources of the Indian Empire, all those "sources of revenue which cannot strictly be called taxation. I "have deducted land revenue for the reason that it is not taxation, "but is that share of the profits of the land which the Govern- "ment, in its character of chief proprietor, has from time im- "memorial deemed its right to demand. The opium revenue is "excluded, because no one in India pays it. I have also deducted "contributions from Native States, the receipts received in the "Army, Postal, Telegraph, and all the spending Departments. "The result is, that the revenue received from taxation proper "in India amounts to 14¼ millions from a population of 150 "millions, which gives a result of 1*s.* 10*d.* per head per year. I "have followed the same investigation with regard to five Euro- "pean States, some of which are not the richest, and I find that "while Indian taxation is but 1*s.* 10*d.* per head per year, the sub- "jects of the Sultan are paying 7*s.* 9*d.* ; those of the Emperor of "Russia, 12*s.* 2*d.* ; the inhabitants of Spain, 18*s.* 5*d.* ; Austria, 19*s.* "7*d.* ; and Italy, 17*s.* It must be remembered, however, that a "shilling bears a larger proportion to the income of a laborer in "India than to that of a laborer in any of the countries mentioned ; "but still there is no such difference between the value of labor "here and in Europe as is represented by the difference of taxa- "tion that I have described."

We have no sympathy whatever with the cry against which Lord Mayo protests, and have ever striven to discredit it. The Income-tax is no real grievance when confined to the wealthy ; but by the wealthy we mean a class a good deal higher than the Government standard of 750 Rs. a year.

Lord Napier seems to have given a very vigorous and wholesome check in the Madras Council a few weeks back to the habit of speaking of the land revenue as a tax. His Excellency is officially reported to have said :—"It was repugnant "to him to hear the land assessment discussed as a tax. It was "*not* in his view a tax, but a share of the produce of the land "which belonged to Government as a right. What was paid

"to Government was not something which had belonged to the "occupier, but something which had never belonged to him, and "which he had no right to retain." We have here the true answer to the Bengal zemindar's claim to immunity from taxation. The zemindars entertain a profoundly incorrect view of what the permanent settlement really was. It was a mere sale of Government property to them, in consideration of their paying a fixed perpetual annuity for the same. It had nothing whatever to do with *taxation*. It was simply a sale to the zemindar of rent that belonged to the Government; and to pretend that the price paid for the rental involved an immunity from taxes is absurd. It springs from a totally false idea of the true nature of the transaction. Because the rental served Government in the room of taxes, the popular delusion has been that in fixing the *rental* at a certain price, the arrangement meant an abandonment of the right to *tax*.

A more mischievous delusion was never propagated. The zemindar is simply paying year after year the stipulated price of a very valuable property in the land. The bargain has proved a most disastrous one for the seller—a most advantageous one for the buyer; while the latter, not content with having obtained the long end of the stick, endeavours to make his purchase cover an exemption from taxation—a right which no Government *could* sell to any subject, and a right which, if any Government were unprincipled enough to *affect* to sell, its successors would be bound to repudiate. It is not within the power we say of any Government to give what the zemindars declare to have been given to them by Lord Cornwallis, namely an exemption from all contribution to the general burden of the State. This single consideration sweeps away as with a besom the cobweb sophistries in which the discussion has been involved. The Cornwallis settlement was no commutation with the zemindar for *taxes*, but simply the sale to him of certain State rights in the soil for a perpetual annuity. He was just as liable to taxation *after* that settlement, as he was *before* it; and to hold any other view of the settlement is subversive of the conditions on which alone society is possible.

THE country at last seems to be waking up to the fact that we owe the embarrassments of recent years to official tampering with the land tax. "The more the subject is enquired into," says the *Englishman*, "the more evident it becomes that the "financial difficulties of the Indian Government spring entirely "from one cause—the reckless sacrifice of its principal source "of revenue. The most striking portion of Mr. Strachey's "speech on the Oudh Rates Bill is his account of the manner "in which the land revenue of the North-Western Provinces "was reduced from 66 to 50 per cent. by the local authorities, "for reasons which cannot now be discovered, and which "probably were never discussed by the Supreme Government "at all."

The *Indian Daily Examiner* has been assured that in the "re-"cent renewals of land settlements in the North-Western Provinces, "the local Government has sacrificed a larger amount of re-"venue annually than the Income-tax ever brought in, simply "through not having considered it necessary to impress on the "settlement officers, that in fixing the rent they should make the "price of produce an element in their calculations." Our contemporary thinks that Lord Mayo might, with advantage to the empire, "take the land question in other words, the national estates, under his own special charge."

Some one should do so at all events; but Lord Mayo could not undertake the charge without neglecting work which he cannot devolve upon others. The land revenue should long since have had a special bureau for its management. The general spread of the convictions which we have sought to fasten on the public mind concerning the character of our modern settlements, is one of the features of our times. Mr. Norton complains in the Madras Council of "the virtual giving "away of the State funds by such revenue settlements as "have prevailed of late years." Mr. Arbuthnot in the same way "that in the re-settlement of the land assessment, sacrifices have "more than once been made which would hardly have been per-"mitted if education in the aggregate revenues of the presiden-"cies (provinces) meant a certain reduction of the sum available "for its administration and improvements."

Mr. Strachey we are glad to see has taken hold of the subject in earnest. We reproduce elsewhere his remarks upon it in the course of the late debate upon the proposed local cesses in Oudh referred to by the *Englishman*.

THE average cost of victualling Europeans in the Madras Presidency, according to the Commissariate returns for the month of February, was as follows :—

	a.	p.	c.	
Bangalore	4	10	83	per day
Madras	4	6	27	,,
Calicut	5	5	4	,,
Wellington	5	8	2	,,
Seetabuldee	6	1	36	,,
Kamptee	5	7	41	,,
Vizagapatam	6	7	57	,,
Rassandroog	7	6	19	,,

The average cost of the ration, including servants and contingencies throughout the Presidency, was about 5½ annas, or 8 pence per day. The cost of the same rations in Burmah during the same month was 7½ annas, or 11 pence per day. The special rations are as follows :—

	a.	p.	c.
Bread	1	6	21
Potatoes		6	62
Mutton		9	15
Beef...	1	1	71
Rice		2	0
Tea		6	12
Coffee..		1	99
Sugar..		5	21
Salt		0	80
Vegetable		1	60
Servants and Contingencies		3	0
Annas ..	5	10	41

But eight pence a day is 20*s.* per month, or £12 per year; while Mr. Grant Duff has been led to suppose that the average *income* of the population is not more than £2 per head. Now if this be the average income (including accumulations), what can the average expenditure of the poor amount to? The estimate necessitates our believing that while the mere food of a European soldier costs the State £17-0-0 per year in Burmah, and £12-0-0 in Madras, the people themselves, rich and poor, find 30*s.* a year sufficient for *all* wants. There is gross delusion in these estimates of cost of living amongst the people. In the Bombay Presidency food is as dear as it is at home, or nearly so, and yet by the estimate its twelve millions of people have an income of no more than twenty-four millions sterling a year, while the same number of persons at home contrive to earn and spend upwards of three hundred millions! There is gross delusion, we say, in these estimates.

THE net military expenditure of the year 1870-71 by the Secretary of State amounted to £3,568,000. This sum was remitted from Indian taxes last year to meet the expenditure incurred in England on account of the Indian army. It consisted of the following items :—

1.	Home depots	£698,000
2.	Transport service	413,500
3.	Pay of Officers on Furlough	450,000
	,, Retired Indian officers	879,800
	,, Retired Queen's troops	224,000
4.	Gratuities to Indian officers, &c.	78,000
5.	Military stores for India	824,720
		£3,568,020

The whole of this expenditure is *military*. The first item is a consolidated charge of £10 per head made by the Horse Guards for every soldier serving in India, on the pretext that the English depôts are kept up for recruiting the Indian army. Thus, although these depôts form an important part of the effective garrison of England, the cost of maintaining them is thrown upon the Indian tax-payer. Highly creditable certainly, that the *poorest* people on earth should thus pay the cost of the garrison required to defend the *richest*.

The second item is the transport service. India is not only made to pay the entire cost of bringing the soldiers here, but of

sending them back. "I have it upon unquestionable authority," said Mr. Norton in the Madras Council on the 17th of February, that "whereas, under the old system of transport, the cost "of a British soldier landed in India was £27, it is now £133. "* * * It would be cheaper to give each man a first class "passage by a P. and O. Company's steamer, and present him "with £15 at the end of the voyage, than to send him out by "our new transports."

Before this transport service was heard of, and while the army was far larger than it now is, the cost of carrying the troops was as follows:—

1861-62...	£ 152,193
1862-63...	„ 139,709
1863-64...	„ 174,357
1864-65...	„ 182,244

Under the new system, we have had to pay a million sterling for the cost of the fleet, and now find that the service apparently costs three times as much as it did before. Mr. Norton's statement must, however, be an exaggeration; but the whole question of this military expenditure in England should be sifted to the bottom. The standing army of Bavaria, numbering 49,900 men, with a reserve force of 30,000, costs in all but £3,400,000 a year; of Austria, with 280,000 men, but seven to eight millions; while the Home expenses alone of the Indian army are £3,600,000.

LAND TENURES.

TENURES AS THEY AFFECT INDIGO.

To the Editor of the "Indian Daily News."

SIR,—I see from your paper that some of your contemporaries assert that indigo-planting depends on the present system of middle tenure. I believe this is a great mistake, for as long as there is a demand for indigo it will flourish under any system. A good many years ago, when too large a quantity of indigo was made, indigo fell to an average of Rs. 100 per maund, which brought ruin on the planters; no system could stand in the face of so large a quantity of indigo. Of late years so large a quantity of indigo has not been made, and indigo now averages about Rs 250 per maund; these prices enable planters to make up for bad seasons. Any change of system might compel some planters to shut up their factories; but this would only bring indigo up to Rs. 350 per maund, and make it possible to him under any system.

Even if Government were to prohibit middle tenures, the indigo interest of this district would not suffer, for I find that those planters who are both zemindars and *moostagers*, lose most in indigo, and the successful planters are those who have least to do with *moostagerees*. This does not happen because the zemindar or moostagerees planters are not able to get up as good a crop, but because their plant is grown on the bank of rivers subject to sudden inundations. A safe indigo concern requires no assistance from the moostagerees or zemindaree system, and in many cases where the proprietor of a safe factory has gone in for moostagerees, he generally tries to give them up again, for he finds no adequate return for the losses sustained on the moostagerees. Before he took the moostagerees he had as much land as he required, and if he was visited by a bad season or two, he would find the moostagerees a burden in place of a help. The above refers to this district.

If it should happen that middle tenures were prohibited, a great many factories would suffer, and the *Neez* system would have to be extended, which would establish the indigo manufacture on a firmer basis. The *Nees* system would require a larger capital at starting if it were to succeed; and many of the present planters would find the expenses for digging tanks, sinking wells, and purchasing machinery, too great for them; but capitalists would soon be found to invest largely for the certain profits arising from higher prices, and once the *Nees* system was established on a firm footing, it would be found to work as cheaply as the present system, and with fewer bad seasons.

I would enter here into the comparative merits of both the present and the *Nees* systems, only that I am afraid I should be taking up your space unnecessarily, repeating in fact what I believe is very generally known.—Yours, &c.

X.

Purneah, 18th February, 1871.

LAND REVENUE.

(The Madras Mail.)

THE theory which appears to guide the "reduction of assessment school" appears to be that the increase in imports, and consequently, Customs' dues, will more than compensate for any reductions in the land revenue, which will tend to make the cultivator rich, and able to afford European luxuries; and, secondly, that by reducing the assessment, more land will be brought under cultivation, the result being the enrichment of the people generally, and a greater supply of food grain. We emphatically deny the soundness of either promise. The whole history of the interior economy of India for the last ten years should itself prove the fallacy of the first, for whilst it is allowed that the increase of cultivation has been enormous, and the amount of money in the country has doubled if not trebled, we find the Customs' revenue barely affected thereby; the fact being that increase of wealth in India does not involve increased expenditure amongst the natives who possess it, and that there is no increase in the demand for what we are pleased to term *luxuries*, which, indeed, prevent no temptations to our native friends. Again, the increased wealth is not, as a rule, distributed amongst the actual cultivators. It is so doubtless to a great extent in the cotton-growing localities in Bombay, and part of this Presidency, where the immense rise in prices, and increased demand have enabled many a ryot to free himself from the clutches of the village sowcar; though we doubt much if he fully appreciates his freedom, and whether his superfluous earnings were not after all as well placed there as in the purchase of jewellery, or buried in the earth. The actual cultivators is, as a rule, in this Presidency, a sub-tenant or slave of the actual holder or renter, and any reduction of the assessment benefits him only in an infinitesimal degree, if at all. In fact, it is often quite the reverse; the owner or renter of the soil imposing a proportionately higher rent to represent what he considers the annual rental or interest of the increased value of his land. To take, for instance, the Trichinopoly district. No one supposes that the rich irrigated lands under the Cauvery Channels are held by the typical *poor ryot* who may be seen actually cultivating them from "morn till dewy eve." They are owned, or rented, by chetties, sowcars, and the like, who take their ease in large towns and villages, and the only result of the reduced assessment has been to increase enormously their wealth and power, without in the least tending to improve the position of the actual cultivators, or increase the general welfare and well-being of the district, or the circulation of the precious mentals. The ryot, in fact, fared better under the old rates for he might acquire, if careful, a piece of land of his own, or make handsome profits from land which he held from some large owner or holder. Now all this is changed. Not only is the land dear in itself to the holder, as giving a status and position which land alone can bestow in this as in other countries; but by the lightness of the Government assessment, which is notoriously far below what it should be, and the high prices ruling of late years, it has become the most valuable investment for surplus capital, and not to be parted with, or rented out, save at prices and rates altogether beyond the reach of the average cultivator. It is as if British Consols or Indian 5 per cents. were suddenly to be doubled in value by an increase more than double the interest or dividend—the security being as good as ever. The present holders would doubtless benefit, but the majority would suffer, for they could not invest under an excessive and prohibitive price. Capitalists would applaud, but the public—and notably the poorer classes of the public—who, it is avowedly the wish of the Government to befriend, would groan.

RECENT SETTLEMENT PROCEEDINGS.

(Hon. Mr. Strachey's Speech in Council.)

THE local Government of Oudh proposes to raise the necessary funds by imposing a light rate upon the land, and the present Bill is intended to give the requisite powers. It proposes to authorize the imposition, on every estate, of a rate not exceeding one and a-quarter per cent. on the annual value of the land as recorded at the settlement. The land revenue demand in Oudh is estimated as equal to one-half of the gross rental of the land. The cesses already levied for roads, schools, and other local purposes, amount to 1½ per cent., and it is now proposed to raise 1¼ per cent. more.

It is important I think to remark that these local rates differ essentially in their nature from the land revenue. They are taxes imposed on the land for local purposes. The land revenue, on the other hand, is that portion of the rent of the land to which, in accordance with the immemorial custom of the country, the State, as superior proprietor of the land, is entitled. But although the land revenue is not taxation, its amount necessarily affects very closely the question when we have to consider the propriety of placing fresh taxation on the land, for it might

happen that the share of the rental taken by the State was so large that no room would be left for taxation. Nobody can say that this is the case in Northern India. The truth, I fear, rather is that we have been sacrificing, by our existing system of settlements, a vast income, which, as all classes of the people, including the private proprietors of land themselves admit, has always belonged to the State. This is a great question into which I do not now purpose to enter, but I wish to state a few facts to illustrate to the Council what I believe to be the truth regarding the pressure of the land revenue demand in Northern India. My particular illustrations will be taken from the North-Western Provinces, but in principle everything that I am about to say applies equally to Oudh and the other more advanced provinces. Under the old settlement for 30 years, which have now for the most part expired in the North-Western Provinces, the share of the rental to which the State was assumed to be entitled was 66 per cent. Such men as Mr. Thomason, and the other most experienced officers of the time, were satisfied that this share was not excessive. If it was not in accordance with ancient custom and with the feelings of the people, I believe that the main divergence was really this: that never had any Government at any previous time taken so little. The proof that the demand was not excessive seems to me to be absolutely complete. The best proof that can be given consists in the fact of the vast progress in wealth and prosperity which the North-Western Provinces have made during the last 30 years, and in the growth of private property in the land of immense value. Under the present system of settlement we take 50 instead of 66 per cent. Why this change was made I cannot say. So far as I have ever been able to discover, it was made in 1854 by the Lieutenant-Governor of the North-Western Provinces on his own authority, and without any serious discussion. In reality we do not ever get 50 per cent., because the annual value of landed property goes on constantly and rapidly increasing. An example has lately come before the Government of India which illustrates what is happening in regard to the settlement of the land revenue. It is my belief, and it would not be difficult I think to show that my belief is based on solid grounds, that this example is by no means a singular one. Although the case is a strong one, and perhaps an extreme one, it may, I believe, be fairly taken as an illustration of a process which is very generally going on. In the Boolundshuhur district of the North-Western Provinces settlement operations have been in progress for some time past. About five years ago the assessment was completed. The proper amount of the land revenue was determined to be £123,000 a year. The Lieutenant-Governor subsequently ordered a special inquiry to be made, and the conclusion arrived at by Sir William Muir, than whom there can be no higher authority, is that although the sum of £123,000 really represented only five years ago an amount equal to 50 per cent. of the rental, so great and so rapid has been the increase in the value of land property, that it is now equal to only about 35 per cent. In other words, the annual rental of the private proprietors has increased 15 per cent. in five years. If a new settlement were now to be made, we should get, under the present system, £141,000 instead of £123,000 a year; and if the rates of the old settlement were in force, we should get £188,000. Under the latter supposition we are loosing £65,000 a year, and the total result of the new settlement for thirty years will be that, by the time it expires, we shall have given away to private parties, in this single district, no less than £1,950,000, which, under former rulers could have been received by the State. The great present disproportion between the rental of the land and the Government revenue is the result of the great increase which has taken place in rents. This has been caused partly by the settlement of the Government demand, and partly by the increased value of agricultural produce, and the increased wealth and prosperity of the country.

This is a good example of the process going on over almost the whole of India. We have spent, and are spending, millions of money on canals, and roads, and railways. Other branches of industry have doubtless benefited, but no industry has derived from this vast outlay anything like the benefit which has been derived by the proprietors and occupants of the land. By the extension of canals, by the improvement of railway and other communications, and the opening out of new and profitable markets, an enormous increase has taken place in the value of agricultural produce, and the additional value which has been given to the land has been at the expense of the State, without the expenditure of any capital or labour on the part of the proprietors of the land. Such facts as these show, in my opinion, conclusively that the land ought to bear the main portion of the charges which have to be incurred for further extension of roads and similar improvements.

In throwing such charges on the land, we are not really imposing on the land a fresh burden. We are only recovering the cost of a small portion of the vast benefit which we have conferred upon the land. If we act wisely on these principles, we shall have little difficulty about the provision of funds for works of local improvement, and we need hear no more of any heavy income-taxes or any other unpopular impost.

THE LAND IMPROVEMENT BILL.

THE following Bill to consolidate and amend the law relating to advances of money by the Government for the construction of permanent works of agricultural improvement, was introduced into the Council of the Governor General of India, for the purpose of making Laws and Regulations on the 16th March 1871, and was referred to a Select Committee with instructions to make their report thereon in a fortnight:—

This Act may be called "The Land Improvement Act, 1871." It extends only to the territories respectively under the government of the Lieutenant-Governors of the North-Western Provinces and the Punjab, and under the administration of the Chief Commissioners of Oudh, the Central Provinces and British Burmah; and it shall come into force on the passing thereof.

The enactments mentioned in the schedule hereto annexed shall be repealed to the extent specified therein.

In this Act "land" means land used for agricultural purposes, or waste land which is cultivable; "rent" means whatever is payable or deliverable for the use or occupation of land; "Landlord" includes a superior, mesne, or immediate proprietor, and any person entitled for the time being to receive rent directly from a tenant; "tenant" means any person actually using or occupying land, and liable to pay or deliver rent therefor; "improvement" means:—1st, wells, tanks, and other works for the storage supply, or distribution of water for agricultural purposes of the preparation of land for irrigation; 2nd, works for the drainage of land, for the reclaiming of land from rivers, or from other waters; for the protection of land from floods, or from erosion or other damage by water; 3rd, the reclaiming, clearing and enclosing of waste lands for agricultural purposes; 4th, the clearing of the land from stones or other obstacles to cultivation; 5th, the renewal or reconstruction of any of the foregoing works or such alterations therein, or additions thereto, as are not required for maintaining the same, and which increase durably their value; and "Collector" means the Collector of land revenue or the Deputy Commissioner, or any officer authorized by the local Government to exercise the powers of a Collector under this Act.

Any landlord or tenant desiring to make an improvement in any land of which he is in possession or occupation, and to obtain an advance of money to enable him to make such improvement, may make an application to the Collector for such advance, stating at the same time the nature and amount of the security which the applicant proposes to furnish for the repayment of such advance.

On receiving such application, the Collector shall make such inquiry as he deems necessary to ascertain the propriety or otherwise of making the advance.

If the Collector be satisfied—(*a*) that the improvement will immediately or prospectively increase the annual value of the land to be improved by an amount exceeding the largest sum to be charged in any one year under this Act for the re-payment of the advance; and (*b*) that the proposed security is adequate, he may grant to the applicant a certificate sanctioning an advance of money for the purpose of making the improvement.

If (*a*) the applicant is a tenant not having the right to transfer his interest in the land without the consent of the landlord; or (*b*) if the applicant is a tenant having such right, but the amount of the advance applied for exceeds the value of the said interest, and if, in either of such cases, the Collector is not satisfied that the proposed security is adequate, the Collector shall serve notice of the application on the landlord personally or upon his agent authorized to receive service on his behalf.

No such notice shall be deemed to have been served unless the service is acknowledged by the landlord, or his agent, or the fact of its having been made be otherwise established to the satisfaction of the Collector.

If the landlord does not within one month after such service signify in writing to the Collector his dissent to the making of the proposed improvement, or if he dissents but, after the Collector has explained his reasons for thinking the improvement desirable, withdraws in writing such dissent, the Collector may grant the certificate.

The certificate shall (*a*) state the amount of the advance; (*b*) state the conditions under which it is to be made and recovered; (*c*) specify the land or interest in the land (if any) which, in the event of any sum not being repaid by the person receiving the advance, shall become chargeable for the repayment of the same; and (*d*) state the nature and amount of any other security furnished.

When such certificate has been granted, the Collector may make the advance therein mentioned.

All sums stated in such certificate shall, when they become due, be recoverable from the person to whom the advance was made, or from any person who has become security for the repayment thereof, as if they were arrears of land revenue due by the person to whom the advance was made or by his security. If any such sum cannot be so recovered, it shall be recoverable as if it were an arrear of revenue due on the land specified in the said certificate; provided that when the person to whom the advance

was made is a landlord or a tenant having a right to transfer his interest in the land without the consent of the landlord, the interest of no person, other than such landlord or tenant, in the said land shall be sold under this section.

The making of an advance under this Act to a tenant shall in no case be deemed to confer upon him any right to, or interest in, the land in respect of which the advance is made, or to alter the respective rights or interests of landlord and tenant in such land.

The Governor-General in Council shall determine, from time to time, the aggregate amount which may be applied by the local Government for the purpose of making advance under this Act, or which may be permitted to remain out-standing and not repaid or discharged at any one time on account of such advances.

The local Government, with the previous sanction of the Governor-General in Council, may make rules consistent with this Act in all matters connected with its enforcement, and may, from time to time, alter and add to the rules so made.

Such rules shall, among other things, make provision:—1*st*, for prescribing the manner in which applications may be made by persons desiring to obtain advances from the Collector for making improvements, and in which inquiries relating to such applications shall be conducted; 2*nd*, for prescribing the forms which are to be used in any proceeding under this Act; 3*rd*, for determining the conditions under which such advances may be made, and under which they are to be repayable; 4*th*, for securing the due expenditure of such advances, and the due execution, inspection, and maintenance, during the term fixed for the repayment of the advance, of the improvements for which the advances are made; 5*th*, for keeping and auditing the accounts of such advances; 6*th*, for making local enquiries or otherwise carrying out the provisions of this Act.

Any sums expended by the Collector in accordance with rules made under this section shall be recoverable as if they were part of the advance in connection with which they were made.

Statement of Objects and Reasons.

The object of this Bill is to consolidate and amend the law relating to advances of money by the Government for the construction of works of agricultural improvement.

Almost from the commencement of the British rule in India, the Government has recognized the duty of making advances, usually called *tuccavi*, to the owners and occupiers of land, for the purpose of promoting the construction of minor works of agricultural improvement, not requiring much engineering skill or the employment of large numbers of labourers, but of such a description that they can be designed and carried out by the people themselves. The existing law upon the subject is contained in the Regulations mentioned in the schedule to the Bill. It is provided by these enactments that *tuccavi* advances shall be recoverable by the same processes which are applicable to the recovery of arrears of land revenue, and the security for repayment is thus rendered complete.

The provisions of the Regulations in question are, in some respects, hardly suited to the circumstances of the present time. The consolidation of the existing law upon the subject is necessary, and it is desirable to take the opportunity of amending the law where it is defective.

The system under which *tuccavi* advances have long been made in India for permanent agricultural improvements, and which it is proposed to continue under the present Bill, is identical in principle with that which has been carried out, with admirable results, in the United Kingdom, by means of the Land Improvement Acts, and it is believed that this principle may properly receive a wider and more systematic development in India than has hitherto been given to it.

The Bill defines the classes of works for which the assistance of the Government may be granted; it authorizes the local Governments, with the previous sanction of the Governor-General in Council, to make rules prescribing the manner in which applications for advances may be made; the conditions under which advances may be granted, and under which they will be re-payable; for securing the due expenditure of the advances, the proper execution, inspection, and maintenance of the works for which the advance was made; and for the keeping and auditing of accounts.

Long experience has shown that the system of granting advances of this description cannot throw any financial burden on the public, for no advance can be made unless the reproductive character of the work is certain, while the security for the repayment, both of the capital and interest, will be in every case complete.

The Bill refers only to advances for works of permanent agricultural improvement. A vicious system formerly prevailed in some parts of India, under which nominal advances, called *taccavi*, were often made to liquidate balances due on account of Government revenue, and for other temporary purposes. This system had nothing in common with that described in the present Bill.

LAND REVENUE IN THE PUNJAB.

I.

(*Indian Public Opinion.*)

In the Settlement Commissioner's Report for 1868-69, there is a very clear statement of financial results of the settlement operations which have within the last few years been in progress in the Umritsur division, and in the districts of Lahore, Goojrat, and Goojranwallah.

They may be tabulated, in round numbers, thus:—

	Former Assessment.	New Assessment.	Initial Decrease of Assessment.	Initial Increase from Canal Income
Three districts of the Umritsur Division... ...	Rs. 33,68,000	Rs. 31,98,000	Rs. 1,69,000	Rs. 1,51,000
			Initial Increase.	
Goojrat ... Goojranwallah ... Lahore ...	16,32,000	17,79,000	1,47,000	50,000
Total results of the 6 Settlements, Initial Decrease.....			22,000	2,01,000

Initial Decrease (inclusive of Canal Increase.)	Increase Progressive, Land and Water.			Tota Increase.
	After 3 years	After 5 years	After 10 yrs.	After 15 yrs.
Rs. 18,000	Rs. 53,000	Rs. 39,000	Rs. 1,00,000	Rs. 2,16,000
Initial Increase inclusive of Canal Increase.				
Rs. 1,97,000	Rs. 23,000	Rs. 30,000	Rs. 2,48,000	Rs. 5,64,000
1,78,000	76,000	69,000	3,48,000	7,80,000

Or, stated in other words, the result of six settlements has been to reduce the ordinary land revenue by 22,000 Rs.; two lakhs however are assessed as water advantage revenue, so that we start with an initial increase of 1,78,000. This will increase in the course of 15 years, by progressive assessments, about 6 lakhs more, so that at the close of that period the land revenue of the six districts will be, [if we include the additional revenue claimed in respect of the enhanced value of the land owing to canal irrigation] 7¾ lakhs larger than it was when the six settlements were taken in hand.

The Settlement Commissioner considers this "satisfactory," and as we are unable to agree with him, we wish, with all the deference and courtesy due to so experienced and able an official, to indicate the grounds of our dissent. We are strengthened in our convictions by the fact that the course of things now going on in the Punjab settlement contrasts entirely with the Oudh and North-West-Provinces settlements, in both of which a large initial increase is being obtained; and also by the opinions of various district officers, well acquainted with the capabilities of their districts, who express very decidedly their opinion that the existing assessments are needlessly and wastefully low.

And first, what is the theory of land revenue? Stripped of all the vague and confusing ideas which have been allowed to obscure the matter, it is simply the right of Government to exact from the occupiers of the land such a proportion of the proceeds of the soil as represents the share in the general taxation of the country which they can reasonably be called to defray. A field is of no use to a man unless he can till it in peace, and find a market for its produce; roads by which he can convey the produce to his customers; water with which to irrigate it; tribunals before which his rights in respect of it may be maintained. The State provides order, army and police, and jails; roads, markets, canals, railways, and courts; and provides and maintains them so effectually that, whereas 20 years ago land was scarcely worth having, it is now every hour rising in value, and its price has actually doubled all over the province within the last five years. In the same way the effect of our administration has been that the value of agricultural produce has (as we believe we can show from the Settlement Commissioner's own figures) a great deal more than doubled since we have been in possession of the province. In order to do all this the State spends a great deal of money, and in the last official year, in order to make both ends meet, was driven to the disagreeable expedient of scraping together six lakhs by a tax which was so odious that every sixth person on whom it fell petitioned in Court against it, and so ill-contrived in its incidence that seventh of the whole was docked from the pay of Government servants, or, in other words paid by Government itself. Under these circumstances the question naturally arises, What fraction of all the additional wealth that the British administration has conferred upon them, are the occupiers of the soil contributing towards the expenses that such an administration involves? An agriculturist who buys

nothing, and who can sell his wheat at 20 seers per Rupee instead of 40, is obviously twice as rich in the one case as the other, and what is gain to the agriculturist is loss to the consuming class who buy everything and have nothing to sell, and who are obviously a great deal worse off than before.

Is, then, the agricultural class paying double revenue in respect of its doubled wealth, or 50 per cent., or 10 per cent., or 5 per cent.? Strange, to say, the agriculturist is actually not paying as much as he did when his possessions were not worth half their present value; and it is only by claiming a portion of the canal earnings that the large amount of the total diminution is concealed. We take a division like Umritsur with the Baree Doab Canal* flowing right through two of its districts—uninterrupted railway communication with Calcutta and Bombay—and prices of every kind experiencing the sort of stimulus that might have been expected from such advantages; and instead of finding its land revenue enhanced, we find an initial decrease of over a lakh and a-half which, even with the canal earnings, leaves the division 18,000 Rs. worse than before the new assessment, and the Settlement Commissioner consoles us with the cheerful reflection that 15 years hence its present revenue will have increased by a couple of lakhs!

Prices in the Umritsur division have been for many years past on the rise as the following table shows:—

No. of Seers to the Rupee.

	Wheat.		Rice.		Barley.		Gram.	
	S.	chs.	S.	chs.	S.	chs.	S.	chs.
1857-58	41	...	12	8	64	13	43	4
1858-59	44	1	12	...	57	8	75	7
1859-60	42	8	12	...	50	8	59	8
1860-61	22	8	10	12	32	8	20	...
1861-62	18	...	8	...	20	8	18	...
1862-63	27	8	8	12	40	...	29	8
1863-64	30	12	7	...	50	...	47	...
1864-65	33	12	7	4	56	...	47	...
1865-66	19	9	6	4	35	4	31	14
1866-67	22	7	7	6	33	2	33	8
1867-68	19	12	7	12	27	12	25	4
1868-69	11	4	6	4	22	11	20	6
1869-70	11	10	4	8	16	5	13	3

These figures indicate a steady rise of at least 100 to 150 per cent. in agricultural produce. Moreover as the effects of the through traffic with Bengal have not yet come in to play, and as within 15 years the Indus Valley line will have opened the route to Kurrachee, who can venture to say what further enhancement in prices may by that time have taken place; and this is the district which Mr. Prinsep leaves (if we put the canal earnings aside) with Rs. 1,69,000 less assessment than it bore before he took the settlement in hand!

Let us take Sealkote, one of the Umritsur districts, as an instance of the manner in which settlement matters are transacted in the Punjab. The first regular settlement operations commenced, it appears, in 1850, and the direct control, after being for some time under Sir R. Temple, passed in 1853 into Mr. Prinsep's hands. It was considered that the former assessment, made at the summary settlement, was far too high, and in 1853 a new assessment was announced which reduced the revenue 2½ lakhs from 11½ lakhs to 9¼. This was subsequently in 1853-59 still further reduced to 8,82,000, or 23 per cent. on the former assessment. This assessment was unquestionably a very light one. Writing in 1863 about it, the Settlement Commissioner says:—"I have traversed the district over and over again and been in frequent communication with the tehseeldar and people. The *jumma* has been collected from year to year with ease. There is one feeling expressed—and it is confirmed by Mr. McNabb who succeeded me in the district—*that the assessment has been a light one and has given universal satisfaction*" The settlement however which was a ten-years one had by this time run out, and a new one was commenced in 1863 which was concluded in 1866, apparently with the result of still further reducing the revenue; for in 1867 we find it standing at 8,31,000, when by the addition of the reyah tehseel, it was raised to 10½ lakhs at which sum it now stands. If, therefore, we read the statistics aright, the assessment, excluding the added tehseel, is at the present moment 50,000 Rs. lower than the assessment which was considered extremely light previous to 1863. Now this assessment was, the Report tells us, intentionally fixed far lower than the previous summary settlement, that having been erroneously grounded on the prices of the previous 3 years in 1844-45-46. The Commissioner therefore took an average of prices for the 30 years preceding, in 16 principal towns, and fixed his assessment with a view to this. The propriety therefore of the present assessment depends on the degree in which the prices obtaining for 30 years previous to 1844 correspond to those which now prevail, and are likely to be in force for years to come. Now the average rates shown in the Settlement Commissioner's diagram are as follows:—

* The Umritsur division has 3,71,000 acres under canal irrigation.

Average at Market Price for 1 Rupee.

	*M.	S.	Kutcha.	Pucca.
1842.....Wheat,	... 2	0	or ...	49 Seers.
1843-44 „	... 1	35	„ ...	45 „

The average for the 30 years was as follows:—

	*M.	S.	Per Rupee.	Pucca Seers.
Cotton	... 1	10	or ...	30½ „
Sugarcane	... 1	15	„ ...	33 „
Wheat	... 2	30	„ ...	67 „
Maize	... 3	10	„ ...	79 „
Barley	... 4	10	„ ...	104 „

Now look at the price current for the Sealkote district for 1869-70—

	No. of Seers per R. on 1st June, '68.	No. of Seers per R. 1st Jan., '69.	No. of Seers per R. 1st June, '69.	No. of Seers per R. 1st Jan., '70.
	Seers chs	Seers chs.	Seers chs.	Seers chs.
Wheat	19 0	10 12	13 4	10 8
Cotton (cleaned) ...	3 0	2 11	1 12	2 8
Maize	18 0	11 0	0 0	14 8
Barley	31 0	15 0	20 0	16 0
Sugar (1st sort) ...	2 12	2 8	2 0	2 6

Or, if it be suggested that the last two years are not a fair sample, take the average of wheat and barley for the last ten years in the Umritsur division—

	Wheat, seers per Rupee	Barley, seers per Rupee.
1860-61	... 22 8	... 32 8
1861-62	... 18 0	... 20 8
1862-63	... 27 8	... 40 0
1863-64	... 30 12	... 50 0
1864-65	... 33 12	... 56 8
1865-66	... 19 9	... 35 4
1866-67	... 22 7	... 33 2
1867-68	... 19 12	... 27 12
1868-69	... 11 4	... 22 11
1869-70	... 11 10	... 16 5

It is impossible to compare the above tables, and, after allowing for all inaccuracies, to doubt that an enormous rise in the value of produce has taken place. The rise has been continuous for years past, and there is every reason to expect it to continue. On what possible grounds, then, can an assessment be justified which professedly proceeds upon rates which for twenty years have never been realized in the province, and which will certainly never be heard of again? Even in the 3 years against which the Settlement Commissioner protests as too abnormally high for the basis of the summary assessment, the rates were less than half the present prices. Mr. Prinsep says that the people managed to pay the higher assessment as long as those rates prevailed: but that when prices sunk they began to get into trouble. Why, then, when so enormous an advance in rates has taken place, should the original revenue not be realized? Why is it that, when the North-West Provinces have already realized 23 lakhs additional land revenue and expect from the re-settlement a total increase of 75 lakhs; when Oudh is increasing its assessments at the rate of 32 per cent.; the Punjab, where the progress of improvement has been at least as marked and rapid, should be making no material advance, and in some instances should be absolutely retrograding? We sincerely trust that the six settlements to which we have referred will receive the most careful scrutiny by the superior authorities before the sanction of Government is accorded to them, and so serious an amount of yearly income finally abandoned. The whole subject seems to us to be treated with a calm indifference that is absolutely astounding. If a couple of peasants get into a squabble about a fraction of a beegah of land, we spare no pains to have the "mukuddama" tried with promptness and exactitude; the results are carefully tabulated; every step in the proceeding is watched with sedulous attention; there is the right of appeal, review of judgment and the supervision of the superior courts to guard against the possibility of miscarriage. But when it is a matter of tens of lakhs Government appears to regard it as unworthy of attention. Year after year goes by without reports being sent in; the Settlement Commissioner is, he says, too busy with other matters. One gentleman, we are told, has been allowed to take his report to England to write at home, and apparently has forgotten in the bosom of his family the fiscal necessities of the Punjab, for he has not been heard of since. Another has been too busy with district duties to complete his report; three officers of the tiny settlement staff were, the Settlement Commissioner states, "new to the work of settlement," and had to have their hands strengthened by a re-arrangement of the subordinate establishment; and so small has been the progress effected during the official year that when we turn to Return 21 of the Revenue Report we are greeted with the following announcement:—

* Kutcha maunds of 24½ pucca seers

RETURN No. 21.

FISCAL RESULTS OF REGULAR AND SUMMARY SETTLEMENTS.

No new assessments during the year as the districts under settlement had not reached the assessment stage.

Considering that the only districts in which settlement operations were in progress were Hazara, Montgomery, Dera Ghazee Khan, Peshawur, and a pergunnah in Hoshyarpore, and that expired settlements to the amount of 60 lakhs are running on at old rates, this appears to us about as unsatisfactory a statement as could well be imagined. At this rate when will the Punjab re-assessment reach its close? And, meanwhile, how many lakhs of revenue does Government intend to throw away?

II.

We stated on a recent occasion that districts aggregating about 60 lakhs of revenue had been recently re-assessed in the Punjab at rates that were calculated by their extreme lowness to excite the gravest doubts as to the soundness of the re-assessment. We now proceed to go somewhat more fully into the figures on which our conclusions are grounded. The districts referred to are the following:—

	Gross Revenue.	Rate per cultivated acre.
Umritsur (about)...	12½ lakhs	1 5 6
Sealkote ...	12¼	1 7 3
Goordaspore ...	9	1 7 6
Lahore ...	6¼	0 10 3
Goojrat ...	6¼	0 14 7
Kangra ...	8	1 6 3

It will be observed that in no single instance does the revenue assessed rise above 1-7-8 per cultivated acre; and the average for the entire province on the cultivated acre is only 1-1-3. Comparing this with the rates existing on other recently assessed districts, the difference between the rates is surprising. In the North-West Provinces the rate on the cultivated acre, as shown in Table E, of the Administration Report as 1-10-3, and we find districts assessed as high as 2-10-2 per cultivated acre. (Futtehpore) Cawnpore, 2-9-0, and several others at rates ranging from 2 Rs. to 2-5. Now the North-West Provinces may be capable of bearing a heavier assessment than this province; still it is somewhat remarkable that such a district as Umritsur should fall so considerably short of the average assessment of the entire North-West Provinces. Prices can scarcely rule higher in any part of Upper India than those realised in all the larger stations of the Punjab; ample means of communication exist; and when we find Government on one side of the Jumna getting an average of 9 annas per acre from cultivated land than it realizes on the other, we cannot but suspect that there is something faulty in the assessment of either one or the other. Both provinces alike are sharing in the advantages of British rule, and both alike should contribute to the outlay which those advantages involve. We commend the following statement from the Administration Report of the North-West Provinces for 1869-70 to the attention of our revenue officials:—

"Para. 169. The increase of land revenue due to the new "assessment is 23,87,901. It is calculated that the entire "increase in land revenue due to the re-settlement will not "be less than 75,00,000." If this can be done in the North-West Provinces, why is such a totally different state of things to prevail in the Punjab? Prices may have risen in the one province, but surely not faster than in the other. Take, for instance, the Lahore district, one of the scenes of the settlement officer's most recent operations. The following has been the average price of wheat since 1863:—

	Srs.	Chs.	
1863-64	32	8	per Rupee.
1864-65	26	12	"
1865-66	19	12	"
1866-67	21	8	"
1867-68	19	8	"
1868-69	11	6	"

This large and steady rise in prices, the Financial Commissioner is no doubt right in attributing, in a large degree, to increased facilities of communication; but increased facilities of communication imply roads, bridges, railways, canals, all made and maintained at enormous expense by Government; how is it then that when Government is so hard-driven as to be obliged to risk the tranquillity of the empire by the imposition of odious forms of taxation, so reasonable, natural and convenient a form of taxation should be wantonly neglected? We should not venture to express our own opinion on a subject requiring special knowledge, but we have reason to know that some of the most experienced officers of the Lahore district, intimately acquainted with the condition of the people, consider that the *present assessment might be largely increased* without laying any oppressive burden whatever on the agricultural classes, and without producing the least discontent. The people know,—unless our settlement officers have taught them the contrary,—that the Government is fairly entitled to a moderate fraction of the enormous gains that it has brought within their reach; under the old rule they were cruelly rack-rented; under the present regime they are foolishly indulged.

If we contrast the Punjab with Oudh, the contrast is equally remarkable. Here is the Government Report for 1869-70:—"Up to September 30th 1868, 18,381 villages had been re-assessed. "The summary *jumma* of these 18,381 villages was Rupees "8,436,768. The revised demand was Rs. 11,200,072. The in- "crease were therefore Rs. 2,763,304, *or at the rate of more than* "32 per cent. At this rate the original summary demand (Rs. "10,306,842) should at the completion of the assessment be raised "to no less than Rs. 13,600,000. The total cost up to the end of "September 1869 had been Rs. 4,024,530. The outlay thus repay- "ing itself at the rate of 68·66 per annum. The expediency of "pushing to completion an undertaking so remunerative is self- "evident." The rates are fixed at an average of 1-15-9 on the cultivated acre, (14 annas above the Punjab average!) and the Financial Commissioner reports that "as a rule the *assessments have been borne without a murmur.*"

These figures seem to us to speak for themselves; and which-ever way we look at the case, we are driven to the same result. Let us, for example, compare the Umritsur and the Lucknow divisions. The ordinary theory of assessment in the Punjab, (if indeed there can be said to have been any theory beyond the caprices of settlement officials) is that the land revenue should be fixed at ¼ of the gross produce; from this ¼ a deduction of ⅛ is made on account of vicissitudes, expenses, &c.; the assessment accordingly should be about ⅛th of the gross produce. Now the Umritsur division has under cultivation—

	Acres.
Umritsur	900,000
Sealkote	800,000
Goordaspore	613,000
	2,313,0000

On these 23 lakhs of acres the following crops were grown in 1868-69:—

	Umritsur. Acres.	Sealkote. Acres.	Goordaspore. Acres.
Wheat	... 3½ lakhs	3½ lakhs	2 lakhs
Rice	... 92,000	77,000	57,000
Other food grains...	3 lakhs	2¼ lakhs	3 lakhs
Sugar	... 27,000	50,000	20,000
Cotton	... 26,000	40,000	6,000
Miscellaneous	... 93,000	50,000	20,000

On a moderate computation with reference to the ruling prices the value of these crops may be put down as—

Umritsur	Rupees 120 lakhs.
Sealkote	,, 119 lakhs.
Goordaspore	,, 79 lakhs.

in all 318 lakhs. Taking the ⅛th as the Government assessment, this would give us 53 lakhs as the proper land revenue. Instead we find it assessed at about 34 lakhs, or nearly 20 lakhs short of the proper figure, and even this assessment is, we gather, reduced 1½ lakhs by the recent settlement.

Now apply the same calculation to the Lucknow division. It has about 15½ lakhs of acres under cultivation. The following crops are grown:—

	Lucknow. Acres.	Oonao Acres.	Barabunkee Acres.
Wheat	1¼ lakhs	1¼ lakhs	1¼ lakhs
Rice	32,000	42,000	1 lakh
Other food grains...	3½ lakhs	3½ lakhs	3½ lakhs
Sugar	8,000	8,000	11,000
Cotton	1,000	8,000	1,200
Miscellaneous ...	22,000	23,000	11,000

Estimating these crops on the same calculation, their value would appear to be—

Lucknow.	Oonao.	Barabunkee.
55 lakhs	55½	72¼

in all some 182 lakhs. According to the principle of the State taking ⅛th, the assessment would be 30¼ lakhs. By the former assessment however it was fixed at only 28½; but [and let the contrast to the Punjab proceedings be here observed] at the recent settlement, it has been raised to 34½, some 4 lakhs over the ⅛th of the gross produce. Can the settlement officials of the Punjab explain this extraordinary contrast? And if they cannot, are not we justified in protesting against so wholesale an abandonment of the State demand? When it is remembered that the income-tax for 1869-70 produced only 6 lakhs, it is surely worth while to consider whether we are making the most of the largest and most important branch of imperial revenue. The question is one on which so much is to be said on both sides, and on which it is so hazardous for outsiders to offer an opinion, that we should not have put forward our own views had not they been endorsed by district officers thoroughly conversant with revenue proceedings. As it is, we can only hope that the Settlement Department will take our observations in good part. If we are wrong we shall be extremely thankful to anyone who will point out to us our mistake. No one can have a sincerer regard or a warmer admiration

for the ability and zeal of the Settlement Commissioner than ourselves. We trust that he will forgive us for trespassing upon his domain, and for offering criticisms on a subject as to which he is far better informed than ourselves. We do so with a simple object of promoting the end for which he has laboured so long and earnestly—the successful administration of the Province; and we ask him to regard us as "friends in Council," not as partizans, still less as assailants.

Si quod novisti rectius istis,
Candidus imparti; si non, his uttere mecum,

III.

Those of our readers who have followed us through the facts and figures discussed in the present series of articles will, we think, admit that we have made out a strong *primâ facie* case against the Settlement Department when we charge it with wasting the property of the State by needlessly low assessments.

We say *primâ facie* because we are anxious to guard ourselves against being supposed to be putting forward the doctrine that an advance in the price of land and agricultural produce involves of necessity, and under all circumstances, a rise of land revenue. There are of course a number of other considerations which an assessing officer is bound to take into account, and which might justify him, even in the face of such a rise of price as the Punjab has experienced, in refusing to enhance an assessment. But we do say that such a rise in prices indicates very clearly the direction in which the assessment should tend, and throws upon the officials concerned the responsibility of explaining why no corresponding rise of revenue has ensued. And when we find that for years together no such explanation is forthcoming; that the reports in which the explanation would naturally be afforded are indefinitely postponed; and that settlements which have never been submitted for sanction, and as to the goodness or badness of which accordingly Government has never had an opportunity of judging, are allowed to run on, sometimes absolutely to their very close, with nothing more than an expression of regret on the part of Government that so much delay should have occurred. We think that it is high time that the rude blasts of common sense from the outside world should invade the sacred precincts of the settlement, and rouse its officials to give some account of their proceedings. We shall then at any rate be informed whether imposts such as that which last year imperilled the tranquillity of the empire are really necessary; or whether the necessity for them arises from our wanton neglect of modes of taxation which we find ready to our hand, and the proper employment of which would not raise a murmur of discontent. At present there are districts, *the revenue of which aggregates a fifth of the entire land tax of the province*, the assessment of which stands on the sole responsibility of the Settlement Commissioner, no sanction of Government having been asked or given, as to which the Settlement Commissioner "regrets that he has not been able to find that complete leisure which is requisite for such absorbing business as writing final reports." Surely we are saying only what every reasonable man must think when we protest against the most important branch of our resources being treated both by Government and the Settlement Department with such easy indifference.

We feel the less diffidence in promoting the public discussion of this subject, inasmuch as we have the Settlement Commissioner's own authority for saying that the present revenue organization is unsatisfactory, and the existing principles of assessment (if we understand him rightly) defective. In his pamphlet on State Canals and Irrigation, Mr. Prinsep, in discussing the various ways in which a larger income might be obtained from the land, insists upon "the complete separation of revenue from judicial administration" as the very foundation of the reforms in support of which he is writing. "We must, he says, "improve our revenue agency, and let it be strong and free for the execution of their plans." Nobody has a right to speak with more authority, and here is what he says as to our present arrangements:—"It is altogether an anomaly to expect officers in these days of strict procedure, who are sitting in-doors oppressed with judicial work, and unable to go about into the interior of their districts, to acquire a thorough knowledge of the people, to mix with them freely, to find time to look after the working of the revenue administration, or to take a leading part in encouraging the people to efforts of general improvement." As a remedy, Mr. Prinsep proposes that a certain number of the existing official staff should be devoted exclusively to revenue work, and being relieved of all judicial duties, should have the conduct as well of all land settlements as of minor works of irrigation and other measures of agricultural development, all matters connected with field survey and mapping being made over to the professional Survey Department. These suggestions seem to us excellent, and we sincerely trust that the forthcoming changes in the Punjab administration may admit of their adoption. But we allude to them now for the purpose of showing that so high an authority as the Settlement Commissioner makes no secret of his discontent with the present organization of our Revenue Department, and insists, as we believe do most other experienced officials, on the inconvenience of mixing up judicial with other duties. When, therefore, we urge a reform of our revenue machinery, we are only repeating what the Settlement Commissioner has already recommended.

Nor does Mr. Prinsep seem any better pleased with the principles on which the present assessments proceed. One of the five capital measures by which he urges that our resources might be augmented is "by altering our system of land revenue assessment." In the first place he says:—"In fixing the assessment for the term of settlement all we can do to tax future possible development is but conjectural. So, too, an attempt to make a uniform or approximately equal assessment on villages in their present condition very often falls far below the mark." The reason is that "we assess all villages pretty much the same whether they are (*a*) fully cultivated and developed; (*b*) fairly cultivated, not developed; (*c*) not fully cultivated and backward. *We do not provide for (a) villages developing into (b) by spread of cultivation or growth of improved staples, nor for the extraordinary expansion and improvement which during the next decade are sure to go on in (c) villages.*" For the two last classes of villages accordingly Mr. Prinsep says that there ought to be a double assessment; "(1), on present condition; (2) the other on expanded condition as a progressive amount to fall in after, say, every ten years." From this mode of progressive assessment he estimates that we might get an additional 10 lakhs at the end of ten years.

In the next place Mr. Prinsep recommends that besides the present average rates on irrigated and unirrigated soil there should be an additional tax, in the shape of a license, on the more valuable crops—sugar, poppy, tobacco and vegetables. From this he reckons on an increase of Rs. 13,79,000.

In the third place he recommends that under certain exceptional circumstances, among which is the somewhat unusual combination of "a good season" with "corn selling considerably above average market rate," 10 per cent. on the existing land revenue might be taken "as a special land-tax" at intervals of not less than 5 years. This, speaking roughly, would be about 20 lakhs, or 4 lakhs per annum.

Now if we apprehend Mr. Prinsep's meaning correctly, all this amounts to an admission that we might, without danger to ourselves or detriment to the country, get a good deal more out of the land if we choose to take it and set about taking it in the right way. As to the first proposal there is nothing, we believe, in the existing law that need have prevented its being acted upon throughout all the settlements; and it is, if we mistake not, already occasionally adopted. Its expediency however is questionable, and great authorities are against it. "Progressive assessments," says Mr. Cust, "have proved a great snare, as the evil day is put off to a period long after the settlement officer has left the district, and the assessment is accepted under the vain hope that the conditions will never be enforced." If this view be taken, the sounder and safer method of assessment would appear to be that indicated in Reg. VII. of 1822, viz., to form it "with reference to the produce and *capabilities* of the land, unless under special circumstances justifying a progressive enhancement." In other words, to base it "on a compromise between existing and progressive condition."

As to the second proposal,—the very gist of our complaint against the settlement—is that these valuable crops are not assessed as high as they ought to be; and we can only understand Mr. Prinsep's estimate that 14 lakhs additional might be levied on tobacco, sugar, poppy, and vegetables, as amounting to a practical admission of the justice of our complaint.

At any rate it is, we think, clear that the whole question of assessment, by far the most important of our financial problems, has been allowed to lapse into indistinctness, and to be regulated rather by the idiosyncracies of particular individuals than by any definite principles and recognized rules. We are well aware of the difficulties that beset it, of the enormous evils of over-assessment, of the necessity of trusting in such a matter rather to the good sense and judgment of the assessing officer than to any minute and precise instructions. But we think that matters have gone too far in this direction; and at any rate we protest against the view that land revenue is a sacred subject upon which no profane foot may intrude, and as to which it is an impertinence for any outsider to offer an opinion.

Assessment is, we venture to think, essentially one of those matters which cannot safely be left to a single independent judgment; and as to which the public have a right to be informed. The great revenue authorities have told us that Government should limit its demand to a sum "not more than half the well discovered net produce to the proprietor during the period of settlement, leaving to the proprietor one-half as his profit (and to cover expenses of collection." Is this the standard by which the Punjab settlements are to be tried? or if not, by what? Is Government getting half, or anything like half, the net profit of the land in Umritsur, Goordaspore, and Sealkote?

If it is not—and if the country is at the same time being harrassed with strange and hated forms of taxation—we are surely

entitled to ask upon what principles, and by whose authority the admitted rights of the State are being thus impaired? Why is Government to get an average of 1 Rupee 10 ans., or, as we believe the new settlements are to make it, 2 Rs. to the cultivated acre on one side of the Jumna, and an average of 1-1-3, on the other? Are the N. W. Provinces settlement officers taking too much, or the Punjab officers too little? We have ventured to state the grounds on which we incline to the latter opinion. So far as we can see, the 6 lakhs which the Income-tax in the Punjab for 1869-70 produced amid such general heart-burning, and with such damage to the popularity of Government, might have been raised from the land without a murmur of discontent, and without encroaching in any perceptible degree upon the unaccustomed hoard of wealth which our rule has conferred on the agricultural class. If we are in the wrong, and the settlement authorities will do us the honor to point out our mistake, we shall feel the utmost satisfaction in apologizing and recanting; if we are right, we hope that they will not consider it derogatory to their dignity to benefit by our advice; in either case, we trust that they will take in good part observations offered certainly in good faith, and, we venture to hope, with all the courtesy and respect which are so eminently their due.

APPENDIX.

Statement showing the margin of profit allowed at various times to the occupants of the soil by the limitation of then Government right.

Under the Sikhs.	1-5th of net profit under the British according to Reg. VII. of 1822.	In calculating compensation only 1-10th of net profit.	According to directions to the Settlement Officer N.W.P. ¼ of net profit.
Nil.			
"It is clear that Native Governments give a very imperfect recognition of property right and *fix no limit to the Government demand or Government interference* . . . . . Landowner and tenant were reduced to the dead level of cultivator, the former receiving some percentage by way of quit-rent often on a very precarious title, or receiving a small portion of land revenue free." Cust's Manual, p. 4.	"The assessment to be demanded . . . . shall be fixed with reference to the produce and capabilities of the land . . provided that the amount of such assessment shall not be raised above that of the present *jumma*, unless it shall clearly appear that the net profits, to be derived from the land by the zemindars and others who may be entitled to share in the profits arising out of the limitation of the Government demand will exceed 1-5th of that amount; and in cases where any increase may be demanded the assessment shall be so regulated as to leave the zemindars and others aforesaid a net profit of 20 p. c. on the amount of the *jumma* payable by or through them respectively."	"Until lately Government set a bad example, by allowing only 10 p. c. for compensation for rent on land occupied for public purposes, & only 5 p.c. when the proprietors refused to engage at settlement. This is called compensation for right of management but is *the only representative of the man's property of which he is ousted.*" Cust's Manual, p. 32.	"It is desirable that the Government should not demand *more than half of the well discovered net produce to the proprietor* during the period of settlement, leaving to the proprietor ¼ as his profit, and to cover the cost of collection." Cust's Manual, p. 74.

With this compare the prices paid in 1869-70 by Government for land taken up for public purposes as contrasted with the revenue assessed on the land in several divisions:—

	Acres.	Amount of compensation of every description paid.	Annual reduction in Government rent roll for one entire year.
Delhi Division.....	1,824	40,776	2,128
Umballa do	1,807	60,202	1,417
Jullundur do.	66	1,105	25
Umritsur do.	189	4,591	277
Lahore do.	880	12,658	174
Mooltan do.	754	11,860	711
Peshawur do.	87	7,583	16
The Grand Total for the whole Province.....	6,024	1,44,603	5,278

From which it appears that instead of Government leaving no margin of profit to the owner of the soil as in the time of the Sikhs, or limiting the margin to 1-5th or 1-10th or ¼ as at various periods of British rule, the state of things is now so completely reversed that Government had to give no less than Rs. 1,44,000 for the proprietor's rights in land that was paying only 5,278 revenue, that is 26 times as much; so that supposing the rule of half as sets to be applied, we find that Government was paying more than 26 years' purchase, instead of nothing at all which was the custom when we took the provinces, or 1½ years revenue which was the established rule in latter times.

THE PUNJAB REVENUE REPORT FOR 1869-70.

(Pioneer.)

THE announcements of the Punjab Revenue Report for 1869-70 are in a high degree satisfactory, for they indicate a steady increase of that prosperity which for years past this province has enjoyed, and which even the famine and pestilence, which partially prevailed during the year in question, did not suffice in any material degree to interrupt. There has been an unprecedented increase in revenue: 1867-68, the best of former years, has been quite eclipsed. Not only was the rent-roll increased by a lakh and a half, and miscellaneous and fluctuating revenue by nearly 2½ lakhs more, but the improved collections attested the return of easy times, and instead of a balance of Rs. 1,97,000 in train of liquidation, this item amounted only to Rs. 30,000. Irrecoverable balances sank from over 2 lakhs to 1¼. Collections on account of past years rose from Rs. 35,000 to nearly 2 lakhs; altogether there was an increase of over 9 lakhs in land revenue receipts. The income-tax showed an increase of 3½ lakhs over the certificate-tax, which it replaced. Salt and Customs revenue increased by over 11 lakhs; canals by 7½ lakhs; stamps by Rs. 87,000. The only decrease of importance is in the income from spirits—a result which the pressure of almost famine prices was certain to bring about. On the other hand, there is proof enough that no undue strictness was employed in the collection of revenue; *dustuk* or reminder, to pay up revenue, the gentlest of all coercive processes, was resorted to only in 33,000 instances. There were only three cases of personal imprisonment for default; only 122 of distraint of personal property; and the amount of land held by the State under its own direct management is altogether insignificant. We are happy, too, to observe that a great start has been made in *tuccavi* advances, *i. e.*, loans by Government to the occupiers of the soil for agricultural works. Whereas in 1867-68 only Rs. 57,000 were thus advanced; there were Rs. 2,81,000 advanced in 1868-69, and no less than 5½ lakhs in the year under notice. This sum was lent for well-building, canal, and irrigation works generally; the purchase of bullocks, and seed; and it must have been an invaluable assistance to the peasantry in recovering from the effects of the calamitous seasons of 1868-69. A large part of the misery and impoverishment which famine brings in its train are done away with; if those whom it has brought low are able to obtain from Government such timely and merciful aid in their efforts to regain their former prosperity, we trust that this important department of our administration may receive yet further development, for no money could be more usefully or profitably employed. The experience of its working in the Punjab hitherto has been most encouraging; of nearly 1½ lakhs that had to be repaid during the year, all but Rs. 338 was duly recovered. "No argument," says the Report, "in favor of the system could be more convincing." The great difficulty in the way of the extension of such loans is, we believe, the early date at which the money has now to be repaid. It would be a great thing if Government would allow of some relaxation in this respect. Mr. Prinsep, in his pamphlet on State Irrigation, has called attention to this and other obstacles to the extension of the system. "The truth is," he says, "people do not freely take *tuccavi* because it gives them trouble to get it, and loss in the end; they are kept hanging about at the sub-collector's office, and have often to walk many miles to the district office; they have to give security which costs something. Then the sub-collector is told to make inquiries, delay ensues, the money is not realized in time, and even when obtained, part of it is intercepted by underlings before it reaches the applicant. This is perhaps not so convenient as having to pay fixed interest and obtaining the money by loan quickly." We trust that the large growth which the system has now attained is an indication that the injurious operation of these difficulties has been in some degree curtailed. Of settlement there is little to be reported. The Kangra and Lahore settlements were concluded early in the year, and the Lahore establishment was transferred to Dera Ghazee Khan; the Kangra establishment partly to Peshawur, and partly to a circle of villages in the Hoshyarpore and Gurdaspore districts, the records of which urgently required revision. There were settlements already in progress in the Montgomery district, and in the Mokutsur tehseel of the Ferozepore district; in Hazara, and Dera Ghazee Khan. Considering the large number of settlements already expired, it is, as we have previously pointed out, a matter of regret that the operations of this department should be on so very

limited a scale. The rent-roll of the districts under settlement for the last year was—

Dera Gazee Khan	Rs. 3,11,000
Peshawur	„ 6,31,000
Hazara	„ 1,56,000
Montgomery.....	„ 3,09,000
	Rs. 14,07,000

The Mokutsur tehseel would add a fraction to this total, but in other districts imperial revenue will not, we apprehend, be affected by the operations in progress. Now 14 lakhs is surely an unfortunately small proportion of the 60 lakhs now liable to re-assessment; and even as to these the arrangements were not such as to render any great progress achievable. The three officers placed at the Settlement Commissioner's disposal for three of the circles were, he says, "new to the work of settlement," and in order "to strengthen their hands," some changes had to be made among the assistant settlement officers. Dera Ghazee Khan is a long tract of 200 miles lying between the Indus and Suliman Range tenanted by lawless Mahomedan tribes, fertilized by numerous inundation canal and never before regularly settled. It is not surprising that with such machinery and under such difficulties but little was done. "At first," writes the Settlement Commissioner, "*the measurements were experimental only for the instruction of put wares.* In Dera Ghazee Khan it has been confined chiefly to demarcation of boundaries and preparation of boundary maps. Nearly all four pergunnahs had been completed when orders were received to reduce the establishment to two pergunnahs, Dera Ghazee Khan and Rajanpore. The superintendents and establishments of Jornpore and Sunghur were discharged on the 15th November, since when work has continued in only two pergunnahs. Out of 104 villages, with an area of 3,716,545 acres, only twelve villages, containing an area of 30,000 acres, were allowed to be measured in the Dera Ghazee Khan district. *The measurement staff on this district was very weak and inefficient*, and the interior measurements were suspended by order of Government in November till the regular scientific survey had been accomplished." Moreover, none of the courts were gazetted till December, the Assistant Settlement Officer did not join till 19th January, and of course not much work could be got through. Now if this is a specimen of settlement proceedings, it is no wonder that so little is effected towards overtaking the arrears of expired settlements or keeping pace with those that expire from year to year. An officer "new to the work," a very "weak and inefficient measurement staff," putwarees who require experimental measurements for their instruction, and half the establishment suppressed in the course of the year "*as a measure of economy.*" Surely this is not the way in which a matter like settlement should be conducted, and Government can scarcely be surprised that the "fiscal results" of the operations of the year should amount precisely to *nil*, as is so imposingly set forth in Table 21 of the Report. The settlement operations now in progress in the N. W. Provinces have already increased the revenue by nearly 24 lakhs; and the Oudh settlement repays its outlay at the rate of 68·66 per annum; why should the Punjab present so complete a contrast?

The fact is, we think, that the Punjab Settlement Department has been allowed to become unsystematic, independent, and consequently, inefficient; and it is now being starved because it does not do its work better. Such a remedy is, it is needless to say, perfectly ineffectual. The whole system requires reorganization on sounder principles with a stronger staff.

The task of assessing land revenue is one that calls for the utmost ability, experience, and judgment on the part of the officers engaged; it should be committed to the best and most tried men; should be regulated by distinct and recognized rules, and conducted with all the expedition compatible with safety and thoroughness. As it is, a young officer, "new to the work of settlement," is sent to a difficult district which has never been settled before, with a "very weak, inefficient, measurement staff," and even that is cut down to half on economical grounds! Moreover, such is the procedure traditional in the department that the reports of the various settlements are frequently not submitted till a large portion, if not the whole, of the term of the settlement has expired, so that the superior authorities never have the means of judging how far the new assessments are such as they approve, and the sanction of Government is positively sometimes accorded only when it has ceased to be necessary! Then the Government, after throwing a largess of compliments all round, and saying how very nice everything is, and how zealous and able all the officers concerned, suggests that the Settlement Department would "do itself more justice" if the reports were submitted at an earlier date, and thereupon everybody goes his way rejoicing. New settlements are commenced, fresh assessments are announced on the responsibility of the settlement officers, and Government hear nothing about it till towards the close of the new settlement, the "anomaly" once again occurs that Government is politely requested to sanction retrospectively arrangements about which it has been told nothing till they have come to a close! We would remind the Lieutenant-Governor of the letter written by the Secretary to Government on the Sealkote settlement seven years ago, and ask him to compare it with the present state of things, and say how far the above description is exaggerated or unfair. If it is not we are surely justified in maintaining that settlement proceedings are treated by the Punjab Government with an indifference, and conducted with a laxity which it is surprising to find in a department so vitally important to the fiscal interests of the State. Reform is urgently required, and we can imagine no one more fitted than the present Financial Commissioner of the Punjab, an officer as distinguished for calm judgment and ability as for his intimate acquaintance with all revenue matters, to devise and carry through the changes which any such reform would necessitate.

THE DECENTRALIZING SCHEME.

THE "PROVINCIAL SERVICES."

(*Gazette of India, March* 25.)

Despatch from the Right Honorable the Secretary of State for India to the Right Honorable the Governor-General of India in Council, dated London, 23rd February 1871.

MY LORD,—I have considered in Council your financial letter dated the 14th December 1870, transmitting for my approval copy of a regulation passed by your Government with the view of enlarging the powers of the several Governments of Presidencies and Provinces in certain departments of the administration.

Hitherto the Government of India has exercised a direct control over all the departments of the several Governments. It has been responsible for their efficiency, and has had to provide the necessary funds to meet the expenditure.

You are now satisfied that, under that system, the local Governments although deeply interested in the welfare of the people confided to their care, are liable in their anxiety for administrative progress, to allow too little weight to fiscal considerations through not knowing the requirements of other parts of India; and that the Supreme Government, which is responsible for the general financial safety, has been obliged to reject many demands deserving of encouragement.

You also consider that the Supreme Government is not in a position to deal satisfactorily with local requirements, and does not possess the knowledge necessary for the full and successful development of local resources.

Impressed with these views, and in order to avoid conflicts of opinion injurious to the public interests, which have resulted from the existence of an ill-defined responsibility, you propose to entrust to the several Governments of Presidencies and Provinces the general control of the following branches of the administration, viz:—Jails, Registration, Education, Medical Services (other than Medical Establishments), Printing, Roads, Miscellaneous Public Improvements, and Civil Buildings, allotting for the annual expenditure connected therewith permanent imperial assignments (local funds being excluded) amounting to 4,688,711*l.*, which is 330,801*l.* less than the sum allowed for the expenditure of the same departments in the year 1870-71.

Those assignments will not henceforward be classified in the Imperial Estimates and Accounts, but will appear under the single head of "Provincial Services." Each local Government will publish its yearly estimates and accounts in the local *Gazette*, with a financial exposition, analogous to that annually made in the Legislative Council of the Governor-General, and it will rest with the several Governments to provide for the growing wants of the country in the departments entrusted to them, and to consider how any deficiency in the ways and means available for provincial services can best be supplied.

You have laid down certain conditions in regard to the creation or abolition of appointments, increases of salary, deposits of money, and services rendered to other departments, which are not to be altered without the previous sanction of the Government of India.

I am fully sensible of the great importance of extending the powers and responsibility of the several Governments in regard to departments which can be regarded as local, and of the anxious deliberation which you have given to this subject.

After a careful consideration of your several propositions, I approve of the principles which you have laid down; I see no reason to doubt the expediency of the arrangements which you have proposed.

The great objects to be kept in view in relation to each of the specified branches of local administration are to secure the greatest degree of economy consistent with efficiency, to provide for the growing demands rising out of improved administration without materially increasing the burdens of the people, and, as far as possible, to secure the general concurrence of the local communities in the measures taken on their behalf.

I am especially anxious that, when devising measures of improvement, it should be the earnest endeavour of each local Government to provide the funds required for them by the exercise of strict economy in their general expenditure, and that additional taxation should only be resorted to in cases of undoubted necessity, and when the income otherwise available is clearly insufficient.

It is obvious that the degree of success that will attend this extension of the powers of the local Governments will greatly depend on the discretion with which those powers are exercised, and I entertain no doubt that the several Governments will fully appreciate the importance of the trust confided to them.

The measures adopted will, I conclude, be reported to me by the Governments of Madras, and Bombay, so far as relates to matters under their control, and by your Government in regard to the administration of Bengal and the remaining provinces.

The arrangements as now proposed are necessarily ex-perimental, and will be subject to revision, either in principle or detail, should experience show that such a course is necessary.—I have, &c. ARGYLL.

THE COTTON CROP.

WESTERN INDIA.

Khandeish.—Mr. Wilkinson Cotton Inspector for Khandeish reports up to the 27th ultimo, as follows :—

"The exports of cotton from Khandeish and Nassick railway station from 1st to 16th March, amounted to 1,809 full-pressed bales, 278 half-pressed, and 13,212 docras, equivalent to a total of 6,722 bales of 3½ cwt., which added to the previous export reported, viz., 19,498 bales, gives 26,220 bales as the amount sent to Bombay from this district from 1st December 1870 to 16th March. This export for 3½ months is 7,136 bales less than that for the three months ending 28th February 1870.

"With such a low rate of export up to the present time the remainder of the crop will have to be pushed forward during the next two months, if no more than the usual balance is to be left in the district, when the rain falls. There is evidence lately that holders of cotton in the districts are losing hope as to a rise in price, and in consequence cotton is more easily obtainable. This in conjunction with the smallness of the crop, makes it probable that the bulk will be exported before the monsoon.

"The price to-day at Julgaum is. Rs. 42 per pulla, or laid down in Bombay Rs. 164-12 per candy for docras."

Sind.—Mr. Strachan, Superintendent of Cotton Experiments, reports up to the 27th ultimo, as follows :—

"I have very little to say about cotton at present. I hear that in some fields near the river a little cotton has been sown, and preparations are being generally made for sowing throughout the districts bordering on the river or main canals. In the villages ginning is not yet finished, and cotton is still going down by river to Kotree. The ruling rates here are from Rs. 12 to Rs. 14 per maund of 82 pounds.

"Winter crops are nearing maturity. Jamba, which here does not look so well as it did last season, is in some places north from Halla a very fine crop ; it is being harvested.

"Wheat is a good crop so far as I have heard or seen ; on the experimental farm it is very good, and rippenning well. Jira is later than the above crops, but it looks very promising in this neighbourhood."

Guzerat.—Mr. Stormont, Superintendent of Cotton Experiments, Broach, reports up to the 31st ultimo, as follows :—

"Very little of importance to be reported since last week. The factories are mostly busy both in the Broach and Surat districts ; in Broach itself they are working overtime. Surat has pulled up wonderfully in the way of export during the week. The total of new bales sent is now close on 7,000.

"With the exception of the few places mentioned in last week's report as being late, the picking may now be considered finished.

"Our experimental indigenous is all picked and mostly cleaned. A small field of Egyptian near Surat, which had fallen back during the rains, is now in full flower, and looking quite healthy, of course it is now too late to yield anything of importance ; still the fact of its breaking out so luxuriantly at this season seems to prove to a certain extent that on land of this kind (whitish free soil) something may yet be done. Nothing, however, can be expected from the cultivation of the ryots."

Southern Mahratta Districts.—Mr. Shearer, Superintendent of Cotton Experiments, Dharwar, reports up to the 5th ultimo, "that where the sowing has been early, the crop is maturing quickly with the intense heat; where it has been late, the plants are only in flower now, and it will be six weeks before the cotton will be ready for picking.

THE INCOME-TAX.

THE new Indian Income-Tax Bill has been published. By it a duty of two pies for every rupee shall be levied in respect of every office or employment of profit in British India under Government or under a company or a municipal or other public body or association not being a company, and upon every salary, annuity or pension paid in British India by Government or by a company or by a municipal or other public body or association not being a company to any person residing in British India or serving on board a ship plying to and from British Indian ports, whether on account of himself or another person.

No income amounting to less than sixty-two rupees eight annas per mensem shall be chargeable under this part. And a yearly duty of two pies in the rupee shall be levied upon all interest on securities of the Government of India :—

Duties.

Persons whose annual income shall be assessed at not less than Rs. 750 but at less than Rs. 1,000 shall pay Rs.....	9	0	0
Persons whose annual income shall be assessed at not less than Rs. 1,000 but at less than Rs. 1,500 shall pay Rs.....	13	0	0
Persons whose annual income shall be assessed at not less than Rs. 1,500 but at less than Rs. 2,000 shall pay Rs	18	0	0
Persons whose annual income shall be assessed at not less than Rs. 2,000 ....two pies in the rupee			

The following is Sir R. Temple's statement of objects and reasons :—

The present Income-tax Act (XVI. of 1870) imposes a duty of 3¼ per cent. on all incomes of Rupees 500 and upwards. The present bill is intended to impose a duty of only 1-1-24 per cent. (or two pies in the rupee) and to effect no income less than Rupees 750.

Besides these two important changes, the Bill introduces several minor modifications of the existing law.

In section 6, the word 'playing' has been substituted for 'trading,' so as to preclude a question which has been raised under the present law.

The Collector is empowered (section 13), in proper cases, to require officers of companies to attend and produce accounts.

The duty on interest on Government Securities will be deducted at the place where the interest is paid (sections 15, 16.)

Owners of land and houses occupying them are expressly made chargeable (section 22) in respect of their annual rack-rent value, and a definition of 'rack-rent' is inserted.

The Collector will be bound to serve the notice requiring returns only where the income is Rupees 4,000 or upwards (section 23).

Every person served with such notices will be requested to return his income during the three years ending 31st December next, before the date of the notice, and to state the period during which such income actually accrued.

The assessments will be made (section 27) on an average of the income for such three years, and the average will be computed upon the period during which the income actually accrued.

Legal practitioners will be excluded (section 36) from appearing on any petition or appeal under the Act. A similar provision was contained in Act No. XXXII of 1860.

Payment may be made henceforward (section 37) in two, instead of four, instalments.

All sums due under the Act will be recoverable as if they were arrears of land revenue (section 39).

Power is given (section 40) to amend the assessment when the person assessed shows that his income has diminished, or gives up business, or dies, or becomes insolvent.

Lastly, orders made under the Act will be final and the proceedings of the Collectors and Commissioners will not be removable into any Court or be subjected to revision.

SILK.

SILK IN MYSORE.

(Madras Mail.)

No where has sericulture received a better trial than at Mysore, and yet the difficulties in the way of its successful cultivation do not seem to have disappeared. The manufacture of silk is of great importance in that region as it affords occupation to a large portion of the Mahomedan population of the Mysore and Bangalore districts. It has, however, been most seriously affected by the disease among the silk worms which has prevailed in other parts of India and in other silkn producing countries. Dr. de Vecchj has taken a great deal of trouble with a view to the success of the product. We are informed that fresh cartoons of eggs from Japan had been imported, and that ryots appeared to have failed on previous occasions of their distribution to pay the requisite attention during the incubation of the eggs and rearing

of the young worms. Dr. de Vecchj kindly undertook to rear the worms at his factory previous to their distribution. We are sorry to notice that his care and perseverance have not repaid by much success; nevertheless he has determined to persevere in the enterprise. A further supply of cartoons have been ordered for the ensuing season, and Dr. Vecchj has proceeded himself to Japan to make a selection of the eggs. It is to be hoped that these arrangements may lead to ultimate success. Dr. de Vecchj deserves success, for he has left nothing undone which could be done by human efforts and indomitable perseverance to secure it. On his success a large portion of the people of Mysore depends for support.

It is evident from the accounts we have received from Assam, and different parts of the Punjab, that this branch of industry requires the greatest care and attention, and that its success depends very much on climate. At Lahore—Captain Hutton quotes from Mr. Temple's report during the season of 1855—the experiment in silk culture was vigorously carried on; there was a superintendent—a man of great skill, and a staff of eleven winders from Bengal; the worms were also, for the most part, of the Bengal species. At first the generations of the worms was very successful. The insects came forth in surprising abundance; they throve on the mulberry leaves that were given them; and at the first began to spin excellent cocoons,—everything prospered, until the weather became hot and the atmosphere dry. But as the spring advanced towards summer, the food became deteriorated by the shrivelling up of the leaves; the worms grew sickly, and the cocoons fell off. The early promise was fair, but the ultimate result was almost *nil* The amount of silk produced realized only a twenty-fourth part of the money expended upon it! The accounts of recent experiments in the Punjab are not very encouraging, and even from the region of silk culture, Bengal, the success of recent experiments, is far from encouraging. The result are far different in British Burmah, where neither the silk nor the worm are believed to be indigenous. The occupation of manufacturing silk is declared by the Deputy Commissioner at Thayetmyo to be a lucrative one, and he believes that many parts of the country are admirably adapted for it. That under the circumstances the occupation is not more extensively followed than it is, is due mainly to the Buddhistic prejudice against the taking of life. The manufacture of raw silk of the best quality involves the death of the chrysalis in the cocoon, an act of impiety which is looked upon by orthodox Buddhists with horror. The people who live by the commission of this sin are considered by their neighbours as of "low caste," if such a term can be appropriately used with regard to people who recognise no distinction of caste. The silk-growers live in villages by themselves, and hold but little social intercourse with their neighbours for fear of being taunted with allusions to the wickedness of their calling. It will be seen from the above accounts that those who are seeking to advance sericulture in this country have no easy task before them. The native manufactures are rude and the manufacturers careless in the extreme. All the work is carried on by them in very open dwellings where the elements make dreadful havoc of the delicate materials, and the smoke makes that portion grimed and dirty which the elements have left unscathed. When we think, however, how habitually "let alone" the lower class of natives are; how they require to be constantly looked after to make them diligent even in that business in which their daily bread depends; instead of wondering that so little success has attended this enterprise, we should only be surprised that it has been in the smallest degree successful.

CEYLON PRODUCTION.

(Silk Supply Journal, Feb. 15.)

THIS is an island which, while producing every requisite for silk production, has, up to the present, neglected its opportunities; and while hundreds of pounds have been spent in laying out coffee estates, no one has thought of spending a few pounds to introduce the mulberry, and turn attention to silk culture on the European system. We welcome the letter from our correspondent given below, and give the extract from Sir Emerson Tennent's *Natural History of Ceylon*, showing that the wild Tusseh silkworms are and have been for years in abundance on the island :—

"Among the strictly nocturnal *Lepidoptera* are some gigantic species. Of those the cinnamon eating *Atlas* often attains the dimensions of nearly a foot in the stretch of its superior wings. It is very common in the gardens about Colombo, and its size and the transparent tale-like spots in its wings cannot fail to strike the most careless saunterer. But little inferior to it in size is the famed Tusseh silk moth, which feeds on the country almond *(Terminalia cattapa)* and the *Palma Cristi*, or castor oil plant; it is easily distinguishable from the *Atlas*, which has a triangular wing, whilst it is fulcated, and the transparent spots are covered with a curious thread-like division drawn across them.

"Towards the northern portions of the island this valuable species entirely displaces the other, owing to the fact that the almond and *Palma Cristi* abound there. The latter plant springs up spontaneously on every manure-heap and neglected spot of ground, and might be cultivated as in India, with great advantage—the leaf to be used as food for the caterpillar, the stalk as fodder for cattle, and the seed for the expression of castor oil. The Dutch took advantage of this facility, and gave every encouragement to the cultivation of silk at Jaffna; it never attained such a development as to become an article of commercial importance. Ceylon now cultivates no silkworms whatever, notwithstanding the abundance of the favourite food of one species and the rich silken robes sometimes worn by the Buddhist priesthood are imported from China and the continent of India. In addition to the *Atlas* moth and the *Mylitta*, there are many other *Bombycidæ* in Ceylon; and though the silk of some of them were susceptible of being unwound from the cocoon, would not bear a comparison with that of the *Bombyx Mori*, or even of the Tusseh moth; it might prove to be valuable when carded and spun I the European residents in the colony would rear the Larvæ of these *Lepidoptera* and make drawings of their various changes, they would render a possible service to commerce, and a certain one to entomological knowledge."—*Natural History of Ceylon, Chap. xii.*

Beside the moth of whose cocoons I send you a sample, I am acquainted with two smaller kinds from which silk might be obtained; but I prefer the former to either of the latter, because its silk, as I have ascertained by actual experiment, can be unwound from the cocoon as well after as before the exit of the moth, which renders unnecessary the killing of the chrysalis in order to obtain the silk, and renders the cocoons susceptible of being exported to England to be reeled there. The cocoons of the other two moths might be reeled in this country, if there were machinery here for the purpose and people who understood the business; but they could not be produced in this country and reeled in England, because the chrysalides, which it would be necessary to kill before the shipment of the cocoons, would be liable to putrify and injure or totally spoil the silk during the voyage; and even if that could be prevented, the freight of the useless chrysalides would cost more than that of the silk itself. The *empty* cocoons might, however, be exported for the purpose of being carded and spun, as suggested by Sir Emerson Tennent in the above extract from his book, and in that case, their being opened by the exit of the moth would not spoil them. The silk will be found to come easily off the cocoons which I send you, after the cocoons have been boiled for a short time with a little carbonate of soda. What appear to be broken filements at the end of the cocoon from which the moth has come out will, on minute examination, be found to be elastic silken loops so arranged as to facilitate the moth's escape from the inside and at the same time to prevent the intrusion of any predatory insect which might prey upon the chrysalis. These silk worms would live in England, if kept in their natural temperature by means of artificial heat, and, as I have found them on nine trees of widely different species, I think it highly probable that there are English plants much hardier than the mulberry tree on which they might be fed. [There can be little doubt that if the thunder-storms do not kill the moths, the drier parts of Oovah would answer well for sericulture. The mulberry grows well everywhere on our hills.—ED. *C. O.*]

PROPOSAL FOR A SILK FARM IN BENGAL.

SUBMITTED the following remarks from Mr. G. DeChristoferis on the above subject :—

"I have to thank you for the copy of the proceedings of the Society of the 21st ultimo, which you forwarded to me. Captain Hutton in his letter on sericulture in Bengal, which appeared therein, has condemned in so peremptory a manner the usefulness of establishing a silk farm in Bengal, and upholds, on the contrary, his views of having the farm established in Mussoorie, that a few more remarks on this matter may not be uncalled for, to clear some points which appear as yet in the dark.

"In proposing to establish a silk farm in Bengal, I was far from supposing that it would have been sufficient to supply seed cocoons within easy reach for all the demand of the country. But if the farm had been in the course of time successful enough to pay itself, or offer little loss, branch farms may have been established in other districts, rendering, therefore, the benefits of the system more general."

It is admitted also by Captain Hutton that the present method of rearing the worms adopted by the natives is deficient in many respects. Would not, therefore, the adoption of a sound and practical system, and particularly the careful choice for cocoons for seed (to which the natives pay little or no attention,) tend of itself to improve the polyvoltine species so generally reared in Bengal? The farm locally established would not only do this but show the natives the way of doing it themselves. And as regards the introduction of exotic species, I think that experiments would be more practical, and to be depended upon when made in the locality where they are meant to be adopted

But the strong argument in Captain Hutton's veto for the establishment of the farm in Bengal seems to be that as the worms cannot be reared upon the trees in the open air, it is perfectly impossible to improve the polyvoltine in Bengal. Rearing silk

worms on trees in the open air is certinly according to the law of nature, but where nature fails art has taken its place often for the best in both animal and vegetable life.

The silk worms imported and reared in Italy and France since centuries, produced, previous to the last disease (the *Atrofa*) the very best cocoons known, and this was owing to the careful and intelligent treatment of them, being reared in rooms kept occasionally warm with artificial heat, and ventilated as may be required. From what ill influence the European crops (and of other countries) have lately failed, and whether the disease is in the worm or the mulberry plant, is a question that science has not yet cleared up.

A trial to rear on trees in the open air, but on a small scale, and for the purpose only of obtaining cocoons for seed, may be made also in Bengal during the cold season, when we have neither to fear too powerful a sun, nor the damages that may be occasioned by gales or rain.

It is now a question whether by establishing a farm in Mussoorie it is intended to reproduce there the cocoons for seed only from the original stock sent from Bengal. In this case it is likely that the polyvoltine species in a much cooler climate may be greatly retarded and become bivoltine or trivoltines, and how is this to be avoided? I would further ask how often during the year can mulberry be cut in Mussoorie, and how we are here in Bengal to depend upon the arrival of the eggs in the time they are wanted. There in summer eggs will hatch after seven or eight days of being deposited. Would not this create another difficulty?

Before closing this letter I wish to record from my old notes an experiment I made as far back as in February 1857, of rearing here some China cocoons from eggs that I received direct from there.

The eggs were partially hatched when they reached me, and continued hatching very irregularly in the same way as do the eggs from Japan.

In the first two stages these worms had not a very healthy appearance, but became more promising as they advanced in age.

The education of the worms was rapid. It begun on the 16th of February, and food was plentifully given, and on the 10th of March they began to spin the cocoon without showing signs of prominent disease. I reeled a portion of these cocoons; they unsound well, even without evening, and the yield was a seer factory weight of silk from kahun 5½ of cocoons (kahun number 1280 cocoon); whereas with the Japanese cocoons which I reared and reeled here last season, it took 14 kahuns to make the same quantity of silk, which is no improvement on the best *Boro Pullo*, or even the best polyvoltine cocoons as far as yield is concerned.

I may remark a curious feature of the China and Japan worms reared in Bengal, that when ready to spin they will not (with few exceptions) ascend of their own accord to form the cocoons on the twigs placed for this purpose between the trays as they do in Europe, but must be taken off the trays and placed in the Chunderkee used in Bengal (a mattray intersected with narrow partitions) by which mode several worms are picked in an unripe state, of the requiring a last feed, and on their spinning the cocoons, numbers of worms getting together, will give a large quantity of double cocoons; *i. e.*, a cocoon with two, and sometimes three worms inside.

OPIUM.

CULTIVATION IN CHINA.

THE Consular Report in China for 1869 states that the consumption of opium in that Empire increases steadily. The question how far the native opium is likely to supersede Indian is one of great commercial importance. It is thought that from its superior qualities Indian opium will probably, to the point it has reached, about 76,000 chests, hold its own as an article of luxury. The native-grown drug has neither the strength nor the flavour of the imported, but the greater cheapness of the indigenous product enables it to displace the foreign in various inland opium marts. The British Consul at Canton states that the difference in price averages 40 per cent. He observes:—"1,100 piculs of opium paid duty here in 1869, being about 8 per cent. of the quantity which, if not actually smuggled, is at least brought in surreptitiously." The Consul at Foo-chow-foo states that the white poppy is cultivated in the prefecture of Wen-chow-foo with great success, and is smuggled piecemeal into Foo-chow-foo in consequence of the Government prohibition of it; it is much used for mixing with the stronger Bengal kinds. The delegates of the Shanghai Chamber of Commerce, who went up the Yang-tze in 1869, found opium grown over a very large area in the provinces of Szechuen, Yunnan, and Kweichow. There the executive authorities shut their eyes to the existence of the plant, and the white poppy-fields may be seen on the most conspicuous places in the great river route, while the cultivation of it is nominally punishable with death. Duties are levied upon it, and establishments for the control of the trade in it are specially licensed by the authorities. The delegates stated that the popular belief is that four men in every five smoke, and one-half of the women. Szechuen sends opium to the natives of other provinces to the value of at least three million taels annually. Mr. Morgan, the British Consul at Tien-tsin, suggests that measures might be taken in India with a view to check the increasing production of the native drug in China. The Bombay merchant, before taking the Malwa opium to Bombay from the hand of the packer, has to procure a pass from the Government Treasury, costing 600 Rupees per chest, which pass free the opium from further taxation in transit. The Consul remarks that if the transit duty were lowered, the China market could be supplied with Malwa at a cheaper rate, and that this would cause such an increased demand for it in those parts of China in which the taste for Indian opium still predominates, that the Indian Government would probably gain more revenue by the lower rate on the larger quantity than from the present higher rate on the smaller quantity. The Bengal drug (Patna and Benares) is cultivated entirely by the Government itself, and is sold by auction at Calcutta in lots of five chests, with liberty to the buyer, on the fall of the hammer, to take succeeding lots at the same rate. The auctions are monthly; a *minimum* limit of 400 Rupees per chest, being the supposed cost, is placed on the drug, and all beyond is profit to the Government. The crop is apportioned in equal quantities to each monthly sale, and the quantity offered for competition is in a great measure regulated by the demand in the markets of China. No private individual is allowed to store opium; when a buyer wishes to export his purchases, they are shipped for him by the Government agent. It is suggested that if larger quantities were offered at the monthly sales, the Government would derive larger actual though smaller relative profits from the greater quantities sold, and these purchasers also could afford to sell their opium cheaper in China, and would thus compete on more equal terms with Chinese producers. The Consul is careful to add that he makes these suggestions solely with a view to the question of finance. He considers the treatment of the subject in its moral bearings out of place in a trade. But the observes that it might be argued with much force that the unproductive consumption of opium in China diminished the wealth of the people, and thereby prevents their purchasing such a quantity of our manufactures as they might otherwise be able to consume.—*Economist.*

PUBLIC WORKS—IRRIGATION.

THE SOANE IRRIGATION SCHEME.

THE supplement to the last *Gazette of India* contains a very full account of the projected scheme of navigation and irrigation canals, in connection with the Soane river, together with the minute of the Government of India according final sanction to the undertaking. The scheme comprises 535 miles of canals for combined navigation and irrigation, and 1,067 miles for irrigation alone.

The position determined on for the annicut or weir is 200 feet above the crossing of the Grand Trunk Road at Dehree, where the level of the bed of the Soane is 326 above "mean sea level." The plan of construction will be the same as that adopted on the Mahanuddee at Cuttack; and the river will be provided with three sets of powerful under-sluices, each five hundred feet in length, on either flank, and one in the centre of the river. The area commanded by the canals is stated at 1,469,000 acres on the west and 1,775,000 acres on the east, out of which it is proposed to provide for the irrigation of 2,611,000 acres. In the khurreef it is estimated that the supply of water required would, at the rate of 1 cubic foot per 133 acres, be about 10,000 cubic feet per second, which is less than half of the lowest supply in the monsoon months. The quantity required for the rubbee crops would, it is calculated, be 3,940 cubic feet per second. The average minimum supply in the river in the cold weather is 4,000 cubic feet per second. It is further proposed to economise the water by filling the existing pynes, tanks, and reservoirs by the Soane canals in the month of October, thus securing a store to supplement any deficiency in the river supply, after a season of scanty rain-fall.

The cost of providing this amount of irrigation is reckoned at about 3¾ millions sterling, and the value of the water is estimated at Rs. 3-3 to Rs. 4-12 per acre. The estimated returns are, however, based upon a rate of Rs. 2 per acre for rice, and Rs. 3 for rubbee crops. On this basis the income from irrigation is estimated at Rs. 52,50,000.

The receipts from navigation are estimated at Rs. 4,00,000. We are, however, inclined to agree with the Viceroy that these figures are somewhat over-sanguine, as regards both the acreage per cubic foot likely to be served in practice by the water, and the extent to which the water is likely to be used.

The proposal to extend the navigation beyond Chunar and the Keul, to Mirzapoor and Monghyr, respectively, is left for future consideration. Estimates for works to the extent of Rs. 17,16,997 have, we observe, been passed.

PRICE OF FOOD THROUGHOUT INDIA.—MARCH 1870—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

BENGAL. (*Rice, the staple food.*)		*Rice.*	*Wheat.*	Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27½	22	,,	,,
	Bancoorah	27½	19	,,	,,
	Beerbhoom	32	16	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	21	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam ,,	Durrung	21	8½	,,	,,
	Goalparah	17	30	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	..	,,	,,
	Seebsaugor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	21	18	,,	,,
	Mymensing	22½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	24	24	,,	,,
	Sarun	2[illegible]	2½	,,	,,
	Shahabad	24	22	,,	,,
	Turhoot	21	21	,,	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	20	27	,,	,,
Sonthal Pergunnah.	Godda	..	..	,,	,,
	Nya Doomkah	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	29	21	,,	,,
Presidency ,,	Calcutta	..	..	,,	,,
	Nuddea	..	..	,,	,,
	Jessore	25½	15	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 3-16	21 9 16	,,	,,
	Bograh	33½	1[illegible]	,,	,,
	Dinajpore	35	17½	,,	,,
	Muldah	30	25	,,	,,
	Morshedabad	28	25	,,	,,
	Pubna	23	20	,,	,,
	Rungpore	25 11-16	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazarebagh	25	20	,,	,,
	Manbhoom	32	16	,,	,,
	Singbhoom	86	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25	..	,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES (*Wheat and Joaree, the staple food.*)		*Rice.*	*Wheat.*	*Joaree.*	*Bajra.*
Meerut Division	Dehra Dhoon	14	23	32	31
	Saharunpore				
	Moozuffernugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	14	15	...	...
	Gurhwal				
Rohilkund ,,	Bijnour	19	25	24	32
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
Agra	Terai Pergunnahs	28	25	24	...
	Muttra	17	24	25	27
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	13	19	27	16
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	17	15	24	23
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
Benares ,,	Goruckpore	23	24	27	31
	Bustee				
	Azimgurh	16	17	22	22
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	8	14	20	18

OUDH, 31st January. (*Wheat and Joaree, the staples.*)		*Rice.*	*Wheat.*	*Joaree.*	*Bajra.*
Lucknow Division	Lucknow	18	24	28	23
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	20	27	34	34
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	22	26	28	22
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	18	23	24	24
	Sultanpoor				
	Pertabghur				

PUNJAB, January. (*Wheat and Joaree, the staples*)		*Rice.*	*Wheat.*	*Joaree*	*Bajra.*
Delhi Division.	Delhi	9	21	30	27
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	19	27	24
	Rohtuk				
	Sirsa				
Amballa	Amballa	13*	24	37	29
	Ludianah				
	Simla				
Jullundhur.	Jullundhur	12	27	40	30
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	12	20	27	23
	Scalkote				
	Gurdaspore				
Lahore.	Lahore	13	20	18	23
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	12	16	22	20
	Jhulum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	17	23	22
	Jhung				
	Montgomery				
	Mozaffnuggur				
Derra I. Khan.	Derra I. Khan	6½	16	25	21
	Derra G. Khan				
	Bunnoo				
Peshawar.	Peshawar	6	15	33	26
	Kohat				
	Huzara				

CENTRAL PROVINCES. (*Wheat and Joaree, the staple food*)		*Rice*	*Wheat*	*Joaree*	
Nagpore.	Nagpore	14	14	23	2nd sort Rice quoted
	Bhundara				
	Chanda				
	Wurduh				
	Balaghat				
Jubbulpore.	Jubbulpore	17	16	31	
	Saugor				
	Dumoh				
	Mundla				
	Seonee				
Nerbudda.	Baitool	13	15	22	
	Hoshungabad				
	Chindwara				
	Nursingpore				
	Nimar				
Fruttehgur.	Raepore	33	17	36	
	Belaspore				
	Sumbulpore				
Upper Godavery.	Seroncha				

MADRAS. (*Rice and Cholum (Joaree) the staple food.*		*Rice*	*Joaree*	
Northern Section.	Ganjam	276	130	Quotations are—so many Rupees per Garce = 3360 lbs.
	Vizagapatam	284	103	
	Godavery	202	118	
	Kistna	290	181	
	Nellore	235	171	
Ceded Districts.	Cuddapah	361	179	
	Bellary	325	143	
	Kurnool	373	181	
East Centre.	Madras	442	205	
	North Arcot	256	171	
	South Arcot	227	122	
Cauvery.	Tanjore	216	94	
	Trichinopoly	234	146	
Southern Section.	Madura	255	110	
	Tinnevelly	358	134	
West Centre.	Combatore	405	222	
	Neilgherries	329	188	
	Salem	427	207	
West.	South Canara	249	123	
	Malabar	282	...	

BOMBAY PRESIDENCY (*Rice, Bajra, and Joaree, the staples*)		*Rice*		*Joaree*	
Northern Division.	Ahmedabad	Rs. 4	No Returns since January.	Rs. 2½	Rupees per maund of 82 lbs.
	Kairee	3½		2½	
	Surat	3¼		3½	
	Tannah				
Southern Division.	Poonah	3½		2½	
	Ahmednuggur				
	Kulladghee	3½		1½	
	Rutnagherry	3			
	Belgaum	3		1½	
	Dharwar	3		1½	
	Sattara	4		2½	
	Carwar			2½	
Sindh	Kurrachee			2½	
	Hyderabad			2½	
	Sukkur	3		2½	

BURMAH. (*Rice, the staple.*)		*Rice*		
Arakan.	Arakan	2 4 0	Per maund of 82 lbs.	No Returns since April 1870.
	Ramree			
	Sandoway			
	Northern Arakan			
Pegu	Rangoon	2 7 0		
	Bassein			
	Myanoung			
	Prome			
	Tounghoo			
Tenasserim	Amherst	2 0 0		
	Tavoy			
	Mergui			
	Shevegyeen			

THE PUBLIC REVENUE AND EXPENDITURE.

Revenue and Expenditure of the Government of India for the first *nine* months of the year 1870-71, as compared with the corresponding period of 1869-70.

Revenues and Receipts.	April 1869 to Jan. 1870.	April 1870 to Jan. 1871.	Increase.	Decrease.
	£	£	£	£
Land Revenue	15,440,459	15,388,363	...	52,096
Tributes, &c., from Native States	511,022	589,807	78,785	...
Forest	318,961	294,834	...	24,127
Excise on Spirits and Drugs	1,835,821	1,935,842	100,021	...
Assessed Taxes	785,194	1,678,142*	892,948	...
Customs	1,892,089	2,092,170	200,081	...
Salt	4,762,244	4,995,409	233,165	...
Opium	6,643,510	6,642,597	...	913
Stamps	1,859,068	738,458	...	1,120,610
Mint	141,389	28,593	...	112,796
Post Office	575,051	695,155	120,104	...
Telegraph	142,070	211,032	68,962	...
Law and Justice	773,391	2,055,075	1,281,684	...
Police	218,379	215,038	...	3,341
Marine	166,326	198,565	32,239	...
Education	63,831	50,745	...	13,086
Interest	281,461	237,021	...	44,440
Miscellaneous	645,346	468,918	...	176,428
Total	37,055,612	38,515,764 From April to Dec. only.	3,007,989	1,547,837
Army	740,191	633,104	...	107,087
Public Works Ordinary. Miscellaneous Receipts	101,295	89,708	...	11,587
Public Works Ordinary. Railway Exchange, Gain	296,245	92,785	...	203,460
Public Works Ordinary. State Railways Traffic Receipts	7,270	4,237	...	3,033
Do. Extraordinary do Capital Account	1	2,914	2,913	...
Total Revenues ...£	38,570,907	39,676,387	3,010,902	1,905,422

Expenditure.	April 1870 to Jan. 1871.	April 1869 to Jan. 1870.	Increase.	Decrease
	£	£	£	£
Interest on Funded and Unfunded Debt	2,241,561	2,317,231	75,670	...
Interest on Service Funds and other Accounts	539,006	476,561	...	62,445
Refunds and Drawbacks	292,942	287,954†	...	4,988
Land Revenue	1,937,466	1,898,286	...	39,180
Forest	234,863	299,607	64,744	...
Excise on Spirits and Drugs	200,903	239,018	38,115	...
Assessed Taxes	32,534	36,183	3,619	...
Customs	150,649	153,276	2,627	...
Salt	330,470	303,372	...	27,098
Opium	1,612,817	1,865,597	253,280	...
Stamps	84,143	46,994	...	37,149
Mint	72,455	48,640	...	23,815
Post Office	558,698	523,018	...	35,680
Telegraph	320,846	265,115	...	55,731
Administration	965,811	935,990	...	29,821
Minor Departments	174,116	167,274	...	6,842
Law and Justice	2,338,915	2,425,779	86,864	...
Police	2,004,935	1,854,970	...	149,965
Marine	348,074	315,121	...	32,953
Education	514,886	487,056	...	27,830
Ecclesiastical	132,740	125,131	...	7,609
Medical Services	374,143	407,236	33,093	...
Stationery and Printing	195,857	178,846	...	17,017
Political Agencies	315,876	210,299	...	105,571
Allowances, &c., under Treaties & Engagements	1,066,347	1,086,879	20,532	...
Miscellaneous	519,357	712,932	193,575	...
Superannuation, &c., Allowances	556,783	575,270	18,487	...
Total	18,116,723	18,243,635 From April to December only.	790,606	663,694
Army	9,362,409	8,804,034	...	558,375
Public Works Ordinary. Public Works	3,877,872	2,475,763	...	1,402,109
Public Works Ordinary. Railways Guaranteed.	50,637	59,641	9,004	...
Public Works Ordinary. Railway Exchange, Loss.	316,196	84,195	...	232,001
Public Works Ordinary. State Railways	3,740	5,597	1,857	...
Do. Extraordinary—Irrigation, &c.	663,316	466,514	...	196,802
Do. State Railways	22,540	159,515	136,975	...
Total Expenditure...£	32,413,433	30,298,894	938,442	3,052,981

* Includes Income Tax realized in the Military and Public Works Departments up to November only.

† Includes Refunds in the Military and Public Works Departments up to December only.

SAVINGS' BANK RETURNS.

Dr. BALANCE SHEET OF THE BOMBAY GOVERNMENT SAVINGS BANK FOR THE OFFICIAL YEAR 1869-70. *Cr.*

	Rs. A. P.		Rs. A. P.
To Amount due to 15,678 Depositors	44,11,369 2 8	By Cash in Her Majesty's Treasury at the New Bank of Bombay, Limited	44,21,173 10 6
Do. do. Government	9,666 10 3		
Do. Balances under one Rupee consolidated	131 12 3		
Do. Suspense Account	6 1 4		
Rupees...	44,21,173 10 6	Rupees...	44,21,173 10 6

STATEMENT OF TRANSACTIONS OF DISTRICT SAVINGS BANKS FOR THE WEEK ENDING 16TH MARCH 1871.

Province.	Banks open.	Deposits. No.	Deposits. Amount.	Withdrawals. No.	Withdrawals. Amount Principal.	Withdrawals. Amount Interest.	Balance.
			Rs. a. p.		Rs. a. p.	Rs. a. p.	Rs. a. p.
Bengal	22	52	4,417 4 0	7	580 0 0	0 12 6	64,012 14 3
North-Western Provinces	10	8	455 0 0	...	.....	.....	26,231 13 8
Punjab	7	4	574 0 0	2	476 0 0	1 3 2	16,800 8 9
Oudh	2	1	80 0 0	...	.....	.....	2,229 0 0
Central Provinces	4	5	834 0 0	...	.....	.....	9,679 11 0
British Burmah	3	...	.....	1	200 0 0	1 14 0	3,878 0 0
Berar	2	...	.....	...	.....	.....	1,324 0 0
India	1	...	.....	...	.....	.....	5,076 6 2
Total	51	70	6,310 4 0	10	1,256 0 0	3 13 8	1,29,232 5 10

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries Concerning India.

Vol. II.] CALCUTTA, THURSDAY, 15TH JUNE 1871. [No. 11.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden	From Bombay every Tuesday at 3 P.M. from Mazagon.
Suez	
Brindisi	
Malta	
Gibraltar	
Southampton	
Galle	Wednesday the 7th, 10th, 21st June; 5th, 19th July; 2nd, 16th, 30th August; 13th, 27th September.
Madras	
Calcutta	
Penang	
Singapore	
Batavia	
Hong Kong	
Shanghai...	
Japan	
King George's Sound... ...	Wednesday the 5th July, 2nd & 30th August, 27th September at noon.
Melbourne	
Sydney	

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London and Liverpool.

A considerable reduction has been recently made in the rates of passage money.

For further particulars apply to

GEORGE F. HENRY,
Superintendent.

Bombay, 1st June 1871.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*.

PASSENGER RATES FROM BOMBAY.

	Cabin.	Deck.	With food.
To Aden	£ 16	..	£ 7-13
To Suez	„ 28	...	„ 13-7
To Port Said	„ 30	...	„ 14-6
To Trieste	„ 40		„ 19.

Cargo taken for Trieste, also for Venice, Constantinople, and Odessa, Aden, Egypt, England and the Continent generally.

There is also a weekly service by Mail Steamers between Alexandria and *vice versa*, in conjunction with the P. & O. Co.'s mail steamer to and from Suez. The Austrian Lloyd's mail steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 280 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4 to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers to Southampton, at a charge of 10s. per cwt. to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned Agent grants also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria.

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS .....£13 | SECOND CLASS.....£9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLSS, £7-10 per head.

Railway Tickets, from SUEZ to ALEXANDRIA, with all the privileges of passengers by the P. & O. Co.,—FIRST CLASS, £3; SECOND CLASS, £2; CHILDREN over 3 and under 10 years at HALF FARE.

In conjunction with the Austrian Lloyd, cargo for Trieste and Venice can be booked through from Bombay by the P. & O. Co., and the Bombay and Bengal Steam Ship Co., and via Bombay from the various ports touched at by the steamers of the British India Steam Navigation Company.

TRANSHIPMENT SERVICE AT PORT SAID.

Goods for Trieste, Venice, Odessa, and ports on the Syrian, Turkish and Greek coasts, shipped by steamers under any Flag whatever from Japanese, Chinese and Indian ports bound to Mediterranean or British ports VIA Suez Canal, are received and transhipped by the Austrian Lloyd's Agent at Port Said, and forwarded to their destination by the Company's regular lines of steamers.

For further particulars, and for freight and passage apply to the Agency of the Austrian Lloyd's Steam Navigation Company.

A. C. GUMPERT,
Manager.

Bombay, 3 Ash Lane, 20th Feb. 1871.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870 W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.

MESSRS. R. RUBATTINO & Co.'s Italian Mail Steamers are running between GENOA and BOMBAY, calling at LEGHORN, NAPLES, MESSINA (occasionally ALEXANDRIA), PORT SAID, SUEZ, ADEN and *vice versa*.

PASSENGER RATES.

INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

	1st Class.	2nd Class.	3rd Class.
To Aden	£22	£15	£4
„ Suez	36	22	8
„ Port Said	38	24	9
„ Alexandria ...	39	25	9-10
„ Messina ...	45	32	12
„ Naples ...	47	33	13
„ Leghorn ...	50	34	14
„ Genoa ...	50	34	14 ...
„ Marseilles (transhipment at Genoa)	52	35	14-10

Including Wines. Without food.

Children under 3 years, free of charge. Children not above 10 years are free.

Passengers are allowed to *break the voyage at any of the abovenamed Mediterranean ports*, and are free to resume it by any of the Company's steamers to the port of destination marked on their tickets.

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Madras, April 1870.

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Amount paid up ..... £250,000.

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LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent, of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid. Subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office.*

Yearly premium for the Assurance of Rs. 1,000.

For the whole term of Life.						For short periods, &c.											
Age next Birthday.	without Profits.			With Profits.			Age next Birthday.		For One Year.			For Three Years.			For Seven Years.			
	Rs	a.	p.	Rs.	a.	p.			Rs	a.	p.	Rs.	a.	p.	Rs.	a.	p.	
30	35	0	0	39	0	0	30											
31	35	0	0	39	0	0	31											
32	36	0	0	40	0	0	32											
33	36	0	0	41	0	0	33		35									35
34	37	0	0	41	0	0	34		&									&
35	38	0	0	42	0	0	35		under	28	0	0	28	0	0	29	0	0	under
36	38	0	0	43	0	0	36		36	28	0	0	29	0	0	29	0	0	36
37	39	0	0	44	0	0	37		37	29	0	0	29	0	0	30	0	0	37
38	40	0	0	45	0	0	38		38	29	0	0	29	0	0	30	0	0	38
39	41	0	0	46	0	0	39		39	29	0	0	29	0	0	30	0	0	39
40	42	0	0	47	0	0	40		40	29	0	0	30	0	0	31	0	0	40
41	43	0	0	49	0	0	41		41	30	0	0	30	0	0	32	0	0	41
42	44	0	0	50	0	0	42		42	30	0	0	31	0	0	33	0	0	42
43	46	0	0	51	0	0	43		43	31	0	0	32	0	0	34	0	0	43
44	47	0	0	53	0	0	44		44	32	0	0	33	0	0	35	0	0	44
45	48	0	0	54	0	0	45		45	33	0	0	34	0	0	36	0	0	45
46	50	0	0	56	0	0	46		46	34	0	0	35	0	0	37	0	0	46
47	51	0	0	57	0	0	47		47	35	0	0	36	0	0	38	0	0	47
48	53	0	0	59	0	0	48		48	36	0	0	37	0	0	39	0	0	48
49	54	0	0	60	0	0	49		49	37	0	0	38	0	0	40	0	0	49
50	55	6	0	62	0	0	50		50	38	0	0	39	0	0	42	0	0	50

The above rates will compare favourably with the *civil rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits,* 31*st December,* 1867.

Age at entry.	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	£. s. d.	£. s. d.	£. s. d.
20	1,000 0 0	109 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.*

Medical fees are paid by the company

Claims are paid *one month* after satisfactory proof of death

Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.

The office is a comparatively young one (first policy issued in 1863), and *is therefore free from old liabilities.*

It possesses a very large capital, *the whole of which is fully subscribed.*

Its investments are all *of a first-class character.*

The life funds are allowed to accumulate *in special trust* for the primary security of life policies.

The expenses of management are guaranteed by the deed of settlement *not to exceed 10 per cent of the premium income.*

The London Direction consists *of first-class city merchants, who look after the business themselves, who are all shareholders in the company, and nearly all of whom have been on the Board from the commencement.*

The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.

The first-class position which the office holds at home, *as shewn by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank.
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bulloch Brothers
Bankipore	W. Fraser, Esq., Bank of Bengal.
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Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal.
Ditto	Bank of Upper India
Ditto	T. Lucas & Co.
Chittagong	Messrs Bulloch Brothers.
Champarun	James Begg, Esq.
Champarun Districts	E. C. Lamb, Esq
Cochin	Pearce, Leslie, & Co.
Coconada	W. M. Abell, & Co.
Dalhousie	Walter Adlard, Esq
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs Kelly & Co
Dacca	N. P. Pogose, Esq.
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Moulmain	Messrs. Bulloch Brothers.
Mean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nagpore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
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Rangoon	Messrs. Bulloch Brothers.
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Sylhet	E. G. Foley, Esq.
Saugor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Turhoot	E. Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December, 1870, exceeded £127,000.

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built, and tiled or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months	6 months.	3 months	2 months.	1 month.
	as.	as.	as.	as.	as.
Private Dwelling Houses	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building.) from	10	7½	5	4	2½
to	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton	16	12	8	7	4
Presses or screw-houses cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5: or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,

No. 1, Hare Street, Calcutta, 31st March 1871. } C. H. OGBOURNE, Manager in India

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries Concerning India.

Vol. II.] CALCUTTA, THURSDAY, 15TH JUNE 1871. [No. 11.

The Indian Economist.

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TEKEL.

THE Prussian monarch's profuse professions of piety have raised a controversy in the English Press of great importance to our age. No observant person can conceal from himself that a profession of religion, as it is called, has ceased to entail any inconvenience or disadvantage upon those who make it, while in most cases it adds to their respectability and improves their chances of advancement in the world. It was the keen perception of this fact that ruled the conduct of the late Professor DeMorgan, who wrote with such touching simplicity in his will:—"I believe in my heart that God has "raised our Lord Jesus Christ from the dead, whom I have not "confessed with my mouth in the sense usually attached to "these words because such confession has been in my time the "way up in the world."

We say nothing here of the sincerity or otherwise of King William's professions. It is sufficient for our purpose to remark at this stage that he has for many years been accustomed to make these professions a ground of appeal to the sympathy and approval of his subjects. Sincere or otherwise, the result of these professions shews that the Prussian King has taken accurate guage of the times in which he lives. He has run no risks, incurred no obloquy, sustained no loss by making them. They have been throughout, and at every step, a sure source of gain to him. He knows well that they throw an air of respectability over his cause, and discredit that of his adversaries. When the aged King told the Fatherland that the war was an unprovoked aggression upon him and his people; that he had given no provocation whatever to the French ruler; and added the touching words—"I have put my trust in God from my youth up," he knew that he was touching a chord that would vibrate in the deepest heart of the people and kindle its enthusiasm in his behalf.

We are not now questioning the sincerity of the statement; we are simply pointing out the fact that all these professions of piety have *paid* the Prussian King, and that whether sincere or otherwise, they are, as far as possible, removed in their nature and essence from that "confession" which the Divine Saviour requires of his disciples, as a proof of their attachment to his cause. Are we not right when we affirm, that it is of the essence of that confession that it should be a sacrifice, and that the moment when such "confession," or as we now call it, "religious profession"—plainly tends to a man's advantage in the world, every ingenuous disciple will shrink from it with the instinctive delicacy of spirit that breathes in DeMorgan's will. Such a one cannot, dare not, *trade* upon so holy a thing. Let confession come attended with suffering—with the Cross—and he will bind it upon him as the badge in which he glories, rejoicing to be accounted worthy to suffer in his Master's name. On the other hand, let him see that "religious profession" in his case will be a pathway to worldly success, and if he have much acquaintance with his own heart, he will be likely, we think to follow the beautiful and touching example of DeMorgan. We live, it may be feared, in an age when far too much is made of the *value* of religious professions, for the cost of such professions in these days is nothing; the gain which commonly attends them manifest. The organs of religious opinion do much to foster and develop the evil. The sacred principle of *reserve* in religion seems to be all but lost; and the religious world moves on in the midst of vulgar congratulations that this and the other great man of our times adopt the common places of evangelical piety and profession. In an age marked by these tendencies, it becomes of deep importance that they who see the evil should protest the worthlessness of profession as a test of character, and should insist upon the standard of Christian morals being applied, without compromise, to the conduct and the lives of professors, rejecting with abhorrence the suggestion that we may dispense with it in any case.

Now try the Prussian monarch by this standard, and what, in the judgment of sober reason, are his professions really worth? In view of the complete misleading of the English mind as to the causes of this last war, we may put it on one side altogether, and deal simply with the two wars waged by him in 1864 and 1866. Now concerning each of those wars the judgment of Europe is unanimous. They were as guilty, unprovoked aggressions on the part of this Prussian King, as any war in either ancient or modern times. They were preceded and attended all through with lying, meanness, and unscrupulousness so utter, that the Cabinets of Europe waited in astonishment upon the course of the monarch and his Minister. One villainy after another was suggested and laid aside, and re-suggested, regardless not merely of morality but of common decency. Mr. Gladstone, who has certainly no anti-Prussian leanings, rightly declares the conduct of the Prussian Court to have been "brutal and unscrupulous" while anyone who takes the trouble to read the story for himself, can rise from it with no other feelings but those of indignation and astonishment at such guilt being possible in modern days. Now what are we to do with this book open before us, when we hear King William in a set oration to his subjects, ascribing the success which crowned his course of defiant wrong-doing, and two bloody wars, to "the *evident favour of God*." No doubt it is a great and re-assuring truth that "promotion cometh neither "from the East nor from the West; but God is the judge "who putteth down one and setteth up another;" but the Prussian King's statement to the Hanoverian deputation, that

he had succeeded in the guilty course upon which he had entered through the "evident favour of God," we are bound to treat as a blasphemy. We dare not do otherwise. It is a cowardly treason against the Right, to hesitate what judgment to pass upon manifest guilt, because it is "a religious professor" who is under trial. Write TEKEL in capital letters upon his back, and treat his profession simply as an aggravation of his guilt. Religious journals have much to answer for, in daring to hold such "professors" because of their worldly rank, in countenance. By so doing, they do what they can to confuse in the public mind the distinctions between Right and Wrong. Can we do King William or society any good by professing to be in doubt concerning the guilt of that war of 1866, when the whole Prussian people, to a man, felt how deadly its crime was, or that other war of 1864 in which Europe saw itself launched upon a new era of international morality by this same pious Prussian monarch. All honor, therefore, to men like the aged Marshman, who protest with their whole might, against the efforts of religious journals like the *Record* and some Indian journals to persuade mankind that the religious professions of this Prussian Court are just subjects of congratulation. Knowing, as the world does, what the course of that Court has been, its cynical defiance of morality and right, its professions of religion should be treated as an offence and an abomination. The course which these journals take, reminds us much of the course taken by the same class of newspaper in the Southern States throughout the American War. Those religious journals, justified as righteous throughout, the immoral cause with which they were identified. They had "a lie in their right hand" and insisted that it was "the truth." No well-informed man can have one moment's doubt of the character of Prussian diplomacy. It has simply been an infamy. We are not the judges of the *person* of the Prussian monarch. He is passing on to a tribunal before which we must all stand, each for himself. But we *are* the judges of the value of his "religious professions" when we find them associated with general unconscientiousness of life. Living in an age, when profession costs nothing, but often, as in King William's case, is a great worldly advantage, it becomes every wise man to treat "religious profession" as a matter of the very smallest worth. We are bound to do this in the interests of Christianity, and for the honour of its great Founder, to confess whom in the only just sense of the word is to encounter loss and suffering for His sake.

The DeMorgans just now are, it may be suspected, the true confessors, the real salt of the earth; and it is wiser to shrink from "professions" that have become profitable, than to be too ready either to make them, or to welcome them, when made by others. Sir Matthew Hale, we are told, "was cautious not to be too much thought religious, lest he should bring discredit on the cause of God." Is not something of this feeling a right and good one? And how painfully does it clash with loud professions on the part of men who have been chief actors in the most guilty and bloody proceedings of our age. The religious world helps the temptation which these men are under to feel as if they were supporters of the Church and of our holy faith, when it should rather warn them against stretching forth their hands towards holy things. The Prussian monarch *may* be the simple-minded poor old man he is declared to be by religious journals; but even were the grounds for believing so better founded than they are, fidelity to Christian principle should make them uneasy and silent as to his professions, in view of the course of violence and ambition which he has run. The truth, we fear, is that the Church, as well as the World, has come to believe in and to worship "success." Had King William fallen upon the field of Sadowa, and the Prussian army been beaten, every religious journal in Europe would, undoubtedly have held it to be the manifest judgment of God upon unrighteous and bloody men. King William won the battle, and he is a dear simple-minded old saint in their eyes. A more masculine and discriminating judgment is called for in the times that are passing over us. Every wise man will regard religious profession, by whomsoever made in these days, as worse than worthless, when he finds it associated with conduct of doubtful morality. We do not say that King William is a hypocrite, but that his course has been marked with political crime of a very dark character is certain; and in these circumstances we should much prefer that his discourses were less interlarded with religious professions. His professions are simply an offence.

THE OVERLAND TRANSPORT SERVICE.

An article in one of the Bombay papers upon the new Transport Service, warns us that we ought to have cautioned our readers against receiving implicitly the demi-official statistics concerning the service which lately appeared in the *Times of India*. Those statistics have led to the inference that "the difference in the cost of transport per head (under "the new system as compared with the old) is only the differ- "ence between £21 and £24." The apologetic statistics referred to appeared a few weeks ago in the *Times* as follows :—

"The abstract of the services performed during the three first "seasons 1867-68, 1868-69, 1869-70, shows that during the "last season no less than 13,117 adults were conveyed outwards "by these ships, and 12,029 taken home, or a total of 25,146. "The total numbers conveyed were—in 1867-68, 18,410; "1868-69, 18,141 ; 1869-70, 25,439 ; or a total for the three "seasons of 61,990."

We have no means of verifying these figures, while two different statements are made by their author, in the space of two or three lines, as to the numbers carried in the last season. In one line we are told that the number was 25,146, and in the next 25,439. The average number of the three seasons, according to the statement, was $61,990 \div 3 = 20,661$. As a matter of fact, we believe the annual number to be carried by these transport ships will not exceed 15,000.

The recruits annually required for each regiment of cavalry in India are estimated at 32, and for each battalion of infantry at 60, and the total annual number required to maintain the present strength of the Army at 3,288, men. The European Army on actual service in the country is only 66,000 to 68,000 strong, and if we allow 7,000 for the reliefs, and 7,000 for the return of time-expired men per year, we shall have a total of 17,000 or 18,000 men to be annually transported, of whom certainly not more than 15,000 will go by these vessels at this new cost of £600,000 a year, or £40 per head, against an average of £20 15*s.* 4*d.* under the system prevailing in 1860-66 ; a difference of about £300,000 a year. But the real comparison is not between 1871 and 1860-66, but between 1871 and the East India Company's system before the Amalgamation of the Armies. Our complaint was "that the India Office and the "Horse Guards, being under neither check nor control of any "kind, spend whatever they please;" and in illustration we said— "Look at the cost of the new Transport Service, as given at "length in the *Statistical Reporter*. A service that used to "cost the East India Company £70,000 a year, is now made to "cost £500,000 to £600,000 a year."

We are told that "it would have been more satisfactory "if the figures per head been given." We would gladly have given them if they had ever been published. All we *can* give, however, we give in the present *Reporter*, viz., the cost of transport under the East India Company from the year 1834-35 down to the end of their rule; and it will be seen that it did not exceed £40,000 to £50,000 a year.

The truth is that the handing over of the Indian Army to the Horse Guards has wrought all the mischiefs that Outram and others predicted. These Horse Guards' reforms have demoralized the Army, while man for man they have doubled its cost, as we showed in the last *Economist*. One of the most prominent items of the enhanced expenditure is the cost of this Transport Service, and we can but re-affirm "that the "building of this fleet was an act of extravagant folly, "when the circumstances of the country are remembered, "since India is not in circumstances to afford this wanton

"outlay of public money." It is said that this is "unjust and reckless criticism, such as might possibly be excused in a daily journal, but is unpardonable in a monthly *Economist*." Let us see. Suppose we admit that it was wise to build this fleet, for the reason alleged that "England ought not to "be without the means of landing in Egypt on an emer- "gency, a force large enough to save that vital point in "her line of communication with India from being captured "by a *coup-de-main*,"—the reason is plainly *Imperial* in its nature, and must suggest to every just mind the impropriety of devolving the entire cost of the precaution upon this country.

But it is matter of notoriety that the Government built the fleet not in the interest of India alone, as the treatment of the charge would imply, but for the transport of troops to any part of the world to which England may find it necessary to send them. The injustice, therefore, of a country so immensely wealthy as our own casting the whole outlay upon a people whose resources we profess to administer as a trust, needs no enforcement. In the circumstances of this country, nothing but necessity could justify the building of such a fleet at all, while no *representative* Government of India would ever have dreamed of such an outlay. The fleet was built not in the interests of *this* country but for the convenience—if not something less respectable—of *that*. If the Home Government really required this fleet for the *general* transport service of the country, it was bound to apportion the cost rateably amongst the interests—Imperial, Indian, and Colonial—to be served thereby. But Parliament would not hear of it; and the Colonies would none of it; and so India, which cannot help herself, is made to build for the whole of them. The building of the fleet might have been defended perhaps, had we seen England and the Colonies evincing their sense of its need by consenting to share in its cost. But the casting of the whole burden upon India, shows either the hollowness of the pretence that it was necessary, or that we are making her pay for a fleet required not for her service alone, but for the whole Empire.

Again, look at the mode of financing followed. No one will deny, we presume, that these ships represent so much *capital*, —why, then, are they treated as part of the current expenditure of India? It is only in this indefensible way that the Indian deficit exists at all. One year, two-thirds of a million are demanded for a Palace at Westminister; the next year, a million and a quarter for a Transport Fleet; the year after, £100,000 for a Lunatic Asylum; and then an indefinite amount for a hospital at Suez, and then for a Civil Engineering College—and so on. Now, though these outlays were all defensible, the impropriety of taking them from the taxes of a country which is starving for capital, is manifest. If India *must* sustain these burdens, is it too much to ask,—since the outlay is simply so much invested capital and the country exceedingly poor—is it too much to ask that their cost should be defrayed by long annuities? Why not allow the country to build the India Office, and the Fleet, and the Asylums, and Colleges in the manner least oppressive to her? She has good credit and can borrow at 4 per cent, without having to mortgage either Fleet, or Palace, or College, while it is ruinous to take the money from her taxes; a fact which is understood quite well in the India Office and therefore increases its guilt. This financing shows an unworthy determination to be safe, by taking the money while we can get it; and so the Indian Minister, careless of economic results, *takes* it; and then stands up in the House of Commons and talks of the Indian deficit. This conduct is being followed by a sure Nemesis; for the just thing is the only enduring thing in this world, as all men may see who have their eyes open to see. Ministers simply would not dare treat the Colonies, or any other Dependency of the Crown, as they treat this country; and we all know the reason. The Press of India, generally, is, we believe determined that there shall be reform.

THE ROYAL NAVY.

OUGHT INDIA TO CONTRIBUTE TO ITS COST?

In reply to our strictures upon the cost of the new Transport Service, and of the Hydraulic Lift being constructed in Bombay harbour under orders of the Secretary of State at the cost of India, the *Bombay Gazette* demands:—"Why should not India "pay the cost of a dock for repairing the ships of the Royal "Navy stationed in these seas? The Royal Navy is the Navy "not of England alone, but of the English Empire, of which "Empire, India forms a part. It is for the protection of Indian "commerce, and the defence of the coasts of India against foreign "invasion that the Royal Navy squadron cruises in these "Eastern waters. Why should India alone, among nations, be "excused from paying for the services thus rendered her, or "privileged to throw the whole burden of maintaining the "Imperial Navy on those unfortunate people at home who are "already taxed thrice, or four times as heavily, as their fellow- "subjects in India?"

The *Times of India* essays a reply to this demand, by pointing out that India is "*not* excused from paying for the services rendered her" by the English Navy. "Within the last three "years, in that stealthy determined manner with which our "subservient Supreme Executive is totally unable to cope, the "stated contribution of India for Admiralty purposes has been "increased to £70,000; while our Marine Department has to "supply steam coal and other stores, and execute many repairs, "the aggregate of which new expenditure, threatens to form an "appreciable addition to the 'imperial' burdens borne by the "'unfortunate people' of this country. Also, under the pretence "of survey service, which the Bombay Marine could have done "better, the Admiralty has succeeded in commissioning three "more of its spare vessels at the cost of the Indian revenues." "As to the new iron dock silently growing up in a remote portion "of our harbour, it was bad enough to commit India to its entire "cost on account of that extravagant overland troop service, "which was devised with a view to "imperial" rather than Indian "interests; but now that the Suez Canal has made the Hydraulic "Lift all but useless for H. M.'s Indian troop-ships, it partakes "of levity in financial selfishness now to turn round and urge, "that as the Royal Navy can do with another dock, India must "pay. It sounds fine to say that "the Royal Navy is the Navy "not of England alone but of the English Empire, of which Em- "pire India forms a part;" but why is India, the only outlying "part of this English Empire which is made to pay for the "Royal Navy?"

We are glad to see this journal finally abandoning all defence of what it now calls by its right name—"that extravagant overland troop service." It does not, however, we think, give the right reply to the demand which the *Gazette* prefers and has frequently preferred before—that India ought to contribute to the cost of the Royal Navy. For Mr. Maclean means that India should contribute *substantially* to that cost. It has been a stock device with this very able, but perverse writer, for years past—whenever the justice of the home military charges has been called in question—to point out that India contributes nothing towards the cost of the Royal fleet; and as the cost of that fleet is nine or ten millions a year, the minute payments referred to by the *Times of India* will not be allowed by him to be any contribution at all, in the sense which he attaches to the word. The *Times of India* has given, we think, the wrong answer. The proper answer is that as *India does not require the services of the Royal Navy*, she ought not to be charged with their cost. For in the first place India may be said to have neither mercantile, marine, nor sea-borne commerce, requiring protection; and in the second, if she is ever invaded by sea, it will be not for her own sake, but because England is her ruler. This last consideration cuts up by the root the demand that India should pay a substantial contribution to the cost of the English Navy. That Navy exists, not for the sake of India, but primarily for the defence of the English shores, and secondly, for the maintenance of

England's Empire over other lands. Reverse the positions of the two people for a moment, and suppose that England was a remote dependency of India, and that the only invasion which the island had to fear in these circumstances, was from the hereditary enemies of her Indian rulers, say the two great military powers of Persia and China. By the supposition, England would be exposed to invasion, not because she herself had any quarrel with Persia or with China, but because she belonged to India, which she would plainly have a right to *claim* defence on that ground as a matter of course.

The only invasion by sea to which we can conceive India liable, is from America, or Russia, or France, while nothing is more certain than that if such an invasion should ever be attempted, it will not be because of any provocation which India has given, but from the outbreak of some quarrel between England and those Powers. With what justice then, could we lay the people of this country under any substantial contribution towards a fleet that is maintained from first to last in English interests, and for the discharge of purely English responsibilities. If our rule bring the calamity of war and invasion upon the country, the very least we can do is to protect its shores as far as possible from suffering through our quarrel. Who will maintain that India requires a Navy to defend her because of the quarrels which are liable to arise between *her* and the Powers we have named? Invasion, if it ever come, will come not because the people of India have outraged France, or Russia, or America, but because England has quarrelled with one or other of them, or with all. And the least we say that she can do in these circumtances, will be to protect the shores of her dependency, as far as she can, from suffering in her quarrel.

But lastly, India is open to invasion from the sea at so few points, while steam and modern gunnery have so completely revolutionized the science of defence, that it would be downright madness for her to maintain a fleet. The few points of her seaboard at which she is liable to invasion can only be efficiently defended in these days by Monitors, and these she is being made to find at her own cost. For her to maintain a fleet, or profess to maintain a fleet, would simply be to excite jealousy as a maritime power, and to provoke invasion. Her just rôle is plainly that of defence, pure and simple, and if we require her to pay for the whole cost of the gun-boats, and the defensive works needed in exposed positions like Bombay, we ask all that can be justly asked of her. It is certain that she will never bring invasion upon herself by quarelling with other Powers, and if invasion is brought *upon* her, by the mistakes or the ill-conduct of our Ministers, or the ambition of our enemies, the least we can do is to aid her defensive works as far as we can with a flying squadron of the Royal Navy. Because of this remote contingency we ought, it seems, to make India substantially contribute to the English fleet, although should any great emergency come, she would not be allowed to assert a right to even a gun-boat of that fleet. Why not make her contribute to the railways and canals of Great Britain also? India is already paying much heavier charges under the head of Marine than is generally supposed, as may be seen from the *Statistical Reporter* which accompanies this issue.

THE LAND.—N. W. PROVINCES.

WHO IS RIGHT, MR. STRACHEY OR SIR WILLIAM MUIR?

THE Honorable Mr. Strachey's complaint in Council, that a very unjustifiable sacrifice of revenue was being made in the North-West Provinces by reducing the assessment from 66 to 50 per cent. of the rental in the re-settlement of the land there, is, we are sorry to see, resented by the Government of those provinces, which puts forth an official reply to the complaint, signed by Mr. Colvin, under date of 3rd April 1871. We have read the memorandum attentively, and are compelled to say that it is unsatisfactory. To begin with, Sir William Muir does not come into Court with clean hands. He is almost as much answerable for the settlement made in the *Central* Provinces as Sir Richard Temple himself, since it was to *his* review the proceedings were submitted by the Supreme Government. This question of unduly lowering the assessment is, therefore, we may reasonably believe, a sore subject with him. It could hardly perhaps, be otherwise; but it is unfortunate that in a matter of such importance, a natural propensity to justify what has been done should be allowed to compromise grave public interests. Mr. Colvin's memorandum is sophistical and misleading. The *heart* of it, is an attempt to shew that 66 per cent. of the rental was *not* exacted under the old settlement; and that instead of 50 per cent. we are really now taking 60; and the question, "we are told is whether 40 per cent. of the net rental is too "large a share to leave to the landlord."

It would be wholly unprofitable to follow the memorandum through its numerous windings; we shall give simply a crucial illustration of its value. Observe that Mr. Colvin is going to prove that 40 per cent. of the net rental is not too large a share to leave to the landlord. Now mark the process by which he does so:—

"The holdings of these landlords will be of two kinds:—

First,—The homestead—the land known as 'seer.' This is the most valuable part of the holding. All the produce of such land goes directly to the landlord. In other lands, the cultivating tenant intercepts a portion; in these, the landlord is himself ordinarily the cultivator.

Secondly,—There is the land held by tenants. This will be more or less profitable, according as the land is held by tenants with or without a right of occupancy, at favourable rates, and according to the influence of the landlord over his tenant.

These three then—(1) the homestead, (2) the land held by tenants at favourable rates, (3) the land held by tenants-at-will—make up the landlord's holding. If we can tell the ordinary area of these holdings and their approximate value, we shall have, after deducting 60 per cent. as the total demand on the landlord, a very good notion of the annual amount of profits left under present rules for his support."

Mr. Colvin next shows by statistics—which we assume to be correct, but which we should like to have the means of testing—that the homestead of each landlord, that is the land which he himself farms, averages about 6 acres, while he cultivates by his tenants on the average 22 or 23 acres more. The result of this joint farming and letting is declared to be as follows:—

"Assuming the rack-rent at which the land composing the homestead can be let to be double the rent paid by ordinary tenants (an extravagant supposition), the debtor and creditor account of net landholders will stand as follows:—

In Aonlah (Bareilly) his net income will be—

	Rs.	a.	p.
6 acres seer by Rs.	7 = 42	0	0
22 acres held by tenants by Rs	3-9 = 77	0	0
Total..	119	0	0
Revenue on 28 acres at Rs. 2-1-6 =	57	10	0
Profit of landowner.	61	6	0

Or Rs. 5-1-9 per mensem, to meet the cost of living for a whole family.

Similarly in Chibramow (Furruckabad) his net income will be—

	Rs.	a.	p.
6 acres seer by Rs.	7 = 42	0	0
23 acres held by tenants by Rs. 3-8 =	80	8	0
Total income ..	122	8	0
Revenue on 29 acres at Rs. 9-1-6 =	60	11	6
Profits of landowner.	61	12	6

Or Rs. 5-2-4 per mensem to meet the entire cost of living."

Now we say that this is an exceedingly disingenuous statement, and calculated to mislead 99 men out of every 100. For no account whatever is taken of the fact that a six acres homestead, consisting as it does of the best land of the village, will of itself, *meet the entire cost of the man's living.* A vast proportion of these homestead lands in the North-West yield the richest produce grown in any part of the world. The farming profits of 6 acres of irrigated land of fine quality in these provinces, would far exceed the profits of 60 acres of ordinary land in our own country. Instead of having to "*meet the entire cost of his living*" out of an imaginary *rental* of the land, the landlord will grow wealthy upon the mere *farming profits* of the rich homestead which he owns. Let Mr. Colvin himself tell us what profit 6 acres of sugar-cane, alternated with rice, will yield in the North-West? The landlord farms the best land himself—the land with *water* and *manure* close at hand; and lets his

surplus 22 or 23 acres at the highest rent he can get. And this is what Mr. Colvin calls "*meeting the entire cost of his living*" out of 5 Rs. a month. Will he now say that this 5 Rs. a-month suggestion, is not a pure travesty of the *status* of these North-West proprietors? We feel angry and justly so at such throwing of dust in men's eyes to defeat inquiry. A six-acres farm of homestead land in the North-West, will be of itself a provision for any proprietor, while by virtue of the land he lets he holds it not merely rent-free, but with a considerable bonus year by year from this other land to swell his farming capital. The facts adduced by Mr. Colvin shew conclusively the needlessness of reducing the assessment from 66 to 50 per cent., for the use of the term "landlord," with its peculiar English associations, is altogether misleading. These proprietors are merely men with rights of occupying some 20 or 30 acres each, who farm the best of the land themselves and let the remainder to others. Their right has ever been subject to the State assessment, and that it is needless in these days of enhanced prices to abandon to them the large margin we are now doing, we do not think there can be honest doubt. At the same time, we are free to admit that we think Mr. Strachey made a mistake in selecting the North-West Provinces as the field in which to open the campaign. The settlement proceedings in these provinces, in so far as we have yet looked into them, are less open to remark than similar proceedings elsewhere. That a needless sacrifice of revenue has, however, been made there as well as everywhere else, we entertain not the least doubt, and we prove it by a very simple consideration, a consideration that sweeps away as with a besom the sophistical statements of this memorandum.

Four millions and half, we are told, are all we are to expect from the land of the North-West Provinces for 30 years *to come*. So that in the face of our enormous expenditure upon irrigation and railways in the provinces, past and prospective, the rent receivable by the State in the year 1900 is to be substantially little more than it was in 1840. So great a revolution in the condition of the people has taken place already, while we are but half-way through the period, as to be without parallel, and the gross produce of the land upon the most moderate computation has risen 40 per cent. in value: still the assessment cannot be raised. We put the case thus, because in the absence of exact statistics, it is in this way only that we can *demonstrate* the fact we are insisting upon, that the land is under-assessed. If the very same land that is now assessed at four millions and a-half for thirty years to come, paid an assessment of four millions thirty years ago, or even three and a half, and the enormous extension of cultivation which Mr. Colvin speaks of has really taken place—what possible conclusion is there, but that we were either frightfully oppressive before, or insanely philanthropic now? At least twenty millions have been spent in the provinces in roads, railways, and canals in the last 20 years, and the value of the harvest is indefinitely in excess of what it was before—and yet the land revenue cannot be increased!

The suspicion of disingenuousness which attaches to this Memo. is increased by the fact that it is difficult to believe that the statistics which Mr. Colvin quotes are quite impartially selected. He says:—

Extremely accurate information can be obtained on this point (size of the homestead farms) from the reports of settlement officers, which are published from time to time by the Government of these provinces in the *Revenue Reporter*. The following figures are furnished by the districts of Furruckabad, Mynpoorie, and Bareilly:—

District.	Pergunnah.	Number.	Area.	Average in acres (fractions omitted.)
Furruckabad ..	Bhojapore	544	5,588	10
,, ..	Talgram	205	2,072	10
,, ..	Mohumdabad	449	2,994	6
,, ..	Pahara	328	1,556	5
,, ..	Khakutmow and Purumnuggur	57	3,257	6
,, ..	Imrutpore	1,273	7,533	6
,, ..	Kaimgunj	1,382	12,617	9
Mynpoorie ..	Karauli	646	Area not exhibited by Settlement Officer.	3
,, ..	Mynpoorie	1,336		4
,, ..	Ghiror	980		6
Bareilly ..	Bullia	1,204	4,014	3

We have, then, in eleven pergunnahs, an average homestead of six acres. These pergunnahs have been taken because, while in all the reports the actual *total* area of the homestead holding is recorded, the average *holding* is given in these only.

Now are we to believe that Mr. Colvin has never seen Mr. Smith's Report on Tehseel Atrowlee in the Allyghur Zillah? That most able and interesting Report contains an equally precise account of the extent of the landlords' holdings, and presents a very different picture from the pergunnahs instanced above. The tehseel consists of the two pergunnahs of Atrowlee and Gungheeree, and the extent of the homestead holdings in each is declared to be as follows:—

Proprietor's Khoodkhast, or land cultivated by Proprietors.

	Holdings.	*Acres.*	*Acres.*	
Atrowlee	862	19,974	23	Homestead farm.
Gungheeree	113	2,248	20	,,

That the Mynpoorie and Bareilly holdings instanced by Mr. Colvin are exceptionally small, there can be little doubt; and they ought therefore to have been excluded from his statement. So much for the size of the proprietor's own farm. Instead of an average of six acres, we find it 20 or 23, at all events in Atrowlee. Concerning the extent of the land over which these village proprietors claim landlord rights, Mr. Colvin says:—

"The total cultivated area per proprietor in pergunnah Aonlah, of the Bareilly district, is 28 acres, 7 more being held as cultivable. In pergunnah Chibramow, of the Furruckabad district, the average cultivated holding of the proprietors, other than talookdars, is recorded at 29 acres. Deducting from these the 6 acres held as homestead, we have 22 and 23 acres per proprietor held by tenants. In either pergunnah the average rent paid by tenants is Rs. 3-8-0 per acre, and the rate of incidence of the revised revenue, calculated at 60 per cent. of the rental is Rs. 2-1-6 per acre.

It would have been more satisfactory had Mr. Colvin given the statistics of *the same* pergunnahs he had already quoted for the homestead farms. It will be observed that no account is taken in his estimate of profits, of the 7 acres of cultivated land held by each proprietor *free of assessment altogether*, and constituting the grazing land of the holder. Carefully looked into therefore, the circumstances of these small proprietors resolve themselves into these facts:—

1. They themselves cultivate on the average, *six* acres each of the best land in their villages.
2. They hold seven acres more, free of assessment altogether, and:
3. They each receive the rents of 22 to 23 acres more, from tenants cultivating under them.

Let it be understood that these proprietors are simply the hereditary cultivators of the village, who claim a right—so long as they pay the State assessment—to exclude strangers therefrom, except as their tenants. Look at their position then. They are all cultivators themselves, and have got the best lands for their farms, the lands supplied with water and manure. They have each 7 acres of land in addition, free of assessment altogether, and they let the surplus 22 or 23 acres, which they do not care to cultivate themselves, to tenants. And this most favored position for a class of small proprietors, resolves itself in Mr. Colvin's mind into the picture of "a landlord" (save the mark) with an average family of 5 persons in all, *having to "meet his entire cost of living" out of Rs. 5-2-4 per month.* He suppresses every economic fact in the condition of the family but this one—that they get 60 Rs. a year of *rent* for their land, and would impose upon the reader the fiction that these so-called "landlords" of the North-West are a class like our own landlords at home, gracefully going idle upon the strength of Rs. 5 a month. The fact simply is that all such communities, as those instanced, are mere peasant proprietors, in the happy position of being allowed to assert landlord rights over land which they claim, not by the natural right of cultivating it, but by virtue of having settled in its neighbourhood in remote times. These village landlords are allowed by us to call the village their own, and cultivating as much or as little as they please themselves, to "let" the remainder to tenants. In consideration of this ancient occupancy, we liberally share the rental with them, and because we do this, it seems we reduce them to the necessity of living upon Rs. 5 a month, the amount of the rent abandoned to them. Was there ever a more unfounded travesty of the real

state of matters put forward? Now, see what Mr. Mill says in almost the last number of the *Fortnightly Review*, upon the very men we are discoursing about :—

"In other parts of Upper India [these North-Western Provinces] those to whom the absolute ownership has been conceded, are the village communities; but there has been a growing disposition to restrict, instead of enlarging, the number of the inhabitants who are considered entitled to communal privileges. Even at an earlier period, single families from which, by custom, the headman of the village had been taken, had not unfrequently been recognised by our Government as sole owners. The remainder of the cultivators, including many who at the first settlement had been admitted, as proprietors, to enter into engagements for the Government revenue, have been reduced to the condition of tenants-at-will. There is great danger that if this tendency of opinion continues, the whole of the northern provinces will be possessed, for the first time in India, by a comparatively small body of absolute owners, many of them peasants, with a vast population under them of tenants-at-will. And this is one of the greatest social revolutions ever effected in any country, with the evil peculiarity of being a revolution not in favour of a majority of the people, but against them—its supporters defend in the name of civilization and political economy, though if there is a truth emphatically taught by political economy, and from which no one who has the smallest tincture of the knowledge of it withholds his assent, it is that the status of an agricultural tenant-at-will is intrinsically vicious, and in a really civilised community, ought not to exist."

We commend this passage to the careful study of the whole country. The unhealthy state of mind, into which multitudes of our officials have got, is well illustrated by Mr. Colvin's paper. We ask him a single question :—If these peasant landlords are in the state he suggests, namely, that of being reduced "to meet their whole cost of living out of Rs. 5 a month," what must be the condition of their wretched tenants-at-will? All these modern settlement proceedings are pervaded by the same spirit of folly. The rights of the Commonwealth are *nothing* : the rights of the actual working cultivator *nothing*; the care of the landlord whom we ourselves have made *everything*! And so in the Central Provinces the people have been reduced *en masse* to tenants-at-will; and the State rights formally made over to a class of petty landlords created for the very purpose of investing them therewith. Mr. Mill plainly does not yet know what has been done in those Provinces.

But once more, and to show finally, how misleading Mr. Colvin's memorandum really is, we observe that it has no application whatever to the *zemindaree* lands in the North-West. His statistics can hardly have reference to any but *putteedaree* lands, lands held by communities of village proprietors. Thus in Atrowlee, out of the entire revenue of Rs. 2,46,000, nearly Rs. 1,40,000 are paid by zemindars *each of whom owns more than one village*. We need not go on. The strictures of Mr. Strachey were in the main just, and absolutely necessary. The memorandum put forward by the Government of the North-West in reply to these strictures is disingenuous, and calculated to mislead uniformed readers, the Select Committee for instance. We hope presently to find time to review closely some of the late settlements in the North-West, and while we admit once more that they are not so open to remark as proceedings in other districts, they do not admit of the wholesale and defiant justification set up in this official apology for them, put forward under Mr. Colvin's name.

HOME MILITARY CHARGES.

The military establishments of India and the expenditure, during the period of the great Sikh wars, were as follows :—

Average Strength	*Europeans*	*Natives*	*Total.*
1843 to 1846	45,772	229,645	275,417 men
1847 to 1851	46,970	233,192	280,162 "

Average Expenditure	*India*	*England*	*Total.*
1843 to 1846	£ 9,785,016	£ 1,357,328	£11,142,341
1847 to 1851	10,309,822	1,444,007	11,753,829

The total military expenditure of the East India Company in the decade immediately preceding the Mutiny was about £11,500,000 a year, of which a very large amount (between five and six millions sterling) was entailed upon the Company by the conquest of Sindh, the rupture with Gwalior, and the two great Sikh wars. The army was nearly 300,000 strong all this time, and was in a state of the highest efficiency throughout the period. From 1851 down to 1857 when the Mutiny occurred, the average strength of the force was about 290,000 men, of whom nearly 50,000 were Europeans, with an average expenditure of about £11,800,000 a year. The force is now reduced by 100,000 men, while the expenditure is run up to £17,000,000 or £18,000,000, all outlays included.

Now the cause of this stupendous enhancement admits of no concealment. The abolition of the East India Company placed the Indian Treasury completely at the mercy of the Horse Guards and of the English Ministry, who have abused their power in a manner so scandalous as almost to defy criticism. While the East India Company administered the finances of the country, the Directors, as responsible for the trust in their hands, resisted with a good deal of courage and persistency the mis-appropriations of Indian revenue, which the Crown was never tired of attempting. It was in the teeth of their urgent and consistent remonstrances, that the cost of the Affghan war was unrighteously fastened upon the people of India, who had nothing whatever to do with it, but to engage in it at the bidding of the English Ministry. Troops that were not needed by the Company were thrust upon them merely to relieve the English estimates, while they were peremptorily required to pay every charge that could be connected in the remotest manner with the very name of India. Upon the whole, and where they themselves were not interested in these mis-appropriations from the Treasury under their charge, they shewed much honorable resolution in its defence. With the disappearance of the Company, the doors of the Treasury were thrown wide open to Ministers to help themselves as they pleased, and they have abused their power in a manner simply disgraceful. Here is the army, reduced by a whole third of its strength, costing five or six millions a year more than before; the cost, man for man, being double and treble under the Horse Guards what it was under the Company. The following episode occurred in the proceedings of the House of Commons last month :—

"*Colonel Sykes* asked the Under-Secretary of State for India whether there was not an egregious error in the return to an address of the House of Commons, dated March 14th 1871, No. 129, which stated that the cost per man for drilling and preparing recruits for filling up vacancies in the East India Company's European troops in India for ten years, from 1850 to 1859, both inclusive, was £19 14*s* 10½*d*. for 24,783 recruits, while the cost per man at the expense of India for a similar object for the European troops of the Crown for seven years, from 1861-62 to 1867-68, both inclusive, was £205 per man for 15,376 recruits, amounting in 1862-63 to £376 per recruit; and whether it was true that India was to be charged for the future £136 13*s*. 11*d*. for each cavalry, and £63 8*s*. 5*d*. for each infantry recruit, independently of the cost of transit to India.

Mr. Grant Duff—In reply to my hon'ble and gallant friend I have to say that there is no error in the return referred to, and, further that the charge to be made by the Imperial Government against the Indian Government is, under present arrangements, precisely as he states it.

Matters have come to this pass, that open robbery of the Indian Treasury is boldly ventured upon, and almost truculently defended. Are Ministers mad? Do they think that in the 19th century it is safe—to put the appeal upon the lowest ground—is it safe to act thus in the face of Europe, and with a vast body of educated, intelligent, and active men pouring year by year from the Indian Universities upon the country? These Home Charges are really reaching a development that threatens catastrophe. To suppose that they will be tolerated, or endured in face of the searching criticism applied to every act of our administration by the India press is downright fatuity. The Colonies have shaken of the yoke of contribution altogether to the military expenditure of England, while our Ministry are committing themselves to the desperate effort of binding upon the shoulders of this people charges, the presentation of which are a simple infamy.

We devote the *Statistical Reporter* which accompanies this issue, to completing the statistics that are necessary to give to our readers and the Select Committee a complete mastery of the case against Ministers and the Horse Guards. The most cursory comparison of the military expenditure of the two periods *before* and *after* the Mutiny—under the East India Company and Horse Guards respectively—will at once show

to what outrageous lengths the system of exaction is now carried. The *present* Indian army, under the administration of the East India Company would not have cost the country £12,000,000 a year, while under the Horse Guards it is run up to sixteen or seventeen millions. So bad is the case, that the very nominees of the Crown recently appointed to report upon the expenditure, dare not justify it, but write :—

"We feel it to be our duty again to refer to the fact, that the "East India Company were able to send efficient artillery and "infantry recruits to India at a cost of £26-7-5 per man, instead "of £136-13-11 for cavalry and £63-8-5 for infantry recruits, as "now proposed. We are fully aware that the changes made "in the terms of enlistment, pay, clothing, &c., would have "increased the charge, as incurred by the East India Company; "but the proposed establishments for, and the periods of, "training, which have formed the basis of this third report of "the Committee, appear to us *to be enormously in excess* of what "can be possibly required for the purpose of properly recruit-"ing the British army in India."

Now if purely English nominees of the Crown report in this way of its exactions, in what terms do Ministers suppose a representative body of Indian tax-payers would deal with them? All honour to Messrs. Jamieson and Seccombe for their effort to redeem our country from the stain upon its integrity which Ministers in their anxiety to ease the English estimates are bringing upon us. In the time of the old Company (1852 to 1859), the recruits sent out to India from the Warley Depôt cost the country on an average £26-7-5 per man for all arms. The average cost of the cavalry and infantry by the Horse Guards sent out in the seven years, 1861-68, was £205 per head, and if we enquire *why*—the sole answer is that the ingenuity of the Ministry is racked to discover pretexts upon which the English estimates may be eased at our cost. The recruits *need* cost us little more now than they did before, but the Horse Guards has set up a *regime* that ignores all question of cost, while it magnificently founds colleges and builds fleets, and reduces whole armies to enforced and pensioned idleness, to gratify its ambition of command. The last of these exactions is the founding at our expense of a Lunatic Asylum to be paid for out of Indian revenues. India engages for a few years, upon definite terms, the services of three or four thousand English soldiers every year; or rather we should say England sends to this country, every year in her own interest, that number of soldiers, deeming it necessary to do so for the safety of her empire here. The men are well paid, and are but too glad to enter the service. A proportion of them, as of other classes, suffer the dreadful misfortune of insanity, when the charge of maintaining these unhappy men at home is clapped upon the shoulders of this country. The men are sent home at our expense, but instead of being then dismissed to the care of their friends, or the parishes to which they belong, they are made a charge upon the revenues of India. In the detailed Home accounts for the present year, we find the following entry :—

Indian Lunatic Asylum; and Civil Engineering College,—	
Purchase, adaptation, and furnishing	£103,500
Maintenance of Lunatics	„ 10,000
	£113,500

We have here two more public buildings in England to be paid for out of Indian revenues. There is such wrong in these exactions that they move our indignation deeply. If India had the power to resist them, Mr. Grant Duff knows that they would be struck out of the accounts instantly; but because we have not the power to resist, the exaction is made without remorse. Lunacy, in the majority of cases, probably, is hereditary, and because India has had the misfortune to engage an English soldier thus afflicted, she must build an asylum for him in his own country and maintain him there. No English Minister would dare make an exaction of this order upon the feeblest of the colonies, and it is dastardly to make them upon India, on the ground that she is powerless to resist them. Why should India which pays so handsomely for English soldiers who enter her service, be saddled with the charge of them if they are so unhappy as to become insane? What would an English merchant in India say at being compelled by law to maintain his peons or purvoes, who unfortunately became insane after a year or two's service in his office. The frightful enhancement of the cost of the army is from beginning to end the work of the Horse Guards and of the Ministry. Being without check or control of any kind, and not burdened with conscience as official money very seldom are, all question of cost concerning our expenditure is looked upon as an impertinence. Our part is to pay what we are told to pay, and think ourselves happy in being governed with a disregard of economy and principle, total and outrageous.

THE SELECT COMMITTEE.

(*Evidence of Mr. Morris.*)

WE feel compelled to direct attention to the very misleading nature of the evidence which Mr. Morris, the late Commissioner of the Central Provinces, is reported to have given before the Select Committee upon—(1) the weight of the assessment, and (2) the sales of waste-lands therein. To deal with the waste-lands *first*—

The last of these sales was advertised in the *Official Gazette* of the Central Provinces in October 1869, and the total quantity of land sold up to that date with the prices obtained for it, were officially declared in a subsequent issue of the *Gazette*, to have been as follows :—

District.	*Acres.*	*Price realized.*
Bhundara	51,360	Rs. 1,50,135
Mundlah	46,523	47,765
Hoshungabad	16,707	68,196
Upper Godavery	11,429	16,976
Belaspore	29,211	13,831
Chindwarra	4,123	10,540
Total	159,353	2,87,443

Now these are the official returns which have appeared in the *Central Provinces' Gazette* at intervals during the last two years; and they show a total of 159,353 acres sold in these districts for a gross sum of Rs. 2,87,443, or an average price of one rupee twelve annas, or about 3*s.* 6*d.* per acre. And yet, we have Mr. Morris assuring the Select Committee that "*the land had been sold by the Government* "*at from* 8*s.* *to* 15*s.* *the acre.*" No one will suppose Mr. Morris guilty of intentionally falsifying the fact; but mis-statements of this order, in presence of a solemn national inquest into the course of our rule, by one whose assurances the judges must feel it necessary implicitly to trust, deserve severe remark. A still grosser mis-statement, if possible, was made by him in assuring the Committee that these waste lands "had been "put up for sale by auction at the minimum price of 3½ rupees "per acre", the scandal being not merely that they were put up to auction at all, but put up at rates as low as *half a rupee* per acre, instead of Mr. Morris's three and a-half. Let the Select Committee call upon the India Office for the Waste-land Rules of the Central Provinces, dated 7th July 1863, and they will find Rule IX. running as follows :—

Rule IX.—The upset price of the lands to be sold will ordinarily be as follows; but in special cases, the Deputy Commissioner, with the sanction of the Commissioner, may put a higher upset price on any lot, provided that in no case shall the upset price exceed four times the ordinary rates :—

(1).—In the Raepore, Belaspore, and Mundla Districts, 8 annas per acre.

(2).—In the Sumbulpore and Upper Godavery Districts, 1 rupee per acre.

(3).—In the Hoshungabad, Nagpore, Chanda, Bhundara, Wurdah, Jubbulpore, Nursingpore, Chindwarra, Seonie, Saugor, Baitool, and Dumoh Districts, Rs. 2-8 per acre.

The upset price will be calculated on the whole area of the lot without any deduction on any account whatever."

Instead of a minimum upset price of Rs. 3½ per acre, the average price which the lands sold for, was but Rs. 1-12-0. Look at the result of the sales in the following districts :—

	Acres.	*Price realised.*
Mundlah	46,523	Rs. 47,765
Upper Godavery	11,429	„ 16,976
Belaspore	29,211	„ 13,831

Thus the State sold nearly 90,000 acres of land in these three districts alone, for a gross sum of less than Rs. 80,000 or 2s. per acre, *with a pledge never to impose a land-tax* upon them. Mr. Morris seems to have affected not to know this fact. He is reported to have said:—"The purchaser bought the proprietary "title, the freehold, for ever, and *he believed* that under the "orders of Sir Charles Wood the purchasers were not liable to "taxation in respect of these lands." Is it possible, we ask, that Mr. Morris was in uncertainty upon the point? If the Select Committee regard our statement, as they well may, as incredible, let them call for a copy of the Deed of Sale, passed under the hand of the Secretary of State to the purchasers of these lands, and they will find that it runs as follows:—

"The Secretary of State for India in Council, in consideration of the sum of rupees——paid by——into the hands of the————of ——(as appears by the receipt herein endorsed) doth, in virtue of all powers and authorities enabling him in that behalf, and so far as he lawfully can, or may, by these presents grant and convey unto——and his heirs all that lot No.——of unassessed waste land, comprising——acres situate, and being at——in the district of ——in the Central Provinces, and bounded——

"As the same has been surveyed and demarcated, together with all rights of forest, pasturage, mines, fisheries, and all other the proprietary-right and interest of the said Secretary of State in Council in and over the soil of the said lands hereinbefore mentioned (except as hereinafter excepted), *to have and to hold* the said lands and premises hereby granted unto, and to the use of the said——his heirs, representatives, and assigns, *for ever free from all present or future demand on account of Government land revenue.*"

We declare these alienations of State-property to have been insane; first, on the ground of this pledge; and second, because the want of the Provinces is not land but population. The undue extent of fertile wastes already alloted to each village under the settlement, and the sparseness of the population, invest these further alienations of State-property with an aspect of insanity. The authors of this singular folly could not see that they were simply holding out a premium to the cultivators to abandon the lands subject to the assessment, and transfer themselves bodily to these so-called wastes, where they could scratch the soil for crops, free of all contribution to the State whatever. The record of the proceedings is all but incredible. Look for a moment at the *three* following blunders in the order in which they were made, each surpassing the other in degree. First of all, the lands under actual cultivation by each village are assessed at rates so low as simply to mock the cost of Government in the Provinces. Then as though this were not enough, an enormous amount of surrounding waste is given to the villagers free of rent altogether, as if for the very purpose of stimulating the process of exhausting the patches they have settled upon, and then moving on to others.

To add the finishing stroke to these idiotic proceedings, the whole outlying wastes beyond were then magnificently offered to anyone who liked to ask for them, free of all taxes whatever, *upon payment of* 1s. *per acre in ten instalments, spread over ten years.* And this is the statesmanship to which the country is handed over, at the moment when two high cost railways were being driven through the heart of the Provinces at an outlay of £25,000 per mile each. Is there any room for surprise at our exclamations against this folly!

Mr. Morris finally assured the Committee that he did not consider the settlement at all light. "He did "not consider the settlement in the Central Provinces "at all light. Some portions had been too lightly assessed, but "they could not double or quadruple a man's taxes all at once. "There was not the slightest doubt that on the next assess-"ment there would be a large enhancement. Compared with "the rate per acre in the North-Western Provinces and in Oude "it appeared light, but at least one-half of the land in the "Central Provinces was very poor indeed, and was culti-"vated badly. If it were in the hands of an industrial "and skilful population the produce might be doubled, "if not quadrupled. Then the population was sparse, the "average of the whole of the Central Provinces being but "seventy-nine per square mile."

Mr. Morris could hardly have been expected to damn his own assessments before the Committee, but what does every fact he points out suggest, but the policy of making the assessment somewhat onerous, instead of so mischievously low, as all the world except Mr. Morris and Sir Richard Temple now know them to be. To have improved the condition of a people like this, living in the midst of a wilderness of cultivable fields, with habits of idleness leading them to scratch the land for a mere subsistence instead of cultivating it, a statesman would have put a little pressure upon them, by levying an appreciable rental on the land, and excluding them from the wastes altogether, until the increase of the population fairly called for their reclamation. Instead of this, our settlement proceedings throughout would seem to have been designed to convert the whole population into vagabonds, roving at their wild will over the vast wastes in which the State thought it policy to *invite* them to roam.

We are bound to notice finally, the effort of Mr. Morris, for it looks very like one in the report, to conceal the existence of the malgoozar from the Committee. Here is his account of this modern creation of our rule, as reported by the *Times of India*:—

Mr. Lyttleton—Is the proprietor represented by a patel? *A.* We do not know patels in the Central Provinces, that is a Bombay expression. *The proprietary right vests in the occupiers, and the village community in the Central Provinces choose one from amongst themselves to represent them,* and this officer, after being sanctioned by the Government, pays the Government revenue. It is often an hereditary appointment.

Mr. Lyttleton—And his remuneration? *A.* He gets from three to five per cent. of the Government revenue. In the Punjab I think the village expenses are all separately provided for, but in the Central Provinces he pays the expenses out of the percentage.

The proprietary right "vests in the occupiers," and the malgoozar, who gets from 3 to 5 per cent. of the Government revenue, is an officer chosen by the village community from amongst themselves, to represent them in their transaction with the Government!

Surely there must be a mistake in the report. Are we really to suppose that Mr. Morris, after governing the Provinces for years, is to this hour ignorant of the status, rights, and powers of that creation of Sir Richard Temple's statesmanship, the malgoozar? Mr. Morris has never heard of the malgoozar at all. The cultivators consist simply of three different classes:—"In the Central Provinces are three different classes of culti-"vators; first, cultivators with fixed rights of whom there are "158,075; second, cultivators with rights of occupancy, but "variable rights of whom there are 140,220; and third, 474,656 "tenants-at-will. Two-fifths are protected, which is a good "proportion." We say it is difficult to acquit Mr. Morris of attempting to hoodwink the Committee, and conceal the existence of the malgoozar. Nothing could be more misleading than the account which he thus gave of the condition of affairs. He suppresses entirely the fact that the settlement has made over the *absolute proprietorship* of the land to a class who were simply collectors of the land revenue 10 years ago. Let the Committee compare these statements of Mr. Morris with the following extract from Sir Richard Temple's administration report of 1865-66:—

"As explained in previous reports, an absolute ownership of the land has been conferred upon *the people*. Besides the sharers in the village properties, by reason of blood and kinship, there is a considerable class of men judged after enquiry to be proprietors of the particular fields they cultivate; these men are, according to the returns, about sixteen thousand in number. Of the ryots, about two-thirds have been recorded as tenants-at-will on their own full admission. Of the remaining one-third, some have been declared, on a review of their past position, to possess full rights of occupancy; and in accepting the settlement, the landholders have engaged to respect those rights; while the rest are those ryots who, merely by length of time, would be held to have the rights contemplated by Act X. of 1859. These latter are informed that their position, in the above respect, depends on the Act, and might possibly be modified if the law were to be altered.

All occupancy ryots, of course, understand that their rent is liable to equitable enhancement (the equitableness, if disputed, to be determined by a Court of Justice) according as circumstances may change, or as competition may arise."

Almost the whole body of cultivators is thus placed at the mercy of a class of landlords, whom the settlement has created in the room of the State, and who instead of being remunerated

by Mr. Morris's 3 to 5 per cent. of the Government Revenue, are taking all they can squeeze out of the tenants whom we have placed in their power The Select Committee should require the Indian office to prepare an exact statistical memoir of the proceedings of the settlement since 1861, when the truth of our allegations would be made plain, and the stupendous error that has been committed fairly apprehended. The evidence of Mr. Morris was misleading throughout.

LITTLE PEDDLINGTON.

THE ELPHINSTONE BUNDERS.

An unworthy effort is being made in Bombay to bring the Government of Sir Seymour Fitzgerald and the Editor of this journal into discredit for the State-purchase of the Elphinstone property there. The *Bombay Gazette* writes upon the matter as follows :—

"We owe it to Mr. Knight's initiative that the poorer inhabit-"ants of Bombay are now paying town duties on the neces-"saries of life. * * Again it is to Mr. Knight's counsels in great "measure that we owe the blunder committed by Government, "in purchasing the Elphinstone property, so that the respon-"sibility of the new bunder fees as well as the town duties must "be laid to his charge. Not satisfied with doing this mis-"chief, &c., &c., &c."

We are willing to take upon our shoulders at once the entire responsibility, if our contemporary pleases, of both measures, and are only waiting a formal re-opening of the discussion upon the Town Duties' Bill to shew the justice of the house tax in Bombay being again lowered, and the town duties materially raised. For the house tax is simply a fraud, as levied in Bombay, owing to the peculiar circumstances of that city, and the just solution of its municipal difficulties is a substantial increase of the town duties, and the levy of a general water rate. Were the circumstances of the Island fairly placed before any body of statesmen in the world, they would justify our statement that the house tax, as now levied in Bombay, is confiscation—pure and simple. So much for the Town Duties' Bill, with which we hope an occasion will arise for dealing at length. And now as to the Elphinstone property. Its true history is this. In October 1866, Mr. Knight, who was in London at the time, heard casually that the Company must either stop their works at great loss, or make a fresh call upon the shareholders, which the directors were very anxious to avoid in view of the depression of the Island. It suddenly struck him that the services which the Company had rendered the State were so important, that they had a just claim upon it for assistance. At this juncture he had an interview with Lord Cranborne at the India Office, and he took the opportunity of urging upon His Lordship the propriety of assisting the Company with a loan. His Lordship received the suggestion warmly, and promised to recommend it to the attention of Sir Seymour Fitzgerald, who was then about to proceed to Bombay, as Governor. To introduce the suggestion to public notice, Mr. Knight then wrote and published a letter to Lord Cranborne upon the subject. The moment the letter appeared in Bombay, the *Bombay Gazette* of course denounced it as an atrocity. Mr. Knight was the "organ of a knot of bankrupt speculators at Mazagon," and the State was adjured to discountenance the unheard of job which he had proposed, and for which no doubt he was to be handsomely paid. In its opposition, the journal at last got blind, and denounced the Government in strong terms for having "jobbed away the "whole harbour foreshore of the Island to a lot of bankrupt "speculators" who had the commerce of the city at their mercy, and who ought in the public interests to be allowed to smash. Now this is an exact history of the business thus far. Mr. Knight's suggestion was made with the motive of helping the Bombay community out of the difficulties into which their public spirit had betrayed them, and for so doing he was covered with mud. He saw, however, at once that "the engineer might be hoist with his own petard" and having let him mount high enough to be well seen by everybody knocked away the stilts on which he had got, by suggesting that since the foreshore had been so improperly parted with, now was the time to get it back. He therefore recommended that instead of assisting the Company with a loan, Government should take advantage of its necessities to resume what it had so "improperly" alienated. The *Bombay Gazette* was silent from that moment, conscious, we suppose, that it had been check-mated. Throughout the long negotiation that followed the journal maintained complete silence. In 1867, Mr. Knight published a second letter to the Secretary of State upon the subject, in which he said :—

"Eight months ago, I ventured to suggest that Government "should assist the Company to complete its works, by guaran-"teeing its debentures upon the London Stock Exchange. I "am now satisfied, after careful consideration of the state of "Bombay, that Government would do better to resume the con-"cessions it has made the Company, and pay them for their works, "a price to be fixed by an arbitration of Government and other "engineers. The Government would thus become once more "the owners of a foreshore, which it is vehemently contended "ought never to have been alienated; and this mass of real "property, now absolutely inconvertible, melted down into a "shape that would give indefinite relief to the Island.

The *Bombay Gazette* still made no sign, but kept silence. At last after three years of negotiation, the foreshore became once more the property of the State, the Company receiving back the principal amount of their outlay, but losing the interest of all the years they had been at work. Had the Company been generous it would have made Mr. Maclean a handsome present for the service he had unintentionally done them, and for the mud with which he had pelted Mr Knight. For nothing is more certain than that it was the violent opposition of the *Bombay Gazette* to the proposal to assist the Company with a loan, that led to our proposal that the Government should take advantage of their necessities to resume the foreshore from their possession altogether. We are now denounced as responsible for the Bunder fees which the Government, rightly or wrongly, is levying at the Elphinstone wharves! We ourselves seriously believe Mr. Knight is to blame for the failure of Mr. Lowe's match tax. No doubt we are largely responsible for the purchase of the Elphinstone property, and for the imposition of the Town Duties' Bill, and for the re-construction of the Bank of Bombay, also purely local measures which the *Bombay Gazette* vehemently opposed. We almost feel that we owe an apology to our readers for noticing these miserable carpings in our columns. The Bombay Government was wise to take back the foreshore, while the question of the wharf fees is one that of necessity will work itself clear in the course of a little time.

THE LOCAL CESS BILL—BENGAL.

A local contemporary says that "Mr. Schalch's Bill, if "accurately designated, would be called not a Bill to levy a "road-cess, but a Bill to impose additional rent on the land-"holders of Bengal for purposes of local improvement!"

Does our contemporary really maintain that the Permanent Settlement pledged the State never to attempt to improve the condition of Bengal for all time, for that is what the objection seems to point at? Suppose the provinces were smitten with pestilence, and it was necessary to spend a considerable sum upon drainage works to save the population, does our contemporary really believe that it would be an infringement of zemindar rights to tax them for the purpose? No Government *could* give such pledges, as these protests assume to have been given by Lord Cornwallis; while, if it was positively certain that such pledges *had* been given, what sort of Government would that be which held itself bound by them? Government can do much; but it cannot, in the nature of things, by any engagement of any kind whatever, relieve itself of the responsibilities which belong to Government everywhere.

Are we really to hold that Government pledges itself by the Cornwallis settlement to abandon the provinces to disorder, ignorance, anarchy, and death? If it did so pledge itself, the more shame upon it; but what weight of shame would belong to *us* in these days for professing to look upon ourselves as bound by such a pledge? Lord Cornwallis could *not* pledge the State never to tax the zemindar. No Government on earth could give such a pledge to any class of its subjects that would be binding upon itself, or its successors for a day. We have long wanted to know why the landholders of Bengal, through whose lands several State railways have gone, are not laid under special tribute for the improvement? Where is the justice of making other provinces pay the guaranteed interest upon costly lines of railway from which they get no advantage whatever? Were there either statesmanship or insight in our finance, the zemindars of Bengal would have been put under special contribution for the cost of the railways which the State has made in the provinces, to the immense enhancement of the value of their estates. And they now, it seems, want *roads* built for them at the cost of other provinces. These gentlemen and their advocates are putting forward, without knowing it, the very same pretensions as that old French nobility, whose follies were at last expiated under the guillotine. "Good God!" says Carlyle, "did not a "French Do-nothing aristocracy, hardly above half a century "ago, declare in like manner, and in its featherhead believe in "like manner—We cannot exist, and continue to dress and "parade ourselves, on the just rent of the soil of France; but "we must have farther payment than rent of the soil; we must "be exempted from taxes too. This was in 1789: in four years "more—Did you look into the Tanneries of Meudon, and the "long-naked making for themselves breeches of human skins! "May the merciful Heavens avert the omen; may we be wiser, "that so we be less wretched."

IS THE LAND REVENUE BEING SACRIFICED OR NOT?

[*We commend the following article from the "Pioneer" to the attention of the reader.*—ED. *I. E.*]

"DOES any human being know the grounds upon which some years ago the Settlement Commissioner of the Punjab so assessed the Umritsur division (one of the richest, best-irrigated, and most improving portions of the Punjab) as to result in a decrease of revenue of Rs. 1,69,000; so that even when Rs. 1,51,000 canal earnings were taken into account, the loss to Government was Rs. 18,000? Surely the grounds of so strange a result must be producible, and if they are producible, surely the Government and the public have a right to be informed of them. But so far as the published reports tell us, the Settlement Commissioner brings about this astounding result absolutely on his own authority, nor does it appear that anybody but himself—certainly not the Government whose servant he is—has the faintest conception as to how it came about.

"We have no intention of entering into a controversy upon details. Indeed the very materials for such a discussion are at present the monopoly of the Settlement Commissioner. All that can be said is—that it seems passing strange that the Umritsur division, with a newly-constructed railway ready to carry its products to the most favorable marts, 2¾ lakhs of acres under canal irrigation, and a rise of prices, for land and agricultural produce, within twenty years of not less than 100 per cent. should be only capable of paying Rs. 17,000 *less* than it did on the occasion of the previous settlement! The astonishment which we feel is, we know, shared by many of those who have the best means of information as to the resources of the country, and whose opinion on the subject is entitled to the utmost respect. With regard to one of the districts in the division, we believe that the district officer, when consulted about the settlement, stated, as his opinion, *that instead of a reduction, there ought to have been a rise of 25 per cent. on the existing rates.* And with regard to another district we know it to be the opinion of an officer at one time in charge of it, himself thoroughly versed in settlement operations, that the Government is not receiving more than one-tenth of the net profits of the soil, instead of the half, to which, by universal consent, it is entitled. Of course these are only opinions, but they show clearly enough that men of sound judgment and ample information take a widely different view from that of the Settlement Commissioner, as to the amounts which Government can with propriety levy from the soil.

"The same thing is, we firmly believe, true of almost every portion of the province. An experiment was lately tried in a division under one of the old assessments which has still some years to run. A hundred land cases, in which land-owners sued their tenants for rents, were taken quite promiscuously from the files of the entire division and examined. The results showed that the 400 acres of land concerned in the suits, paid Government a revenue of Rs. 400, or one rupee per acre. The landlords, however, sued for rents *averaging seven rupees per acre* and (putting out of the account all payments out of court, &c.,) actually recovered cash decrees for amounts averaging Rs. 4 per acre. In other words, the proceeds of these 400 acres were Rs. 2,000, of this the land-owner took Rs. 1,600 as rent and Government Rs. 400 as revenue; whereas, by the unquestioned doctrine of assessment, Government was entitled to Rs. 1,000. This calculation indicates the sort of rise in which a properly-conducted settlement ought, in our opinion, to result; it suffices at any rate to make a positive decrease quite unintelligible.

"It is in the power of the Punjab Government—if still incredulous as to the truth of the grave charges brought against the land revenue assessments—at once to clear up the question by calling upon the various district officers for a candid statement of their opinion."

THE DUKE OF ARGYLL UPON THE LAND REVENUE OF INDIA.

[*Notice by the "Star of India."*]

"THE land revenue was the next subject to which His Grace referred, and on this point he avowed that "his own opinion "was that a permanent settlement was the wisest settlement, "and that it was better for wealth to accumulate in the hands "of the people than to flow into the Treasury." But he would tax that increased wealth which he anticipates a permanent settlement must produce, "by some means" to be adopted "for getting at that wealth." Now this is the very point upon which we think all peaceful Government in India depends, and the stability of British power in India. Government is already at its wit's end to discover "some means" of raising money by imposing more taxes, and we find the Secretary of State for India insisting that a permanent settlement of the land, of course, upon the same "moderate views" that influence the existing settlements, is the wisest settlement possible. We cannot suppose that the Duke of Argyll has given this important subject the attention that it deserves. The land in India is now in the possession of the Government, and is a valuable property which that Government is bound to use for the benefit of the people. What account can the Government render to the British nation and to the people of India, after the revenues, which might be derived from the land, have been ignorantly lost? It will be found impossible to raise money from the "great land-holding class of India," when the only means of taking it have been foolishly given away to that very class. You cannot present them with a handsome rent-roll and take it back again by an income-tax or "some other means." To do so would create rebellion. How does it happen that our statesmen are keen enough to discover the value of land in England, especially if it is their own, when, as rulers of India, they cannot discern its value, and indeed seem to regard it as of no value at all? There is a fatality about their reasoning on this subject, that is really appalling."

NOTE BY EDITOR "INDIAN ECONOMIST."

IT is not very wonderful perhaps that the Duke of Argyll, who is one of the largest landed proprietors of the kingdom, and who

has converted, we believe, within the last few years a large part of Argyllshire into deer-forest and grazing ground, compelling the people to abandon the home of their fore-fathers for the purpose—should wish to see "the great land-holding class," as he calls it of India, "enjoy a higher share than it now does of the wealth" of the country. His Grace, we suppose, must hold these views. Not to do so, would be to condemn the system of things which tolerates his own order. But mark that he and his order stand on one side, while the people, with every economic authority of repute, stand on the other. No fact is more certain, we suppose, than that the present land-system of England is doomed, as inconsistent with the well-being of the many, in whose interests the Duke proposes to advocate the setting up of a similar order of things here.

The Duke of Argyll believes that the land of Argyllshire is his own, to convert it into deer-forest if he pleases; but the time is fast coming when he will have to show a better title to do this than ancient Crown grants, or time-stained parchment deeds. "Properly speaking," says Carlyle, "the land "belongs to these two: to the Almighty God, and to all His "children of men that have ever worked well on it, or that shall "ever work well on it." We will meanwhile confine, if His Grace pleases, the Crown grant and permanent settlement-system to the unhappy Provinces in which one of His Grace's order was allowed to set it up some eighty years ago, in the times of men's ignorance. The Duke no doubt sincerely believes that it is good policy for the State to make over the rights of the people in the soil to "a great land-holding class." How can he believe otherwise! Does he not himself claim one-half of Argyllshire by a title so absolute, that no man may set foot upon it without his permission, not even the man whose forefathers lived and toiled upon it, and watered it with their tears, and sweat, and blood, and who sleep beneath its ancient sward and greenwood. My Lord Duke is not, we fear, the safest man we could have just now in the India Office, when the great question of land-tenure is in the white heat stage of its discussion. The man who dare give, with the light we now have upon the subject, an order for the Permanent Settlement of India, will go down to posterity with the merited execrations of a hundred and fifty millions of people and their descendants, upon his head The Duke of Argyll is a very conceited, pragmatic man, with an implicit belief in his own "conscientiousness," and a contemptuous indifference, we fear, for the opinions of others; the very man to repeat the error of Lord Cornwallis.

THE SOOPA SETTLEMENT.

Our statement that the Government rights in the soil in the Soopa talooka "have been made over to men too often sensual scoundrels, to whom the Commonwealth, if it owes anything at all, owes a periodical tying up at the triangles," has been remarked upon by a Bombay journal; and no doubt it seems extreme. We ought to have quoted para. 39 of the Report, instead of simply referring to it. The men of whom we speak are there described as follows:—

"The Narwa villages in Parchol are the worst paying and the most neglected in the talooka. The Bhatella Desais, owing to their influence and cunning, have succeeded hitherto in keeping the Government demand at a disproportionately low figure, which enables them to take less personal interest in the cultivation of the land. Hence all the fine masonry wells in Eroo are out of order, and the *dub*, a weed which may be aptly called the Nemesis of improvident tillage, holds up its head to reprove the Desai, who thinks it beneath him to be a farmer or land-lord in the sense the Kun'ra Desai's. His pride takes another form,—the pride of caste and privilege to marry three and four wives from the cultivating Bhatella class, who give him from 2,000 to 4,000 rupees to effect a settlement for their daughters in his home"

Here is a class of middlemen who, not content themselves with idling upon the land, are doing their best to deteriorate its agriculture, and deepen the poverty of the cultivator. They are not the owners of the land, remember, but ex-officials of the old Mahratta rule, whom we are treating with tenderness from motives of benevolence. We think the consideration misplaced, and instead of longer allowing men of this order to destroy the property of the Commonwealth, would force them by an exceptionally sharp assessment, into other courses, or break them down altogether, and give the occupancy right to the actual cultivator.

That unduly low rents commonly lead to miserable husbandry, is a fact so widely observed as not to admit of contradiction. "I have not," says Arthur Young, "seen an instance of "rent being very low, and husbandry at the same time being "good. Innumerable are the instances of farmers living miserably and even breaking on farms at very low rents being "succeeded by others on the same lands at very high rents "who make fortunes. Throughout my journey I have uni-"versally observed that such farms as were the most wretchedly "managed were very much under-let." The great chief of agricultural authorities recorded this conviction as the result of his observations throughout his tour in the North of England, 1770-80. He remarked upon the same fact subsequently in his Irish tour, and modern observation confirms its accuracy—"Estates that are under-rented," says McCulloch, "are almost "uniformly farmed in an inferior style compared with those that "are let at their fair value." The same fact has been observed by our settlement officers all over India. By fixing the land revenue for thirty years at the unduly low rates we are adopting, we are doing our best to stereotype the slovenliness of native husbandry, while, by creating a race of middlemen between the State and the cultivator, we are sowing the seeds of a terrible harvest of difficulties in the future, such as is being reaped in Bengal. It has been our lot for many years, to be opposing reactionary extremes on the part of the State. At one time the land is to pay everything; at another as now—nothing The very men who in 1857 were confiscating all the freeholds of the country as our only just policy towards the land, had found out in 1861, that it was not right even to tax it, and their school has been more or less in the ascendant ever since.

The subjoined letter addressed by us on the 3rd instant to the *Bombay Gazette* upon the subject of this Settlement will speak for itself:—

Sir,—I will trouble you with a very few lines in reply to your article of this morning.

1.—You twist my statement that it is a widely observed *fact* that unduly low rents lead to careless husbandry, into my holding "the fallacious and mischievous *doctrine* that the State does "good to agricultural by exacting the highest possible rent from "the cultivator." Such want of candour makes controversy for any good purpose, hopeless. Do you really see no alternative between rack renting the soil on the one hand, and letting it at the "unduly low rents" of which I complain on the other? I object to *high* rents quite as strongly as you can do, as you must know if you really read the *Economist*.

2.—My estimate that the present land revenue of £20,000,000 does not exceed one-twentieth of the produce is, you say, "of "course, simple guess work," although the fact is capable of being proved to a child, and the demonstration has been given over and over again in the *Indian Economist*.

3.—You compare the weight of the land-tax of England with that of the land revenue of India, and suppress the fact that economic authorities are agreed that the surrender of the State rights in our own land was a fatal mistake which they counsel us not to imitate in India.*

R. Knight.

Bombay, 3rd June 1871.

A LANDLORD

WHO DOES NOT LET THE GRASS GROW UNDER HIS FEET.

At the close of a recent controversy between Mr. Knight and the *Bombay Gazette* on the subject of the Soopa Land Set-

[THE ENGLISH LAND SYSTEM VS. THE INDIAN.]

* "From the first hour when the philosophy of administration has been understood, it has been admitted that the true source of State revenue is the land, and that the only sound policy is to preserve the land as the property of the State. *The misfortune of all the western kingdoms of the world* has been, that this discovery was not clearly made till the practical application of it had become impossible, through the appropriation of the soil, as private property; and when India came into the hands of our fathers, they found themselves in possession of *the one opportunity left in the world* for carrying on Government without taxation; and without the necessity for ever instituting taxes."—*London Times*, 1862.

tlement, the following letter appeared in the correspondence columns of that journal :—

To the Editor of the "Bombay Gazette."

SIR,—You have done a public service by exposing the mischievous doctrine of Mr. R. Knight. As a rule, he is not particular, in his extreme anxiety to furnish facts and figures, about their accuracy, and I cannot help thinking that Mr. Knight is doing a grievous injustice to the ryots of this country, when he asserts, with some confidence, that the landlord amounts to one-twentieth of the produce of the land.

I have some 450 acres of paddy-land not far from the Tannah railway station, which I annually let to a large number of small cultivators, under the distinct understanding that they are to have half the actual produce of the land, I on my part agreeing to pay the Government assessment and all expenses of repairing the bunds, &c., besides providing a certain number of watchmen when the harvest is being gathered.

The total yield of last year was one hundred and sixty-seven candies of paddy, of which some 200 cultivators took their share, aggregating 83½ candies, leaving eighty-three and a-half more as my share. The sale realized Rs. 1,768, out of which I had to pay Government Rs. 1,026 for the tax upon the land, and the expenses of repairing the various bunds of the batty fields, and the wages of watchmen amounted to Rs. 831, leaving a deficit of Rs. 89 to be made up by me.

I am not one of those landlords who allow the grass to grow under their feet, but it appears that in purchasing the property some years ago, I had not made sufficient allowance for the depreciation in the value of grain.

After these results, which I am prepared to show from my books to Mr. Knight, or anybody else, can Mr. Knight have the hardihood to say that the land here can bear additional taxation?—Yours obediently,

Bombay, June 5th. JUSTICE.

The writer of this letter was far from seeing its importance. Here, in fact, was one of those "middlemen," of whose creation we complain, offering himself as evidence against our conclusions, *in behalf of the ryots*, while admitting that the measure of his tenderness towards them was "a distinct understanding" with his own 200 tenants, that they were to hand over to him one-half the actual produce of the land. The impudent audacity of the writer, in coming forward as the champion of the ryot made us curious to know whom he could be, and upon the strength of his challenge to us to examine his books, we wrote to the editor to disclose his name. Mr. Maclean applied for permission to divulge it, and received the following answer :—

MY DEAR SIR,—I have no objection whatever [to the disclosure of my name.] On the contrary, I should be happy to convince Mr. Knight that the ryots are not so well off as he thinks.—Yours very truly,

6th June. NARAYEN VASUDEOJEE.

So the writer was the well-known dubash of the P. & O. Co., one of those "landlords," as he himself tells us, "who do not allow the grass to grow under their feet;" in point of fact, one who takes one-half the produce of the land from the wretched cultivator at his mercy, and will then "be happy to convince Mr. Knight that the ryots are not so well off as he thinks." The impudence of the whole display is really sublime. Here is a middleman who, through the folly of Government, has got possession of 450 acres of rice-land, within 20 miles of Bombay, and close to the Tannah railway station, who openly avows that he is rack-renting the cultivator by taking one-half of the produce of his fields as rent every year, while he himself is paying the State the nominal rental of 2½ rupees per acre.

We saw, at a glance, that we had got the very case we wanted to show to the dullest and most prejudiced of our opponents the folly and ruin of our present course. Mr. Vasudeo describes the results of a single year's cultivation to have been as follows :—

Yield of 450 *acres* — 167 *candies or* — *lbs.* 93,520 *paddy.*

Thus the total yield was, we are to understand, a little over 200 lbs. of paddy (unhusked rice) per acre. Gentle reader, the rice lands of the Concan yield, on the average, from 2,000 lbs. to 4,000 lbs. per acre, but Mr. Vasudeo's estate yields *him*, it seems, 200 lbs. only. The balance sheet of the year we are told was as follows :—

The yield = 167 candies.....	@ Rs.	21	Rs 3,536
200 Cultivators	„	1,768	
The Government assessment	„	1,026	
Mr. Vasudeo's expenses.....	„	831	
		3,625	

So that the poor ryots got Rs. 8 each for their year's work, and the poor middleman nothing but a loss of Rs. 89. A tale of so much distress excited our pity, and being interestep in the case, we addressed the following letter to poor Mr. Vasudeo :—

DEAR SIR,—You offer in the *Bombay Gazette* to allow me to inspect your accounts, if I wish to satisfy myself of the truth of the statements contained in your letter signed "Justice," which appeared in the columns of the journal on the 6th inst. I will not trouble you to shew me your books, but hope, after your challenge, you will answer frankly the following questions :—

1. When did you purchase this land of which you write, and of whom, and what price did you pay for it?
2. What was the ruling price of grain at the time, as you say you made a mistake in your calculations?
3. Am I to understand that you have 200 tenants cultivating these 450 acres of land, with an average holding of 2½ acres each?
4. Have you *leased* the land to them, and if so, for how many years, or are they simply tenants-at-will?
5. Have you sunk any money in improving the land since you bought it? I do not, of course, mean have you kept the Bunds in order, but have you, for instance, built any houses for the cultivators, or made roads through the property, or sunk wells in it, and if so, what has been your total outlay in this way?
6. For how many years will your possession last? Or is it permanently settled at the rate of 2½ rupees per acre?
7. What is the average gross produce on similar land in the Tannah Collectorate in *paddy*, and clean rice, per acre?
8. What has been the gross produce of the property, year by year, from the time you bought it?
9. Do the 200 ryots, of whom you speak, depend entirely upon the cultivation of your estate?
10. Does the land yield you a revenue from any other source, besides rice cultivation?
11. How often do you yourself visit the estate?
12. Are your cultivators in debt, and if so to whom, and do you know the rates of interest they are paying?
13. Do you ever yourself make advances to them, and if so, upon what terms?
14. Do you mean to affirm that the results of last year's cultivation, fairly represent the value of the estate?

You have come forward to take part in a controversy upon the issue of which the well-being of 150 millions of your countrymen and of their descendants for all time depends; and you have told the world that "as a rule, Mr. Knight is not particular about the accuracy of his facts and figures." The question is far too important for Mr. Knight to care about his personal reputation in connection with it; but I hope you will see the propriety of your answering fully and frankly, and with care, the questions which your letter leads me to ask, from no impertinent curiosity, but from the overwhelming necessity there is for settling men's minds upon this controversy. You will, I hope, pardon my once more requesting you to be *careful* in your answers, as I may ask you to allow me to verify them if they are not such as I apprehend they must be.

Yours obediently,

R. KNIGHT,

Indian Economist.

Narayen Vasudeo, Esq.

The reader will see the importance we think of every one of these questions. Not one is asked from curiosity, or the desire to pry into Mr. Vasudeo's affairs. Both he and his affairs are a matter of profound indifference to us, but we were very anxious to nurse into blossom a case that promised so much real fruit in the enquiry.

WE have waited up to the moment of going to press for Mr. Vasudeo's answer, which we hope is simply delayed, and that our next issue will contain his reply. In the meanwhile let the reader remember that while the Government assessment on his land is but 2½ Rupees per acre, our middleman has "a distinct understanding" with the cultivators that he is to receive *half the produce* of their toil for being allowed to cultivate at all. Mr. Vasudeo is simply, a middleman, who discerning the folly of which Government is guilty, is putting into his own pocket what the State has thrown away. Being a landlord, who does not allow the grass to grow under his feet, he exacts one-half the produce of the land and then offers to prove to us that the ryots are not so well off as we think!

The truth is Mr. Vasudeo is a clever man, not over-burdened with consideration for others, and seeing the State shew such quixotic tenderness for the ryot, he simply resolves to skin him, himself. He sees from Major Barr's Reports that the Gaekwar is taking a third and even half the produce as revenue, and since we are silly enough to take only one-twentieth,

Mr. Vassudeo has contrived by getting the ryots into his power to squeeze out of them the 9-20ths which we have abandoned. The division therefore is this :—

The Ryots.. ..	10-20ths of the produce for their sweat and toil.
The Middleman ..	9-20ths for doing nothing.
The State Landlord	1-20ths for doing everything.

Will Government never open its eyes to this folly? The very last report from Baroda, published but a few days since, speaks of "the general prosperity of the Gaekwar's subjects and the "careful and full cultivation of his territory," and discourses about the land assessment as follows :—

"The rates of assessment levied from cultivators have been the same as last year. High as they undoubtedly must be considered, when contrasted with those levied in our own districts, yet very few cultivators are found to emigrate from Baroda territory, into which, on the other hand, cultivators from British and Talookdaree districts not unfrequently come.

"It is found from information furnished by the Durbar, that the revenue derived from all sources amounted to Baroda Rs. 1,42,00,000. Most of this is realized in cash, but in a few districts it is still customary to recover revenue in kind, that is in grain—in some places in the proportion of one-half of the produce, in others of one-third."

The Gaekwar wisely takes for the public good, what Mr. Vassudeo is allowed to take for his own aggrandisement. For this gentleman, to obtrude himself in this discussion as protesting against Mr. Knight's "abominable doctrines," is really an exquisite joke. The unhealthly product of a diseased state of things he should hide himself and his estate from the public gaze, as much as possible, only let him *first* answer our letter.

LETTERS TO THE EDITOR.

BURMAH WASTE LAND RULES.

To the Editor of the "Indian Economist."

SIR,—I observe a letter in your issue of March 15th, headed "Burmah Waste Land Rules," which it strikes me is calculated to give a somewhat one-sided view of the facts of the case. The writer complains that the Government authorities in British Burmah have leased or sold, or are leasing or selling, the whole of the waste lands of the province to European speculators, and are thereby depriving the natives of their rights, or, as he says, "their property," meaning their common rights, *i. e.*, facilities for grazing, procuring grass for thatching, cutting bamboos, timber, &c. Having passed most of my time in the forests for the last 15 years, I have seen a good deal of interested complaints of this nature. Will an "Englishman" inform the public whether Government have, or have not, reserved a certain acreage of common land to each village, amply sufficient, when properly worked, to supply all the grass, fuel, timber, grazing, &c., needed by the villagers. These complaints about Government selling waste lands and filterfering with rights, arise invariably from one of two classes. There is either an obstructive set of officials who wish to keep "interlopers" out of the province, or the people have been accustomed to an *embarras de richesse* of waste land, at the rate, for instance, of 300 acres for each buffaloe they possess.

They are also probably addicted to *goom* cultivation, which means converting timber into manure, cutting down a fresh patch for this laudable and economical purpose every six months, and as timber trees, even in tropical climates, do not grow quite as fast as they can be felled and burnt, our industrious friends require a considerable range of forest for their operations. Now these reasons plainly ought not to weigh with any Government calling itself civilized. If an "Englishman," or anyone else enquires, I think he will discover that the speculators so much complained of, put in one way or another, more money into the pockets of the villagers in a single year, than their *goom* cultivation, grazing, &c., under the old wasteful system did in ten, so that after all they are not so very badly treated.—I remain, Sir, yours truly,

WANDERER.

NOTICE.

Mr. Knight will be greatly obliged if Subscribers who have not yet remitted the amount of their Bills, will do so before the end of July, when the Second Volume of the Journal will be complete.

5 J

EDITORIAL NOTES.

THE result of the opium sale held at the Government Sale Room, on the 4th May, was :—

	Chests.	Highest.	Lowest.	Average.	Proceeds.
Behar....	2,665 ..	1,380 ..	1,365 ..	1,366 3 2 ..	33,76,700
Benares..	1,665 ..	1,340 ..	1,330 ..	1,338 11 8 ..	27,53,500

The prices realized at the sale of the 6th instant were :—

	Chests.	Highest.	Lowest.	Average.	Proceeds.
Behar	2,665 ..	1,390 ...	1,365 ...	1,371 8 0 ...	36,55,060
Benares...	1,665 ..	1,335 ..	1,320 ...	1,333 2 2 ...	22,09,035

As the budget estimate was Rs. 1,075 only, these prices are about Rs. 280 per chest in excess of the anticipated income. Should this enhancement of price be maintained throughout the year, the actual will exceed the estimated revenue from this source by £1,500,000 sterling.

Mr. H. M. Mehta complains in the *Daily News* that the Government is rigging the market, by putting forward, an hour or two before the public sales, unfounded reports of the shortness of the coming crop.

The gross proceeds of the last six sales have been as follows :—

January..	Rs.	30,00,925
February	"	49,75,325
March	"	30,59,950
April	"	30,35,125
May	"	54,33,250
June	"	58,58,075

A continuance of present rates will run the revenue up to about the highest point it has yet reached, Rs. 65,00,00,000.

THE Havre correspondent of the *Economist* says that a tax on lucifer matches has been repeatedly proposed in France, but no Finance Minister would ever entertain it, thinking it unproductive, liable to fraud, and somewhat puerile withal. Another tax frequently recommended, but always condemned in France, he suggests, may perhaps find favour with Mr. Lowe, if not with the public—one on pianos.

WE have for some time past purposed introducing the *Madras Revenue Register* to the notice of official men who may not have seen it. A better title for the publication would be the Revenue Register of India, as the journal is a record of all revenue suits throughout the country, which involve principles of importance. The Register, which should be in the hands of every Collector and Deputy Collector in India, is published at the *Foster Press*, Madras, and has now reached its fifth volume. The benighted Presidency, as is sometimes called, has done good service to India in producing this very valuable administrative record, with its sister work, the *Madras Jurist*.

A CORRESPONDENT of the *Pioneer* affirms that "the present arrangements for recruiting the British army in India are the cheapest that could be adopted;" although the East India Company used to manage the matter for one-sixth of the outlay made by the Horse Guards. But, then, what right have we to protest at all? "Rome in ancient times, Holland and Spain in "modern, not only made their conquests pay all their expenses, "including home depôts, no doubt, but have also compelled them "to remit very respectable sums as tribute to the home ex-"chequers. Suppose that Holland, and not England, had got "India—and such was by no means improbable at one period—"what would be India's position now? Pray what are the re-"lative positions of the two peoples? Did or did not England "conquer India from end to end, and can or cannot England "treat India as her very bondslave if she pleases?" The writer who dares suggest a conclusion of this nature to his countrymen in India, knows as well as we, that if he ventured upon such a sentiment in any public assembly in that "Old England," of which he speaks, that he would be hooted from its midst as a disgrace to the English name.

THE *Bombay Gazette* has suddenly become "the ryot's" friend! A few years ago the journal, under its present editor, was the

passionate defender of the indigo planter, and denouncer of the "miserable faction" which strove to secure "tenant-right" for the unhappy millions of Bengal. It was essential, we were then told, for the prosperity of the country, that the ryot should be left to the rack-renting tender mercies of the zemindar. The same wr... now filled with indignation at the spread of our "abominable doctrine" that we are under-assessing the land. Well, we like the new attitude a good deal better than the old and our contemporary may smooth his brow. We are quite as much opposed to oppressing the ryot as *he* can possibly be, while we are a little more consistent, as we would no more tolerate the zemindar's rack-renting him than the State. Under the 30-years' lease system, in which this same writer of old could see nothing but a ruined agriculture, we have conferred a status upon the ryot, incomparably better than the cultivator of any other land enjoys; and the suggestion that it may be perhaps wiser at once to raise the assessment upon his land to a level with the State requirements, than to vex the man with an income-tax or some other device of supplemental taxation, is possibly intelligible after all, and not so wickedly oppressive as "the ryot's friend" declares it to be.

THE DUKE of Argyll, it turns out, is a supporter of the Permanent Settlement folly. At all events, His Grace is reported to have spoken as follows in a late debate in the House of Lords :—

"He knew it was the opinion of many that the State ought to retain in its own hands the power of raising the land assessment from time to time. His own opinion was that a permanent settlement was the wisest settlement, and that it was better for wealth to accumulate in the hands of the people than to flow into the Treasury. He thought that the wealth of every good and wise Government lay in the wealth of its people, and he should rejoice to see the great land-holding class of India enjoy a higher share of this wealth than it now did. One point must, however, be looked to. If the Government gave over the land in permanent settlement, thereby adding largely to the wealth of the agricultural classes, there must be some means of getting at that wealth by other taxes for the purposes of defraying expenditure. Remembering this, it became the more important that the principle sanctioned last year—that the permanent settlement of the land revenue did not preclude us from raising local taxes for local expenditure—should be maintained. The local Governments of India were now preparing measures for raising local cesses; but he had impressed upon Lord Mayo the necessity of great caution in developing this system and the importance of carrying along with us, if possible, the feelings of the people."

Observe, we are to give up the land revenue—which the people pay without thought of grievance—only to take the money we require in new and untried, and hateful ways!

AN engineer writes to the *Times of India* concerning the Hydraulic Lift now being constructed in the Bombay harbour for the use of the new transports :—

"It is useless criticising this ill-advised scheme. The "strongest criticism would be to offer to construct three "masonry docks, capable of taking in any of the transport "steamers, for the same sum. I will gladly join you in the "contract. Such a dock, giving 25 feet of water on the blocks, "could be built for four lakhs; so that the difference between "twelve lakhs—the price of three docks—and half a million, "the price of the Hydraulic Lift, would be worth dividing between "us."

We do trust we shall find unanimity amongst our contemporaries in the demand that the India Office shall, in some way or other, be compelled to consult the tax-payers of this country as to their outlays on Indian account. It is monstrous that mere functionaries in Downing Street should have the power of drawing millions from our Treasury, for any whim, or caprice, or notion, that they choose to indulge. These functionaries are all human, and it is as certain as any law in physics that the powers they now claim are abused. Power *always* is abused where it is subjected to neither criticism nor control. That these Home Charges are marked by scandalous abuse is as certain as that the Government exists at all. Where is the man living who could be entrusted with such power as the Secretary of State for India wields over the Indian Treasury, without abusing it.

IN the *Statistical Reporter* which accompanies our present issue, the reader will find a summarized account of the Home Charges of the East India Company's Government from the abolition of the trade with China (1834) down to the extinction of the Company's rule (1858); and the Home Charges of the last three years (1869-1871) under the direct rule of the Crown. This is the first time, we believe, that these Charges have been published in India in so complete a form, and we purpose reviewing them at length in our next issue.

MR. MILL complains in the *Fortnightly Review* that "we admitted those rebellious oppressors, the Oudh talookdars, to engage with our Government for the revenue; we declared them "proprietors of the soil, and delivered over the cultivating "classes into their hands, and it is with great difficulty that, "some years after, an Act was got passed, making some small "reparation to a portion of the dispropertied classes, by giving "to tenants who could prove a certain number of years' possession, a guarantee against eviction."

What will he say when he learns that throughout the whole of the Central Provinces we have been making elaborate efforts since 1862, to impose the system of tenancy-at-will upon the mass of the people. The Oudh talookdars *claimed* to be the owners of their lands, but the malgoozar of the Central Provinces cannot to this hour believe that he has been *made* proprietor of the land. The right is so remote from his conceptions, that he distrusts the statements made to him upon the subject by the settlement officers.

He cannot believe to this hour that he is at liberty to take all he can get out of the cultivator. He cannot be *made* to believe it. The reports teem—positively teem—with statements to this effect. We are striving with all our might to open the flood-gates of litigation that will soon be upon us, while the malgoozar stands trembling and afraid to use the powers which our settlement officers are urging him to assert. The position is so ridiculous, and yet so tragic, in what it portends, as to be almost incredible. This tenancy-at-will tenure which Mr. Mill with every other economist declares to be radically vicious, and which we are deliberately upsetting in our own land, we are striving with all our might to habilitate in India. "The claim of the State" (says Sir Richard Temple's Administration Report, 1865-66, page IX.) to any "ownership "in the cultivated or occupied lands has been formally aban- "doned in the favor of the people." He means by "the people" simply the malgoozar. Ridiculous as it seems, it is the fact that the Administration Reports teem with expressions of hope that as the malgoozars understand the rights conferred on them, litigation will increase in the province. Report after report expresses a hope to see the law courts filled with suits for enhanced rents or eviction. We are stating a simple fact. We believe Mr. Campbell (the present Governor of Bengal) attempted to enlarge the rules for protecting a part of the cultivators from the malgoozar, but the papers have never seen the light. The broad fact is that there are nearly 500,000 *wholly unprotected* cultivators made tenants-at-will by this settlement, and it is even thought policy and statesmanship to *urge* the malgoozar to squeeze these men by resort to the Courts. The very last Report, 1869-70, congratulates us upon the fact that upon the whole "there appears to be a growing "appreciation of the rights conferred at the settlement, and "as these rights become more generally understood, a freer "resort to the Courts must be looked for."

We are to *hope* to see the unfortunate tenants bullied by the machinery of the Courts, into the recognition of rights that are not yet eight years old, and of purely arbitrary creation.

MR. MORRIS, if we may trust the reports, positively denied before the Select Committee that the assessment in the Central Provinces was light. And yet he himself told us in his Administration Report for 1869-70 (para. 61) that the leases were saleable throughout the provinces "at from three to eight and fourteen "times the (Government) revenue." Sir Richard Temple also affirmed (Administration Report, 1862-63, para. 127) *before* the great rise in prices came, that "the rates represented only a

"small proportion of the value of the gross produce, leaving a "large margin to the landholder for his own profit and for the "improvement of his estate." In illustration of this notorious fact, Mr. Elliot reports (*Hooshungabad Settlement Report*, para. 71) that the assessment fixed for 30 years upon that district, was "about one twenty-sixth part of the present gross produce of the district."* Now whom are we to believe? And how does Mr. Morris reconcile his own report and the statements of Sir Richard Temple, his predecessor, and the fact stated by Mr. Elliot with the assurance given to the Committee that "he did not consider the settlement in the Central Provinces at all light."

We would not press the advantage unfairly, but it is a deplorable matter for men in so influential a position, so terribly to mislead the Committee. Mr. Morris told them further that "the increase of revenue in the Central Provinces was to "be looked for more from a rise in prices, and an extension of "cultivation than anything else."

In the name of common sense, what *further* rise does Mr. Morris look for? Ten years ago, wheat was 12*s.* a quarter in the provinces, while it has since risen to 36*s.* Is that not rise enough? The Committee are making a mistake in examining men like Mr. Morris at all. They might as well ask Sir Richard Temple what to think of the settlement. Poor human nature will not do penance in the white sheet in these days. We could literally *fill* the present issue of the *Economist* with proofs of the absurd lightness of the assessment in the provinces, while Mr. Morris professes to be in doubt upon the fact.

WE believe it to be the simple fact that there is no class of farmers in the world, who have one-half the advantages in respect of *tenure* that an Indian ryot enjoys under the 30-years' lease-system, now so widely prevalent in this country. Under this system, the ryot enjoys a lease which is heritable, transferable, and renewable for ever, upon terms which can never be otherwise than moderate, and which secure the benefit of all improvements made by him, for all time, to himself alone. Subject to the assessment only, which is fixed for periods of 30 years upon a consideration of the position and quality of the land, his holding is for all practical purposes, a freehold. He can do with it whatever he pleases—cultivate it, or lease it, fallow it, farm it, or rent it, or sell it, or even abandon it wholly, or in part, at any period of the lease. "His landlord preserves no game to eat his crops, inserts no cultivating clauses in the lease to fetter his discretion, asks no premium for entrance upon his lease, and claims no fine on its renewal. He is made virtual proprietor by the occupancy status conferred upon him, while the State of design abandons to him a considerable share of the rental." If we compare these advantages with the conditions under which a Scotch farmer holds under the famous 19 years' lease-system of Scotland, the position of the latter is one of servitude itself, contrasted with that of the ryot. It would be well if gentlemen who are perpetually talking about the land bearing all the burdens of the State in India, would acquaint themselves with the conditions under which land is held in their own country. To describe the land-tax as burdening the ryot, and preventing the investment of capital in improved agricultural processes, is simply to show complete ignorance of the conditions under which land is held in other countries. If agriculture does not improve under the thirty years' lease-system of India, nothing in the wide world can improve it.

THE *Times of India* reports a suggestive incident as having occurred while Sir Cecil Beadon was under examination by Mr. Fawcett, before the Select Committee in London, a few weeks ago:—

"*Mr Fawcett*—The witness says that India may any day be deprived of the opium revenue, and he says that, if so, it would be necessary to reduce the expenditure; and I want him to say *how* he would reduce the expenditure.

At this point *the Chairman* (a member of the Ministry—Ed. *I. E.*) requested strangers to withdraw, and the room was accordingly cleared.

On the public being re-admitted, after twenty minutes' withdrawal, the question was not pressed."

It is not difficult, we think, to account for the suppression of what occurred while the doors were closed. The real leak in our exchequer is in the India Office, and until that leak is stopped, there will be no real economy in the administration of our finances. *The only adequate reform open to us, we fear, is the abolition of the Home Treasury.* No other dependency of the Crown keeps a treasury in London, and the existence of such an institution in our case is a pure mischief, being an unfortunate legacy left us by the old East India Company. Parliament reviews, with the utmost jealousy, every sixpence of expenditure from the English exchequer, while it allows Ministers uncontrolled authority over the millions of revenue administered by the India Office, upon the tacit and highly honorable understanding that they are to ease the English estimates therefrom, as far as can be done without scandal. The understanding, though tacit, is as real as though its terms had been embodied in an Act of Parliament. And so long as the Ministry have authority to spend Indian taxes as they please, and take care to spend them so as to ease the English Treasury, we shall find the Commons manifesting the most heroic resignation under our sufferings.

Instead of a Treasury in London, the key of which is in the hands of the English Ministry, let the Government of India do, as the other dependencies of the Crown do, appoint Barings or Rothschilds their financial agents. We shall then have some voice in outlays, which are now made without even the form of a reference to this Government as to whether they are desirable, or wise, or even just.

C. B. H., in the *Bombay Gazette*, thinks that it cannot possibly be true that the "unduly low rents" of which we complain in late settlement proceedings, should at once tend to "careless husbandry" and yet leave resources in the ryots' hands "to be wasted in foolish ceremonies and in feasting. "One of these arguments" he says "may be true, but both cannot be true." We ask, why not? Let us suppose that a fair rental of the Soopa talooka under careful husbandry would be 15 lakhs a year, what will be the natural result of letting it at 3½ lakhs? The rental being nominal, the cultivator will not require to exert himself in the least to pay it; while the soil being bountiful, the most careless husbandry will yield a surplus of 10 lakhs, leaving a margin of 6½ lakhs in the ryots' hands for the idle display and feasting of which we speak. Where is there the least contradiction in affirming that both results will follow? We are glad to see that C. B. H. and even the *Bombay Gazette*, allows that there has been in *this* Soopa case at all events, a very blameable sacrifice of revenue.

A CORRESPONDENT of the *Mofussilite*, in noticing our last issue, thinks that a proportion of our enhanced military expenditure under the Horse Guards may fairly be ascribed to the great rise in the price of food during the last few years. We admit it fully, and welcome discriminative criticism of this order. The writer under notice estimates the "*unexplained* excess" at about £3,250,000. He says:—

> The cost of a soldier has increased 66 per cent. in these last 15 years; but as the price of labour and food has, during the same period, been enhanced 33 per cent., or in other words, the purchasing power of money has decreased one-third since the mutiny, as all must by experience know, this fact at once explains why the cost of the army should also be enhanced, and for this reason alone the cost should stand at somewhat thus:—
>
> | | |
> |---|---|
> | 67,000 Europeans @ £121 a year | £8,040,000 |
> | 122,000 Natives @ £ 40 „ | 4,880,000 |
> | | 12,920,000 |
> | Unexplained excess | 3,230,000 |
> | Present expenditure | £16,150,000 |

We should undoubtedly make a very happy compromise if we could at once reduce the expenditure by £3,250,000, but our conviction would still be absolute that an expenditure of even £13,000,000 is greatly in excess of what a really economic administration of India would sanction. The average cost of *rations* for the European troops in India cannot exceed £12 or £14 a year, per head; and it is mainly in this item, be it

* In Raepore it is 1-27th.

remembered, that the rise in prices is felt. That the military expenditure of the country is altogether extravagant, as a general charge, admits, we are satisfied of no answer. And the authors of it are the Horse Guards and the Ministry between them.

THE *Hindoo Patriot* makes great jubilation over Mr. Colvin's reply to the Honorable Mr. Strachey's strictures upon the lowness of the assessments in the North-West. "So much" it says "for the boasted land settlement of the North-Western "Provinces. It severely presses down the springs of agricul- "tural industry, while it has created a class of landlords, whose "capacity for improvement and political influence are measured "by the fact that they have not more than one rupee a month "per head of their respective families! What a dead-level 'system this! Is it not worse than the Mahometan system "of public robbery?"

Mr. Colvin may learn from this extract how much his memorandum will mislead superficial readers. We recommend the *Patriot*, and some other of our contemporaries who have been equally misled by Mr. Colvin's paper, to read it again in the light we have cast upon it elsewhere in our columns.

WE call attention once more to the prices prevailing in the Nagpore and Chatteesghur districts respectively:—

Prices for the Month of April 1870.

	Rice.	*Wheat.*	*Jowaree.*
Nagpore.....	16 seers	22 seers	25 seers.
Chatteesghur	32 "	40 "	40 "

Nagpore is but 180 miles from the heart of the Chatteesghur district, while for want of a road the price of food in Nagpore is just twice what it is at Raepore. A light railway to Raepore would raise the value of the Chatteesghur harvest by a million sterling. According to the Settlement Report of the district, the annual harvest and assessment compare as follows:—

Annual Harvest	Rs. 1,02,22,163
" Assessment .... "	6,58,708

Thus the official account allows that the assessment is but 1/27th of the produce. In point of fact it is not 1/50th. Give the district but an outlet for its produce, and instead of 6 lakhs a year, the State may take 50, without the slightest oppression of the people.

THE HOME MILITARY CHARGES.

[OPINIONS OF THE INDIAN PRESS.]

AMONG the duties of the Finance Committee of the House of Commons will be a searching inquiry into the Home Charges. Already, we believe, the Secretary of State has appointed a Committee of his Council to report on the establishments of the India Office, the cost of which goes on increasing year by year. Why are so many clerks and messengers and even departments required? Do not one half create work for the other half? It is remarked that many of the staff are honourables and esquires, and the India Office is looked on much in the light of an aristocratic preserve. The first reform is a trifling one, unless it is an earnest of future attacks on evils worthy of a Secretary of State's steel.

One hopeful sign of the future is the rumoured intense indignation, entertained at the India Office, with respect to the War Office job which has saddled India with so enormous a sum for the depôts, and which keeps so many men unnecessarily in these depôts at England's expense.—*Friend of India.*

FROM a statement lately laid before the House of Commons, we see that there has been a steady increase in the amount charged to this country for European military stores during the last four years. In 1866-67, a year of eleven months, the cost of these stores was only £548,287; in the following year it was £733,941; in 1868-69 it was £849,454; and last year it reached £855,709. During the same period the charges on account of freight increased still more rapidly, having risen from £7,774 in 1866-67 to £22,781 in 1869-70. —*Englishman.*

IT is an outrageous farce as well as a gross injustice to pretend to make both ends meet by reducing establishments in India, clipping salaries in India, by skimping public works in India, and by laying on additional taxes in India, while the privilege of unlimited and irresponsible expenditure is kept up at home. What good is there in saving at our little spigot, while that huge bunghole remains open? We know that the pay of the European soldier has been raised of late, and we do not grudge it him in the least; but that increase is utterly inadequate to account for this astonishing increase in his cost, and we hope that Parliament will insist on the mystery of that last increase being cleared up, otherwise their inquiry into Indian finance will be mere puerility.—*Madras Athenæum.*

We are by no means so enamoured of the home accounts, as to suppose that they are faultless; and Mr. Knight, for instance, has fairly hit a blot in the article in which he lately drew attention to the scandalous extravagance of the pension list for clerks of the India Office. An exposure of this kind is of real service to India; and we cannot but think that the cause of financial reform would be greatly benefitted if reformers were fonder of searching out the exact meaning of the figures published in official papers, and less inclined to deal in vague generalities about the loveliness of generosity and the duty which a strong power owes to its weaker partner. —*Bombay Gazette.*

IT must be allowed that soldiering is a much more scientific and expensive business now than it was in the days of the East India Company, and that therefore the cost of training recruits is necessarily much higher. But this allowance goes a very little way towards explaining the fact that "the Company were able to send efficient artillery and infantry recruits to India at a cost of £26 7*s.* 5*d.* a man, instead of £135 13*s.* 11*d.* for cavalry, and £63 8*s.* 5*d.* for infantry recruits, as now proposed." The difference is so monstrous that India may well long to have her own army back again, and to buy once more the services of the English soldiers she requires at the fair market price for such labour.—*Bombay Gazette.*

THE home expenditure debited against India is scandalously unfair and a disgrace to the English people, at the same time that it is a hypocritical and dishonest oppression on the helpless dependency, and this seems to admit of only one remedy, viz., an assimilation of the Indian administration in London to that of the Colonies; by which the political supremacy should remain with Her Majesty's Government and the English Parliament, while the expenditure of Indian money should be made over to the persons in the Indian Government who are financially responsible for it, or who should be so. We should hear no more of Indian depôts providing an army of 16,000 men for the defence of the Channel Coast, at the charge of India. The next ball to the Sultan would be at the cost of the Home Government, and possibly some means might be devised to limit the Secretary of State's powers to order payment of half a million sterling here and another there, while this country groans under inquisitorial taxation and its necessary corollary of extortion, bribery, and perjury.

The splendid liberality with which India Office clerks are permitted to retire on full pay of £200 to £900 a year, in the prime of life, would not, we think, continue very long after Indian finance were placed on a fair footing; and some cheaper mode of transport might also be found equally serviceable with that now in vogue—nay, by reconstruction of a local Indian Army it is thought that the new Transport Service might be allowed to go to auction!—*Indian Public Opinion.*

To keep the Indian Army up to its full complement, there are some ten thousand men being drilled and disciplined at the depôts at home. So long as they remain there, they are altogether useless to India, but they form a most important element of the home defences. There is no doubt that in a case of emergency they would be at once drafted into the home army without the smallest consideration for the claims of India. And yet the richest country in all the world does not shrink from the meanness and dishonesty of charging the cost of these ten thousand men upon the revenues of India, at an average rate of some £200 per man. This is the story which the report of Mr. Seccombe's Committee makes known to the world.

Does any one expect that reparation will be made to India? Let him cease to do so. No effort at reparation even will be made. India is a "milch-cow," and she must be made to understand that Western civilisation and enlightened government, speeches by Mr. Grant Duff, breathing the very soul of the purest philanthropy, addresses by the Duke of Argyll couched in a similar strain, balls to the Sultan of Turkey, and palaces erected in Downing Street, are not to be had for nothing. She must contribute also to the home defences of that great country who generously provides her with all these things,—a full price.—*Indian Observer.*

FOR flippancy and utter disregard of the rights of a people, nothing can equal, nothing certainly surpass, the reply of the Under-Secretary of State for India to Colonel Sykes in a short but pithy enquiry concerning certain charges forced upon the people of India in defiance of moral obligation. The Colonel wished to be informed whether it was the fact that, while the cost for recruits for the East India Company's European Army, from 1850 to 1859, was £19-14-10½ per head that recruiting for the European troops by the Crown from 1861-62 to 1867-68 cost £205 per man; and whether the charge in future was to be £136-13-11 for each cavalry and £63-8-5 for each infantry recruit "independent of the cost of transit to India." "In reply to my honourable and gallant friend," was the supercilious reply, "I have to say that there is no error in "the return referred to, and further that the charge to be made by "the Imperial Government against the Indian Government is pre- "cisely as he states it." No explanation of the enormous difference, be it observed; no reasoning to tone down the criticism that it cannot

escape. "The charges *are* high, my honourable and gallant friend, "and ye people of India, very high, but that's precisely what you'll "have to pay whether you like it or not; I'm not going to trouble "myself by giving explanations, because, say what you will, nothing "can alter our determination, and if existing arrangements don't suit "you they suit us. *Bus.*"—*Delhi Gazette.*

As if India were not taxed severely and unjustly enough in order to pay for the European soldiers employed in her garrisons, and for the transport of troops to and from England, she is saddled with a consolidated charge of £10 per annum, for every British soldier doing garrison duty in England; this impudent and extortionate charge amounts to about £700,000 annually. In 1859 the Indian revenues had to bear the burden of a charge of £881,000 on account of home depôts of European troops, serving in India, and in 1860 £830,000. It would appear that, although within the last ten years the number of European soldiers in India has been reduced by some 30,000, that is to say, from 100,000 to 70,000, yet there has been no corresponding diminution of expenditure, this being kept up at nearly £700,000 annually in the home accounts; the conclusion to be deduced from so startling a fact being that other incidental military charges are brought to bear upon India, whose cup of oppression is thus made full to overflowing.—*The Mofussilite.*

That India ought not to pay the whole cost of maintaining bodies of recruits, whose presence in England adds materially to the strength of our home defences in time of need, is another point on which the Indian members of the Committee lay rightful stress. In common fairness, at least a third should be struck off from the Indian side of the account. Half a million a year, besides the heavy costs of the present Transport Service, is a great deal too much to pay for the landing in India of three or four thousand recruits who, in the words of a Deputy Inspector-General writing to the *Times*, "either die like flies or get invalided after a year or so."—*Allen's Indian Mail.*

A Committee of officers, from different departments, (Foreign Office, India Office, Admiralty, &c. &c.,) was appointed to consider the whole subject of the suppression of the East African slave trade, the Zanzibar Agency, &c., &c. The Report, which was laid before Parliament, recommended an equal division of the cost between the Imperial and the Indian Exchequers, which we regard as a new exaction from the Indian revenue. This compromise, we are informed, was upheld by the Foreign Office and the India Office; but the Treasury—seeing the chance of another indent on India—has set its face against the payment of a single rupee towards that imperial purpose. This appears to us to be so monstrous, that we are bound to cast discredit on our information—however unpleasant it may be—to express a doubt of that which we take so much pains to obtain. *If* this story be true, we may be quite sure that the Treasury will make such terms with respect to the expenses of the Persian Mission, as will enable them to slip out of it in such a manner as not to burden themselves with any further payment.—*Times of India.*

THE COST OF RECRUITS FOR INDIA.

Colonel Sykes has given notice of his intention, at an early date, to ask for further explanation of the curious difference between the cost of an Indian recruit sent out from Warley in the days of the East India Company, and that of a recruit prepared for India by the War Office in the present day. We hardly dare hope that the answers he may get will satisfy him or anyone else that under the present *régime* justice is done to India. But the reasons he has for pressing such a demand will be plain enough to anyone who looks over the three reports lately issued by Mr. Seccombe's Committee for re-adjusting the charges made against India for effective services of British regiments employed there. The Committee in question consisted of two members representing the India Office, and of two more acting on behalf of the War Office and the Horse Guards. Their first report, dated March 11, 1869, strikes the key-note of Colonel Sykes's present refrain. They feel it their duty "to bring prominently to notice the very heavy charge attending the present system of Indian depôts." They point out that the War Office depots "include a very large staff whilst the Warley depot was conducted by a very small number of commissioned and non-commissioned officers for the supply of recruits to nine regiments of infantry and the whole of the artillery in India, including a small body of engineers." Comparing the £26 7*s.* 5*d.* which each recruit cost between 1850 and 1856, with the average of £205 per man on the seven years from 1861 to 1867, they are of one mind in thinking that "the outlay appears to demand inquiry with a view to its reduction."

In the three years from 1857 to 1859 the average cost was yet lower by several pounds than in the seven previous years, while the number of recruits sent out was double and treble that of any former year. In the subsequent period from 1861 to 1867, the lowest averages of cost, £134, £126, and £129, likewise represent the largest number of recruits. In three other years the average exceeded £220; and its highest figure, £376, marks the year when only 787 recruits were despatched to India. Taking the general average however of these seven years, the Committee, in behalf both of the Indian and the Imperial Government, cannot help avowing their belief that the charge for a recruit "is susceptible of very great reduction." Their second report of November 1869, enforces the same moral in yet stronger words. They are "unanimously of opinion that the present rate of expenditure is too large, when compared with that incurred prior to the Mutiny in India; and excessive, when compared with the charge incurred by the East India Company in the maintenance of their depot at Warley." They therefore hold that "a very large reduction" in these charges may be effected "without any sacrifice of efficiency." Two members of the Committee, Mr. Seccombe and Major-General Jamieson, specify some instances of unfair dealing towards the Indian Government. Why, they ask in other words, should India bear the whole burden of maintaining depots which virtually form a part of England's home defences, and why should that burden be increased by the long periods of training now enforced on recruits for Indian service?

There are, indeed, a few items of outlay to which the War Office contributes its share, but it takes good care to make India pay all that can on the slightest pretext be shifted to her shoulders. The War Office delegates on this very Committee, in their third report of February 1870, readily fall in with the Ministerial proposal to charge the India Office with "a proportion of the staff charges" of each battalion to which a depot troop or company may be attached. To this considerate demand, however, the other two members decidedly object, on the ground that these charges would be the same if there were no depot companies, and that fair play to both sides does not include "the relief of the Imperial exchequer from charges which it would incur independently of any Indian requirements." In other words, they object to seeing India plundered for England's convenience. The same two renew their former protest against the present terms of home training—ten months for cavalry, and seven for infantry recruits—as being "enormously in excess" of former usage and actual needs. Contrasting the large and costly scale of the depot establishments with the number of recruits yearly wanted, they quietly remark that any rate of charge based on such a scale must be "excessive." On this point, indeed, their views are essentially those of their colleagues, also for all alike declare that one depot company is quite enough for the purpose of training the recruits required for a batallion serving in India. For the present, however, it has been arranged that the charge on India for each infantry recruit shall be £63 8*s.* 5*d.*, and for each cavalry recruit £136 13*s.* 11*d.* If to these be added a share of the regimental staff charges the respective amounts will be raised to £66 19*s*, and £144 9*s.* 5*d.* It is evident that even the lower rates are twice as much as they would be if the periods of training were lessened by about one-*half*, if one depot company were maintained instead of two for each infantry batallion, and if England bore her proper share in the general outlay.—*Home News.*

THE PEARL FISHERY.

The divers employed in the Tuticorin and Tinnevelly beds are thought to have entered into a combination to bring up no oysters. The following is from the *Madras Mail*:—

Captain H. Richardson, acting superintendent of pearl banks, to the Collector of Tinnevelly, reported in February last, the result of his examination of the pearl banks on the coast of Tinnevelly and Madura. He commenced the examination on the 27th December, and went off to the Vypar bank. He did not find the same quantity of soorum as last year, and although the divers brought up oysters at every dive, the size or quantity had not improved to any appreciable extent. He spent two days examining the ground off Chippicolum, where the Chank divers reported that they had come on some very large oysters last year, but were not successful in finding any. Went on with the examination of the ground outside Hare Island as far out as Tolairam Par, and so continued on till he came off Pinnacoil, and in reference to this bank, he thinks he can do better than give a copy of his journal as written at the moment: "At noon, Pinnacoil bearing west, and having spread the canoes wide apart from the steamer, drifted to the south-west over the position where oysters were found last year; but in a drift of four to five miles, the divers brought up but one or two oysters, although I am firmly convinced that the oysters were there. They brought up a little soorum now and then. We made a thorough examination of this ground for a breadth of four miles in 7, 7½, and 8 fathoms water, but the divers only brought up one oyster a time, and that of a large size, which, on examination, showed that the cable was forcibly ruptured from a stone or other substance. The behaviour of the divers and others show me that there is some combination, as no surprise is expressed at not finding the oysters, which were plentiful last year. The Jodi Taluven refused to come with us on this occasion although he noticed that we were going to Manapad and had promised me that he would go, he said he was going to Mookoor, but did not go till long after we had returned.' On going over the Trichendur bank the same result ensued. The divers did not bring up any oysters.

He gave up this bank after a most careful search without one oyster being brought up, and remarked on this fact by quoting a sentence in a letter from the late Collector, Mr. Longley, who visited this bank twice last year when living at Trichendur when making an independent examination of the bank for his own personal satisfaction; my not being present, he wrote to him in the following terms:—

"I was much pleased with the examination made of Trichendur bank. The number and size of the oysters brought up exceeded my most sanguine expectations.

Captain Richardson then went over all the ground until he came to Manapad bank, where the same examination was carried on with similar results. No oysters were brought up. He next proceeded to the Madura coast, and went up to Paumben, and examined all the ground from that downwards to the south-west, having four of our last year's divers. The small bank of oysters to the southward of Moosel Island was still there, but had not increased in size or quantity. The small bank, four miles south-west of Sheramoodelly Teevoo, was also similar to last year. Examined all the ground carefully from Nalla Tanni Teevoo to Ooppoo Tanni Teevoo without finding oysters in any quantity, and then stood off eight miles to the new bank, and moored a buoy on the bank in eight fathoms, and stood off with the steamer and canoe and examined the bank in various directions, the canoe showing oysters two miles from the steamer, and three miles from the buoy. The oysters are not so numerous as last year, and very much mixed up with barnacles. The divers also brought up many large-sized oysters open, fish gone, from this bank; went on to Tuticorin, passing over the Vypar banks, but being late, the men brought up but few oysters before giving up work. The Board of Revenue think it advisable to employ a European diver to conduct the examination of the pearl fishery. The Government approve of this suggestion and have requested Captain Phipps who relieved Captain Richardson to carry on the inspection as often has he possibly can.

THE MAYO COAL.

Extract from a letter from Mr. Riall Carnac, to the Secretary to the Chamber of Commerce, Bombay, dated Boolundshahr, April 22.

It will be in the remembrance of your Chamber that the "Mayo Colliery" at Ghugus, in the Chanda district, was formally opened by His Excellency the Viceroy in February 1870. Ghugus is 69 miles from Wurdah, the nearest point on the Great Indian Peninsula Railway; and the coal quarried there has now to make a somewhat long and expensive journey by cart before it can be brought into use on the railway line.

(Mr. Carnac is inclined to think that much yarn, sent up in bales and boxes, is entered under piece-goods.)

The present cost of the Mayo Colliery coal delivered at Wurdah, 69 miles from the pit, is about Rs. 25 per ton. The cost of the coal at the pit's mouth is now Rs. 4 per ton; the heavy balance of Rs. 21, representing the charge for cart-hire from the pit to Wurdah. Mr. Bernard estimates that when the workings become larger and the plant better, the cost of the coal at the pit's mouth will be considerably reduced. He also anticipates that it will be possible at other year to get more favorable contracts for the carriage of the coal, which now forms so heavy an item in the cost.

Since November last from 60 to 80 tons of coal have been raised monthly from the Mayo Colliery. Of this the Great Indian Peninsula Railway Company had taken up to the 15th of March last 101 tons, had burnt 84 tons, and had run over 4,000 miles with it; the average expenditure of this coal being about 51 lbs. per train-mile; and the average expenditure of the English coal being about 38 lbs. for the same distance. The coal raised from the Mayo Colliery thus cost Rs. 25 per ton, and did about 74 per cent. of the work of English coal.

In round numbers, the following quantities of coal were delivered from the Mayo Colliery from the 15th of December to the 15th of March:—

	Tons.
To the Great Indian Peninsula Railway at Wurdah	101
Cotton-presses	20
Public Works Department at Kamptee	10
Steam-borer engines	30
Gas Company at Bombay	20
Smithies at the several boring places	10
Miscellaneous, such as jail kitchens, smelting furnaces, kilns, &c.	15
Tons ..	200

So much for the coal of the Ghugus field (Mayo Colliery). The coal discovered at Wurrora has now to be noticed. A bore hole was sunk close to the Travellers' Bungalow and Tehseeldar's Court-house at Wurrora, within about twenty yards of the main line of road connecting Chanda with Nagpore. Wurrora is but 46 miles from the Wurdah station, or 23 miles nearer the railway line than Ghugus. At a depth of 176 feet, coal was struck by the steam-borer, which then went through 13 feet 6 inches of coal, and stopped in coal.

The coal brought up by the steam-borer was analysed by Dr. Lyon, Chemical Analyser to the Government of Bombay, who was so good as to undertake the duty, and who reported as follows:—

"Assay of sample of coal forwarded with Letter No. 251, from the Office of the Commissioner of Nagpore.

"Coal dull, black, and earthy-looking; stains the fingers readily; breaks with a slaty fracture, and ignites with difficulty.

"Specific gravity in mass	1·51
"Ditto in powder	1·54
"Moisture	11·42 per cent.
"Coke	60·50 "
"Ash	16·99 "
"Sulphur	·75 "

"*Approximate calorific value by Bretheir's method.*

"Pounds lead reduced by 1 lb. coal	18·31
"Hence, pounds of water which 1 lb. coal is capable of raising from 32° Fahr. to 212° Fahr.	48·38
"And pounds of water which 1 lb. coal is capable of evaporating from 212° Fahr.	7·78

"I. B. LYON, Assistant-Surgeon,
"Chemical Analyser to Govt."

The coal of the Wurrora field is believed to be considerably superior to that of the Ghugus field (Mayo Colliery). The specimen analysed was a small portion of coal brought up by the steam-borer, but Mr. Bernard writes that "the steam-borer brings up good-sized specimens, 3 or 4 inch cubes, so that some confidence may be placed in the present assay," as being a fair sample of the coal. But he adds:—

"It will be seen that the Wurrora specimen seems to be at least 30 per cent. better and more valuable than the Ghugus sample. We shall soon have the Wurrora pit down to the coal, and we shall then be able to tell if much of the Wurrora coal agrees with the sample brought up by the steam-borer. The coal of this part seems more or less variable, so we must not reckon too much on the assay results of these pieces brought up by the steam-borer. It is, however, satisfactory to find that the Government Analyser's results so far bear out the opinion expressed by Mr. Fryer when he first saw the Wurrora coal. A pit has been sunk on the spot within a few yards of the main road from Nagpore to Chanda, where coal was struck by the borer, and it is hoped that several tons of coal from this pit will be delivered at the railway before the rains set in. It will be remembered that the chief cause of the heavy cost at the railway station of the coal of the Mayo pit is the long land-carriage which it has to undergo. Well, it will be seen from the above remarks that by the discovery of coal at Wurrora, the distance the coal has to be carted has now been reduced by 23 miles, or by one-third. And it will also be seen that there is reason to hope that the new coal will prove superior to that of the Mayo Colliery which is already being used in some quantities, and which, costing Rs. 25 per ton at the railway, does about 74 per cent. of the work of English coal.

Mr. Bernard estimates that it will be possible to deliver the coal of the Wurrora pit at the railway at from Rs. 19 to Rs. 17 a ton, so that if this coal is found to do 75 per cent. of the work of English coal, it will be able to compete with English coal costing Rs. 24 per ton at Wurdah. When the line of railway from Wurdah to Wurrora shall have been completed, the cost of the coal at Wurdah will of course be much reduced, and it is hardly necessary to remark that the benefit to the cotton trade of an ample supply of cheap coal will be great. Not only will the cotton presses be able to work at less cost, but the expense of the carriage of cotton on the Great Indian Peninsula Railway will be reduced, and it may not unfairly be hoped that this result may conduce to a proportionate reduction in the charges for the carriage of our cotton.

PRICE OF COTTON.

VIEWS REGARDING A PAYING-PRICE FOR COTTON IN AMERICA.

Extract from the "Commercial and Financial Chronicle," New York, March 4th, 1871.

It has been a surprise to many that the Southern planters are not better off to-day. They have marketed several cotton-crops at high prices, and yet now that the quotation has fallen to a low point, they (that is, the large majority of them) appear to have nothing laid up to fall back upon, and many are even discussing the question whether raising cotton after all is not a failure. Before the war ten cents per pound to the planter was supposed to be a good paying-price; that even a higher figure has since not paid them would appear to be proved from the fact stated above. And yet this past experience is not conclusive as to the future, although it sheds considerable light upon it. Why, then, is the Southern in no better condition?

First,—Evidently because cotton and other agricultural products cannot—even with the greatest economy—be raised as cheaply as formerly.

Second,—But chiefly because the Southern planters are not thrifty, careful, economical managers. This point was very well stated by General Colquitt, in an admirable speech made by him

last week at the Georgia State Agricultural Convention, of which Society he is President. He clearly showed that until they learned how to save in little things, to manage prudently and wisely, and raise their own food, success was not possible. All this knowledge, however, is not of spontaneous growth—it is only attained by severe experience. In this view the present low prices may be of great benefit, inasmuch as they will enforce thrift and economy, and year by year make possible cheaper cotton.

Third,—Again, the debt the planters incur, and the ruinous rates of interest which they pay to extend cultivation, have helped to sap the profits of past years, or, in other words, increase largely the cost of production; and for this there would appear to be no remedy, except in decreased cultivation. As General Colquitt very forcibly puts it—"If the planter wants a mule in order to cultivate more land, and has not the money to purchase the mule, let him cultivate less land, and do without the mule." Experience teaches that no other course is safe.

A natural conclusion from these facts is that no account can be made of the present actual cost of the production of cotton to the planter. That he is worse off to-day than at the beginning of this season is evident. Whether he is likely to keep up the production on the present scale with present prices, our readers can judge as well as we.

PUBLIC WORKS—IRRIGATION.

THE ORISSA IRRIGATION WORKS.

(Continued from our last.)

(2.)—Canals lying in the Cuttack District.

NOTHING was done towards irrigating fields in this district till 1868, when deputy collectors were appointed to measure the lands for irrigation and invite the people to execute leases. The area of land irrigated up to this year was estimated at 11,700 acres. The water-rate being fixed at the high figure of Rs. 2-8 per acre, the ryots did not avail themselves of canal water even during drought, though they expressed their willingness to use it in the event of the rate being reduced from Rs. 2-8 to 1 rupee per acre. Applications were made subsequently by ryots for water for raising cold weather crops, but as the irrigation engineers had failed to supply it last year, they did not venture to do so this year.

II. The following statement gives the estimated and actual cost of the works since the Government took over the same, to March 1870:—

Works.	Expenditure. Amount of each estimate.	Up to 31st December 1868.	Grand total including 1869-70.
	Rs.	Rs.	Rs.
General	75,772	77,812	98,034
Narajo Head Work	4,52,092	4,98,586	5,34,680
Mahanuddy Do.	12,43,800	10,18,065	14,56,335
Taldanda Canal, 27 miles...	5,80,019	1,05,749	1,75,144
Malehgory Canal, 15 miles	2,77,359	13,841	32,534
Kendraparah Canal, 40 miles	10,46,967	7,08,958	9,34,950
Patamondee	.....	.....	20
High Level Canal, 33¼ miles	3,23,587	2,85,333	2,95,242
Range I.	14,11,057	5,42,237	7,49,600
Range II.	11,48,448	10,442	14,897
Range III	10,83,719	6,270	11,080
Midnapore canal, 48 miles:			
Range I	4,40,065	4,03,916	4,62,803
Range. II.	1,82,497	1,62,297	1,65,430
Range III	4,44,961	3,22,439	4,22,141
Range IV.	2,93,233	6,279	54,340
Range V.	2,48,148	46,975	1,56,558
Range VI.	7,44,113	3,89,069	5,38,390
Tidal canal, 27 miles—			
Range I	3,60,665	1,69,009	2,04,112
Range II	4,02,651	1,99,694	2,83,719
Grand Total	1,07,59,363	49,67,505	62,89,999

For 1870-71 the budget estimate was as follows:—

Imperial Funds—	Rs.	
Original works	33,19,500	
Repairs	4,00,000	
Establishment	9,93,590	
Tools and plants	4,65,000	
		51,78,090
Local Funds—		
Repairs		87,000
Grand Total		52,65,090

Of the above sum Rs. 49,78,000 was sanctioned, the reduction made being Rs. 2,00,090. The following statement gives the details of establishment for 1869-70 and 1870-71:—

Details of Establishment for 1870-71.

		1869-70
Chief Engineers, &c.	70,380	
Lithographic & Printing Establishments	14,100	
Supdt. Engineers	83,020	
	1,67,500	89,652
Construction.		
Engineers	2,71,200	
Upper Subordinate	1,78,928	
Lower Do.	36,000	
Temporary Do.	1,500	
Petty Establishment	30,000	
Office Establishment	1,80,400	
Medical	14,280	
Conservancy	1,092	
	7,13,400	6,60,348
Accounts	48,810	50,000
Revenue	63,880	
Total	9,93,590	8,00,000

The establishment charges, it will be observed, absorb not less than 23 per cent. of the total allotment for 1870-71 ! ! It is difficult to estimate the probable aggregate cost of the works when completed, for past experience shows that the estimates have been largely exceeded by actual expenditure, not to say that not one-tenth of the works have yet been completed up to date.

III. For want of sufficient data we are unable to form an accurate idea of the probable financial results of the works. The total expenditure during the last two years and a-half incurred by Government, we are informed, amount to about two millions; which added to one million of purchase money, makes an aggregate of 3 millions, carrying interest at 4 per cent. of 12 lakhs per annum, whereas the probable receipts estimated for 1870-71 were as follows:—

	Rs.
Revenue, Imperial	79,500
Water Rent	1,05,000
Total	1,84,500

The above estimate was, however, greatly exaggerated, not to say that no deduction was allowed on account of the charge of collection of water rent. The sources of revenue placed under the Revenue Superintendent of Canals are irrigation, rent of canal lands, fisheries, and produce of canal banks, navigation and plantations, the two fruitful sources of revenue, being under executive engineers. The success of the irrigation project seems to have a slight hold on the Midnapore district alone, for in the Cuttack district the people do not appreciate its value. The people of the last-mentioned district are ignorant, wedded to traditions, and little given to enterprise like those of Midnapore. In both the districts rice-fields have been irrigated under the new system, but in Midnapore alone the people have profited by raising a second crop of rice, sugar, cotton, &c. The annual revenue charge amounts to 4 lakhs, which is a great deal more than what had hitherto been derived from the irrigation works. Enormous sums have been expended on some of the principal works, and unless the distributaries and other subsidiary works are put in hand and completed, the expected revenue cannot be realized.

IV. The following statement describes the present state of the works:—

Finished Navigable Canals.

	Miles.
Kendraparah canal	40
Taldanda Do.	10
H. L. canal C to Bramini	25
Midnapore canal	26
	101

Distributaries or Irrigating Channels.

	Miles.
Kendraparah, No. 14	150
Taldanda	10
H. L. District	100
Midnapore	150
	410

Works in progress.

Taldanda—18 miles of excavation finished.

H. L. canal—About 30 miles of distributaries in several places.

Malehgam—Excavation finished 12 miles.

Of the above, the following works are completed :—

1st.—The Kendraparah canal, whose distributaries are in fair state of progress.

2nd.—Taldanda canal has been open for 8 miles.

3rd.—About 22 miles of high level canal with a few distributaries is declared open for public use.

4th.—The canal between Midnapore and Oolooberrah is open for 35 miles ; the distributaries are in progress. Much remains still to be done for the completion of this work.

It is believed that if the works progress at the present rate, it will take at least 12 years for completion.

V. Under the management of the Company, we are informed, all sorts of irregularities occurred both in the execution of the works and in the accounts. At the time the works were transferred to Government there was a large balance of stock shewn in the books, which, during the last two years, not a single officer of the Company could point out. Lakhs of rupees worth of stock (how many it cannot be ascertained now), are thus, we are told, lying unaccounted for ! Many of the works executed by the Company's engineers had to be done over again. This was not because they were made of bad materials or indifferently executed, but because they were not suited to the purpose they were intended for. Again, the establishment which the Company, by the terms of their agreement, bequeathed to Government were, for the most part, composed of the refuse of the Public Works Department, the Railways, the Madras shopkeepers, &c., and they are considered by many hard bargains. Not a few Europeans or Eurasians possessing no higher status in the Public Works Department than that of an overseer of the subordinate class were ushered into the Irrigation Department on a salary of 1,000 Rs. per month, and the Government has been compelled to maintain them on that high pay, and the worse of it is, that they are borne on the list of the engineers' establishment as 2nd grade executive engineers on a salary of Rs. 750 with a personal allowance of Rs. 250 per month. Thus these officers are better off than many an old Executive Engineer of the 2nd Grade, who, with all their professional knowledge and experience in the department, must be content with Rs. 950 a month. Those favored sons of fortune will one day be sent to build a church, a barrack, or a post office ! What need there was on the part of Government to take in this transferred lot of raw livestock with whom it would be always difficult for it to deal, we, for one, cannot understand.

VI. Under this head we will notice the rules laid down for the guidance of the canal officers. Our correspondent writes as follows :—

" The penalties prescribed for waste of water are based on unsound principle, since the liability is not for wilful waste but for negligence or unwillingness to inform the irrigation authority of any breach having been formed or any such accidents by which water is wasted.

Deputy Collectors are authorized to close any outlet between sunset and sunrise without granting any remission of water-rate. This places the ryots entirely at the mercy of the authorities and the subordinates of the department, causing, in many instances, great harm to their crops.

The Revenue Superintendent, or his deputies, are to decide whether, or not, one desiring to obtain water for irrigation or other purposes, has to pay for the cost of construction and maintenance of water channel, reservoir, &c.

In the event of the irrigated land changing owner, the last owner or occupant is made liable for the payment of water-rate. This has proved a source of oppression to the ryots.

In the case of a portion of a field having been irrigated, a record of the entire field has been made in the revenue field map, the water-rate will be charged on the entire field, provided the fact of using water only for the small portion of the same is reported to the authorities in due time—is it not the duty of the irrigation authorities to ascertain such matters ?

There are certain periods of the year at which the measurement of irrigated lands are taken ; but the time fixed suits the convenience of the authorities more than that of the ryots.

The canal patrol, who is a chowkeedar on a salary of Rs. 5 a month, has to enter in a register the fact of any cultivator making use of canal water for the first time of the current year, in default of which, he is liable to be fined or criminally prosecuted. This is as much a lucrative as a responsible post.

The Revenue Superintendent, Deputy Superintendent, and Assistant Superintendent, are vested with powers of a Collector and Magistrate in disposing of cases connected with the revenue. This facilitates the work a great deal, but it is productive of injustice and hardship. This system is better adapted to the non-regulation provinces than to a regulation province.

The rules have been framed so arbitrarily that they are frequently attended with oppression. The rule by which a cultivator is made to pay the water-rate, even if he does not apply for or makes use of canal water, but only for the circumstance of the canal distributaries being carried over his fields, in order to supply water to his brother cultivator, who applies for it, is indeed based on no principle whatever. With what justice is it made imperative on one to pay for water which he does not use himself and which he never asked the irrigation authorities to supply him with, albeit, that by the process of percolation of water through the distributaries, his land is kept moist and in a favourable state of the growth of the crops.

By cutting channels over fields the ryots are put to the trouble of walking miles and miles with their cattle in order to reach their fields, and even in the case of bridging these channels at every mile, which the Irrigation Department contemplate doing, the time that will be lost in travelling over an average distance of 4 miles a day with cattle and ploughs, is not compensated in anyway.

The drainage of the country has, to a great extent, been stopped. About 50 miles either side of the canal, the land has become so much saturated with moisture, which is owing to the bed of the canal being higher than the general level of the adjacent country, that village after village were deserted, being found too damp for human habitation. This is not all. Malarious fever and other maladies hitherto unknown to this country have appeared in a mild form and are watching an opportunity, as it were, to break out in Bengal epidemic character. On referring to the statistics of the country and local enquiries made by many a kind-hearted educated man, it will appear that for sickness, if not mortality, has increased considerably, compared with the past years.

The Mahanuddy anicut has closed all communication by water between Sumbulpore and the interior of Cuttack. The produce of Sumbulpore district such as rice, grain, wheat, ghee, oil, sugar, bajra, moongh, arhur, was hitherto brought into this district, but since the anicut has been constructed, the river navigation has been stopped altogether, placing thereby the country at a great disadvantage.

It was the last famine which led to the introduction of irrigation in this country. It was with a view to avert famine and save the country from its havocs in future, the Government took into their hands the irrigation works in Orissa, but the rules framed for the purpose have proved so severe that the poor ryots find it hard to comply with them. They feel so much oppressed that they would rather be carried millions by millions by famine, a scourge sent by Providence at certain distant periods only, than be subject to the irrigation rules whereby they are tormented at every moment of their life. By the one enemy a certain generation only of a particular period suffer for a short interval, while by the other every generation is tormented with constant oppression for an indefinite period.

The periodical floods of the Cuttack rivers which inundate the Orissa districts, instead of causing any material injury, serve to add to the fertility of the soil. It is the drought, and not the flood, which is a source of danger. The misery and mortality which the people of Orissa suffered during famines were to be traced to drought alone. To prevent the occurrence of drought with its concomitant evils, and to fortify the country against the periodical floods, by means of canals and embankments, is an error, the truth of which, time only will verify. To do so is as illogical as to introduce a permanent evil by removing a temporary one. The above is the opinion of the people of the districts and not mine."

This is the dark side of the picture ; we will now give the bright side. Our correspondent says :—

" In my opinion, by the completion of the works, internal navigation and commerce will greatly benefit. The irrigation scheme in Orissa will not pay for at least 25 years, but that it will save the country from the depredations of famine in future is almost certain. The Oorias are naturally of simple habits. Their wants do not go beyond *puckal vat*, salt, dhotee, and angocha. Their contact with the other civilized nations of India for the past years has not effected any sensible change in their habits and character, or tastes. To bring home to the mind of such a people the utility of the irrigation scheme must be the work of time, and all the endeavours of Government to do so must produce some amount of oppression. It could not be denied that the Government had at heart the good of the people, when it introduced the irrigation scheme, but it would have been better if it had not brought so early into existence the rules and regulations which are too rigorous and oppressive to the people. A taste for irrigation should have been first introduced among the people before any attempts had been made to make irrigation remunerative to any extent."

Here we must stop to-day. We may take up the subject in a future issue.

PUBLIC WORKS—RAILWAYS.

PUNJAB NORTHERN STATE RAILWAY.

We were prepared for the expression of astonishment which our estimate to completion of the first 102 miles of this model line has elicited from the public and the press, and as some exhibition of our data appears to be expected, and reasonably so, we give below a few details, the integrity of which will be admitted by all connected with the higher departments of the line.

Column No. 2.—*Agency* ... £14,000

This is the very lowest amount that the India Office at Home and the Marine Department in Calcutta will write off as cost of agency in surveying, despatching, and forwarding materials from London, *via* Calcutta.

No. 3.—*Engineering Establishments* ... £243,400

The home charge of £1,200 per annum is for a special engineer in consultation with the India Office, and for several assistants on the bridge works. The Indian establishment is much under the mark. It consists at present of—

1	Chief Engineer, at each per month	.....	£ 180	£ 2,160
2	Superintending Engineers	.....	120	2,880
15	Executive do.	.....	80	14,400
12	Assistant do.	.....	40	5,760
60	Subordinate do.	.....	25	18,000
40	Do. do.	.....	3	1,440
	Staff Military Pay	.....	..	600
	Proportion of salaries of Joint Secy. Punjaub, and Secy. and Deputy Secy to India	..	..	2,760
	Travelling expenses	.....	..	2,000
		Per annum....	..	£ 50,000

in place of £40,000 as entered in our estimate! We retain the latter figure as it is *sufficient*.

No. 4.—*Office and Control Establishments* £171,000

is considerably within the mark and needs no detail.

No. 5.—*Materials* £630,000

is made up as under:—

*11,000 Tons rails, fish plates, bolts, spikes switches, turntables, weigh bridges, &c., at £8 per ton, ...	£88,000
3,000 Tons small girders, piles, cylinders, &c., at £15, ..	45,000
12,000 tons iron work for three large bridges, £21-10, ..	282,000
240,000 Sleepers at Rs. 5...	120,000
Timber for Bridges, &c,.....	18,000
Stores from Calcutta (including imports,).....	77,000
	630,000

Each of these items is moderately stated.

No. 6.—*Ocean Freight and Railway Carriage* .. £ 247,000

Freight of 26,000 tons at £ 1-10 to 3-10 say, at £ 2-10 ..	£ 65,000
Railway charges on ditto £ 5-5	136,500
Do. on Stores and Plant	45,500
	247,000

No. 7.—*Cartage* ... ... £ 25,000

No. 8.—*Plant* ... . £ 95,000

No one acquainted with railway work will say that these are excessive.

No. 9.—*Works* ... ... £ 600,000

It is not easy to figure this without the assistance of the engineering estimates. We are, however, perfectly safe in the amounts we have adopted, and we shall be very glad to think they may not be *greatly exceeded*!

Foundations, piers, and erection of girders in large bridges	£ 300,000
Bungalows, including Government property transferred ..	50,000
Stations and Workshops, † ..	40,000
Bhimber bridge, and minor bridges and culverts .	75,000
Earthwork and ballast .	115,000
Laying permanent way .	20,000
Total .	£ 600,000

For convenience we now summarise the whole, after correcting an error in the item of interest:—

Agency	£ 14,000
Engineer Establishments	243,400
Office and Control Do.....	171,000
Materials	630,000
Freight and Transport.....	247,000
Cartage	25,000
Plant	95,000
Works.....	600,000
Interest on above	394,000
Rolling stock	300,000
Contingencies	132,600
Total cost of 102 miles	2,852,000

or £28,000 per mile, if the work is briskly taken in hand and finished by 31st March 1877.

* We take the 6'6" section, because, as already explained, the material has long since been landed, and a great portion of it is now in the Punjab in store and in the line, and any saving effected by ultimate adoption of light narrow gauge will be barely equal to the loss Government must sustain on the original metals.

We enter the sleepers of course as for Indian gauge, many thousands being already cut at a cost in some cases of upwards of *ten rupees per sleeper!* Startling as this assertion may be, it is very considerably on the agreeable side of the exact truth!

† Exclusive of costly fixed machinery (machine, tools and steam engines which are included in *Plant No. 8.*

We respectfully request the consideration of these figures by all persons acquainted with the Indian railway construction, and we deferentially offer them to the notice of Mr. Molesworth of pocket-book celebrity, who, according to the *Madras Mail*, is about to take up the appointment of Consulting Engineer to Government of India for all State railways. We trust Mr. Molesworth may be as methodical and successful in his consulting, as he has hitherto been in his editorial capacity.

LAND REVENUE IN THE PUNJAB.

Our readers will recollect that on a former occasion we calculated the agricultural produce of the Umritsur division at 318 lakhs, and showed that if Government got its proper ⅛th, the revenue ought to be 53 instead of 34 lakhs.

Let us now gauge the correctness of this calculation by another standard. Our practical test of the value of land is the price which Government has to pay for it when it is taken up for public purposes. Applying this test to the Umritsur division we get the following results in round numbers:—

Taken up previous to	Acres.	Compensation paid.	Revenue remitted.
1865-66	25,000	3,20,000	22,500
		or 14½ times the revenue remitted.	
In 65-66	321	4,000	130
		or about 30 times the revenue	
In 66-67	673	7,780	200
		or 38 times as much as the revenue.	
In 67-68	486	9,000	227
		or 43 times the revenue.	
In 68-69	363	28,700	350
		or 82 times the revenue	
In 69-70	189	4,500	277
		or 16 times the revenue.	
Total since 66	2,031	54,580	1,177
		or 46 times the revenue.	

From this it is apparent that Government has had to pay for the land which it required for public purposes since 1865, 46 times the revenue assessed upon it. Contrast this with the state of things which we found when we annexed the Punjab, and upon which the rights of Government are based. In 1852 the Board of Administration in giving instruction to its officers as to compensation to be allowed for loss of proprietary rights, told them to reckon the right at 10 *per cent. of the Government revenue*, and to allow the proprietor whose land was taken 15 years purchase on this 1/10, so that for every 100 Rs. of revenue remitted, there would be 150 Rs. given as compensation. "This," said the Board, "will afford to the owners of land *a full and fair equivalent for their proprietary rights.*" In 1859 this rate of 1/10, which had been taken as representing the proprietary right was altered to a *quarter* of the revenue, and officers were directed to give as compensation 15 years' purchase of 25 per cent. so that for every hundred rupees of revenue remitted the proprietary rights were compensated at 375 Rs.—"*the cash to extinguish the rights of property and of cultivation.*"

According to this system, and supposing even the enlarged 25 per cent. on the revenue to have been adhered to, we should have something short of about 4,500 Rupees as the compensation for the 1,177 revenue remitted, that is, 3¾ times the amount; instead of this we have the monstrous sum of 54,000 Rupees or 46 times the amount—or, to put it in another way, supposing the 54,000 Rupees to be the proper compensation, the revenue ought, if the due relation between the State and the proprietors had been maintained, to be 14,400 instead of 1,177. Now we beg to ask, does the Settlement Commissioner, in the face of figures such as these, venture to maintain that he has adhered to the rule laid down for his guidance by the great revenue authorities, *viz.* Government should demand "not more than half the well-discovered net produce to the proprietor during the period of settlement, leaving to the proprietor one-half as his profits and to cover the expenses of collection"? Does he mean us to believe that Government is really getting ½ of the net profits, or ⅓d, or ¼th? What does he believe himself about it, and on what is his opinion grounded! As to this point, there is this further remark to be made. One of the returns by which the Supreme Government can check the propriety of assessments [Imperial Return 1 E 3] has a column showing "the supposed net profit per acre,"—*i. e.*, the balance left to the proprietor after the expenses of cultivation have been met, and the land revenue paid. This return has been omitted in the Report for 1869-70, and indeed it well might be, for the Settlement Commissioner's failure to submit reports in due course renders it wholly and absolutely worthless. It appears in the Report submitted by Mr. Melville as Officiating Financial Commissioner for 1868-69,—and we invite the Settlement Commissioner to make known the grounds on which the column of "supposed net profits" in the Umritsur district was based. It represents the supposed net profits of the proprietors as being within a fraction the same as the Government demand, sometimes an anna per acre more, *sometimes absolutely less.*

COMPARATIVE ABSTRACT OF TRAFFIC ON INDIAN RAILWAYS FOR THE FOUR QUARTERS OF 1869 AND 1870.

Quarters	East Indian. Main Line.		East Indian. Jubbulpoor Line.		Eastern Bengal.		Calcutta and South Eastern (State)		Oudh and Rohilkhund.		Punjab and Delhi.		Madras.		Great Southern of India.		Carnatic.		Great Indian Peninsula.		Khamgaum Branch.	Bombay, Baroda, and Central India.		Sindh.		Total.	
	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1869	1870	1870	1869	1870	1869	1870	1869
First Quarter.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Total earnings	718,404	709,439	36,996	30,024	41,569	43,006	2,023	2,238	6,572	5,789	96,271	60,266	127,741	117,909	17,330	16,346	537	1,117	510,207	499,958	151*	142,436	130,409	19,779	16,884	1,710,606	1,634,196
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	530	420	707	677	165	168	19	19	1,063	874	7	312	307	106	107	4,449	4,109
Average receipt per week	55,262	54,572	2,845	2,379	3,221	3,308	156	172	505	445	6,636	4,636	9,826	9,070	1,333	1,257	64	86	39,247	38,458	59	10,957	10,031	1,521	1,292	131,632	125,707
Average receipt per week per mile open..	48 8	48·2	12·8	10·7	28·5	29·2	5·6	6·1	12·0	10 6	12 5	11·0	13·9	13·4	7·9	7·5	3·4	4·5	36·9	44·0	8·4	35·1	32·6	14·3	12·0	29·6	30·6
Second Quarter.																											
Total earnings	703,584	633,617	32,143	23,757	39,069	38,905	1,915	2,410	6,016	5,139	96,905	56,743	125,258	139,687	18,233	17,180	1,150	1,810	541,330	383,013	775	171,727	122,541	23,741	25,129	1,761,846	1,450,140
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	554	420	707	677	165	168	19	19	1,184	874	7	312	307	106	106	4,594	4,108
Average receipt per week	54,122	48,739	2,473	1,827	3,005	2,992	147	185	463	395	7,454	4,365	9,635	10,761	1,403	1,322	88	139	41,641	29,462	60	13,210	9,423	1,826	1,933	135,527	111,549
Average receipt per week per mile open..	47·8	43·1	11·1	8·2	26 5	26·5	5·2	6·6	11·0	9·4	13·5	10·4	13·6	15 9	8 4	7·8	4·6	7·3	35·2	33·7	8·6	42·3	30·7	17·2	18·2	29·5	27·2
Third Quarter.																											
Total earnings	542,523	491,870	16,314	16,700	44,154	41,699	1,519	1,460	5,758	4,672	72,137	43,679	104,903	147,476	17,975	17,871	796	1,068	215,999	202,077	41*	60,180	60,621	16,438	12,519	1,098,937	1,041,701
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	559	433	707	696	168	168	19	19	1,184	873	7	312	308	106	106	4,599	4,140
Average receipt per week	41,756	37,636	1,255	1,284	3,396	3,206	116	112	443	359	5,549	3,360	8,062	11,344	1,383	1,374	61	82	16,615	15,544	16	4,629	4,663	1,264	963	84,546	80,131
Average receipt per week per mile open..	36·9	33·4	5·6	5·7	30·1	28·3	4·1	4·0	10·5	8·5	9·9	7·8	11·4	16 3	8·2	8·1	3·2	4·3	14·0	17·8	2·3	14·8	15·1	11·9	9·0	18·4	19·4
Fourth Quarter.																											
Total earnings	636,191	628,027	36,652	24,558	53,641	41,245	1,756	1,440	7,188	5,684	84,455	66,325	117,693	133,747	17,291	19,321	730	849	370,494	340,967	63†	104,567	114,280	14,212	16,377	1,444,333	1,391,736
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	572	517	716	707	168	168	19	19	1,198	873	7	312	308	106	106	4,635	4,226
Average receipt per week	48,938	48,310	2,819	1,889	4,080	3,173	135	111	553	437	6,497	5,102	9,053	10,288	1,330	1,409	56	65	28,500	26,221	14	8,044	8,791	1,093	1,260	111,112	107,086
Average receipt per week per mile open..	43·3	42·7	12·6	8·5	36·1	28·0	4·8	4·0	13·1	10·4	11·4	9·9	12·6	14·6	7·9	8·4	3·0	3·4	23·8	30·0	2·0	25·8	28·5	10·3	11·9	24·0	25·3
Total for the year.																											
Total earnings	2,601,002	2,462,953	122,095	95,939	178,133	164,845	7,213	7,548	25,534	21,275	339,768	227,012	475,495	539,019	70,829	69,730	3,513	4,844	1,638,030	1,425,915	1,030	478,910	427,851	74,170	70,829	6,015,728	5,517,760
Mean mileage open	1,131	1,131	223	223	113	113	28	28	42	42	554	447	709	689	168	168	19	19	1,157	873	7	312	308	106	106	4,560	4,147
Average receipt per week	50,019	47,364	2,348	1,845	3,426	3,170	139	145	491	409	6,534	4,366	9,144	10,366	1,362	1,341	68	94	31,501	27,421	46	9,210	8,228	1,426	1,362	115,705	106,111
Average receipt per week per mile open..	44·2	41·8	10·5	8·3	30·3	28·0	5·0	5·2	11·7	9·7	11·8	9·8	12·9	15·0	8·1	8·0	3·6	5·0	27·2	31·4	6·5	29·5	26·7	13·5	13·8	25·2	25·6

* Receipt for two weeks and four days. † 1st to 31st December.

PRICES OF FOOD THROUGHOUT INDIA.—APRIL AND MAY 1870—SEERS ($2\frac{5}{35}$ lbs.) PER RUPEE.

BENGAL. (Rice, the staple food.)		Rice.	Wheat.		
				Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27½	23	Seers.	Rupee.
	Bancoorah	27½	19	,,	,,
	Beerbhoom	33	16	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	21	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam ,,	Durrung	21	8½	,,	,,
	Goalparah	17	20	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	...	,,	,,
	Seebsangor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	23	18	,,	,,
	Mymensing	23½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	24	23	,,	,,
	Sarun	23	20½	,,	,,
	Shahabad	24	22	,,	,,
	Tirhoot	23	21	,,	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	29	27	,,	,,
Sonthal Pergunnah.	Godda	...	...	,,	,,
	Nya Doomkah	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	20	21	,,	,,
Presidency Division.	Calcutta	..	..	,,	,,
	Nudden	..	...	,,	,,
	Jessore	25½	15	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 3-16	21 0-16	,,	,,
	Bograh	33½	15½	,,	,,
	Dinapore	35	17½	,,	,,
	Maldah	30	28	,,	,,
	Morshedabad	28	27	,,	,,
	Pubna	23	20	,,	,,
	Rungpore	25 11-16	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazareebagh	25	20	,,	,,
	Maunbhoom	32	16	,,	,,
	Singbhoom	86	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25	...	,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES (Wheat and Joaree, the staple food.)		Rice.	Wheat.	Joaree.	Bajra.
Meerut Division	Dehra Dhoon	17	27	33	32
	Saharunpore				
	Moozuffernugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	12	15	...	...
	Gurhwal				
Rohilkund ,,	Bijnour	20	31	34	36
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
	Terai Pergunnahs	27	29	24	24
Agra	Muttra	17	27	31	28
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	12	27	34	26
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	16	25	27	20
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
Benares ,,	Goruckpore	22	22	27	29
	Bustee				
	Azimgurh	16	20	22	20
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	8	15	19	18

OUDH. (Wheat and Joaree, the staples.)		Rice.	Wheat.	Joaree.	Bajra.
Lucknow Division	Lucknow	18	26	32	20
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	21	33	25	26
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	21	27	35	18
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	18	25	...	...
	Sultanpoor				
	Pertabghur				

PUNJAB. (Wheat and Joaree, the staples).		Rice.	Wheat.	Joaree.	Bajra.
Delhi Division.	Delhi	9	23	33	29
	Gurgaon				
	Kurnal				
Hissar	Hissar	[illegible]	[illegible]	30	25
	Rohtuk				
	Sirsa				
Amballa	Amballa	12	27	30	31
	Ludiana				
	Simla				
Jullundhur.	Jullundhur	14	29	41	30
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	10	25	33	32
	Sealkote				
	Gurdaspore				
Lahore.	Lahore	13	25	31	25
	Ferozepore				
	Guyeraiwalla				
Gujerat.	Rawul Pindi	8	17	25	24
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	19	23	21
	Jhung				
	Montgomery				
	Mozafhuggur				
Deera I. Khan.	Deera I. Khan	7	19	25	23
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	7	15	20	21
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree, the staple food.)		Rice	Wheat	Joaree	
Nagpore.	Nagpore	16	22	25	2nd sort Rice quoted
	Bhundara				
	Chanda				
	Wurdah				
	Balaghat				
Jubbulpore.	Jubbulpore	18	30	40	
	Saugor				
	Dumoh				
	Mundla				
	Seonee				
Nerbudda.	Baitool	14	21	28	
	Hoshungabad				
	Chindwara				
	Nursingpore				
	Nimar				
Chuttersghur.	Raepore	32	40	40	
	Belaspore				
	Sumbulpore				
Upper Godavery.	Seroncha	7	12	..	

MADRAS Rice and Cholum (Joaree) the staple food.		Rice	Joaree		2nd sort Rice quoted.
Northern Section.	Ganjam	236	134		
	Vizagapatam	284	158		
	Godavery	202	118		
	Kistna	280	183		
	Nellore	235	152		
Ceded Districts.	Cuddapah	340	179	Quotations are—so many Rupees per Garce = 3960 lbs.	
	Bellary	304	143		
	Kurnool	372	163		
East Centre.	Madras	442	200		
	North Arcot	224	111		
	South Arcot	201	86		
Cauvery.	Tanjore	216	163		
	Trichinopoly	234	110		
Southern Section.	Madura	327	128		
	Tinnevelly	358	208		
West Centre.	Coimbatore	311	157		
	Neilgherries	427	246		
	Salem	232	118		
West.	South Canara	275	..		
	Malabar	334	..		

BOMBAY PRESIDENCY. (Price of Atta, 1st Sort)		Atta	
Northern Division.	Ahmedabad	9½	seers
	Kaira	10	,,
	Surat	11	,,
	Tannah	7½	,,
Southern Division.	Poonah	7	,,
	Ahmednuggur	..	
	Kulladghee	15	,,
	Rutnagherry	7½	,,
	Belgaum	6	,,
	Dharwar	9½	,,
	Sattara	8	,,
	Carwar	11	,,
Sindh	Kurrachee	7	,,
	Hyderabad	...	
	Sukkur	..	

BURMAH. (Rice, the staple.)		Rice				
Arakan.	Arakan	2	4	0	Per maund of 82 lbs.	No Returns since April 1870.
	Ramree					
	Sandoway					
	Northern Arakan					
Pegu	Rangoon	2	7	0		
	Bassein					
	Myanoung					
	Prome					
	Tounghoo					
Tenasserim	Amherst	2	0	0		
	Tavoy					
	Mergui					
	Shevegyeen					

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 7th and 15th day of May 1871.

	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1871.							
22nd April.....	29,75,530	15,19,660	21,26,550	59,56,500	20,42,000	3,23,85,000	4,70,05,240
30th April.....	29,12,860	15,53,780	21,93,700	57,19,200	20,39,500	3,17,85,000	4,62,04,040
7th May.....	30,12,840	15,87,380	22,45,500	60,44,700	20,13,000	3,33,23,000	4,82,26,420
15th May	30,11,970	15,58,580	23,90,050	58,80,400	21,14,000	3,11,57,000	4,61,12,000

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Retired by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
30th April 1871 ..	Calcutta	3,60,55,160	5,69,960	3,54,85,200	1,10,86,256	33,58,488	72,495	1,42,42,231	2,87,59,470
Ditto ...	Madras	97,11,020	17,02,190	80,08,830	64,54,266	...	...	17,28,404	81,82,670
Ditto ...	Bombay	4,39,04,040	55,24,890	3,83,79,150	2,56,02,769	24,15,371	...	1,31,49,860	4,11,68,000
Ditto ...	Allahabad	73,45,570	17,59,260	55,86,310	35,37,948	...	...	11,03,292	46,41,240
Ditto ...	Lahore	94,99,480	37,66,510	57,32,970	72,65,393	...	...	7,00,037	79,65,430
Ditto ...	Calicut	11,94,215	86,240	11,08,010	7,83,431	...	...	1,00,059	8,83,490
Ditto ...	Trichinopoly ...	12,83,310	9,11,970	3,71,340	10,37,381	...	...	1,00,059	11,37,440
Ditto ...	Vizagapatam ...	4,16,190	24,850	3,91,340	2,11,811	..	...	1,00,059	3,11,870
Ditto ...	Nagpore	27,59,790	7,11,700	20,48,090	17,57,848	...	...	5,47,902	23,05,750
Ditto ...	Kurrachee	48,14,010	25,65,670	22,48,340	42,56,584	..	..	5,00,106	47,56,690
Ditto ...	Akola	21,32,100	1,84,840	19,47,260	11,94,760	...	30	...	11,94,790
	Total ...	11,91,14,920	1,78,08,080	10,13,06,840	6,31,88,447	57,73,859	72,525	3,22,72,009	10,13,06,840

SILVER received and coined in the MINTS of CALCUTTA, MADRAS, and BOMBAY, 1870-71.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
November	520	59,349	...	...	3,806	...	1,44,504	92,117	...
December	2,600	1,81,929	...	...	...	...	...	1,61,541	...
January 1871.....	1,359	15,242	...	...	...	...	2,34,421	3,01,662	...
February.....	1,48,244	6,911	...	...	1,504	...	...	3,86,906	49,987
March	607	1,089	...	...	...	...	...	4,84,798	2,02,909
April	1,874	2,058	...	..	357	...	14,174	2,43,515	50,474

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1870-71 contrasted with previous Years.

	November.	December.	Jan 1871.	Feb. 1871.	March 1871.	April 1871.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	1,83,50,723	1,99,80,320	2,84,18,697	3,16,22,045	3,38,05,931	3,78,93,140
Bengal.....	1,21,74,892	1,38,42,355	1,75,89,650	1,49,37,750	2,41,86,769	2,11,85,561
British Burmah.....	36,45,337	31,82,587	21,54,993	28,50,376	37,85,136	32,70,156
North-Western Provinces.....	1,96,74,077	2,34,78,368	2,66,91,640	2,44,20,225	1,85,03,347	1,81,59,055
Oudh.....	47,42,276	58,39,690	65,27,100	56,89,247	49,59,323	43,00,459
Punjab.....	92,46,874	1,11,23,599	1,11,97,672	1,21,01,569	1,20,30,928	1,19,88,811
Bombay	1,83,67,631	1,79,41,554	2,36,81,651	2,90,87,843	3,45,16,819	3,66,21,588
Central Provinces.....	56,52,447	61,08,760	78,77,193	76,75,822	73,21,400	78,27,972
Madras.....	2,56,50,415	2,69,76,113	2,85,64,842	2,73,54,662	2,96,02,761	2,87,66,337
	11,75,13,372	12,84,73,346	15,27,03,438	15,57,39,539	16,87,12,414	17,00,13,079
The same month 1868-69.....	7,15,22,402	8,01,62,355	8,76,86,400	8,69,65,712	10,17,58,040	13,05,88,334
Ditto 1869-70.....	8,14,11,652	9,77,02,951	11,83,90,970	12,69,21,285	13,98,20,999	10,45,09,269

THE BANK OF BENGAL.

Statement of Affairs.	30th May 1871.
Liabilities.	
	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,64,159 7 0
General Treasury Balance at Head Office ...	4,34,36,293 14 10
Other Deposits at Head Office and Branches ...	2,26,11,299 9 9
Bank Post Bills, &c.	6,34,922 15 8
Cash Credit undrawn	.....
Sundries	9,23,301 2 3
Total Rs. ...	9,11,69,977 1 6
Assets.	
Government Securities	89,55,656 8 0
Loans on Government Securities at Head Office and Branches	59,81,139 15 4
Accounts of Credit on do. do. ...	44,70,842 14 11
Mercantile Bills discounted at do. ...	2,13,61,186 2 11
Dead Stock	12,06,637 4 0
Stamps	12,467 8 0
Balances with other Banks.	4,12,732 3 9
Sundries	1,05,118 12 7
Cash and Currency Notes at Head Office. ...	2,16,11,655 6 3
Cash and Currency Notes at Branches	2,70,52,540 5 9
Total Rs. ...	9,11,69,977 1 6

THE NEW BANK OF BOMBAY.

Statement of Affairs.	27th May 1871.
Liabilities.	
	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital. ...	10,00,000 0 0
General Treasury Balance.	1,64,04,057 0 0
Deposits at Head Office	1,66,65,969 0 0
Deposits at Branches.	61,34,107 0 0
Bank Post Bills outstanding	40,192 0 0
Reserve	4,15,000 0 0
Undrawn Cash Credits	7,13,051 0 0
Total Rs. ...	4,63,72,376 0 0
Assets.	
Government Securities	72,65,462 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	22,41,744 0 0
Credits Accounts do. do. on Gov. Sec. ...	31,19,794 0 0
Bills discounted and purchased at do. ...	1,12,42,140 0 0
Dead Stock and Less written off	4,87,231 0 0
Stamps.	6,609 0 0
Balance with Agents and Correspondents. ...	4,59,426 0 0
Overdrafts	22,023 0 0
Government Reserve Cash.	.....
Cash and Currency Notes at Head Office. ...	2,11,96,971 0 0
Do. do. at Branches. ...	.....
Bullion at H. O. and Branches	3,71,426 0 0
Total Rs. ...	4,63,72,376 0 0

THE BANK OF MADRAS.

Statement of Affairs.	27th May 1871.
Liabilities.	
	Rs. A. P.
Capital.	56,25,000 0 0
Public Deposits at Head Office	83,89,872 0 0
Do. at Branches.	58,17,789 0 0
Other deposits at Head Office and Branches ...	1,11,07,511 0 0
Cash Credits undrawn at do	1,61,822 0 0
Post Bills	63,034 0 0
Reserve Fund.	5,62,500 0 0
Rest	2,38,812 0 0
Total Rs. ...	3,19,65,292 0
Assets.	
Silver and Notes at Head Office	59,44,557 0
Silver and Notes at Branches	82,48,643 0 0
Government Securities	7,05,768 0 0
Government Reserve—Cash	58,89,872 0 0
Securities	.....
Loans at Head Office and Branches	16,81,747 0 0
Accounts of Credit at Head Office and Branches	4,45,360 0 0
Mercantile Bills discounted at Head Office and Branches	65,37,025 0 0
Dead Stock at Head Office and Branches. ...	2,24,965 0 0
Bills of Exchange do	18,99,874 0 0
Due by other Banks.	3,[illegible],477 0 0
Total Rs. ...	3,19,65,292 0 0

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54	4 per cent Loan.							4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
		of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	of 1856-57.	Transfer Loan dated 15th July 1870.	T. W. of 1854-55.	of 1856-57.		2 years.		3 years.		5 years.	10 years.	15 years.	
														Repayable Jan. 1869.	4½ per cent Transfer Loan.	Repayable Jan. 1870.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1877.	
31st Oct. 1870 ...	53,100	34,133	2,347	20,54,614	42,11,700	1,53,35,300	1,23,79,800	1,83,32,400	14,500	48,05,000	2,03,300	5,87,81,000	4,63,50,000	.....	.....	1,65,000	18,60,000	33,58,000	34,15,000	36,19,[illegible]00	17,50,18,994
30th Nov. 1870...	53,100	34,133	2,347	20,52,908	42,62,900	1,53,63,100	1,23,95,000	1,88,67,600	14,500	48,29,500	1,35,700	5,92,13,300	4,76,20,000	.....	.....	1,65,000	.....	33,63,000	34,16,000	36,42,[illegible]00	17,73,74,288
31st Dec. 1870 ..	53,100	34,133	2,347	19,59,468	41,43,100	1,52,55,100	1,23,52,500	1,83,26,100	14,500	48,78,100	87,700	5,96,27,700	4,88,75,900	.....	.....	33,63,000	.....	.....	33,46,000	36,81,[illegible]00	17,80,14,048
28th Feb. 1871 ...	53,100	34,133	2,347	19,58,935	41,45,000	1,52,22,200	1,24,02,100	1,84,22,500	14,500	48,84,500	82,700	5,99,10,100	4,86,76,300	.....	.....	1,65,000	18,60,000	33,87,000	33,46,000	36,81,[illegible]00	17,82,40,315
15th March 1871.	53,100	34,133	2,347	19,62,347	41,41,100	1,53,45,300	1,23,92,200	1,67,04,200	14,500	48,73,500	70,200	5,95,92,400	4,81,89,600	.....	.....	1,65,000	18,60,000	33,85,000	33,46,000	39,14,[illegible]00	17,57,72,227
15th April 1871..	53,100	34,133	23,47	19,62,347	41,34,600	1,51,66,400	1,22,97,800	1,59,07,500	14,500	48,28,100	69,700	5,78,69,000	4,81,63,400	.....	.....	1,65,000	18,60,000	33,15,000	33,46,000	36,5[illegible],000	17,29,43,227
30th April 1871...	53,100	32,640	2,347	19,59,680	41,37,000	1,50,80,000	1,23,92,200	1,51,24,800	14,500	46,36,100	69,700	5,72,51,800	4,69,84,900	.....	.....	1,65,000	18,60,000	33,15,000	33,46,000	36,[illegible],000	17,00,24,767
15th May 1871 ...	53,100	32,640	2,347	19,59,680	41,10,000	1,51,16,000	1,22,97,800	1,46,77,700	14,500	45,49,900	69,700	5,67,07,900	4,67,64,800	.....	.....	1,65,000	18,60,000	33,16,000	33,46,000	36,[illegible],000	16,86,43,067

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Divid.	Quotations.
Banks			
Agra & Limited, Rs.	£10	4 p. c.	95 a 100
Ditto, Certificates B.	10	.....	100
Ditto B. Shares	415	.....	....
Agra Savings' Bank	100	.....	115 a 120
Allahabad Bank, Limited	100	5 p. c.	100 a 102
Bank of Bengal	1000	3½ p. c.	1450 a 1460
Bank of Calcutta, Limited, A	88½	3 p. c.	20 a
Ditto ditto B	50	3 p. c.	20 a 25
Bank of Upper India, Limited	50	6 p. c.	61 a 62
Delhi and London Bank, Limited	250	1½ p. c.	115 a 120
Mussoorie Savings' Bank	100	7 p. c.	132 a 135
National Bank of India	£12½	nil.	100 a
Oudh and United Service, Limited	100	nil.	in liqdn.
Punjaub Bank, Limited	100	4 p. c.	80 a 90
Simla Bank, Limited	500	5 p. c.	550 a 555
Univ. Ser. Bank (Agra)	100	4 p. c.	90 a 95
United Bank (Simla)	100	5 p. c.	100 a 100
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	nil.	390 a 400
Ditto ditto	200	nil.	80 a 81
Bengal Coal Co, Limited	1000	5 p. c.	1450 a
Bonded Warehouse Association	440	20 p. sh.	555 a 560
Brunton's Press Co., Limited	300	4 p. c.	163 a 165
Burdwan Stone Co., Limited	100	nil.	6 a 7
Calcutta Docking Co, Limited	700	nil.	250 a 300
Ditto New ½ Shares	350	nil.	120 a 125
Delhi Railway Co.	218-2-10	2½ p. c.	228 a 230
Eastern Bengal Indigo Co.	100	nil.	53 a 58
Eastern Bengal Railway Co	218-2-10	2½ p. c.	235 a 236
Eastern Steam Tug Co., Limited	150	nil.	100 a 125
East India Railway Co.	18-2-10	2½ p. c.	250 a 251
Equitable Coal Co., Limited	250	4 p. c.	200 a 205
Goosery Cotton Mills Co.	200	6 p. c.	215 a
Gourepore Co., Limited	1000	6 p. c.	1225 a 1230
Ditto ½ Share	125	.....	162 a 163
Great Eastern Hotel Co	250	2 p. c.	160 a 165
Howrah Docking Co., Limited	1000	2 p. c.	190 a 200
India General S N. Co, Limited	1000	2 p. c.	320 a 325
Ditto ditto, ½	500	2 p. c.	162½ a 165
Ditto ditto, ¼	250	nil.	81½ a 82½
Landing and Shipping Co.	100	7 p. c.	46 a 48
Nanmyth's Pat Press Co.	500	2½ p. c.	500 a 600
Oriental Gas Co.	£5	4½ p. c.	65 a 70
Ditto (Contributory)	£1	4½ p. c.	13¾ a 14
Oudh and Rohilcund Railway	£10	2½ p. c.	109 a 110
Port Canning Land Co, Limited	1450	nil.	350 a 360
Sind, Punjab and Delhi Railway Co	£20	2½ p. c.	228 a 230
R Scott Thomson & Co.	500	3 p. c.	80 a 85
Tirhoot Indigo Co., Limited	200	nil.	61 a
Tea Companies.		*Yearly.*	
Assam Tea Company	100	5 p. c.	300 a 310
Bengal Tea Co., Limited	100	nil.	55 a
Ditto (Contributory)	60	nil.	30 a 32
Bismouth Tea Co., Limited	200	10 p. c.	190 a 192
Ditto (Contributory)	50	10 p. c.	45 47½
Central Cachar Tea Co.	200	nil.	80 a 82
Dehing Tea Co., Limited	85	nil.	30 a
Dehra Doon Tea Co., Limited	100	nil.	20 a 25
Durrung Tea Co, Limited	100	1½ p. c.	40 a 42
Eastern Cachar Tea Co.	100	8 p. c.	93 a 95
East Indus Tea Co, Limited	100	nil.	52 a 54
Jellalpore Cachar Tea Co.	250	20 p. c.	400 a 420
Kunchunpore Tea Co., Limited	1000	nil.	300 a 400
Ditto (Contributory)	375	nil.	nominal.
Kurseong and Darjeeling Tea Co	250	2 p. c.	90 a
Ditto (Contributory)	200	2 p. c.	65 a
Kuttal Tea Co., Limited	200	.....	65
Lower Assam Tea Co., Limited	50	nil.	nominal.
Monacherra Tea Co., Limited	90	nil.	42 a 45
Moran Tea Co., Limited	75	nil.	par.
Mud denhaut Tea Co., Limited	250	nil.	nominal
Muttuck Tea Co., Limited	125	nil.	40 a
New Golak Ghat Tea Co.	£10	.....	105 a 106
New Mutual Tea Co.	30	25 p. c.	100 a 110
Punkabaree Tea Co., Limited	100	3 p. c.	65 a
Room Tea Co., Limited	100	5 p. c.	80 a 90
Tuckvar Tea Co., Limited	200	nil.	90 a 95
Upper Assam Tea Co, Limited	100	nil.	22 a 25
Victoria Tea Co., Limited	250	nil.	30 a

EXCHANGE ON LONDON.

	Calcutta. s. d.
Bank Bills, at 6 months' sight	1-11—1-11-1-16
Do at 3 months' sight	1-10⅞
Do. on demand, ditto	1-10¾
Credit Bills (1st Class) at 6 months' sight	1-11⅛
Documentary Bills at 6 months' sight	1-11⅛

BANK RATE OF DISCOUNT.

	per cent.
Discount on Private Bills and Notes	6 to 7 ,,
Ditto on Acceptance of Local Banks	6 to 7 ,,
Int. on Loans on Security of Govt. Paper	5½ ,,

GOVERNMENT SECURITIES.

	Calcutta.	Bombay.
Five-and-a-half per cent.	113½	113⅛
Five per cent.	103½	106⅛
Four & half per cent. (Public Works Loan)	106½	107
15 years' Debenture Loans	109⅝	108⅛
10 years do. do.	108⅛	108
5 years do. do.	106⅛	103
Six per cent. Municipal Loans	113⅛	115

BOMBAY SHARE LIST.

Bank.	Shares.	Nomi. Value per Sh.	Paid up.	Last Div'd.	Mkt Share.
		Rs.	Rs.	per an.	Rs.
Agra Bank	100,000	100	all	4 pr. ct.	300
Bank of Bengal	22,000	1,000	all	5 pr. ct.	1,600nl.
Bank of Bombay (New)	10,000	500	all	6 pr. ct.	632½
,, 2nd Res. issue	10,000	500	100	5 do.	100
Bank of Madras	5,250	1,000	all	7 pr. ct.	1,380
Chartered Mercantile of L. and China	30,000	250	all	4 pr. ct.	250par.
Chartered Bk. of I. & C.	40,000	200	all	nil	150
National Bank of India	37,080	250	125	nil	104
Oriental Bank	10,000	250	all	12 do.	500
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	...	£20	218-3-0	pr. ct.	245
Do New £20 shares	...	...	20	109-1-5	do.	126
Bombay, B. & C. I. R. Co.	...	£100	1,000	do.	1,100
Do. New shares	...	...	18	196-5-1	do.	208
Land Companies.					
Elphinstone Land	10,800	1,000	all	30	
Ditto New Issue	10,800	1,000	650	11-14	
Frere Land	8,000	150	all		164
Mazagon Land and R.	750	2,000	2,000	nil.	970
Port Canning	4,000	2,000	1,450	nil	380
Colaba Company	4,000	3,000	all	70	1,710
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,850	225 p. s.	2,150
Albert Press Company, Kurrachee	200	2,000	1,100	75 do.	1,050
Alexandra Press Co.	250	3,000	880	nil.	445
Apollo Press Co.	150	12,000	11,000	200 do.	7,400
Bombay Press Co.	200	2,000	all	265 do.	2,435
Ditto (New)	200	500	all	66½ do.	600
Colaba Press Co.	500	1,880	all	nil.	5,000
East India Press Co	350	2,000	all	...	3,500
Fort Press Co.	150	8,500	all	300	10,700
Framjee Cowasjee Press	300	2,000	1,800	....	1,050
Hydraulic Press Co.	200	6,000	6,000	nil.	2,500
Kurrachee Press Co.	300	5,000	2,000	100 p. s.	1,250
Mofussil Press & G Co.	2,000	400	350	35 ,, ,,	510
Prince of Wales Press Co.	120	2,500	all	350	2,450
Victoria Press, Madras	225	2,000	1,000	nil.	925
Spinning & Weaving Cos.					
Albert Mills Company	400	2,000	1,700	50	1,600
Alliance Spinning Co.	500	2,500	all	200	2,735
Bombay	100	5,500	all	.....	3,000
Bombay United	900	1,000	all	45*	970
Broach Mills	1,600	150	150	....	300
Do. New	300	150	50	....	..
Dhurumsey Spinning	750	2,000	all	....	2,850
Great Eastern	750	2,000	all	75 p. s.	2,135
Manockjee Petit's	2,500	1,000	all	140 ,,	1,070
Oriental	800	2,500	all	350 ,,	2,700
Royal	690	2,500	2,400	... ..	2,325
Shipping Company.					
Bombay Shipping Co.	1,000	5,000	3,500	1,800	...
Kurrachee Landing and Shipping Co.	500	2,000	300	21 p. s.	170
Miscellaneous.					
Mechanics' Building Co	1,000	50	all	5 p. c.	34
Treacher and Company	2,000	500	all	25 p. s.	440

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs.	Rs. exd.
Bank of Bombay	Jan. '66	200	500	85	20
Bank of China	..	4,000	95	19½	1
Bombay Presidency Bank	Aug. '67	40,000	250	.....	
Bombay T. and B Association	Sept. '67	20,000	200	35	6
Brokers' Banking Co.	Sept '67	20,000	200	40	15
Central Bank	Mar. '66	40,000	250	2	1
East India Bank	..	25,000	..	..	1
Indian Peninsula Bank	Feb. '67	25,000	200	13	1
Royal Bank of India	May. '67	50,000	200	70½	2
Old Financial	Apr. '67	30,000	130	74	1
Companies.					
Back Bay Reclamation Co.	Nov. '66		5, 00	2,375	32
Bombay, and Bengal S. S.	.....	892	3,500	2,440	10
Victoria Spinning Co.	55	5,000	5,000	2,400	10

FREIGHT.—CALCUTTA.

London..	Cotton	£3 0s. 0d.	per ton
	Cases	£3 0s. 0d.	
	Seeds	£2 10s. 0d.	
Liverpool.	Iron Ships Cotton	£2 7s. 6d. to £2 10s. 0d.	
	Wooden Ships	£2 0s. 0d. to £2 7s. 6d.	
	Myrabolans & Coir bdls	£1 5s. 0d.	
	Seeds	£1 15s. 0d.	
Havre	Cotton	£2 17s. 6d. to £3. 0s. 0d.	
	Coffee		
Overland...	Steamers	£3 0s. 0d. to £3 5s. 0d.	
Liverpool via Suez Canal		£2 10s. 0d. to £2 12s. 6d.	
China	Steamer Cotton	Rs. 8 per bale.	
	Opium	Rs. 25 to 30 per chest.	
	Sailing Ships	Rs 6 per bale.	
Calcutta—Salt		Rs. 3 0 0 to 4 0 0 per ton	
Calcutta to Bombay		Rs. 16 and Calcutta Port charges.	
Mauritius		8 annas. to 10 per bag nominal.	

BOMBAY.

For Liverpool—		
Iron ships, cotton	£2 7s. 6d. to 2 10 0	per ton
Wooden ships do	£2 0s. 0d. to 2- 7-6	
For London.—		
Cotton	£2 0s. 0d.	
Seeds	£2 10s. 0d.	
P. & O. Steamer	£4 10s. to 5-0	
B. & B. Steamer	£3 10 0 to 3-12-6	
For China.—		
Cotton—Steamer	Rs. 8 per bale.	
Opium—Steamer Hong Kong	Rs. 25 @ 30 per chest.	

INDIAN SECURITIES. LONDON.

Share	Paid.	Indian Railways.	Closing Prices April 21	Closing Prices April 28
st.	100	Bombay, Baroda and Central India (gua. 5 per ct.)	105 to 106	105 to 106
20	2	Do. Ext.	par to 1 prem.	par to 1 prem.
—	—	Ditto	— —	— —
st.	100	Do. do.	— —	— —
st.	100	Carnatic (L), gua. 5 p. c.	102 to 103	102½ to 103½
20	48s	Do., do., issued at 12s. pm.	par. to ¼ prem.	par. to ¼ prem.
st.	100	Eastern Bengal (gua. 5 p. ct.)	104½ to 105¼	105 to 106
st.	100	East Indian (gua. 5p. ct.)	108 to 109	108½ to 109½
st.	100	Gt. Ind. Peninsula (g. 5 p. ct.)	107 to 108	107 to 108
20	12	Ditto, New (gua. 5 p. ct.)	1 to 1½ prem.	1 to 1½ prem.
20	6	Ditto, New (gua. 5 p. ct.)	1 to 1½ prem.	1 to 1½ prem.
st.	all	Ditto, 4 per c. deb. stk	88 to 90	88 to 90
—	—	Ditto, ditto issued at 12s pm	— —	— —
st.	100	Gt. South of India (g. 5 p. c.)	103½ to 104½	104 to 105
st.	100	Ditto (4½ per cent)	96 to 98	97 to 99
st.	100	Madras (guar. 5 per cent)	104½ to 105½	105 to 106
st.	100	Ditto, (4½ per cent)	98 to 100	98 to 100
st.	100	Ditto, (4½ per cent)	93 to 95	93 to 95
st.	—	Ditto ditto ditto	92 to 94	92 to 94
st.	100	Oude & Rohilkund (g. 5 p. ct.)	103½ to 104½	103½ to 104½
st.	100	Ditto, shares ditto	par. to ¼ prem.	par. to ¼ prem.
st.	100	Scinde (gua. 5 per cent.)	103½ to 104½	103½ to 104½
st.	100	Ditto, Punjaub (gua. 5 p. c.)	103½ to 104½	103½ to 104½
st.	100	Ditto, Delhi (gua. 5 p. c.)	103½ to 104½	103½ to 104½
—	—	Ditto, ditto (gua. p. c.)	— —	— —
—	—	Do. Ind. St. Flo. (g. 5 p. c.)	— —	— —

Indian Govt. Securities.	Closing Prices April 21	Closing Prices April 28.
India Stock 10½ per cent .....April 1874	207	208
Ditto 5 per Cent .....July 1880	112½ to 12½	112
Ditto 4 per Cent .....Oct. 1888	100¾ 10½	100¾
India Enfaced Paper 4 per Cent.	102½ to 92½	92½
Ditto 5 per Cent..... Jan. 1872	99½	99½
Ditto 5½ per Cent .... May 1879	107	107½
Ditto 5 per Cent. Rupee Deben. 1872	90 to 92	90 to 92
Ditto ditto 1877	107	107
India Debentures, 5 per Cent Aug. 1873	102½	102½
India Bonds, 4 per Cent £1,000	15s. prem.	19s. prem.

Amt. of Share.	Paid.	Miscellaneous.	Closing Prices, April 21	Closing Prices, April 28.
5	all	Bombay Gas (Limited)	6¾ to 7¼	6¾ to 7¼
5	4	Ditto, ditto, New	1½ to 1¾ prem	1½ to 1¾ prem.
20	10	Ceylon Co., (Limited)	4 to 3½ dis.	¼ to 3½ dis.
20	5	Ditto, A Shares	4 to 3½ dis.	3¾ to 3½ dis.
50	7	East India Land, Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis.
st.	100	Madras Irrigation & Canal (guar. 5 per cent by the Indian Government	100 to 102	100 to 102
1	7s.	Nerbudda Coal and Iron (Lt.)	1-16 dis. to 1/16 prem	1/16 dis. to 1/16 prem
5	all	Oriental Gas (Limited)	7¾ to 8¼	7¾ to 8¼
5	2½	Ditto. New	1½ to 2 prem.	1¾ to 2 prem.
50	all	P. and O. Steam Company	49 to 51	49 to 51
50	10	Ditto. New, 1867	2 to 1 dis.	2 to 1 dis.

Amt. of Share.	Paid.	Joint Stock Banks.	Closing Prices, April 21.	Closing Prices, April 28.
10	all	Agra Limited, A	7¾ to 8¼	7¾ to 8¼
20	all	Char. of India, Aus, & China.	13 to 14	13 to 14
25	all	Chartered Mer. of India, London and China	22 to 24	22 to 23
20	all	Eng. Scot. and Anst Chart.	15½ to 16½	16 to 17
20	4	Land Mort. Bank of India, Ld.	3¾ to 3½ dis.	3¾ to 3½ dis.
100	all	Do. 5 per cent. Debentures 1864 for 30 years	83 to 86	83 to 86
25	all	Oriental Bank Corporation (£)	42½ to 43½	41 to 42

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council.

Debenture Capital.	Rate.	Company.	Closing Prices, April 21.	Closing Prices, April 28.
£237,595	5	Bombay, Baroda, and Central India	102 to 104	102 to 104
881,700	5	Ditto ditto	102 to 104	102 to 104
100,000	4½	Ditto ditto	99 to 101	99 to 101
1,292,400	5	East Indian	106 to 108	106 to 108
1,806,300	5	Ditto	106 to 108	107 to 109
1,000,000	4½	Ditto*	99 to 101	99 to 101
440,000	4½	Ditto*	98 to 100	98 to 100
—	5	Eastern Bengal	100 to 102	100 to 102
1,968,660	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto	102 to 104	102 to 104
175,500	5	Great Southern of India	101 to 103	101 to 103
100,000	4½	Ditto	98 to 100	98 to 100
916,600	5	Madras	102 to 104	102 to 104
499,800	5	Ditto	102 to 104	102 to 104
20,000	5	Oude & Rohilkund (Lm)	100 to 102	102 to 104

* Transferable by endorsement, without stamp.

GOLD AND SILVER

	Per Ounce.
Foreign Gold in Bars	£3 17s. 8½d. to £3 17s. 9d.
Silver in Bars (standard)	5s. 03/16d. to 5s. 0¼d.
Mexican Dollars	4s. 10½d. to 4s. 10¾d.

EXCHANGE.

Banks Drawing rates on Calcutta at 60 days' sight. 1s 10½d.
Ditto on Bombay 1s. 10½d.

Advertisements.

CHARTERED MERCANTILE BANK OF INDIA, LONDON, AND CHINA.

(INCORPORATED BY ROYAL CHARTER.)

[illegible] £37,068 0s. 4d.

THIRTEENTH ANNUAL REPORT OF THE COURT OF DIRECTORS TO THE SHAREHOLDERS.

The Directors now present the Audited Annual Balance Sheet, Profit and Loss and Reserve Fund Accounts for the year ending 31st December last.

The profit for the year, after deducting charges, amounts to £49,479 14s. 3d. Out of this sum a dividend of 4 per cent, amounting to £30,000, was paid on the 1st July 1870, and a further dividend of 2 per cent, amounting to £15,000 is now declared, leaving a balance of £4,479 14s. 3d. carried to Reserve Fund. The Dividend Warrants are in preparation, and will be transmitted to the Shareholders in a few days.

As announced at the last interim meeting, provision is now made for the final extinction of the bad and doubtful debts of previous years, to which have been added those appertaining to 1870. The sum of £117,411 13s. 11d., representing the aggregate amount of those losses, has been debited to the Reserve Fund Account, which, after crediting it with the above sum of £4,479 14s. 3d. will then stand at £37,068 0s. 4d.

The Directors regret on this occasion being obliged to reduce the Dividend. The year, as a whole, has been the most unfavorable for Eastern Exchange operations within the experience of the Bank. On the other hand, it is matter of congratulation that in the midst of such trying difficulties, the losses of the year have been comparatively small.

The business of the Bank at its several branches for the current half-year is more satisfactory and encouraging than for some time past, and leads the Directors to believe in a better result than they have lately been able to show.

The Directors retiring on this occasion are Mr. J. J. Mackenzie and Mr. C. J. Erskine, who being eligible, offer themselves for re-election, and the Court recommend them accordingly.

The Shareholders will have to appoint Auditors for the current year.

65, Old Broad Street, GEO. G. NICOL,
4th April, 1871. *Chairman.*

GENERAL BALANCE OF THE CHARTERED MERCANTILE BANK OF INDIA, LONDON, AND CHINA,

FOR THE YEAR ENDING 31st DECEMBER 1870.

LIABILITIES.

	£	s.	d.
Capital paid up		750,000	0 0
Current and Fixed Deposits		3,368,649	19 10
Bills Payable, Notes in circulation, and other sums due to the public		4,802,872	1 8
Reserve Fund		37,068	0 4
Profit and Loss Account—			
Profit for Year ending 31st December 1870, as below	£49,479 14 3		
Less Dividend for Half-year ending 30th June 1870, £30,000 0 0			
,, carried to Reserve Fund 4,479 14 3			
	34,479 14 3		
		15,000	0 0
		£8,973,590	1 10

ASSETS.

	£	s.	d.
Coin and Bullion		1,863,440	0 5
Cash with Bankers and Money at Call		477,344	6 4
Government Securities		912,917	12 5
Landed and House Property at Head Office and Branches		224,806	8 2
Bills Receivable, in hand and on Deposit, Loans, and other Debts, &c., due to the Corporation		5,495,081	14 6
		£8,973,590	1 10

PROFIT AND LOSS ACCOUNT.

To Expenses of Management at Head Office, Ten Branches, and Six Sub-Agencies for the year	£103,633	16 6
,, Balance	49,479	14 3
	£153,113	10 9
By Gross Profit for the Year ending 31st December 1870, after deduction of Income Tax	£153,113	10 9
	£153,113	10 9
By Balance brought down, profit for the year	£49,479	14 3

RESERVE FUND.

To amount written off for bad and doubtful debts up to 31st December 1870, including the old outstanding accounts referred to in the Auditors' Certificates of former years	£117,411	13 11
To Balance carried down	37,068	0 4
	£154,479	14 3
By Balance on 31st December, 1869	£150,000	0 0
,, Amount transferred from Profit and Loss Acount	4,479	14 3
	£154,479	14 3
By Balance brought down	£37,068	0 4

GEO. G. NICOL, *Chairman.*
J. MURRAY ROBERTSON, JAS. J. MACKENZIE, } *Directors.*
D. T. ROBERTSON, *Chief Manager.*
GEO. E. BERNARD, *Chief Accountant.*

London, 3rd *April* 1871.—We have examined the several Statements transmitted from the Managers of the several Branches, and also the Books and Vouchers in London, upon which the above Accounts have been framed, and hereby certify to their correctness, according to such Books and Statements, to 31st December 1870.

TURQUAND, YOUNGS & CO.,
Public Accountants, 16 Tokenhouse Yard, E. C.

London, 3rd *April* 1871.—We have examined the Returns of Bills of Exchange, Local Bills Discounted and other Securities held by the Bank and its several agencies, as transmitted from the several Managers, and are satisfied that such Bills and Securities are available. We also consider that sufficient deductions have been made for all bad and doubtful debts.

GEO. CHRISTIAN, *Auditor.*
CHAS. H. PICKFORD, *Auditor.*

THE OBSERVER,
A WEEKLY NEWSPAPER AND REVIEW,
(Published every Saturday in Calcutta.)

OPINIONS OF THE PRESS.

If the liberal spirit and the thoughtful and scholarly style which [illegible] throughout are sustained hereafter, it is destined to [illegible] position among Anglo-Indian [illegible] *Mofussilite, Monday 6.*

Tone, purpose, special knowledge, and literary skill visible in its articles.—*Pioneer, Feb.* 14.

It is well written, well arranged, well edited and well printed.—*Lucknow Times, Feb.* 8.

The articles are ably written, the tone moderate, and it is altogether an acquisition to the Indian Press.—*Mofussilite, Feb.* 9.

In print and style it is superior to any other Indian paper, and its articles are of the highest class.—*Indian Church Gazette, Feb.* 11.

The favourable critiques that have appeared in different papers, fully bear out our own opinion respecting this neatly-printed and ably-edited hebdomadal.—*Bengal Times, Feb.* 15.

The project of a master-mind, and the offspring of a master-hand.—*The Progress, Feb* 10.

It promises to be one of the best conducted Indian weeklies.—*Hindoo Patriot, Feb.* 6.

Indeed, the paper bids fair to be a first class journal, and as such we wish it all success.—*The Bengallee, Feb.* 11.

We wish the *Observer* every success, and trust he may have many readers.—*Rangoon Mail, Feb.* 18.

It is very well got up and compares favorably with any of the Indian weeklies we have seen.—*Penang Argus, Feb.* 13.

SUBSCRIPTION PAYABLE IN ADVANCE.

Yearly Rs. 20, With Postage Rs. 24 | Quarterly Rs. 6, With Postage Rs. 7
Half-yearly „ 11 „ „ 13 | Single Copy, 8 Annas.

Established in 1820.

C. LAZARUS & Co., CALCUTTA.
(Incorporated with Shearwood & Co.)

CABINET MAKERS, Upholsterers, Billiard and Bagatelle Table Manufacturers, by appointment, to His Excellency the Right Hon'ble EARL OF MAYO, K.P.,G.C.S.I., Viceroy & Governor General of India, and to His Royal Highness the DUKE OF EDINBURGH, K.G.,K.T., G.C.S.I., Importers, Appraisers, House and Land Agents, General Furnishing Contractors, 56, 58, 60 & 61, Bentinck Street, *Calcutta.*

SOLE AGENTS IN INDIA FOR SEDLEY'S PATENT BRIDGES.

C. LAZARUS & Co., sensible of the very liberal support extended to their Establishment during the past *fifty years*, desire on this occasion to return to their friends and patrons their most sincere thanks. To merit a continuance of that esteemed patronage will, C. Lazarus & Co. beg to state, at all times be their studious endeavour; nor will, they be wanting in any respect to maintain that uniform excellence of workmanship, combined with economic charges, with which their establishment has hitherto been identified.

BILLIARD TABLES

C. LAZARUS & Co., as Manufacturers, invite particular attention to their large stock of full-size Billiard Tables, the cushions of which are constructed on an entirely new principle, similar to those supplied by C. L. and Co. and now in use at the Bengal Club, and in most of the clubs and Messes of the three Presidencies.

CONSEQUENT on the numerous applications that C. LAZARUS & Co. have lately had from parties residing at a distance from Calcutta to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the old Cushions to Calcutta for that purpose is attended with great delay, thereby occasioning much inconvenience, C. L. & Co. have been induced to keep a stock of Cushions on their new principle always on hand, which can be fitted to any Table, the accurate length and width of the slate Bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

JAQUES', BURROUGHES', WATT'S & THURSTON'S BILLIARD POOL BALLS

Billiard cloth, cues, Billiard and Pool Marking boards, Tips, Chalk, India-rubber Strips for cushions and every requisite for the Billiard Table. Billiard cushions renovated. Billiard Tables repaired and re-cushioned on their new principle, thereby making an old table as good as new.

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In accordance with their established practice of introducing novelties to the Indian public, C. Lazarus & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusements by importing the popular B. B. B. Tables. The peculiarity of these is that on the *one* table the favourite games of Billiards, Battue, and Bagatelle may be played, thus affording a *pleasing variety* of amusement concentrated on a single board at little more than the cost of one. Anticipating that the demand for these tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

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EDITORIAL.

THERE are some vacancies on the Staff of Contributors to the *Madras Mail*. Gentlemen possessed of the requisite ability, who are desirous of discussing current topics from a liberal and independent stand-point, are solicited to address themselves in confidential communication with the Editor, from whom all information can be obtained as to the requirements and honorarium of this Journal.

Madras, 7th June 1871.

MESSRS. BADHAM & Co.,
HOSIERS, GLOVERS, & GENERAL WAREHOUSEMEN,
APOLLO HOUSE,

WILL CONTINUE TO SELL AT THE FOLLOWING LOW RATES TO INSURE A SPEEDY SALE.

		R	A
HOSIERY	Fine Brown Cotton Half Hose, per doz.	10	0
	Fine Mixed Colours	11	0
	Fine Fancy Stripes	14	0
	Fine Super Colors	16	0
HOSIERY	Fine Merino Half Hose, per doz.	16	0
	Fine Super Merino	16	0
	Knickerbockers, Ribbed, per pair	4	0
HOSIERY	Fine Merino Under-Vests, ½ dozen for	20	0
	Fine Super India Gauze	26	0
SHIRTS	Badham's India Cloth, six for	36	0
	Badham's Silk and Wool, six for	50	0
	Badham's Pure all Wool, six for	48	0
	Badham's French Cambric, six for	25	0
COLLARS	Shakespeare, per doz	5	8
	Dux, per doz	5	8
	West End, per doz	5	8
	Pall Mall, per doz	5	8
HATS.	Black Felt Ins	6	0
	Black Felt Worthing	5	12
	Black Felt Derby	6	0
	Black Felt Cantab	6	0
	Drab Felt Cantab	5	12
SCARFS.	Duke of Edinburgh	2	12
	The Campbell Bow	1	4
	The Windsors	2	8
	The Romal "Satin"	2	12
HANDKERCHIEFS.	Fine White Cambric, Hemmed, per doz	5	0
	Fine White Cambric, Hemmed, Coloured Borders	5	0
	Fine Irish Cambric	10	0

HOUSEHOLD LINEN—Damask Linen Table Cloths, Damask Napkins, Sheeting (Double and Single).

JEWELLERY—Gold Links, Solitaries, Shirt Studs, Pins, &c.

TRUNKS, &c.—Overland Trunks, Portmanteaus, Courier Bags, Rugs, Straps, Bags, &c.

BADHAM & Co.

Apollo House, Bombay, 1st June 1871.

Improved Patent Tarpaulins.

PREPARED ON ENGLISH CANVAS ONLY; guaranteed Free from Adhesiveness either in Sun or Rain; finished expressly for use in hot climates, no Tarred matter is used in our composition, which is perfectly pliable, and free of all spontaneously combustible matter. Our tarpaulins with ordinary usage will last for years. The Arsenal Fort William, has tested and found them all that we describe, and, in addition, proof against Damp and White Ants

Assorted sizes always in stock.

All Tarpaulins made by us are branded

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REGULATION SIZE.

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Patent Improved Tarpaulins of Sizes
ALWAYS IN STOCK.

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TENTS! TENTS! TENTS!
OF ALL SIZES MADE TO ORDER.

THE Tents made at this Institution are guaranteed to be of the best materials and in finish and quality superior to any other Tents made in India. The public are cautioned against purchasing Tents said to "equal those made at Jubbulpore."

Illustrated priced Catalogues gratis on application.

Jubbulpore, June 1871. R. RANKEN, Lieut.-Colonel, Superintendent.

THE INDIAN LIFE ASSUR[illegible] COMPANY (*Limited.*)

REGISTERED UNDER ACT X. OF [illegible]866.

Head Office—MEERUT.

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R. R. Dean, Esq. ... . *Manager, Allahabad Bank.*
W. Hobson, Esq. ... . ,, *Mussoorie Savings' Bank.*
J. C. Parry, Esq. ... ... *Late Genl. Manager, Delhi & London Bank*
F. Peterson, Esq. .. .. *Manager, Simla Bank Corporation.*
C. W. Stowell, Esq. ... .. ,, *Uncovenanted Service Bank*
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William Moir, Esq., M.B., Civil Surgeon, Meerut.

SECRETARY.

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AGENTS.

Hill, Dillman, & Co., Calcutta.

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The object for which it was established with a full direction in India was to secure the Indian public against a repetition of such heavy losses as have recently been sustained by the collapse of certain Assurance Offices in England, where the entire management of those institutions was located.

Security.—To ensure absolute security, the funds of the company are invested *only* in Government securities. The company is strictly prohibited from making advances on house or landed property or on stocks, shares or obligations of any company whatever, though such advances are usually extensively made by other Assurance companies.

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the assured. Policies are also granted for short terms from one to ten years at moderate rates

The Proposal Form is simple in its terms and the *conditions* of the *policies* are liberal, all *unnecessary restrictions having been removed*

The rates of premium are made as moderate as is consistent with *complete security* of the assured.

Advantages of Assurance -- It secures by a small monthly, quarterly, half-yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the borrowers' property from claims and sureties from loss

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscriber loses the benefit of all he has paid, whereas in the case of a policy it still ensures and may be made available for any other purpose.

Forms of Proposal, tables of rates, and all further information may be obtained by letter or on application to any of the Agents or to the Secretary.

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Required for an assurance of Rs 1,000 for the whole term of life.

Age	Civilians.				Military and Naval.			
	Without Profits.		With Profits.		Without Profits.		With Profits.	
	Rs	As.	Rs.	As	Rs.	As.	Rs	As.
20	31	9	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	3	50	15	57	14
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

D. LANCASTER,
Meerut, 12th November 1870. *Secretary.*

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782

UNLIMITED.

The importance of this company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 2,000,000*l.* sterling as losses under insured risks and without a single call on its proprietors whose liability is unlimited.

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A. C. BRICE & Co.,
No. 6, Rampart Row, Bombay, 1870. Agents.

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FIRE AND LIFE.

HEAD OFFICE.— Queen Insurance Buildings, Liverpool.

CAPITAL.—(£2,000,000) Two Millions.

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The rates of premuim for *Fire* and *Life* Insurances will be found as moderate as those of other first-class offices. Policies are issued under the *Life* branch of this Company recently established in Bombay, on civil lives and military lives in civil employ.

For further information and particulars, and for prospectuses, &c., regarding Fire and Life Insurances, apply to

LAWRENCE & Co.,
Bombay, 1st January 1871. Agents in Bombay.

THE BOMBAY FIRE INSURANCE COMPANY (LIMITED.)

THE undersigned are prepared to accept risks and issue policies covering merchandise, goods in godowns, warehouses, dwelling houses, or other insurable property, on favourable terms.

Apply to FORBES & Co.,
Bombay, 1st February 1871. Secretaries and Managers.

[redacted]

ESTABLISHED 1710.

Policies opened on warehouses and shops, merchandise, dwellings, household furniture, and other insurable property, in Bombay and the Mofussil, at current rates by

Bombay 1871. PEEL, CASSELS, & Co., Agents.

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The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorised to decide upon Proposals submitted, to issue Policies, and to settle claims.

The Life Reserve Fund is over

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which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund), being about 30 per cent of the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

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Agents for the Presidency of Bombay.

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ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic , Cap. XCII.

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Life Assurances of every description granted.
Retiring provision combined with Life Assurance.
Free Policies issued which can never altogether lapse through non-payment of Premium.
No extra charge for sea-passage.
Reduction to European rates without Medical examination.
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Interest	,, 162,680	Reserve Fund	,, 971,410
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	£1,249,535		£3,301,005

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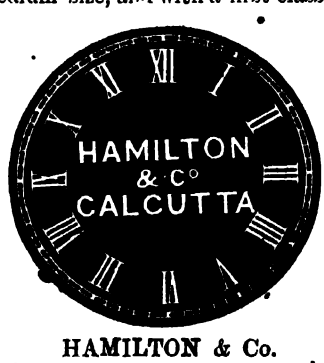
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THE

Indian Economist

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

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The Indian Economist.

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LETTERS TO THE EDITOR.

LOCAL CESSES.

To the Editor of the "Indian Economist."

SIR,—As the Provincial Governments have lately discovered an admirable mode of increasing the land revenue by local cesses, there is less necessity of advocating a direct enhancement of the land revenue on the expiration of the old leases. The new source of income has not the drawback of compelling us to wait until the old leases expire. In Madras, in Oudh, in the North West-Provinces, and in the Punjaub, the land revenue has been increased within the current year to six per cent., and even to ten per cent. I am ready to acknowledge that this probably is the result of the protests unceasingly made by the *Indian Economist* against the just demands of the State being tampered with. But it appears to me that as cultivation depends much on circumstances beyond the control of man, an error committed by the settlement of the land revenue on the basis of the prosperous returns of certain years, must make its evil results felt for a series of years, while those who urge that the land revenue is lost to the State might be satisfied by the readiness with which the Provincial Governments now make up the amounts due to the State, in the case of prosperous districts, by a recourse to that admirable system of local taxation called the "cesses."

C. B. H.

[*Note by the Editor.*]

Our correspondent has no adequate idea of the State wants. It is not 6 but 60 per cent that is required.—ED. *I. E.*

TENANT RIGHT.

NORTH WEST PROVINCES.

To the Editor of the "Indian Economist."

SIR,—A letter in your issue of the 15th July, headed "Tenant Right," calls attention to a point which I think deserves consideration on the part of all officers in the North-West Provinces who are engaged in dealing with suits for enhancement. The High Court has ruled that there is no provision in the law to prevent these suits being brought year after year. Ordinarily, of course there is little fear that any such thing would take place; but it gives a landlord the power to indulge in very harassing and vexatious proceedings. Many as are the faults and difficulties connected with the procedure which Act X. has rendered necessary in the decision of enhancement suits, and in spite of the inequalities arrived at under that procedure, it can hardly be contended that it is advisable that neither the landlord nor the tenant should be able to calculate on the permanence of the contract existing between them for more than a single year. The idea, moreover, is utterly opposed to the feelings of the mass of the cultivators. They admit one reason, justifying the enhancement of their rent, and one only—that is, that as Government has raised the revenue on the landlords, they too must share the burden. But the notion that the landlord has a right to sue for enhancement after what has thus been raised at the commencement of the term of settlement is utterly unintelligible to them, and when it occurs, their protests are most vehement. The majority of the zemindars too would admit the force of their assertions. Public opinion therefore agrees with the theory that the security of a lease is advantageous to both parties concerned in it. It is therefore obviously desirable that this result should be attained, if possible, under the provisions of Act X. of 1859. I think it may be effected as follows: Suits for enhancement are laid under Clause I. Section 23 of Act X. If such suits are held to be suits to "determine the rates at which puttahs and kabooliyats are to be delivered", let the ryot be directed to demand under the same clause a puttah at the rates determined. Section 76 will then provide for the protection of the ryot from vexatious suits. For if "the parties do not agree as to the term for which the puttah is to be granted, the Collector shall fix such term, as under the circumstances of the case he may think just and proper." It further provides that such term should not exceed 10 years. This is all that is required: at any rate the ryot if he chooses can obtain a "ten years' lease," but I am confident that in most cases the parties would agree to a longer term. I do not for a moment assert that it would be well that very long terms should be customary, for I think the zemindars should be enabled to raise their rents within the term of settlement, and not to allow the rental to remain stationary for the thirty years to come. Judicious enhancement by the zemindars will lead to their own profit and to that of the State, and it may often happen that where enhancement is now difficult, a lapse of ten or more years may enable the landlord to raise the rents of his tenants without in any way oppressing them or discouraging their industry. Vexatious enhancement can, however, profit no one, and if as I think the law provides a means of preventing it, it ought to be made use of for the sake of those whose interests it is the object of that law to protect.

H.

A STATE LAND BANK.

To the Editor of the "Indian Economist."

SIR,— While you are urging on the landlords of India that property possesses its right, its duties are not being lost sight of. The Bill before Council for providing that loans may be made to farmers for the purposes of improvement is manifestly a step in the right direction.

I believe, however, that the interests of the country might be subserved by adding to the Bill a careful adaptation of the principal features of the Post Office Savings' Bank system as worked in England.

It is not necessary to recapitulate the attempts that have been made to devote capital to employment in agricultural improvements in other countries. An excellent article in the *Revue des Deux Mondes*, about eight months ago, discussed the subject. In comparison with more purely commercial transactions, works of agricultural improvement labour under the disadvantage of the want of means to realize promptly, and in the early stages of works, such as reclamation and irrigation, want of punctuality in the payment of instalments of interest.

In commerce, the affairs which call credit into play, precede the effect it produces, and its instruments are concerned with the adjustment of transactions already concluded. To agriculture, credit must be first applied, and the transactions which call for its aid will result. This point, well brought out by the writer of the article above referred to, seems to me to supply arguments in favour of Government undertaking the business of a Land Bank on a large scale.

I believe that the notion, once popular, of the vastness of the buried hoards of the ryot are delusions, as far as the Southern

Presidency goes. Still, a good deal of money is put by from year to year, and with due encouragement, might be more profitably invested than it is.

The success of the Post Office Savings' Bank in England has been singular; and in 1869, according to a late return, upwards of £250,000 stood to the credit of Government, after paying 3½ per cent. to depositors.

Where there is 5 per cent. might readily be paid on Talook Banks here: it would probably be unnecessary to grant depositors the privilege of drawing anywhere, as in England they can. The deposits might be largely employed in advances for the improvement of existing wells and tanks, and in the construction of new. As far as new tanks are concerned, until the new Local Committees are sufficiently organized and educated to look after the matter, the greatest care would be necessary, before committing such funds to an investment of whose success there could be a doubt.

In the case of wells, ryots commonly borrow at 18 per cent. the 200 Rupees or so which it takes to build a well, and thus, if it waters 3 acres, subject their land to a charge of 12 Rupees per acre. The security of land alone would not be enough to cover the loan in most cases. In this district, where the average holding is but 8 acres, the average ryot could without difficulty get his application backed by a brother ryot, and care might easily be taken that the land hypothecated was likely to sell for the full amount of the loan. Re-payments might be made in easy instalments or a permanent addition to the assessment made. 4½ Rupees would be enough to cover the interest required on the capital lent, and this amount would bring the assessment on the land under the well to about 6 Rupees, which could readily be paid. The gross produce in this district may be taken at 12 Rupees per acre on unirrigated land, and 48 Rupees per acre under an ordinary well. The expenses of cultivation are, in either case, about half the produce.

Where (Government, not Zemindary) land is underlet, the tenant, a puttahdar, would have to agree as to the terms before borrowing. In every district, extension of existing Banks is possible, and the work might be done with sufficient profit; but the deposits could not for many years be expected to permit of large works being undertaken. Only the established assurance that they could put in their money, keep it safe, get 6 per cent. for it, and draw it out when they liked, would induce the poor ryots to use the banks. The rich ryots could not be expected to use them: th y can lend money at much higher rates than any Bank could give them, though its operations might before long bring down the rate of interest they now obtain.—I remain, your obedient servant.

July 27th. C. S.

DISTRICTS, MADRAS.

DIVISION OF THE RENTAL IN OUDH.

To the Editor of the "Indian Economist."

SIR,—The profound sympathy which I feel with the aim of your articles on the assessment of the land revenue, and the unqualified assent which I give to their theory, make me anxious that you should supply a great defect, which in my humble opinion depri es them of any but a theoretic value.

You have never, as far as I know, pointed out how the question is variously affected in different parts of India by different social conditions.

To take Oudh, as an instance. It has been, certainly, for the last six hundred years a diminutive Rajputana, and a Rajput is, or considers himself, entitled to live on rent. In spite of frequent clan wars, their condition of life was eminently favourable to the production of large families, and I know instances where the representatives of a single chief have, in 12 or 14 generations, amounted to nearly two thousand persons, instances where the accuracy of the genealogy has been conclusively proved by the divisions of the ancestral villages.

The old Oudh government held your theory fanatically, and considered themselves entitled to the whole rent of the land. Theoretically, they were as unquestionably right as you are. But, in attempting to enforce their views practically, they entirely overlooked (what I venture to think you do not realize with sufficient clearness) that they thereby doomed to starvation hundreds of thousands who had hitherto lived on the Government revenue. Their rents could only be collected by the most violent oppression, and as they were opposed everywhere by the strong vitality of clan-organizations, the result was a protracted anarchy which had in fact ended in their complete defeat when we took over the country. A new Government is entitled to succeed to the whole rights, as well as the whole duties of the rulers whom it displaces.

This was the problem which we had to encounter when we annexed the province, and it met with the, as I think, satisfactory answer, that the least which would support the old zemindari bodies was fifty per cent. of the rent. Fifty per cent. was therefore the necessary limit to the Government demand. I may remark in passing that this is about one eighth of the gross produce.

It is obvious that the proportion would be much higher under a ryotwari assessment, or in fact, anywhere where there was no large class which had for generations lived solely on the revenue. If an outsider might hazard an opinion, I should say, that in the Central Provinces one-fourth might have been taken with equal advantage to the Central Government and the local population. The census has a most direct bearing on the question of thirty years' assessments. If the population increases as fast as the value of the land, a thirty years' assessment is, in fact, permanent. I myself think that it will increase in about the same proportion. A Hindu is content to live as his father did, and does not care to accumulate wealth, which at the end of the period of assessment might be justly demanded from him by Government. The result is that he procreates about up to his means. The present era of unparalleled prosperity has been marked by an unparalleled number of marriages, and if we had any trustworthy statistics on the subject, it would probably be found that the births next year will be at least twenty-five per cent. in excess of those of 1869 or 1870. Eventually, the increased production is all absorbed by an increased population living on the revenue, in very much the same conditions of wealth and comfort as their less numerous ancestors. These conditions are not far removed from the minimum requisite for existence, and we can no more starve the sons than we could their fathers. The only remedy is to treat the land as a private owner, and regularly apportion the rents to the production. The alternative is in fact between a permanent and a yearly assessment. Without expressing any decided opinion, I am not myself able to propose any scheme for making the latter, and, I think, the more desirable plan work.

There is, however, another case in which perhaps Government might with advantage interfere, and which arises out of the absurd application of the theory of freedom of contract to land in India. The large talookdars will be contented to live on the best income they can obtain, without performing the troublesome duties of a landlord. In villages not yet occupied by hereditary revenue eaters, a class of contractors, undistinguishable from them in an economic point of view, will start into existence. They will increase and multiply much as other men in similar circumstances, and though they may have no legal rights against the State, there they will be, and at the end of thirty years it will be as impossible to get the revenue, which is their sole means of subsistence, as if they were protected by a hundred laws or the prescription of centuries.

OUDH, *July* 1871. X. Y. Z.

[*Note by the Editor.*]

It will evidently surprise our correspondent to be informed that the Settlement department of the *Ryotwari* districts of Bombay look upon the proposal to take 6½ per cent of the rental as "an absurdity," and never exact more than 33."—ED. *I. E.*

MUNICIPAL FINANCE.

BOMBAY, A BEACON.

AN idea seems to be entertained in this country that the masters of political science have pronounced themselves in favour of *direct* taxation, and that the practice of raising revenue by taxes upon commodities, or *indirect* taxation as it is called, is held by them to be mischievous and unsound. The fact however, simply is this, that political science teaches that were the world other than it really is, that were men generally truthful, and honest, and prudent, and wise, and that if in the Utopia of their residence it were needful to raise the vast revenues which the statesmanship of modern times has necessitated and demands, this enlightened and virtuous Utopia would nerve itself to sustain the unpleasant, but really economic, method of *direct* taxation in preference to any other. In other words, *direct* taxation is theoretically, in Utopia, the fairer and the more economic method of the two; while the unfortunate fact is that in this real world in which we live, move, and have our being, it is the most unfair and oppressive of all methods that have been devised. Where *are* men generally truthful, honest, prudent, and wise? They are the reverse of all this, and because they are neither truthful nor honest, the only way of taxing them fairly is to tax them indirectly; in other words, to tax them in ways they cannot evade, since under the direct system the honest and truthful pay, and the dishonest and untruthful do not. So again, because men generally are neither wise nor prudent, it is necessary to accommodate ourselves to the fact, and to levy taxes in a way that neither their want of wisdom nor of prudence may render abortive. Direct taxation very soon reaches its utmost endurable limits even in the wealthiest communities, while to attempt to raise a large revenue by such methods from a poor population is simple insanity. The school of fanatics which sprang up some 30 years ago at home, calling itself the Liverpool Reform Association, succeeded for a while in impressing the popular mind with the notion that the plan of indirect taxation ought to be abolished altogether, and the expenditure of all countries met by direct taxes upon property or income. The school has died out everywhere but in this country, modern experience having shown in the most conclusive manner that direct taxation is simply unendurable as soon as it becomes heavy. For many years America was the great example to which we were pointed, while the Ameri-

an financiers, than whom the world has seen [illegible]one abler, were compelled to abandon the direct system the moment it became necessary to raise a large income. In our own country, we are all familiar with the objections which lie against the income tax, a tax declared even by its supporters to be odious, unjust, and oppressive "in the highest degree," while a Committee of the House of Commons has declared this character to be inseparable from the tax. An attempt to raise £20,000,000 a year by an income tax in our own country which is the richest in the world, would be nearly impossible, while we raise forty-five millions a year without appreciably burdening anyone by taxes upon commodities. And yet M. Thiers is being fiercely assailed by the English Press for declining a task which even in our country would be declared impossible. We are not defending his budget in detail, but we say that in so far as he has determined to trust mainly to *indirect* taxation, he has shewn sound practical wisdom, and has adopted a course which we ourselves should have been compelled to adopt in similar circumstances. A few years ago, however, before the Liverpool school had exploded, shallow political writers affected to regard a belief in *direct* taxation as the mark of men who were in advance of their times, and we have unfortunately had leading men in India, within the last ten years, full of these views, who have given a complexion to the course of Legislation upon the subject. The most influential of them was Sir Bartle Frere, one of the best intentioned men that ever set foot in the country, but one of the very weakest. His chief dread seemed to be lest the world should hold him to be an inch behind the most advanced men of his time; and the influence of his counsels upon the course of official thought is traceable to this day. He would have signed away the land revenue of the country if abler men than himself had not stood across his path, while the people of Bombay owe directly to him all the embarrassments brought upon them by the Municipal Act of 1865 Who said Sir Bartle, could hear patiently of town-duties in Bombay, while the towns of England were raising their revenues by direct rates on houses? A more superficial man never rose to power, nor a more amiable one. You cannot deal hardly with him if you would, but he was weakness itself as an administrator. We have now painfully to undo his work, and to encounter the odium of seeming to advocate a retrograde policy, the fact simply being that Sir Bartle Frere committed the Island to a course of stupendous folly.

Political economists do *not* prefer direct taxation to indirect. It is the nameless fanatics of the science who do so. The masters of the science speak plainly enough upon the subject, and tell us that in the world in which we live, taxes upon commodities are the best practicable taxes we can levy. We must lay stress upon this point, because the Government of India, down even to this day has got the old leaven of delusion working in its Council Room. The attempt to substitute a house tax everywhere for octroi duties, and the ill-concealed dislike with which the latter are regarded, are reminiscences of Sir Bartle Frere's ascendancy. You may lay it down as an axiom of all finance in India, that the direct presentation of a bill for taxes by the machinery we are compelled to employ means terrorism, oppression, and disaffection; while it is simply impossible that such taxation should ever be really productive.

Sir Bartle Frere's Act decreed not merely a new constitution, but a new fiscal system for the island; and it is from this last error that *all* its embarrassments have arisen. The Act decreed the repeal of the old Town Duties of the place, and the adoption of what was erroneously believed to be the English system of direct rates upon house property in their room. The gentleman who drew the Act, and the exponents of its provisions in the Council room, all fell into the extraordinary error of confounding the levy of an income tax upon house property with the Municipal rates levied at home upon the *occupiers* of such property. Believing with all their heart in the direct rate system which prevails in the parishes of our own country, they thought they were imitating that system when they decreed that the Municipal resources should for the future, be derived from a tax upon house property in the island of 5 to 10 per cent. Misled by the term house tax, they in fact decreed that the Municipal expenditure of the island was for the future to be met by an income tax upon one description of income only, viz., that derived from house property. Had they but imposed fairly a *general* Municipal [illegible]ould have been less objection to the course, but they exempted all incomes whatever, but this one special kind. That they did so in total ignorance of that they were doing, the debates prove in the most absolute manner. They speak throughout of this special income tax upon house property, under the belief that it was the same thing as the English house tax, the fact simply being that the tax *they* were imposing was a tax upon income, the income of a single class alone,—while the English house tax is simply a tax upon expenditure. Unfortunate and unjust as this error was, they contrived to cap it by another, and that was the decree that in place of the old system of raising the Municipal income by taxes upon commodities, or town duties, these duties should be abolished altogether in favour of the system of direct rates. Now this error has been fatal to the peace of the community, and to the working of the new Act. Had they made the least exact enquiry into the economic facts of the condition of the people, they would have seen at once that the attempt to raise the income required by the city, under a system of *direct rates* would be simply a gigantic fraud. *There were no statistics to guide them*, and they made we say a stupendous blunder.

The dislike which is commonly avowed for statistics, springs in the great majority of instances from unwillingness to accept their teachings. We owe almost every social and economic reform of the age to this science, for it is the great weapon with which selfish ignorance is being everywhere overthrown in favour of enlightened and disinterested legislation. That statistics may be so carelessly compiled, or so disingenuously treated as to be useless in the one case, and misleading in the other, is of course true; but to ask us to abjure their use, or to refuse their teachings when they admit of easy verification or disproof, is the counsel of idleness or of dishonesty. Now the statistics of Bombay prove beyond the possibility of cavil, the error made in attempting to wring the Municipal income out of the pockets of the single class of house owners, and the absolute need there is of recasting the fiscal system of the island altogether. Let the reader look for a moment at the following statistics of the number of persons inhabiting each house in the United Kingdom and its principal cities, and at the number of persons to each house in the principal districts of Bombay:—

		Population.	*Per house.*
BOMBAY.—Dongree	.. ..	6[illegible],259	.. 83 persons.
Market	.. ...	75,4[illegible]2	.. 7[illegible] ,,
Dhobee Tula	.. ..	71,795	.. 58 ,,
Oomercarry	.. ..	6[illegible],[illegible]20 .. .	..● 53 ,,
Mandvee	.. ..	41,152 .. .	.. 48 ,,
Fummuswady	.. .	22,529	.. 47 ,,
Chuckla	.. ..	41,442	.. 45 ,,

Now the direct rate system at home falls upon a population housed at the following rates:—

	Population.	*Per house.*
Birmingham	338,868	5·7 persons.
Leeds	227,18[illegible]	5·2 ,,
Liverpool	482,460	7·6 ,,
London	3,[illegible]70,[illegible]00	7·8 ,,
Manchester	357,979	5·8 ,,
Glasgow	491,715	5·3 ,,
England, generally	18,954,444	5·4 ,,
Scotland	3,[illegible]62,294	7·7 ,,
Ireland	5,764,543	5·0 ,,
Wales	1,111,780	5·8 ,,
Channel Islands . ..	143,447	6·2 ,,

Thus while in England, under this system, the taxes fall upon one person out of every five, six, or seven, that is, upon every family, in Bombay they commonly fall upon one person out of every sixty, seventy, or eighty, or even in some cases 100 or 150. Now even at home it is complained that vast numbers escape contribution under this system who ought to pay; and the English Municipalities are anxious to discover some *indirect* mode of taxation that may reach them. Even at home we say the system is complained of as unfair, although it reaches one in every 5 or 6 of the population. Here it is 50, 60, 70, and even 80 and upwards, while so totally unsuited is the system to the circumstances of the people, that it is still complained that the area of collection is too wide, and should be contracted. Instead of resorting to occupiers at all, there is such

difficulty in collecting the police and lighting rates that the Justices have been repeatedly advised to go to the 15,000 *owners* for all the rates. The demand is simply an irony upon the situation to which the Act has reduced the Executive.

Let us go a little ... right ... and on Talav the system works in the great wards into which the city is divided. We take then the Mandvee and Market districts, a rich and poor one, lying contiguous to each other, and affording between them a fair illustration of the working of the system. Their population is as follows :—

	Population.	*Houses.*
Market	75,472	1,089
Mandvee	41,152	851
Chuckla	41,412	934
	157,996	2,866

There are thus 70 persons to each house in the Market, 48 in Mandvee, and 44·3 in its sub-division Chuckla, and the rates, according to the returns of a late year, fell exclusively upon 3,133 persons. That is to say, these three thousand persons paid everything; the remaining 150,000 nothing. The rates fell upon these men somewhat as follows :—

One person was taxed	...	..	..	..	Rs.	2,450
9 persons each ..	..	..	..	...	,,	1,200
26	,,	,,	..	..	..	..	..	,,	840
140	,,	,,	..	..	.	..	..	,,	500
307	,,	,,	...	..	..	...	..	,,	280
341	,,	,,	.	..	...	..	..	,,	168
824	,,	,,	...	..	..	..	..	,,	120
1,354	,,	,,	..	..	.	.	.	,,	42
133	,,	,,	..	..	..	..		,,	14
3,133									

Can anyone wonder that there are 7,000 distress warrants running in Bombay for rates levied in this infamously cruel way? If we allow that each man was married, and allot to him the average number of children in each family in the island, —the population being an adult population in the main— the 3,000 tax-payers in these districts represent a total number of 8,366 men, women, and children. Thus the taxes fall with confiscatory violence upon the few, while the 150,000 never receive a visit from the tax gatherer at all. The 3,000 of course complain bitterly, and fill the town with their out-cries. For the tax-gatherer passes by the 70 persons, and falls with the weight of an avalanche upon the 71st, and the wiseacres of the local press then complain that the taxes are most oppressive. Is it a satisfactory reply to this disclosure to affirm that in one way or other, the rates percolate through those victims to the 150,000 beyond? As a matter of fact, it is certain they do *not*. But were it ever so true, where did the Bombay community get the right to lay upon their victims the burden of collecting in 70 driblets the heavy assessment they force from them in a lump. The course is a violent injustice, without excuse, and without precedent. Were the percolation perfect and complete, the system would still have to be condemned. We have been at considerable pains, to analyse the *Census* of 1864, and find that the population is made up as follows :—

Merchants, Bankers, Civilians, &c., and their families ..	53,639
Shopkeepers and their families	17[illegible],707
Artisans and Labourers	317,545
Domestics and other Servants	94,116
Professions, Doctors, Priests, Writers, Teachers, &c .	13,750
Boatmen and Harbourmen	53,974
Soldiers, Policemen, Hamals, Ramoosees	34,979
Prostitutes, Musicians, and Beggars	4[illegible],246
	818,036

Look at that population, chiefly adult, and then say that the right way to tax them is by direct rates on rental when they are living 60, 70, and 80 in a house. If the question is approached with candour, the conclusion is certain that there is no possible way of taxing such a population equitably, but by taxes upon articles of consumption; and that the revenue of the island must be raised by *indirect* taxation of some kind or other. The taxation of the island is not heavy: it is exceedingly light, but most iniquitously levied.

The direct rates constitute two-thirds of the whole amount of the taxation of the city, or £200,000 out of the £300,000, and as they fall upon 15,000 or 16,000 men only, what wonder that there is suffering. They are making these few thousand men pay the taxes of the whole island, upon the pretence that they percolate through the few to the many beyond, while the pretence is a pu[illegible]um. Look at the fact of 100,000 domestic servants in the island, living in comfort, and all saving money, and not one of them being taxed a rupee. Now, it is an axiom of political science that a system of direct taxation, based upon the exemption of large classes, is confiscation, and nothing else. It is quite true that the house owners of Bombay, a mere fraction of the people, are grievously burdened, but simply because the masses of the community are untaxed altogether.

And now, as to the appreciation of this rate system in our own country. It is as much one of the questions of the day there, as here. It is the fact that at the very moment when they were madly setting up this system in Bombay, they were finding it utterly intolerable at home, although the system might reasonably have been expected to work there if anywhere. The London *Economist*, a great authority upon these subjects, wrote recently concerning this very system of direct rates as follows :—

"The radical defect of the present system of local revenue is its dependence on a single source and its emphatic want of elasticity. The owners of property and the occupiers of taxable houses are only a part, and not the larger part perhaps, of the locality to be dealt with. *The thing to be sought after is a local revenue from several kinds of consumption, something corresponding to the excise and customs duties of the National Exchequer.*"

The direct system is thus felt to be unjust and oppressive, where the rates fall upon one person in every 5; what must they then be when their weight is concentrated upon one person out of every 70, 80, or 100? Let us now see what economic authorities really do say about the respective merits of direct and indirect taxes. Mr. Mill says :—

"In so far as the house-tax *falls on the occupier*, it is one of the fairest and most unobjectionable of all taxes. * * * But even a house-tax has inequalities and consequent injustices, no tax is exempt from them; and it is neither just nor politic to make all the inequalities fall in the same places by calling upon one tax to defray the whole, or the chief part of the public expenditure."

Could human language more explicitly condemn what we are doing in India, where we make the tax fall upon the owner, and are told that we ought to take every rupee we require out of this one source of income. Now mark what a great authority (McCulloch) says in support of such taxes as the town duties :—

"All attempts to assess individuals in proportion to their incomes, must necessarily miscarry, and will most likely be in the end productive of more evil than good. *Nothing therefore remains but to adopt the best practicable taxes, and these appear to be duties on commodities or on expenditure.*"

Mr. Laing goes a great deal further, and says :—

"*Magna Charta* is to the common man a trifle, a straw, compared to the great social right of paying taxes only for what he consumes. Exemption from *direct* taxation is the main point of difference between the taxation of the subject of a free and of a despotic State, a citizen and a serf."

Another considerable authority, Mr. Greg, says :—

"There is no tax to which objections do not apply: no tax which is not more or less inequitable in its pressure, injurious in its operation, and annoying in its collection. This objection, though from its universality not decisive against any particular tax, is decisive against making it the only one. *It is in a variety of imposts that we are to look for the solution of the great problem, how to make taxation equitable and endurable.* * * *The apparent merits of direct taxation are apparent only.* Finally, taxation whether direct or indirect, cannot be, and ought not to be, confined to a few; to approach this, verges upon confiscation; to recommend it, is to preach Jacquerie and spoilation."

What could more expressly condemn what they are doing in Bombay, where they are making the whole weight of the taxes fall upon one in sixty, seventy, and eighty of the population, and where the mischievous folly is preached up that the many ought not to be taxed at all, but that the house owner ought to bear all the burdens of the place. Adam Smith says, that "the subjects of every State ought to contribute towards the support of "the Government as nearly as possible in proportion to their "respective abilities; that is, in proportion to the revenue, which "they enjoy under the protection of the State, and that in the "observation or neglect of this maxim consists what is called the "equality or inequality of taxation;" while Mr. Dudley Baxter, in his late book upon taxation, affirms "No man who is able "to labour ought to owe either his home or protection to "the charity of others, or to throw upon them his fair share of

"the burden; but that *every* individual, in just proportion to his "abilities, ought to contribute to the expenses of the State."

And this brings us to remark that economists do not even lay down the rule that we must not tax necessaries of life. In the salt tax of India, we have a good instance of the fact that taxes upon necessaries may sometimes be the best taxes we could levy. So simple are the tastes of the people, so inartificial their mode of life, that you must either tax them through the necessaries of life, or let them go untaxed altogether. Accommodating ourselves to this fact, we raise a net revenue of £6,000,000 sterling a year from salt, and the man has no knowledge of India who will affirm that there is any other mode open to us by which we could get that amount of revenue, against which ten times as many objections might not be raised. Again, a rag of some kind or other upon the loins is a necessary, but we tax piece goods 5 per cent. for all that. And once more, what do we think of the practice of taxing *water* at home for municipal purposes? They are doing so in Manchester; and they have been making preparations for doing so in London, and other cities. The fundamental principle of all successful taxation is that it shall reach *the masses*, while the notion is fostered in India that the masses should go free. If so, we may make up our minds to disease, filthiness, and death, for the few *cannot* conserve for the many. Dealing with this question, McCulloch explicitly vindicates "a moderate tax on corn or other necessaries," and warns us against "laying stress in the matter of taxing necessaries on theoretical principles," and says, "In truth the practical influence of taxes on necessaries depends principally *on their amount, and on the state of the country in which they are imposed.*" The Duke of Argyll writes quite recently on the same subject:—

"I do not concur with those who speak of entertaining a very strong feeling as to the morality of taxing such an easily and widely produced necessary of life as salt. The justification which has been suggested as the only one for this tax is the only justification of any tax, namely, that the produce is spent for the benefit of the people, and that it is so levied as to be as little oppressive as possible on all grounds of general principles. Salt is a perfectly legitimate subject of taxation. It *is impossible in any country to reach the masses of the population by direct taxes. If they are to contribute at all to the expenditure of the State, it must be through taxes levied upon some articles of universal consumption.* If such taxes are fairly adjusted, a large revenue can be thus raised, not only with less consciousness on the part of the people, but with less real hardship upon them than in any other way whatever."

Is this not explicit enough? Town duties are defensible, on the simple ground that *while they reach everybody, they oppress nobody;* defensible on the very same ground as the tax on water in Manchester. Why should it be right and proper to tax water there, and wrong and improper to tax grain in India? In London they are levying, and are going to levy for twenty years to come a very heavy duty upon one of the first necessaries of life. The duty levied upon coal in London amounts to 20 or 30 lakhs a year, and Parliament has pledged itself not to reduce that duty for 20 years. The very same question which we are debating in India was raised in Parliament in 1868, when it decided that it was better to tax this necessary of life five per cent,—mark the rate,—rather than raise the *direct rates* of the metropolis. And yet Adam Smith says:—"In a country where the "winters are so cold as in Great Britain, fuel is during that "season, in the strictest sense of the word, a necessary "of life, not only for the purpose of dressing victuals, "but for the comfortable subsistence of many different sorts of "workmen who work within doors, and coals are cheapest of all "fuel." The very same arguments that are used against town duties in India, were used in London against the coal dues. Mr. Candlish complained that these "coal duties were a tax "upon one of the first necessities of human life, to the amount "of 1s. 7d. per head per annum for each man, woman, and child, "in the London district." Coal, too, he added, "was one of "the raw materials entering into nearly all our manufacturing operation and hence was a tax upon all our manufacturing processes." London, he said "ought to provide for its municipal necessities by local taxation, and not by *octroi* duties." What are these arguments but the very arguments used in India. Parliament would not listen to Mr. Candlish, and would not be held back from levying the duties, and such dues are levied not in London alone, but in Brighton, Dublin, Newcastle, and other towns. There never was a more deplorable blunder than the system of finance ignorantly set up in the island of Bombay. Against every *direct* tax upon *the many*, there [illegible] country an insuperable objection in the way of its collection. It has been affirmed that for every rupee which finds its way into the Municipal Exchequer from these direct rates, five rupees are taken out of the pockets of the people by the machinery employed in collecting it. Direct taxation of the masses never has been successful in India, and never can be. We could have no better authority upon this subject, than the Local Government of Bengal, and he says:—

"All history and all experience show that direct taxes are unpopular in all countries, and that they are especially unpopular in India, where even in a minute form they have already on some occasions excited a popular resistance, usually foreign to the character of the people. That direct taxes levied from a large proportion of the population will be detested is, I think, unquestionable."

Concerning a house-tax in particular, he says:—

"Unfortunately it is everywhere most unpopular, and it is particularly so in India, as our experience of the small chowkeedar tax in towns has shown. I do not doubt that by a general house tax unflinchingly carried out throughout all India, a considerable sum might be realized. But the doubt strongly arises to my mind whether it would be worth our while to assess and collect an odious tax over so vast a surface. I do not think it would pay the soldiers required."

We conclude then that it may be laid down as a leading principle of Indian finance, that *direct taxes upon the poor must ever be odious, oppressive, and dangerous, from the character of the machinery to which their collection is entrusted.*

To make a gross collection of about 3 lakhs of rupees, they have been sending out in Bombay some 50,000 bills to be collected from some 15,000 of the poor and lower middling classes, whom they dignify with the title of house owners. A more monstrous system was never heard of; but this absurdity is the direct outcome of the notion, that everything English is the perfection of wisdom, and that everything Indian should be recast upon the English model. Does any man believe it to be even tolerable that 50,000 bills should be put into the hands of the peon class of Bombay, for a gross collection of three lakhs of rupees a year from the people, to be backed up by the issue of thousands of distress warrants?

THE TOWN DUTIES AND GENERAL REVENUES OF BOMBAY.

THE present town duties of Bombay are levied in a most unintelligent manner. It was impossible to get them levied in proper form in 1868, owing to the excitement in the island from the mischievous writings and speeches of the gentlemen who had got possession of the public ear at the time. We were but too glad to get the duties introduced at all, and were compelled to keep back the statement of our convictions as to their proper weight and incidence. The duties as at present levied and their yield are as follows:—

Town duties, Bombay, 1870.

Grain and Pulse ...	710,356	candies	@	4 annas per candy	Rs. 1,77,589
Ghee	284,379	maunds	@	6 annas per maund	,, 1,06,583
Sugar, Jaggery, &c ..	10,763,224	Rs. value	@	1 per cent ..	,, 1,07,638
Wines and Spirits ..	966,845	gallons	@	2 annas per gallon	,, 1,20,857
Beer	321,328	gallons	@	6 pies per gallon ..	,, 10,041
Metals	10,224,010	Rs. value	@	½ per cent	,, 51,906
Timber	2,245,016	,,	@	2½ ,, ...	,, 56,125
					Rs. 6,30,139
Drawback or refund				13,316	
Charges of collection				23,623	
					36,939
				Net Income ..	Rs. 5,93,200

Note.—The candy averages ... ... 740 lbs.
The maund is the local maund of .. .. 28 ,,

Now observe how unintelligently these rates have been enacted. Grain is sold at so many rupees per candy, the quotations rising or falling in general by the rupee, and *not* by the anna. To make the duty therefore fall upon the consumer, upon whom it is intended to fall, the rate should have been at least ½ a rupee per candy. Far better would it have been to make it

boldly and at once one rupee, when there would have been no room for doubt as to its real incidence, and when by so doing we should levy in the simplest way and by a single intention, as surgeons say, the whole amount we deem it necessary and equitable to take from the poorest classes. A rupee per [illegible] would be as nearly [illegible] paid on Taleetax of one rupee per year, and we say advisedly that *this is the proper tax* to levy upon the masses of Bombay, as their contribution to the water supply and conservancy of the island : and the men are political quacks who talk of such taxation being either oppressive or opposed to political economy. The same want of intelligence fixed the tax upon ghee at six annas per maund and one per cent. upon sugar. Bear in mind that the object is to set the people free from the calls of the tax-gatherer, to abolish a system of direct rates under which the most scandalous extortion may, and we are assured does, exist without the possibility of its prevention. Poll the people on the subject. Ask *them* whether they prefer the tax collector's peon and his bills, or an almost imperceptible addition to the price of their ghee and their sugar. And if *they* deliberately prefer the latter, who has the right to say them nay ? It is a question of statemanship, and not one of political economy at all. The people prefer to be taxed through the commodities they consume, and it is the only way in which they can be taxed with fairness and without oppression, while the political quacks of the place declare it contrary to principle to allow it. They mean that it is contrary to the axioms of the great school of Noodledom to which they all belong. The same mistake as with grain has been made with Wines, the price of which rises or falls, not by the anna, but by the rupee. A two annas duty per gallon is almost sure to fall on the wrong person, the importer, instead of the consumer. The wine merchant cannot add four annas a dozen to his price for town duty, but if you will make the duty one rupee per dozen it will fall steadily on the consumer. The duty on Beer is hardly worth retaining, while the duty on timber should plainly go altogether, the cost of timber being already ruinously high in Bombay. The tariff of duties ought then to be about as follows :—

What the Town Duties ought to be.

Grain and Pulse ..	71[illegible],000 candies	@	1 Rs. per candy ..	Rs	7,10,000
Ghee . . .	2,84,379 maunds	@	1 Rs per maund ..	,,	2,84,379
Sugar, Jaggery, &c ..	10,763,224 Rs. value	@	5 per cent.	,,	5,38,161
Wines and Spirits ..	966,845 gallons	@	8 as. per gallon ..	,,	4,83,422
Beer	321,128 gallons	(Free, or 4 annas per gallon)			
Metals	... 10,223,910 Rs. value	@	2½ per cent	,,	2,56,530
Timber . .	2,245,016 ,, ,,		(Free)		
				Rs.	22,72,521
Less—Drawback and cost of collection					40,000
			Net Income ..	Rs.	22,32,521

Now here is a revenue of 22 lakhs a year, instead of the present six ; and the greater amount would be raised with just as much ease, and with just as little consciousness on the part of the people as the lesser, while by adopting this tariff we might at once extinguish the army of leeches now let forth upon the town for the levy of direct rates. The men who imposed this direct rate system meant well ; but a more patent blunder was never committed than substituting it for the old town duties of the island. Instead of attempting to defend and bolster it, the rates should go by the board altogether, as contrary to sound policy, and all statesmanship worthy of the name. We have said nothing of the impost on metals which, however, is most legitimate in so far as the metals are consumed in Bombay itself, while a refund could without difficulty be allowed on their exportation either in the manufactured or raw shape if thought desirable.

The liquor licenses should be retained, but instead of Rs. 1,50,000 a year, should be made to yield double or treble that small amount. The tobacco and snuff duties should also be retained. and if possible enhanced, while the water rate should be recast altogether. What could be more unjust than the system under which that rate is now levied ? It is imposed under Section 85 of the Act of 1865, which empowers the Commissioner " with the consent of the Justices and the sanction of" the Governor in Council to determine the amount of the rates," which have been fixed as follows :—

By Metre at 1 Rupee per 1,000 gallons.

By assessment on rental { 5 per cent. on the 1st 100 Rs. / 2½ ,, ,, 2nd ,, ,, / 1¼ ,, ,, every succeeding 100 Rs.

Now there are in all 7,000 or 6,000 connections, or private services pipes in the island, and though the total cost of the whole supply including the sinking fund, is but Rs. 2,50,000 a year, these 7,000 men are made to pay 4,00,000 a year, simply for taking their share of the water through a private pipe. Thus these 7,000 persons are not only paying the cost of the entire supply, but are made to furnish a sinking fund of Rs. 1,50,000 a year to extinguish the original cost of the works. We do verily believe that there never was in any civilized community yet so gigantic a system of fraud as the fiscal system of Bombay. There is but one word for it. It is a gigantic system of fraud, and its victims are the men against whom the distress warrants are out. This water rate is levied moreover upon a principle diametrically opposed to the right one. The rate should be light or heavy as the rental is low or high. A rich man will take more than his fair share of the supply and might be charged the fancy rate of 5 per cent., while the poor man should plainly be charged the lowest rate 1¼ per cent.

The wheel tax of the Island would be unexceptionable were it but equitably levied. The tax yields about Rs. 2,25,000 a year, and is professedly levied for the maintenance and repairs of the existing roads and for the construction of new ones, and nothing could be more equitable than to order that they for whom the roads are thus made and kept in order should defray the cost of the work. But observe the violation of all equity that takes place in the apportioning of the rates. It was ascertained in a very ingenious way by the Executive Engineer a few years ago, that the bullock hackeries which are on the road all day long, grinding the metal to powder under the heavy loads which they carry, without springs of any kind to distribute the pressure, abrade and destroy the roads far more than the office shigram or the private carriage which upon the average is running perhaps one hour out of the 24. But while the bullock hackery, which is engaged in the commerce of the Island, is charged no more than Rs. 12 per year, the one-horse shigram of the poor clerk, and the private carriage of the officer or the official are charged Rs. 54 and Rs. 84. Now what is this but to lay the poor clerk, or the soldier, or the official, under contribution to the commerce of the place ? The bullock hackery is lugging cotton or piece goods about all day from godown to wharf, or from wharf to railway, but instead of the tax being levied on its wheels proportionably, to the mischief that they do, the tax is reduced to nothing that the tariff of hackery rates may be made 12 annas per day instead of 14. In other words, the unfortunate owners of the shigram and the carriage are required to pay four times the amount of an equitable assessment, that the merchants of Bombay may be able to hire the bullock hackery at 12 annas per day, instead of 14. The want of intelligence shewn in such arrangements becomes want of honesty when the injustice has been pointed out; and however much it may offend the Bombay Justices to be told so they are as a body wanting in political honesty. They seem determined—at all events certain of them who aspire to be their leaders—*not* to be honest. Their pride has taken fire at the charge, and they refuse to see the injustice of what they are doing. A carriage of some kind or other is a positive 'necessary' to an English gentleman in India, however poor his position, while this enlightened community levies a heavy fine upon him for not having the physical power to walk four or five miles from his dwelling to his office, and back again. Nothing is more certain than that the wheel tax ought to be re-cast, and the position of the bullock hackery and the shigram reversed.

Instead of the amorphous botch of a thing imposed upon the island, called by courtesy a budget, the ways and means should be something like this :—

Town duties *(recast)*	Rs. 22,00,000
House Tax 5 per cent. *(old prescriptive rate)*	5,00,000
Halalcore cess *(not a tax)*..	2,00,000
Water rates *(recast, not a tax)*	[illegible]
Wheel Tax *(recast)*..	4,00,000
Liquor Licences *(recast)*	3,00,000
Tobacco and snuff	2,00,000
Market Fees *(not a tax)*	2,00,000
Fire Insurance *(not a tax)*	5,00,000
	Rs. 48,00,000

Now Bombay can perfectly well afford a municipal income of this order, and it *must* have a municipal income of this order to do what is absolutely necessary to be done in the island, and the neglect of which is a reproach alike to the Municipality and to the Government. First of all, the water supply must be placed on a safe footing. In a tropical city, where an unlimited supply of water is to be got at a moderate cost, it is sheer drivelling to be enquiring for years together into the exact number of gallons necessary to meet the absolute wants of the place. *Every* tropical city should supply itself with an unlimited store of pure water if it is to be got, for purposes of health, cleanliness, economy, and beauty. For a very moderate outlay, Bombay may supply itself with sufficient water to send pure living streams down every street of the city from one end of the island to the other, to the indefinite comfort and enrichment of the people. In the next place, it is absolutely necessary to pull down the Cocoanut plantations at Girgaum, and to make openings in the native town as lungs for the place, and to give the children green play-grounds in every district. Then there is that pestilential swamp at Worlee to be reclaimed, and made beautiful. And finally, there is provision to be made for the drainage of the island when we have once made up our minds as to the right system. Now all this means that the island wants 50 lakhs a year of income instead of the present 30, while it is as certain as the Sun in the heavens that the amount can be raised without issuing ten distress warrants in a year, if we go about it in the right way. By the direct rate system it is hopeless. In the way we have pointed out, it is a matter of the greatest possible ease. We do very earnestly trust that wisdom will be given to the Bombay Government to settle this great question in some such way as we have pointed out. No other is open to it that will not perpetuate the present suffering and oppression of the people. It is not the weight of the taxes—for they are absurdly light—it is their partial and unjust incidence that at once oppresses the people and starves the Executive.

FIRE INSURANCE.

A SOURCE OF MUNICIPAL REVENUE.

We are now about to suggest a source of income so obvious when once pointed out, so unexceptionable in itself, and the failure to avail ourselves of which is the occasion of so needless a waste in Bombay, that we are astonished it should have escaped observation so long. For some years, the conviction has been gaining ground that the State might with great public advantage take upon itself the business of Life Insurance, now carried on by private Companies, to the indefinite profit of the shareholders, and loss of the insured. Nothing could be more wasteful than the present system under which enormous sums of money are annually squandered in commissions, advertisements, printing puffery of all kinds, and the maintenance of establishments and agencies of the most costly character. Now this is nearly all waste, and simply means needlessly high rates of premium. Were the State, in other words, the Commonwealth, to become the great insurers of the people, it is perhaps not too much to affirm that 9-10ths of the present outlay upon the mere machinery of the work would be saved. The vested interests, however, represented by the Insurance Companies at home, are so powerful that it is doubtful if this generation will witness a reform. In India fortunately the business of Insurance has not yet reached the 'vested interest' stage, and we may here rest it, and if wise will do so on a broad and economic foundation. The bills of mortality now carefully registered throughout the country and the forthcoming census, should, from the first, be regarded but as stepping stones amongst other reforms to the introduction and establishment of a great system of State Life Insurance throughout the Empire, and the sooner the commencement is made the better. In the nature of things, the initial steps can be tentative only, but we [illegible] sanguine to forecast that were the State to address itself seriously to the task of [illegible] system of National Life Insurance in India, within a generation of years, it would be found to be the source of a vast and constantly growing income that would make us independent of the most obnoxious and precarious of the present sources of our revenue.

It is not with *Life* Insurance, however, that we are now concerned, which should be the business of the State, but with Fire Insurance, which it seems to us is the undoubted business of every well-organized Municipality in existence. As the State should be the great *Life* Insurance office of the people, so should every Municipality in the Empire be the great *Fire* Insurance Company of the city, town, or rural district. Insurance should be compulsory on all, a special rate being levied for the purpose. Nothing could be more unsatisfactory, or demoralizing, than the working of the present system. It is perfectly well-known that a vast majority of the fires which occur in the great towns of England are incendiary, the property being fired to obtain the amount of the policy. The Companies and the Fire Brigades are quite aware of the fact, and systematically connive at it, prosecuting only in cases where the accident is a public scandal, for a serious fire sends hundreds of new insurers into the offices, while the competition for business is so keen that an office which should contest payment of its risks, would soon find itself without business altogether. Fires arising from pure accident are rare everywhere, and were the Municipalities to undertake the risk, the insurance made compulsory on all, and the cause of every fire carefully sifted to the bottom, the rates might be made exceedingly low, while they would yield a very important income to the community. Insurance should be compulsory, for when a fire does occur in a crowded town, no one can tell to what extent it may spread, while, let the area of the loss be as great or small as it may, the advantage of spreading it equally over the community is obvious. Fire Insurance should be as much the business of the Municipality as the establishment of a Fire Brigade, while a minute tax levied in this unexceptionable manner upon all descriptions of property might be made the source of a very large income.

Now if there is one city in the world in which these considerations have greater force than another, it is in the city of Bombay. Let the reader listen carefully to what we are about to reveal. The story is so instructive, and so startling, that it ought to produce a sensation. The risk from fire in Bombay is as small as in any city in the world. The island knows no winter, and has neither fireplaces, nor stoves, nor chimneys, nor gas, in almost any of its dwellings Doors and windows everywhere stand wide open, the walls bare of all hangings, and the rooms of furniture, that could be fired. The people work very little by candle light, and the town is darkness by about half-past nine The only fire in the house is the charcoal sigree, or the stone cooking place, and it is not too much to affirm that the risk from accidental fire in Bombay cannot be one-tenth of what it is in London. As matter of fact, fires are almost unknown in Bombay. Well, the rates of the great English Fire offices are at home as follows:—

s-d	
1-6	per cent. for Ordinary risks.
2-6	,, for Hazardous risks.
4-6	,, for Doubly hazardous risks.

Now ten or twelve of the chief of these offices have agencies in Bombay, and what rate does the reader suppose these agencies have combined to charge the island?

22s. 6d. per cent. for Ordinary risks

The full force of the wrong came home to ourselves a few days ago in the following way:—We have just established the *Economist Press* in Bombay, and, as prudent Englishmen, wished to insure the plant of the office, when we were presented by the——Agency with a Bill for Rs. 460 for an

insurance of Rs. 40,000. Gentle reader, in London the insurance risk would have been £3 to £4. Now see what this means. The preposterous rate of 1½ per cent. is charged by the agencies of the great London Companies millions of merc[illegible] on the Island, and *the whole of it*, less the commission of the agent, is every year transferred to London. What is the total amount of the risk undertaken by these offices, we do not know. It is probably not less than five to ten millions, and instead of the community insuring the property itself, it ignorantly suffers this drain of £50,000 to £100,000 a year to be made from its resources. If the community were wise, it would not suffer the establishment of these offices at all in the Island, and the growth of vested interests in such a case. The house-property of Bombay cannot be valued we believe at less than £30,000,000 sterling, and other descriptions of property at another 20,000,000, and were Insurance made a Municipal law, an annual rate of 2 annas per cent. on value would yield a clear income of £62,500 a year. The rate would operate as a sort of mild property tax, having the enormous advantage over such a rate, pure and simple, of guaranteeing the property assessed from all risk by fire. The Insurance should be compulsory upon houses, and perhaps upon furniture and stock-in-trade of the value of 1,000 Rs. and upwards. The burden would be almost inappreciable, while its imposition should effectually silence the opposition to town duties upon the masses who would escape all contribution to the property tax, or Insurance against fire. It would, of course, be easy for us to start fifty small objections to the proposal, but we leave that part of the business to certain Bombay dailies that seem to think it their special office to oppose everything they find in our columns. Suffice it to say, that for ourselves, we see "no" lion in the way whatever. The rate should be compulsory for the plain reason that although a man may not care to insure his own property, a fire occurring therein may destroy the whole street, and the rate must be general to justify the taking of the risk. The Municipality under this system would itself rebuild all properties destroyed by fire upon a system devised to prevent their future occurrence.

THE SOOPA SETTLEMENT.

A HINT TO MR. HUME.

THE wounded vanity of Mr. Beyts will not it seems let him sleep, and though the Soopa report is a by-word, we have him again striving in a column or two of small print to shew that when he said one thing, we ought to have understood that he meant another, and are guilty of the utmost dishonesty for attaching to "semi-technical" words their real meanings, but which we are assured, with amusing self-complacency, are known only to officers of the department. Now Mr. Beyts may as well cease this tall, silly writing. That he has an acquaintance with the details of Settlement work in this Presidency, to which we can lay no claim, is certain, but he plainly has very little acquaintance with the principles of Settlement work generally in the country, as we shall presently shew. When he tells us that the word 'waste' in this presidency has a "semi-technical sense" and does not mean *Khar* land, he is simply trifling, and when he tells us that we do not know what the 'right of occupancy' means, he is simply rude. At all events, it does not mean 'tenants' improvements,' which Mr. Beyts has tried to make it mean, in apology for the misleading statements in his report. That the talook has been absurdly under-assessed is doubted we suppose by no one but Mr. Beyts himself and the Bombay papers who profess to believe it all right. Let the honest fellows go on bepraising the report and its "moderate views of assessment" as long as they please; our object is accomplished: we shall see no more of such reports.

These exhibitions of Mr. Beyts, and his lofty and condescending explanations of the nature of his work, which we are assured we cannot possibly understand or appreciate, are simply indications that his [illegible]ity has been deeply wounded by the criticisms which his report provoked, and absolutely demanded. His own absurd self-complacency, the unwatchfulness of his superiors, and the reactionary tendency of the times between them have betrayed the Government into sanctioning a Settlement that is simply a scandal, at a period when the State is suffering severe financial embarrassment. Our estimates, forced upon us by the absence of all statistics in the report, may or may not represent the exact truth. Whether *they* are absolutely correct or not, or characterized by more or less error, is a matter of no moment whatever, and does not touch the real issue. The fact remains that this Soopa talook which is one of the very richest in India,—unless Mr. Beyts' own description of it is altogether false—which has grown immensely wealthy during 30 years of unduly low assessments and unprecedentedly high prices, and for which the State has now done everything it can possibly do—even to the length of sending a railway through it at a cost of £20,000 or £25,000 a mile—has been re-settled by this wise and now indignant gentleman for 30 years to come at all but the very same rates imposed thereon 30 years ago! And the instrument of this monstrous folly instead of modestly keeping silence under the criticism which such work provokes, and necessitates attempts to brazen out the matter by a flood of conceited assurances that men outside the department cannot possibly know anything of the merits of his work because they know nothing of its nature. Mr. Beyts and his sycophantic allies in the Bombay Press make take our word for it, that the mistake he has made is as well discerned *inside* the department itself as by the *Indian Economist*.

And now for a word or two to shew this conceited gentleman that he has a good deal yet to learn of Settlement work which he would do well as soon as possible to master. Let no one suppose, however, that what we are about to say is merely for the enlightenment of Mr. Beyts. It is a fact of great importance at the threshold of the renewal of those Bombay leases, that the local Government should be aware that the Bombay Settlement department has taken up the notion that for the State to levy as its share 60 per cent. of the 'net profit' of cultivation—as Mr. Beyts terms it—or the "net produce" or "net assets," as they call it in the North-West, is "an absurdity." That is the word he uses. The reader will see directly of what immense importance is the fact to which we call attention. To make the State of the case quite clear, we reproduce once more the following statement from the Pardee Settlement report. Mr. Beyts is dealing with the farming profits of the talook, and he says:—

As it is considered that sugar-cane cultivation once every fourth year, with ordinary jerayet rotations, is more paying than a succession of vegetable crops, not much in demand in an out-of-the-way district, I will assume the following rotations—1st year, hemp, which is only grown to serve as manure for the cane, and is ploughed into the soil in an half-grown state,—cane seed is not put down until the second year, so that this particular kind of cultivation actually engages the soil two whole years. For the third and fourth years my estimate for jerayet mixed, and Kodra crops, will stand good—

First and Second years' expenses:—	Rs.	As.
200 cart loads of tank deposit for top dressing	10	0
Ploughing	2	8
Hemp seed, 3 maunds, or 120 lbs	3	0
Weeding	1	0
Ploughing the land over and over about 16 times	23	0
2,000 joints of cane for planting	50	0
Hire of sowing implements, 16 bullocks, and 16 men for planting the cane	8	0
Fencing the field closely against the depredations of wild animals and thieves	6	0
Cost of irrigating the field throughout the season	30	0
Weeding four times at intervals	4	0
Half the actual price of leather bags and well ropes, which generally last two cane seasons	6	0
Hire of watchmen for six months, at Rs. 3 per mensem	18	0
Fuel for boiling the juice, hire of bullock power, and pressing mill, &c., during the eight days necessary to dispose of an acres' produce	40	0
100 earthen pots to hold the sugar	5	0
Conveyance to railway station, or market, generally at a sea-port	6	0
Farmers' personal superintendence during four months, at Rs. 8 per mensem	32	0
Total	243	8
Return—Coarse sugar, 120 maunds, or 4,800 lbs. at Rs. 3 per maund, delivery at market being included at this price	360	0
Balance in favour of Field	116	8
Add profit *vide* the 2nd and 3rd years' jerayet estimate, para. 20, to suffice for the third and fourth years' garden rotations	29	4
Total profits in 4 years	145	12

"These estimates of net profit are fairly drawn up. And suppose the field owner to hire labour and implements, should he use his own cattle, and the members of his household engage themselves in the operations of the field, so much will be saved in the expenses of the farm. By rent computations, we thus most usefully find the value of jerayet land to be Rs. 5, rice land Rs. 31½, and garden land Rs. 37 per acre. Now, according to the proportions officially laid down in the records of the Collectorate, Government are entitled to 60 per cent., and the ryot to 40 only. This would, I need not say, be utterly impossible to levy. A reference to the 54th and 55th paras. of my Soopa Settlement Report plainly shews that this proportion is an absurdity, and that in reality, one-third of the produce is about the heaviest assessment ever imposed by our Government."

Now if Mr. Beyts is to be regarded as expressing the matured views of the Settlement department of Bombay observe, where we are landed. The relations of the State towards the land in this Presidency have ever been distinguished from those which prevail in the North-West Provinces by the fact that on this side of India, the State (with unimportant exceptions) is acknowledged to be the *sole* proprietor of the soil. The ryots of Bombay hold direct of the State as their great, sole landlord, under what is called a right of occupancy. But in the North-West Provinces, the existence of a positive co-proprietorship in the land on the part of the zemindar has ever been asserted and allowed. Under Mr. Bird's settlement, it was thought that fair provision was made for these private landlord rights, by fixing the State share at ⅔rds or 66 per cent. of what Mr. Beyts calls the 'net produce,' while in Bombay, where no proprietary or private landlord rights exist at all, or even a pretence to such rights, we are told that it is a positive "absurdity" to talk of taking even 60 per cent., and that ⅓rd or 33 per cent. of this 'net produce' is the "heaviest assessment" ever imposed by the Bombay Government! Well, if this be so, the sooner the so-called private landlords or zemindars of the North-West surrender their ancient rights to the State, and ask to be put upon the footing of the ryots, or peasant cultivators of Bombay, the better for themselves. We may fairly presume after this extract from Mr. Beyts, that the fact we have disclosed will come upon the Bombay department with the force of a surprise. If Mr. Beyts is a true exponent of "the moderate views of assessment" held by the department generally, the fact stands disclosed that the heaviest assessment we are taking from the peasant cultivators in this presidency is but ⅓rd of the 'net produce' or assets, while in the North-West, under the new settlements now in process there, they are taking 50 per cent. from the *landlords*, and are told by Mr. Strachey and ourselves that they ought to be taking 66. Do not let us humbug ourselves any longer about these "Settlement proceedings." *The Bombay system has answered, simply, because in the main, it is the clumsy device of a quit rent*, and the State landlordship is nothing more than a phrase.

It is certainly time that a special department of agriculture and land revenue were formed, and we suggest to Mr. Hume, that his very first task should be to collate the Settlement Reports of all parts of India in the most exhaustive manner. What is being done every day in the North-West, and is there regarded as a just and normal and necessary assertion of State rights, even over private *owners'* lands, is held to be an "absurdity" when proposed to be done with the soil of Bombay, which belongs absolutely to the State. Could we give even this conceited gentleman, Mr. Beyts, a clearer proof of the necessity of public oversight of even his exalted proceeding?

THE "INDIAN OBSERVER" AND THE "INDIAN ECONOMIST."

THE mis-representations of even friendly critics in the Indian Press, as to what they find in our columns, almost passes belief. Thus the *Indian Observer* which has so generously acknowledged the services we have rendered public interests, still does not hesitate to speak of the *Indian Economist* as "leading the cry for the demolition of the North-West Provinces' zemindars." The mis-representation, though not deliberate, is absolute. We have simply protested against the lowering of the State demand upon the zemindars of those Provinces from 66 per cent. of the net assets to 50, believing the assets to be in every case under-estimated. In other words, we have simply demanded that the share of the State should stand where it was fixed by the Settlement of Mr. Bird. Mr. Colvin now tells us that, as a matter of [illegible] was not taken under that Settlement, but 60 only. We have little [illegible] he is right, and that the real proportion was even *less* than 50 per cent., but when he attempted to shew that the exaction of a *nominal* two-thirds would reduce the zemindar and his family to the position of having to meet the entire cost of their living out of 5 rupees a month, we were compelled to point out that he had travestied the position of the class altogether, by representing them as dependent upon a third of the rental for their living, whereas they are peasant cultivators "eating their bread in the sweat of their brow," cultivating the best part of their holdings with their own hands, and letting the remainder to a class of tenants-at-will. We said that Mr. Colvin's memorandum was mis-leading and disingenuous. We did not mean that he was deliberately deceiving us, but simply that he had been betrayed in his apology into a statement of the case that was really untrue. In controversies so important as this land question, men must be prepared to take as well as to give hard blows. We certainly have to take our share of the 'pudding,' and believing with our whole heart in the general truth and necessity of what we urge, we are not minutely careful as to the strength with which we ourselves strike. Long observation of the course of public affairs has taught us that it is of no use in active politics to attempt to maintain a judicial tone. It is for the actual administration, for the Government, to do that. The reformer must not stay to weigh the effect of every word he says, or to point out the reservations with which his doctrines are to be received. If he does so, he will command no attention, and might as well whistle to the winds. The error of our times is *unduly low assessments* everywhere. Were the zemindaree rights of the North-West in the least danger, the *Indian Economist* would perhaps not be last in the field for their defence. The danger lies wholly in the opposite direction,—a needless and unwise sacrifice of revenue that is absolutely required for administrative improvements.

THE LEGISLATURE AND THE COURTS.

Observations on the present condition of the Law in the Punjab, and on the Desirability of substituting direct for Judiciary Legislation. Reprinted from "the Pioneer."

THIS Punjab pamphlet sings an old song. It proposes to supersede judicial interpretation of the laws by legislative explanations, issued from time to time, as occasion arises. This would be in effect to absorb the Chief Courts in the Government. It would still be necessary to hear arguments, to balance reasons, and ascertain the true meaning of disputed enactments. It would still be necessary to preserve as far as possible consistency and harmony in the construction and working of the several laws in force, and to exclude the element of personal caprice and opportunities for corrupt decisions and orders as much as possible. It has been found under every civilized government as time runs on, that these ends could be best attained, and most economically too, by the division of labour, which leads to the institution of law courts of appeal and revision; and under such a system a class of skilled, professional lawyers must necessarily grow up. Sometimes they abuse their powers, the remedy for which is a strong Bench, thoroughly versed in legal principles, and saturated so to speak with the spirit of justice and sound government; but upon the whole, and where not spoiled by a tacit understanding between them and the judges that all litigated matters are mere sport for the craft, they do immensely more good than harm. The end it is true is too often sacrificed to the means, as under the old system of pleading, or when a witness who comes forward in the discharge of a public duty to give evidence is allowed to be bullied and badgered, as if he were committing a crime; but most even of the refinements of procedure are dictated by a sense of what strict justice to the

parties requires, so far as that can be reconciled with promptness and uniformity of action.

We do not think that the demands on the district officer can be really so great as the Punjabi would make [illegible], but mere common [illegible] cannot be equal to special study and learning in this, any more than in any other pursuit. Effective laws must descend to many details, and in doing so afford scope for a very various exercise of logical power, discrimination, and general sagacity. But no one should be the mere slave of precedents, apart from the reasoning on which they rest. Strong officers are not, and weak ones are not to be made strong by merely taking away the crutches on which they have been used to rest. To assume as a principle of government that every man is fit for every kind of work, energetic, vigilant, painstaking, superior to personal influences, and to the suggestions of indolence, is to blink the commonest facts of human nature. Men must be selected, superintended, controlled, and stimulated by blame and praise, and that this may be done intelligently and to good effect, the upper departments of the administration must necessarily be assigned to men of special gifts and experience. A jumble of functions is fatal to real progress, and the very worst imitation of economy. What is wanted in the Punjaub as elsewhere, is a clear line of demarcation whenever it is possible between the judical and the executive functionaries. When such a separation of functions on account of the thinness and poverty of the population for political reasons cannot be made, the executive officer should be supplied with a good native assistant, of whom so many are growing up, well versed in the law and able to direct his superior's attention to the rulings on any disputed point. But a large discretion should be allowed to executive officers. The law on subjects relating to their duties should avoid fettering them with too many rules. Success in administration as tested by the progress and contentment of the community placed under them, should be rigorously exacted as a condition of continued employment. The feeble and injudicious men would thus be weeded out; while those who remained would support the honour of their country, and really earn their salaries. The working of such a system requires a strong hand and strong will, conscious of high aims and a genuine impartiality. If we cannot place men with these qualities of a "great ruler" at the head of our provinces, we are unworthy of our position in India: if we can they should be enabled to send the pulsations of a vigorous life to the furtherest extremities of the system. Such men, however, must not be hampered and embarrassed by having to take up the work of judges. Their policy and also their law would both suffer by the admixture of functions. Transfer this duty of judicial legislation to the Governor-General in Council, and the objections are in some respects still stronger. A royal road to the satisfactory adjustment of the complications of human interests and affairs has yet to be discovered, and the way does not lie through an extinction of the Law Courts. When the experience of five or ten years has shown where doubtful points exist in any law of general application, the Legislature may most properly step in, as in the case of the Limitation Act, and embody the results in a new statute, but the idea of superseding the Courts by a Council of the Legislature is simply chimerical.

THE INDIAN EVIDENCE BILL.

We trust very earnestly that Mr. Stephens will maintain Sections 140 to 148 and Section 158 of the Indian Evidence Bill in spite of the opposition of the Lawyers. The present unchecked license of the bar is simply an opprobrium upon the English name. The Sections of the Bill which have roused the indignation of the Bombay lawyers are as follows:—

If any such question relates to a matter not relevant to the suit or proceeding, except in so far as it affects the credit of the witness by injuring his character, the witness shall not be compelled to answer it, and if he does answer it, or refuses to answer it, no evidence shall be given of any such answer or refusal to answer in any subsequent suit or proceeding, except a criminal prosecution of such witness for giving false evidence by such answer.

No such question as is mentioned in section one hundred and forty shall be asked by any barrister, advocate, attorney, pleader, or other agent without express written instructions signed by the party on whose behalf he appears, or by the agent of such party.

When any such question is asked by any such barrister, attorney, pleader, or agent, the Court may, if it thinks fit, require from the person asking it the production of such written authority, and if he does not produce it, or if when produced, it appears to the Court insufficient to authorize the question asked, the person asking such question shall be deemed to have committed a contempt of Court; but no such barrister, attorney, pleader, or agent, shall be held to have committed any other offence, or to have subjected himself to any civil proceedings by asking any such questions.

The Judge may, if he thinks fit, take possession of such written instructions, upon their production, and write upon them a memorandum identifying the document as one called for by him under the power hereby conferred upon him, and specifying the time, place, and occasion on which, and the person by whom, the question suggested in them was asked. The Judge shall sign such memorandum with his name and official title, and deliver the instructions and memorandum to the person of whom the question was asked. Upon the production in any civil or criminal proceeding of any document purporting to be such a document, the Court shall presume that it is genuine, and that the person signing it, published the imputation suggested by it, with the intention of harming the reputation of the person of whom it was asked.

When any such question is asked by any party to any suit or proceeding, the Judge may make a memorandum of the question or questions asked, and the answers given to them, and sign the name, and give such memorandum to the witness of whom such question was asked.

No such instructions and no such questions shall be deemed to fall within any of the exceptions to Section four hundred and ninety-nine of the Indian Penal Code, or to be a privileged communication merely because the instructions were given, or because the questions was asked under the provisions of this Act.

The Court may forbid any questions or inquires which it regards as indecent or scandalous, although such questions or inquires may have some bearing on the questions before the Court, unless they relate to facts in issue, or to matters absolutely necessary to be known in order to determine whether or not the facts in issue existed.

The Court shall forbid any question which appears to it to be intended to insult or annoy, or which, though proper in itself, appears to the Court needlessly offensive in form.

When a witness has been asked and has answered any question which is relevant to the inquiry only in so far as it tends to test his veracity, or credibility, no evidence shall be given to contradict him; but if he answers falsely, he may afterwards be charged with giving false evidence.

Exception 1.—If a witness is asked whether he has been previously convicted of any crime and does not admit it, evidence may be given of his previous conviction.

Exception 2.—If a witness is asked any question tending to impeach his impartiality, and answers it by denying the facts suggested, he may be contradicted.

The Judge may ask any question he pleases in any form at any time of any witness about any fact relevant or irrevelant, or may order the production of any document or thing, and neither the parties nor their agents shall be entitled to make any objection to any such question or order, nor, without the leave of the Court, to cross-examine any witness upon any answer given in reply to any such question.

Provided that this Section shall not authorize any Judge to compel any witness to answer any question or to produce any document which under any provision of this act he would be entitled to refuse to answer or produce if the question were asked or the document were called for by the adverse party, nor shall it authorize any Judge to dispense with primary evidence of any document, except in the cases hereinbefore excepted.

These Sections lay the axe at the root of the undue license to which English lawyers lay claim as a prescriptive right, upon the pretence that the interests of justice are promoted by its exercise. The Bar itself is the very last Court to which appeal can be made as to the propriety of these sections. It is the character of its conduct, and the general indifference of the Bench thereto that has necessitated legislative interference. A very striking proof of the blindness of the Bar itself as to the evil to be dealt with is given by the Bombay memorialists who positively adduce the cross-examination of the claimant in the Tichborne case as a proof of the propriety of the present system! They say:—

The exercise by a Judge of his powers under these sections would often frustrate the whole effect of cross-examination. For instance, the questions put in cross-examination by Sir J. Coleridge to the claimant in the case of Tichborne *vs.* Lushington, now pending in the Court of Common Pleas in England, might have been almost all forbidden by the presiding Judge, if these sections had been law there.

And we take the liberty to add, *ought* most positively to have been forbidden. A more striking illustration of the undue license allowed the Bar, could hardly be given than Sir John Coleridge's conduct of this very case, in which every effort has been made by him for weeks together, and from morning to night, to entrap the witness into adopting some of the thousand

falsehoods presented to him, and urged upon [illegible] with the skill of a practised lawyer, for his acceptance. [illegible] conduct of the case is, we say, a reflection upon the Court that has permitted it, and it is an insult to the intelligence of society to affect to regard five-sixths of the questions put in the cross-examination of the claimant as conducive in anyway to the ascertainment of his identity. The Court has presented the hateful spectacle day after day, of a vulgar conflict between a skilled lawyer, striving with his whole might to foist the adoption of a string of falsehoods upon an uneducated man, who had he been but a shade weaker would have adopted half of them to find them all marshalled against him afterwards. We suppose the Bombay lawyers will admit that it is just possible the man may prove to be the real Sir Roger Tichborne, when the fact will remain, that in the mere attempt to establish his identity, English procedure permitted him for months together, to be bullied, badgered, and insulted in a way nearly incredible, by one of the keenest lawyers at the Bar. We say deliberately that the case is a positive scandal to English law, and that to pretend that the man's identity could be satisfactorily ascertained only by subjecting him to such a cross-examination as we have seen, is a pure pretence and nothing more. He may or may not be the man he claims to be, but the outrages to which the man has been subjected—without a word of rebuke from the Court—have naturally arrayed popular sympathies strongly on his side, and at last ended in nerving the man himself into contending like a bully with the bully at the Bar. If we are not much mistaken, this very Tichborne case to which the Bombay lawyers refer, will shake the whole system of this prescriptive license to its foundations. To pretend that the claimant's identity is only to be ascertained by a course such as that taken by the opposing Counsel in the case, is, we say, to insult public intelligence, while the Court that has permitted such a course to be followed deserves nothing but censure. On what grounds English journalists have abstained from noticing these proceedings we cannot possibly divine, and if the state of English law is such that opinions may not without peril be pronounced freely on the scandal these proceedings have presented, it is time that the law were amended.

OUR FINANCE AUTHORITIES.

The Indian Deficit, and the Income Tax, by J. M. Maclean, London, 1871.—*F. Algar.*

IT is impossible to review this pamphlet, in the usual way, for it bristles with propositions that not merely controvert established principles of economic science, but plain matters of fact. The only way to do justice to it, is to draw out the propositions which the writer maintains categorically, just as they stand, and leave them to the judgment of the reader. At starting then, Mr. Maclean maintains, and affects to believe:—

I. That "the Bombay merchant with his ten or twenty thousand a year pays absolutely in indirect taxes no larger a sum than the working man who with difficulty earns his ten or twelve pounds a year." (page 6).

Let us see. The amount of indirect taxation paid by this working man earning £10 or £12 a year in Bombay, is simply the contribution which he makes to the salt tax, which in Bombay is about 5 annas per head per year, and 5 per cent. in the bit of cloth which he wears, if it happens to be of foreign manufacture; for if of domestic, it pays nothing. The total contribution of the class he represents will therefore be about 1 rupee or 2s. per head per year. The English merchant of Bombay on the other hand, who is affirmed to pay "absolutely" the same as this class and no more, will be a very curious merchant indeed, if he escapes from a contribution of £100 a year in the way of indirect taxes. Thus he has to pay 7½ per cent. on all the tea, sugar, coffee, and oilman's stores consumed in his house; the same rate on every article of clothing he puts on from head to foot; the same on every dose of medicine he takes; on every bit of glass or crockery on his table; on the matting on his floor; the paint on his walls; the watch in his pocket; the jewellery on his wife; the stationery in his office; and the very ingredients of the dishes on his table; and finally on his beer, three pence a dozen: on the wines he drinks six shillings; [illegible] spirits, twelve; and ten per cent. on his pipe. In addition to this [illegible], the Municipality relieves him if he keep a couple of carriages, of Rs. 168 a year for that privilege, of Rs. 100 a year at least for the water he consumes; Rs. 120 a year to give the benefits of police and lighting to the island and the Supreme Government considerately adds to all this or (according to Mr. Maclean) *ought* to add, an Income Tax to adjust matters equitably between this "bloated aristocrat," and the poor oppressed people of the country earning but 8 or 10 Rs. a month. Now what purpose does Mr. Maclean hope to answer by such outrageous mis-statements of fact? Does he really wish to mislead? It is *the few* in India, who sustain nearly the chief burden of the customs, and we reasonably doubt if the Bombay merchant who is declared by Mr. Maclean to pay "absolutely" no more than the Bombay cooly to the Treasury, really escapes with a lighter contribution in the way of indirect taxation than £60 to £150 a year. The whole basis therefore on which the writer builds is a falsehood. To bolster the Income Tax, he boldly declares that there is no indirect taxation upon the wealthy European at all. The statement is utterly false, and with it away of course goes the whole superstructure built upon it.

The next proposition we notice runs as follows:—

II. "Indian civilians detest the Income Tax, for two good reasons; first, because it reduces their salaries, and, secondly, because it is the invention of an outsider, who was sent out with the mission to teach Anglo Indians how to count. Pride and interest alike suggested a strenuous resistance to the new tax; and a cordial alliance having been formed with the traders, those too powerful classes set themselves deliberately to work to compel the Government of India to relieve them of taxation, and throw the whole burden on the poor, whose murmurs are never heard within the Council Chambers of Calcutta or Whitehall." (*page* 7.)

We ask, can Mr. Maclean reasonably expect to be regarded as in earnest, as writing in good faith, when he assures the world that the opposition to the Income Tax arose in this way? Such writing is an insult to the community. Had Mr. Maclean, studied the statistics of the subject, he would not need to be informed that the Income Tax is an *impossible* tax in India, because as a rule there are really no incomes to assess, while it is an axiom in the science of taxation that direct taxes, based upon a system of class exemptions, is simply confiscation.

To exhaust Mr. Maclean's pamphlet in this way would be to fill the present number of the *Economist* with nothing else: and we must be content simply with another specimen or two. The next categoric statement then of this romance, to which we shall call attention, is as follows:—

III. "The Home charges consist of payments for stores, interest on borrowed capital, and salaries and pensions for work done in, and for the benefit of India, and the only specific sum in these home charges that anybody has been able to find fault with is the payment of a few thousand pounds on account of the India House Ball to the Sultan," (page 11.)

Comment is we venture to believe, unnecessary. We pass on with the single remark that there would be a want of self-respect in treating such a statement as seriously made. It is a joke, and a very poor one. The next proposition we shall notice runs thus:

IV. That the balance of trade against India which has been made the subject of so many indictments against foreign rule, is a sign not of the constant diminution, but of the steady increase of the material wealth of India." (page 14.)

So it seems that Mr. Maclean has at last got the length of discovering that the Imports of India really *do* fall short of the value of its exports by some millions a year. Well, this is great gain upon a writer of this stamp. For if any one will be at the pains to turn up the files of the *Bombay Gazette* for December 1866 and January 1867, he will find there this same writer affirming in the most positive and absolute terms that instead of the balance of trade being *against* India, as we had pointed out, that the boot was on the other leg, and that her Imports enormously exceeded her Exports, *as evidenced by the immense imports of bullion*

into the country! Day after day, did he attempt during those two months to establish the preposterous falsehood that in spite of the £16,000,000 required for the exigencies of home rule, the Imports immensely exceeded the Exports of the country. He knew very well that there *were no statistics as to appeal to*, and so led us a nice dance for weeks in the effort to make his sophistries plain to the public. *Now* matters are changed a little. The statistics are to be got by every one and he who runs, may read. And so the new dodge is to admit what was then so positively denied, and simply to deny the importance of the deficiency altogether. If we decline to argue with such writings, whose fault is it? Mr. Maclean is *not* an honest writer. He is a very accomplished man, but he unhappily regards journalism in India as a farce, and has ever done so, and the result is, that he has done almost nothing in his profession but attempt to hinder the truth from being discerned. The last proposition we notice is the admission:—

V. That amalgamation was a costly blunder

Well, who was its great supporter in the Press but he? And is it fitting that now without one word of regret or apology for the course which he then took, "the costly blunder" should be philosophised about, as though it were the work of a generation dead and gone. Amalgamation has been a 'costly blunder' indeed, and no one did more to maintain the wisdom and necessity of the measure than Mr. Maclean. It is no doubt deeply mortifying to find, upon his return to India, those doctrines completely in the ascendant which he has ever done his utmost to decry and to discredit, but we must have from him stronger stuff than this pamplet to turn back a tide, which is happily at last at flood.

AGRICULTURE STATISTICS.—MADRAS.

The entire area of the Madras Presidency comprises 143,380 square miles, or 91¾ millions of acres. Square miles 37,780 or somewhat more than ¼ of the whole is Zemindari from which no Agricultural Statistics can be obtained, leaving 150,600 square miles or 67½ millions of acres under ryotwari Settlement (including Inam land and villages) to be accounted for. There is no obvious reason to suppose that the proportion of waste to appropriated land, and the relative area under each crop varies much as between ryotwari and Zemindari tracts:—

	Square miles.	Acres.
Zemindar	37,780	24,179,200
Ryotwara	150,600	67,584,000
	188,380	91,763,200

This year no information has been received from South Canara, a district of 4,206 square miles, or 2,691,840 acres, a defect which will, it is hoped, be cured in future years.

Of the 67½ millions of acres, 26½ millions (26,290,000) are appropriated and included in farm holdings, of which 23,882,000 were under crop during the year as shown below. 2½ millions acres were fallow. The rest 41¼ millions is mountain and hill tract, forest and wood land, swamp and sand, hill and the like, unenclosed pasture land and unappropriated culturable waste:—

Food grains	21,088,000
Oil-seeds	1,018,000
Green & garden crops	336,000
Topes & Orchards	397,000
Cotton & Indigo	2,043,000
	27,882,000

By far the larger area was under *food-grains*, *viz.*, 20 millions of acres against less than 4 millions under all other products. Of the former area 3,790,000 acres was artificially irrigated rice-land, 464,000 of which grew two crops, and about half a million of acres grew rice without artificial irrigation:—

Irrigated	3,790,000
Unirrigated	499,000
	4,289,000

The rest 15,365,000 acres was under dry crops which are solely dependent on the rain-fall of the year. *Wheat* is very moderately represented in this Presidency (23,000 acres) but nearly five millions of acres are under cholum, and upwards of 1½ millions under ragi, both very important food grains in all parts of the country, and the principal nourishment of the lower orders everywhere except in Malabar and Canara. Under the head of pulses are included 1,275,000 acres of grain, which is used chiefly as food for cattle:—

Cholum	4,875,000
Ragi	1,611,000
Wheat	23,000
Paragu	1,635,000
Cumboo	3,197,000
Corrahi	1,018,000
Millets	614,000
Other food crops	410,000
Pulses &c	2,023,000
	15,356,000 acres.

Oil-seeds, &c.

Of the 1,018,000 acres under seeds of kinds, gingelly oil seeds occupied 870,000 acres, and is an important article of produce in almost every district except Tinnevelly and Chingleput. The value of the exports of this kind of produce in 1869-70, was upwards of £5,000,000:—

Rape	5[illegible],000
Castor Oil	67,000
Gingelly	870,000
Coriander	31,000
	1,018,000 acres.

Garden Products

Occupied 3,36,000 acres, by far the more important products being tobacco and chillies. Sugar-cane, which is nearly always cultivated on irrigated land, occupied 29,000 acres, and the silk industries of the Coimbatore district are represented by between two or three thousand acres of mulberry:—

Sugar-cane	29,000
Potatoes	4,000
Chillies	7,000
Mulberry	31,000
Tobacco	75,000
Miscellaneous	112,000
Chaya root dyes	10,000
Betel leaf	46,000
Plantain	17,000
	336,000

Topes and Orchards.

Of 397,000 acres covered by topes and orchards, 172,000 acre are occupied by the cocoanut, and 37,000 acres by the areca nut of Malabar, probably about half as much again would have been shown for Canara had returns been received from that district. As compared with the West Coast the plantation industry of all outer districts is insignificant:—

Cocoanut	218,000
Areca	43,000
Palmyra	19,000
Tamarind	29,000
Mango	27,000
Jack, &c	59,000
	397,000 acres.

Special Crops.

Of these, cotton and indigo are by far the most important, and occupy about 1½ and upwards of a quarter of a million of acres respectively. The tea and coffee plantation are in Malabar and the Hills:—

Cotton	1,714,000
Indigo	227,000
Hemp, Flax	23,000
Coffee, Tea	79,000
	2,043,000

No land is laid down for pasture. The cattle are grazed on fallow and unenclosed waste.

EDITORIAL NOTES.

Our last number contained an article upon *Irrigation in Orissa* from the columns of a contemporary, who seems strangely to have misrepresented the facts. We publish further on in our columns a reply to the article in question supplied by the *Englishman*.

F. F. enquires of the *Pioneer*: "Has the English plough been "modified to suit bullock draught in this country? If so, where, "and at what cost, can such a plough be obtained?" He will find the information he wants, in the *Agricultural Gazette* which accompanies our present issue.

THE *Pioneer* notices a mis-quotation made by us from Mr. Halsey's letter in the *Agricultural Gazette* for June last. The sentence was awkwardly worded, and we supposed Mr. Halsey to mean that such results were not to be got out of the soil of the Punjaub, but out of the soil of the North West. The mis-quotation was of course an intentional dishonesty in the eyes of some of our critics.

A CORRESPONDENT in Oudh points out to us that under the provisions of the Talookdars Relief Bill, one fourth of the Province will probably come under the direct management of British officers. He adds, "a finer opportunity never occurred for having Agricultural Statistics of all kinds collected and verified, yet nothing will be done unless the Press stir up the authorities." We commend the suggestion to the notice of Mr. Hume.

THE difficulty we meet in obtaining the precise information required to enable us to deal satisfactorily with the case of Mr. Narrayan Wasoodew's estate at Tanna, compels us to postpone its consideration once more. The case is important as illustrating a process that is going on all over the country, and we wish to present it in its true bearings to the public. Mr. Narrayan himself is not able to supply the information we require, having bought the property only 3 or 4 years ago. We hope the next *Economist* will contain a full notice of the case.

SOME corroboration of our estimate that the consumption of grain in India per head of the population averages about 2 lbs. per day, is furnished by the fact that the quantity of grain which paid town duty in Bombay during the last year (1870) was 710,000 candies of the average weight of 740 lbs. each. The population of the island is 800,000, and the comparison stands thus :—

	Candies	Annual consumption
Actual Import.	710,356	740 lbs = Rs. 52,56,63,440
	People.	
Our Estimate	800,000 × 2 lbs. × 365 = Rs. 58,40,000,000	

The return of imports is believed to be somewhat below the real quantities, but the figures approach very nearly it will be seen to our estimate, although the price of food, being abnormally high in Bombay, must materially affect the consumption of the masses.

THE 4½ Debenture Loan for Rs. 27,69,000 which fell due on the 4th ultimo, has been gratuitously renewed by the Government for 10 years at precisely the same rate of interest, although 4 per cent. paper is being quoted at nearly *par*. In other words the Finance Minister has gratuitously incurred a new loan for this amount at 4½ per cent., when it was quite open to him to have done so at 4 or nearly so. The whole amount of the debentures was but £270,000, while the cash balances are nine or ten millions sterling in excess of what they need be. The arrangement means that the country is to pay Rs. 13,845 a year, for 10 years to come, upon this small loan as a sheer gratuity to the holders.

THE Legislative Cobblers of B——having got their victim into tight boots, the municipal Tailors solemnly agreed that it was necessary to let out his breeches, while the Hatters' Company resolved that the way to cure his corns was to give him a new hat.—*Old Story*.

The plain palpable cause of the Municipal embarrasments of Bombay is—not the extravagant scale of the expenditure, for that expenditure ought to be largely increased, as we have shewn above—but that the Act of 1865 imposed upon the community a system of taxation so unintelligent as to be almost incredible,

Men are herding together in Bombay at the rate in some cases of even 100 in a house. The *average* is 83 persons throughout the district of Bhooleshwar, which is of itself a vast town of 60,000 people. The men are fools, and worse when the thing is once pointed out, who dream of taxing a community so housed by direct rates. You must either tax what they consume, or let them go [illegible].

A BOMBAY paper (*Times of India*) professes to give what it calls "the total working expenses of the Transports during the last season :—

Serapis	£39,100
Crocodile	34,995
Euphrates	63,899
Jumna,	59,180
Malabar,	60,678
	£258,042

The average number of passengers conveyed each voyage was 1,106; and the total number for the season 24,482, more than 6 000 in excess of the number conveyed during the previous season. The average cost of passage money, per adult, reckoning officers, ladies, and soldiers is £19-4s. The aggregate cost per adult, however, when interest on original outlay of capital is calculated is set down at £25-19s.

The statement is altogther misleading. The real cost of this service to the country no one knows, but we have strong reason for believing, as we shewed in the last last *Economist*, that it does not fall short of £750,000 a year.

THE *Bombay Gazette* wants to know if there is "any instance on record in which the State has acquired a title to all the landed property of a country except by conquest, or such tricks of usury as Joseph practised on behalf of his master Pharaoh, in Egypt!"

The writer has plainly never read the history of Joseph with attention. There is about as much ground for charging the Egyptian Minister with "tricks of usury" as the Government of India. Joseph reserved and wisely reserved 20 per cent. of the gross produce of the land for the expenses of the State, and took *no more* from the land after he had acquired a proprietary right in the soil, than he took without that right before. There is indecency in these flippant and shallow criticisms upon the Scriptures when put forward by professedly Christian journals. Let the *Bombay Gazette* go back to the record and study it, and if candid, it will change its views as to the nature of Joseph's dealing with the people.

THE same journal has made the surprising discovery that "the idea of rent, as it is now understood, is an entirely modern "conception," and assures its readers that "whether it be sound "or not, so far as regards the improvement of the land and the "welfare of the agricultural class, the fancied opposition of the "two terms—land rent and land tax—is merely a distinction "without a difference."

Is it cynical contempt for the intelligence of its readers, or editorial ignorance upon which we are to charge the fatherhood of such writing! There is real audacity in putting forward assurances of such an order in the face of a community of educated men. "The theory of rent is a modern discovery, and whether it is true or false, the distinction between rent and tax, is a distinction without a difference." Is it, we say, contempt for the reading public, or editorial ignorance that inspires such writings!

THE same journal is good enough to assure us that its main reason for advocating a permanent settlement is "that it be-"lieves real agricultural improvements can never be effectively "carried out except by means of individual enterprise."

So extensive is the writer's acquaintance with the history of modern progress, that he really believes in "the zemindar" and "the landlord" as the promoters of agricultural improvements. Were he is acquainted with the history either of his own land or this, he would not require to be told that landlords as a class do almost nothing for the improvement of agriculture. In our

own country, it is the practical farmer that does all that is done, while the condition of Bengal from zemindar neglect is the matter of constant remark. If the agriculture of this country is ever improved, it will not be by the zemindar, but by the State and the actual cultivator. We have no zemindars in this Presidency at all, while for every rupee of private capital sunk in works of permanent improvement [illegible] fifty are expended by the Bombay ryots. So much the worse, we suppose, for—the facts.

A CORRESPONDENT of one of the Bombay papers reminds us that Sir George Wingate, nearly 30 years ago, in his report of the survey and settlement of the Madeh talooka, warned us against over-assessment, as follows :—

"No unnecessary reduction can injure the country, and Government revenue can only suffer to the extent of such reduction. An error upon one side involves an inevitable ruin of the country; an error upon the other, some inconsiderable sacrifice of the finance of the State, and with such unequal stakes depending, can we hesitate as to which should be given the preponderance? The line of true policy under such circumstances is not shown in an attempt to fix the assessment at what the land will exactly bear, but in fixing it as far within his limit as the exigences of the State will permit."

We accept, and heartily endorse every word of this. Only let it be remembered what would Sir George Wingate have been the first to discern in these days that the prevailing error of the times 30 years ago was the opposite of the errors of our own days. Then it was over-assessment that had to be guarded against; now, and for many years past, it has been the imposition of unduly *low* assessments. This passage of Sir George Wingate's writing might be well taken as a motto for our Settlement departments throughout India.

The prices realized at the last Opium Sale were as follows :—

	Chests.	Highest.	Lowest.	Average.	Proceeds.
Behar.....	2,605	1,[illegible]90	1,390	1,384-0-11	Rs. 36,00,025
Benares....	1,665	1,340	1,390	1,3[illegible]1-15-8	,, 22,17,750

The budget estimate was for Rs. 1,075 per chest.

Instead of the 55,724 chests originally estimated, a Calcutta paper (*Examiner*) tells us that it is probable the out-turn of the Behar and Benares agencies for the current season will not exceed 41,000 chests. "The deficiency is attributed to a blight which is said to have fastened upon the poppy plants, and to have defied the precautions taken by the local authorities. Amongst the expedients resorted to for counteracting any effect which this deficiency may have on the financial estimates, is the experiment of introducing foreign seed. Turkey seeds have not hitherto proved very successful, and we (*Examiner*) learn that arrangements are in progress for the supply of other descriptions of seed."

Should the serious deficiency threatened really occur, the price of the drug is, we presume, likely to rise for the next two years to the further stimulus of its growth in China. We have pointed out for ten years past, that the great economic objection to the present system of monopoly is its interference with the natural laws which should regulate the area of the growth in this country.

A curious misapprehension exists in Bombay as to the powers of the Collectors of Income-tax in that presidency. Thus one journal writes :—

"We are astonished beyond measure at the extraordinary powers with which income-tax gatherers have just been invested. They are now clothed with judicial and magisterial power, and the police are to carry out their decisions, and superintendents of gaols are to receive their prisoners. 'Woe unto the man who is not satisfied with the tax imposed upon him; the Civil Courts are closed against him; if he does not pay, the tax-gatherer may immediately double the amount, and cover this by distraint, or send him to prison. Are our legislators and rulers mad, that they take a leaf out of the code of the most despotic and degraded of oriental nations? The next thing will be to make it penal to write anything against the legislation of the country. It is difficult to say what, in the form of tyranny, we may not look for next.—*Bombay Guardian.*

The writer misapprehends the matter altogether. It is only in cases where the assessed person has failed to appeal to the Commissioner against the decision of the Assessor [Collector] that the latter has magisterial power to distrain or imprison. What possible good would there be in forcing the Assessor to act through the Police Magistrate. The great fault of our administration is that it is not direct and simple enough. The Collector may just as well himself distrain as demand the intervention of the Magistrate. If men liable to the tax are too negligent to appeal against the amount charged against them, whom have they to blame but themselves when a distraint comes? And of what consequence is it whether the warrant issues from the Police office, or the Assessor's office. The time for appeal has gone bye, and the Magistrate can only act as the Collector requires him to do.

WE have called attention in a leading article above, to the fact that the agencies in this country of the great English Fire offices are charging nearly twenty times the rates of premium levied at home, while the risk is not one-tenth so great here as there. We do not know how it is in Calcutta and Madras, but in Bombay the agencies seem to have established an association amongst themselves for the levy of these most preposterous charges. At all events, we have now before us a letter from one of the principal of them, running as follows :—

"The tariff rate for the risk is 18 annas per cent. All the associated Companies charge alike; but with the office there is the advantage of great experience and accumulated funds.

Now, it is the simple patent fact, that the risk of fire in India is indefinitely less than in England, while these offices are charging a premium based upon the assumption that one house in every 80 or 90 is burnt down every year in Bombay. As a matter of fact, fire is all but unknown in the island, and yet the rates charged therein compare with English rates as follows :—

In Bombay.—Ordinary risks....	...	22s 6d per cent.
At Home.—Ordinary risks...	...	1s 6d ,,
Hazardous risks	...	2s 6d ,,
Doubly hazardous.	...	4s 6d ,,

Thus an ordinary risk in Bombay, where accidents from fire are all but unknown, is charged just *five* times the rate for "doubly hazardous" risks at home. It will be the fault of the Municipalities if they do not at once act upon our hint of undertaking this business themselves. India is sustaining in this way a needless drain of probably not less than £100,000 a year for the mere enrichment of these great London Fire Companies. In other words, the country suffers a needless drain of a clear million sterling every eight or nine years from sheer improvidence, the three presidency towns contributing nearly the whole of it.

THE budget estimates for the current year (1871-72) furnish, according to the *Pioneer*, "a very clear statement of the revenue "expenditure of each province under the decentralization "system. Bengal heads the list, with a local surplus of "£9,201,990, rather more than the surplus of all the other pro-"vinces put together. The North-West Provinces come "second, with a surplus of £2,576,450."

As we have pointed out for years, these local budgets are simply a delusion and a snare. They serve no purpose whatever, but to prevent the real state of matters being apprehended. Thus the contemporary we have quoted, proceeds to deduce the following conclusions for these estimates :—

"The amount of taxation per head in each province seems to be pretty nearly as follows :—

	s.	d.
Oudh	2	5
Central Provinces	1	9
Burmah	8	5
Bengal	7	1
North-West Provinces	3	4
Punjaub	3	7
Madras	5	3
Bombay	13	4

"This shows great inequality between the separate provinces."

The figures are pure delusion from beginning to end. They represent the very opposite of what is true. Oudh, Madras, and the North-West, are by far the most heavily taxed provinces of the Empire. It is simply a reflection upon the finance department that the system on which these local balance sheets are made out should still be maintained. It is quite possible to present

them in a form that would be exceedingly valuable for administrative purposes, and open to no cavil whatever. In their present shape they simply insult the intelligence of the country, and, instead of praising them, as our contemporary does, they should be treated with contempt.

Mr. Beyts takes exception, in a letter to the *Times of India*, to our estimate of the value of the grass lands of the Soopa talooka. He says :—

> If you were to enquire of the Assistant Collector in charge of the Soopa talooka, you will learn that grass can be conveyed but by cart to Surat, and there sold at Rs. 5-12-0 per 1,000 poolies.

Cannot Mr. Beyts see that such retorts are useless? It is not our business to "enquire" about the state of matters in Soopa, but had we spent two or three years therein in Settlement proceedings, we venture to think that the fact that there are 25,000 acres under grass in the talook, against 15,000 only of arable land, would have attracted our notice very early, and that we should not have waited for a newspaper to draw attention to the matter. Bear in mind that Mr. Beyts' work professes to be a land Settlement report of the district, while the fact that 25,000 acres out of the 40,000 under dry cultivation are under grass excites no remark whatever from beginning to end of it. Such work is blind and perfunctory upon the face of it, and instead of resenting our notice of such strange oversight, and carping at the estimates which we are *forced* to make under the disadvantage of outsiders, Mr. Beyts would do a great deal better to make a note of our criticisms for his future guidance. He *will* make a note of it, we are persuaded, and we shall by and bye have the satisfaction of reviewing very different work from his hands. It is absurd to expect that our estimates should be more than suggestive. *That* is their only value, while to complain that they are more or less incorrect, is simply to say that *we* are not the Settlement officer of the district. Suppose it to be true, that the grass instead of being providently sent to Bombay is improvidently sold in Surat below its proper market value, whose fault is it? The State is the landlord of an ignorant tenantry, and does Mr. Beyts think it to be no part of his duty, as Agent of the State, to point out the best markets to the people, and stimulate them to seek them?

Our proceedings are altogether unsympathizing and faulty. We shall do a good deal better by and bye as Mr. Beyts will, we hope, live to see. The railway would bring this Soopa grass to Bombay for 6 pies per ton per mile. Does Mr. Beyts think it no part of his duty to inform the ryot of this fact when he is settling the rental of the land with the man for 30 years to come?

The following paragraph from the *Umritsur Bazaar Putrika* has been going the round of the Indian Press :—

> "The population of Bengal is estimated at 40 millions, and the revenue is 17 millions; this leaves about 4 Rs. 4 annas per head in Bengal. So much for one part of the statement, let us look to the other. The population of the States under Native rule is estimated at 48 millions, and if Rs. 6 per head were raised as tax, the total revenue of the native States would be 6 × 42 millions of rupees, or 29 million pounds sterling. This is *primâ facie* false. But the following table in one glance shows how much the Native rulers take from their people :—

State.	Population.	Annual income. Rs.
Travancore	1,202,647	4,480,630
Puttialla	1,586,[illegible]0	3,0[illegible],00
Udeypore	1,101,140	2,061,270
Jaypore	1,9[illegible],00	5,0[illegible],000
Joudhpore	1,783,6[illegible]0	3,5[illegible],000
Ulwar	1,[illegible]0	2,[illegible]00
Scindia	2,5[illegible]0,000	1,109,[illegible]00

> "From the above statement, taken from the Government Records, the taxation per head in the principal native states will stand thus :—
> "Travancore, 3 Rs. 12 annas; Puttialla, 1 Rupee 14 annas; Udeypore, 2 Rs.; Jaypore, 2 Rs. 10 annas; Joudhpore, 2 Rs.; Ulwar, 2 Rs.; and Scindia, 7 annas per head."

The paragraph is simply a new illustration of the mischievous delusions propagated by the local balance sheets now prepared by the Finance department. Instead of the population of Bengal being taxed seventeen millions, it is not *taxed* eight; for in the so-called taxes are included the following items which are not taxes at all, as the veriest tyro in Indian Finance, is aware :—

Opium receipts	Rs.
Post office	,,

To these items must be added the whole of the export duties levied in Calcutta, and a very considerable proportion of the import duties. The land revenue itself of Bengal is not a tax, and instead of contributing four rupees four annas per head of population as taxes, the people of Bengal hardly know what the word taxation means. The taxes really levied in the province are :—

Salt duty	Rs.	in so far as they fall upon Bengal itself.
Customs duty	,,	
Stamp duties	,,	
Abkaree	,,	
Income tax	,,	

The English Press ought not to countenance these delusions of native contemporaries, but it is the Government that is primarily to blame for their existence. Were the public accounts presented in their proper shape to the country, these mischievous delusions would die of themselves.

"Official Returns," says another contemporary, "show that "Bengal contributes about one-third of the whole Indian revenue, "while her 'charges' represent less than one-sixth of the whole "Indian expenditure, and that she yielded in 1868-69 a 'surplus "for Imperial demands' of nearly 10,000,000*l.* sterling. There is "nothing in this fact at which Bengal has a right to feel aggrieved any more than Lancashire would have reason to be "aggrieved if it should turn out that her superiority in wealth "makes her the most productive of all countries to a Chancellor of "the Exchequer. Still, it is a fact which may well be kept in "mind, when it is proposed to multiply the local burdens "of Bengal." Are these old delusions never to be dissipated? A heavy responsibility rests on the men, who by maintaining the present false system of public accounts keep them in countenance. The statement that Bengal contributes a surplus of nearly £10,000,000 for Imperial demands, is just as true as would be the contention that Middlesex, being the head quarters of the Excise and Stamp offices, and receiving credit for the proceeds of the London Custom House, paid nearly all the taxes of the United Kingdom. Bengal is paying far less than its just share towards the Imperial burdens.

It is difficult to understand for what purpose Mr. J. C. Geddes was brought before the Select Committee, but to discredit views which that gentleman holds is so extreme a shape as to cover their adherents with ridicule. We find it difficult to suppose that Mr. Geddes himself believes in the absurdities which he maintained before the Committee.

Thus, instead of insisting that the debt of India is properly an English liability, and not justly chargeable against the people of this country at all, and that the finances of India ought to be relieved of the charge of four or five millions a year now made thereon for dividends, Mr. Geddes completely travesties the case, by demanding that "the people of England should make a yearly contribution of several millions from their taxes towards defraying the cost of the administration of India." The demand presented in this shape provokes of course only ridicule. Anyone else in Mr. Geddes' position would have demanded that the people of England should cease to exact four or five millions a year from the Indian taxes to meet a purely English liability, fastened upon the shoulders of this people by no law whatever but that of might. We have shewn, over and over again, how this Indian debt grew up, and that it is a purely English liability from beginning to end, unjustly fastened upon the Indian treasury. India wants no contribution from the English tax-payer. She simply begs him to take his hand out of her pocket, and, to pay his own debts himself, instead of unjustly requiring *her* to pay them. In the same way, did Mr. Geddes travesty almost every conviction he professed to represent. The effect of his evidence, the *calculated* effect, we fear, was to discredit all criticisms what-

ever upon existing arrangements that point in anyway to the conclusions of this gentleman. We suppose Mr. Geddes was simply seeking notoriety. He may now return to India with the satisfaction, if it be any, of knowing that he has done what he could to make men impatient of all criticism whatever of the Government. The pamphlet he published a few months ago was a tissue of absurdities from beginning to end, and simply defied review, while the parading him as a witness before the Select Committee, looks very like a device for discrediting all criticism upon the conduct and effects of our rule.

THE Calcutta *Examiner* is edited by so able a writer (Mr. O'Sullivan, we believe) that we are surprised to find it giving even a qualified approval to the absurd statement of Mr. Geddes, that the famine in Orissa would not have occurred but for the exportation of rice from the province, necessitated by the pressure of taxation thereon. Mr. Geddes says :—

"The famine was occasioned by the pressure of taxation. I mean by the depreciation of food on account of payments for taxation. There are reserves of food kept in store, in order to meet a scarcity in favourable seasons. Those reserves had been sold, in order to provide for the payment of taxation. Therefore, often the increase of exports in India are a sign of the reverse of prosperity. I do not attribute the whole of the increase of exportation to the pressure of taxation, but a good deal of it."

Upon this the *Examiner* remarks, that Mr. Geddes "is so far "right, that it is the case that but for the high prices and ex- "portation, privation, not utter famine, is what the province "would have had to endure."

Now we have a very distinct memory that the largest export of rice that ever took place from the Province was in the year immediately preceding the famine, when it reached a total of 30,000 tons, stimulated not by the pressure of taxation however, but by the high prices offered for rice at the ports. But 30,000 tons represent only the food supply of about 150,000 persons, while the population of Orissa was 3,000,000, and the rice crop of the season had fallen short of its normal amount by nearly twenty times the amount of the export, or 500,000 tons. Had the Province not exported a single hundredweight, the suffering would not have been appreciably less than it was. Three millions of people require for their sustenance a million tons of food a year, while the harvest was short of its normal yield by more than one-half the proper quantity. Of what appreciable moment then, was it to a people in these circumstances, whether their total food supply was 500,000 tons or 530,000, when 1,000,000 tons were needed to keep them alive! There is a strange incapacity in this country to discern what statistics really mean. The theory of Mr. Geddes is simply an absurdity, when placed in the light of exact information. But then there was no one in the Select Committee who possessed it, who could reasonably perhaps be expected to possess it; but absurdities of this order ought not to find countenance in India itself. Mr. Geddes has travestied the economic effects of the export drain arising from taxation, in a way that makes one ashamed almost to refer to the subject—all important as it is—while with their usual perversity the publicists who refuse to listen to an exact statement upon the subject, profess to feel a strong admiration for the crude and wild nonsense put forth by this gentleman thereon.

IN the *Agricultural Gazette* which accompanies our present issue, we publish some exceedingly interesting Returns concerning the Agriculture of West Berar during the last season. We are indebted for these Returns to Mr. Saunders, the Resident at Hyderabad, who with a public spirit but too rare in the country, directed their preparation for publication in this journal. The Assistant Commissioner of West Berar (Captain Mackenzie) has laid us under great obligation by the lucid and careful manner in which he has executed the work, and now presents the returns. It will be seen that the yield of joware was 600 lbs. on "not particularly good land," and that the average yield of *kurbee* on good and bad alike was 1,106 lbs. per acre, and that this *kurbee* is sometimes sold for as much as Rs. 10 per 100 bundles of 300 lbs. in weight, while the husk (boosa) is kept for feeding the owners' cattle during the rains. The bazaar rate for the grain during the season was 38 lbs. per rupee, so that the gross money value of the crop on very ordinary soil indeed, averaged per acre something like this :—

377 lbs. grain @ 38 lbs. per Rupee.....	Rs.	10	0 0
1106 lbs. Kurbee, @ say 5 Rs. for 300 lbs.....	,,	18	8 0
lbs. Husk (boosa)	,,		
	Rs.		

And yet we are to understand that *kurbee* has no value in Indapoor, although that talook is not very far from Berar, and has direct railway communication with Poonah and Bombay. Colonel Francis's statement may be true, but it is unlikely in the highest degree that it is so, and we ought not to be accused of "misleading the public and the Government" when we simply call attention to what at least seems to be a stupendous oversight. For if *kurbee* be really as valuable in Indapoor, as we think it *must* be, what becomes of the Settlement Report? It is exploded altogether, for it is based throughout upon the belief that the *kurbee* of the *district is worth nothing*!

The last quotations for *kurbee* in the official price lists (May 1871) were as follows :—

Poonah	12 as.	per maund (82 lbs.)
Indapoor	8 as.	,, ,,
Sholapoor	10 as.	,, ,,

According to these Returns, therefore, 1,100 lbs. of *kurbee*—that is the produce of one acre according to the Berar returns of poor soil—were worth 6¼ rupees at Indapoor and 10½ rupees in Poonah; while the total average assessment upon the talook for 30 years to come, is only 7 annas 8 pies per acre! (Settlement Report, para. 163.) The value of the kurbee has plainly been lost sight of altogether, and a pure grazing district been treated as an arable one throughout, to the indefinite loss of the State. At all events, the very strongest *prima facie* case is made out.

The Metric Committee of the British Association held a Conference on Monday (12th June 1871), on the invitation of the Council of the International Decimal Association, in the Lecture Theatre of the Kensington Museum, on the teaching of the metric system of weights and measures in schools. The Earl Fortescue presided.

The points urged were the great inconvenience arising from the want of international uniformity of weights, and of a system adequate to the requirements of trade, and the purposes of science, the simplicity and easy use of a complete metric system; the facility of introducing lunary divisions in such a system, while preserving the strictly decimal numeration; the saving of time in educating, that a time should be fixed (three or five years) for the introduction of teaching it compulsory in school—that it was now recognized and used in countries with which our trade in 1869 amounted to £356,000,000, or 66 per cent. of the whole trade of the country—that its general adoption would pave the way for the introduction of that great desideratum, international coinage; the insufficiency of the Permissive Act, 27 and 28 Vict. Cap. 117, and the necessity of legislation on the compulsory principle.

Resolutions were carried, declaring :—1. That the metrical system commends itself for educational purposes by its simplicity and unity, its compactness and adaptability to all the wants of life, the ease with which it may be taught in schools, and the great economy of time it would effect in the work of elementary education. 2. That the introduction of the decimal division in weights, measures, and coins, would confer a great boon on the general community. 3. That with the increasing opportunities of comparing the relative progress of nations in arts, science, and manufactures, with the growing foreign commerce, and the immense facilities afforded for international intercourse for railway, steampacket, and telegraph purposes, not the least advantage of the metric system being that it is in force in so many countries all over the world.

The Chairman, we are told, congratulated the Conference upon the progress the metric system had made, and especially on the

adhesion to it, not only of associated Chambers of Commerce and the Liverpool Chamber of Commerce, but the Central Chamber of Agriculture, the London Farmers' Club, and various other Agricultural Associations. He contrasted the chaotic complications of the existing mode of calculating weights and measures, with the simplicity of a system founded upon the decimal principle which might be taught in comparatively a quarter of an hour. We are indebted for this paragraph to *The Farmer*.

We have put the Municipal Controller of Bombay to some pains by requiring him to furnish us with certain information concerning the distress warrants now running in the island, which it was necessary to obtain for the full understanding of the present difficulty. We find then that these warrants classified are for the following amounts :—

4069	warrants	for	sums	of	from	..	...	.
1310		,,		,,		..	.	..
820	,,	,,		,,		.		..
178	,,	,,		,,		...	..	
50	,,	,,		,,		.	..	.

Rs 1 @ 10
,, 10 @ 20
,, 20 @ 50
,, 50 @ 100
,, 100 @ 800

Thus, under this precious system, six thousand men in the island are being at this moment pursued by distress warrants for sums of from one to 20 Rupees, and 820 more for sums below 50 Rs. Now it is the outcries of these men that have excited Mr. Forbes's compassion, but we put it to himself to say what possible relief this class is to get from any change in the constitution of the Municipal body, or in its executive staff. You may change the constitution and the staff every week for the next ten years, and while the system of direct rates is allowed to endure, you will not reduce the distress warrants by ten in a year. The delusion is nursed that the house-owners of the island are a wealthy body. In the main they are miserably poor. We have ascertained at the cost of a good deal of trouble to the Controller's office that the number of house owners against whom warrants are running is no less than 2,731, two-thirds of whom are so wretchedly poor that the sum which they are unable to pay does not upon the average exceed eleven Rupees! Now if the publicists of Bombay wilfully shut their eyes to disclosures of this order are we to be blamed for speaking of them with indignant severity? Once more, we find that of the five hundred and thirty distress warrants running for wheel tax, no less than 408 are against poor men keeping but one horse, presumably from necessity. And we fasten upon this class a fine of 54 Rs. a year for wheel tax alone, under this precious system of rates. The whole thing is a scandal and disgrace to the community. Were Sir Seymour Fitzgerald boldly to set aside the *Act*, and direct all these warrants to be quashed in a body, he would deserve nothing but commendation for doing so. The system cannot possibly last, and the guilt of the men who deliberately attempt to bolster it, rather than confess the error that has been made, is not to be exaggerated. We think it right to add that the few statistics given in this short article represent an amount of work which cannot even be understood by persons not practically familiar with such pursuits.

A PAMPHLET has just reached us with the title *Direct Taxation for India the great Financial Blunder*, published by Messrs. Thacker, Vining and Co. It advocates the imposition of a special rate of 75 Rupees per acre upon all sugar-cane cultivation in the country, and the *Bombay Gazette* commends the suggestion to the notice of Government on the ground that it is "a new tax which would have the altogether exceptional cha- "racter of pressing but lightly even on the rich, and not being "felt at all by the poor." The author estimates that a revenue of twelve millions sterling might be derived from this source.—

"More than one-half, that is to say, of the whole amount of the land revenue, and far more than sufficient to cover all the expenditure on public works, ordinary and extraordinary."

We do not ourselves see how it would be possible to impose a special tax like this in districts already 'settled' without manifest breach of faith to the cultivator; and an import duty of 25 per cent. would simply operate as a mere bounty to that extent upon all the sugar grown in the country that was not subject to the tax. The writer says :—"As there is *no reason* why the "produce of the sugar-cane should not readily yield 25 per cent. "on the gross value or Rs. 300 per acre, I would propose the "levy of Rs. 75 per acre on *all* land under sugar-cane cultiva- "tion. In making this proposal I would beg to be understood "to be in no way advocating the levy of the tax as an *extra as-* "*sessment on the land*, but as an *impost on the produce alone*. "It may be argued that, in whatever form regarded, the result "is the same, viz., *an assessment on the land*. This, I deny, "for, if it be an extra assessment on the land, the impost now "proposed to be levied would no longer be one *on certain class* "*of produce*, but would be payable by the occupant whether the "land was cultivated *with the special produce taxed or not*."

This is true; but having leased the land to the cultivator upon the express understanding that he may do with it what he pleases, how can we now forbid his growing sugar, the most profitable crop of all, and one for which he may have even sunk a well at great expense, without breach of faith? For however theoretically true that the tax would not fall on the land but on the consumer, the fact would still remain that the tax violated one of the plainest conditions of the lease, unfettered freedom of cultivation. The imposition of a special rate of this severe order would, we fear, destroy the cultivation of the cane altogether, except on the part of very wealthy ryots. For the ryot already has to go to the Soucar for money to pay his assessment of a few annas or rupees per acre, while the attempt to cultivate sugar with so heavy a duty to pay upon it, would enmesh him in the toils of the bania hopelessly. The advance of Rs. 75 would have become Rs. 300 by the time the account was made up. Has not the writer overlooked, moreover, in his calculations, that sugar is a two seasons' crop, engaging the land for 2 whole years. We fear that the proposal is impossible in so far as it points to a source of Imperial Revenue but we know no good reason whatever why an appreciable duty upon Sugar should not form one of the chief items in every schedule of Town Duties in the country. The Bombay paper we have already quoted, with curious inconsistency approves this suggestion of taxing Sugar with an Import Duty of 25 per cent. and yet objects passionately to a town duty of one per cent thereon for Municipal purposes; and declares it to be "iniquitous" and we know not what else. The Town Duty of Bombay ought to be 5 per cent. instead of one. Whether we might not profitably tax both sugar and tobacco Imperially by a system of licenses, is we think worth considering. We are afraid that the proposal in the pamphlet before us to tax *the crop*, however economically sound, is impracticable because of the difficulties created by the Land Settlements. We should be glad however to see the proposal more fully discussed. The pamphlet is we understand, the work of a Bombay civilian.

INCOME TAX BENGAL, 1869-70.

Minute by the Lieut.-Governor.

I am aware that as this report is so late, and that for the following year is due, and will be the occasion for a review of the system, it has not been thought desirable to go very fully into the subject till the report for 1870-71 is made; but I should like to note one or two points which strike me in running over the figures for 1869-70, and to ask for any explanations that can be given.

PARA. 13.—Classification by professions and trades.—*Professions—Assessments in the higher classes.*

These seem to lead to a singular inversion of our preconceived ideas. There are no incomes in the highest class; so lawyers appear not to make the enormous income sometimes supposed. But in the next highest class, as incomes of Rs. 10,000 to Rs. 1,00,000, we have the following startling results of the column showing number of persons assessed :—

Ministers of religion	58
Legal practitioners	17
Medical practitioners	0

This would make it appear that religion is much more lucrative than law after all. Even the greater rigidity of conscience in making returns, which may be assumed in the former case, does not sufficiently account for the difference. Medicine, as a lucrative profession, is nowhere. Not a single medical man in

Calcutta or anywhere else seems to make by practice so much as Rs. 10,000 per annum. I should like to know whether the Board can throw any light on these singular results.

Again, I find that the most numerous class of income tax payers are *cultivators*. As distinguished from 25,483 'proprietors and sub-proprietors,' and 13,463 'tenants,' it appears that so many as 34,375 mere 'cultivators' have been assessed to a tax on incomes of not less than Rs 500 per annum, thus beating the traders,* who number 33,308.

I gather that these assessments on cultivators are made by estimating the profits of the land at so much per beegah. I have seen, I think, an allusion in the public prints to a circular of the Board, in which the rates are stated to have been taken at from Rs. 5 to Rs. 20 per beegah; and at any rate I have learned from the member in charge that very high rates have been ordinary assumed. Nothing is more difficult than to get at the profits of the man who actually farms the land. In England it is found to be impossible to do so; and the income tax of the farmer is, by law, roughly taken at half the rent. If the rent be taken to average £1 to £2 per acre, the farmers of England pay on an assumed income of 10 to 20 shillings, say Rs. 5 to Rs. 10 per acre. It is strange, indeed, if an Indian farmer makes more by the land than an English farmer, the merits of small culture notwithstanding. In very small holdings it may be assumed that a man who cultivates himself must make the wages of his labour and that may be taken as part of his income; so that from a holding of 6 or 7 acres, an income of Rs. 40, or 50, or 60, may be possible enough; but this kind of holding does not approach the lower limits of the income tax. I cannot suppose that any ordinary ryot, who holds 10 or 20 acres, can approach an income of Rs. 500 per annum. If we come to larger holdings of 40, 50, or even 100 acres (and of such I take it there are very few), a man cannot cultivate so much with his own hands. He must employ labour; the wages of the labourers must be deducted from his profit: and I cannot imagine that many such cultivators really make, one year with another, a profit liable to income tax. It is certain that if the profits bear any such relations to rent, as is supposed in England, it could not be so.

I should then have expected that in this country of very small holdings cultivators would have been almost entirely free of income tax, instead of being the most numerous class assessed. The impression left on my mind is that they are over-assessed as compared to other classes. I am therefore not surprised to find that in the Board's report of 18th July 1870, (No. 116A), it is stated that the income tax falls with the greatest severity on the class of ryots and agriculturists, that it is among this class that the greatest discontent is felt in connection with this mode of taxation; that among them more than others a strong and bitter feeling has been excited by the tax, and that instances have been brought to the notice of a member of the Board in which cultivators threaten to migrate to Nepaul, where there is no income tax.

The exclusion of incomes under Rs. 750 will, it may be supposed, this year relieve a large proportion of the cultivators, and I understand that the Board's recent circular, alluded to in the newspapers, is intended to caution the assessors against excessive estimates of the profits of farming; but I am inclined to think that it may be necessary to go further, and to make some radical change in the mode of assessing this particular class. I shall be glad to have Mr. Money's views on the subject.

There seems to be a singular disparity and variation in the assessment of some districts. The yield is not largest in the districts around Calcutta, which have had the greatest advantages in the way of roads, railways, commerce, education, and all that is known as civilization. The yield of the obscure and inaccessible non-regulation district of Maunbhoom, which under the former income tax was but a fraction of that of Hooghly, Burdwan, Jessore, and Nudden, is now ahead of any of them. Of all the districts in Bengal, that which has been for a long series of years most favoured in the way of roads, sub-divisions, colleges and schools, and administration of every sort (making it *par excellence* the model district of Bengal) is Nuddea; yet it is assessed to income tax at just about half of the Maunbhoom assessment. I should like to know whether these variations can be in anyway accounted for. It strikes me that the name of the officer who seems to have mis-administered the tax in Maunbhoom is that of one of two native officers lately reported by the Board of Examiners as distinguished by ignorance of the laws which they are supposed to administer. It should be ascertained if this is the same man.

The district most prolific of large incomes of both the two highest classes appears to be Gya; and of good incomes of the two next classes, Purneah gives the largest numbers. I should like to know what classes are most conspicuous among the large tax-payers in these districts, and to what circumstances their apparently superior wealth is due. It will no doubt be fully explained in the next report how it happens that the tax-payers of 1869-70, are upwards of 50 per cent. more numerous than those of 1870-71, though no change was made in the classes of income assessable under the law. But as the member in charge intimates that very many persons were unjustly assessed in the particular year 1869-70, (when the numbers much exceeded both previous years and the subsequent year), I should like to know under what circumstances, and why, the increased numbers of that one year occurred.

I will leave it to the Member in charge either to answer the questions now put separately, or to include in the report for 1870-71 the points to which I have drawn his attention. At any rate, I should like these same points, among others, to be specially noticed as regards 1870-71. I hope it may turn out that the cultivators do not now bear so large a share of the burden. At a time when the owners and occupiers of land are (justly as I think) subjected to a special local taxation for certain local purposes, I should be sorry that there should be any ground for supposing that the income tax is assessed in such a way as to fall with disproportionate severity on them. I should be sorry to think that because their sources of income are visible, and it is almost impossible to disprove an estimate of the profits of cultivation, they are made to pay more than traders and others, whose sources of income are not visible, and who can prove or disprove anything by their books. I observe that even in the many assessed year 1869-70, of 64,407 objections, 36,489 or fully three-fourths, were allowed; while Mr. Money thinks that many more ought to have been allowed. I should be glad if it could be shown for any year in what proportion the objections of traders, and in what proportion the objections of cultivators, were allowed.

* Traders' do not include 'bankers' or 'merchants.'

(*Englishman, Aug.* 23.)

We publish a Minute by the Lieutenant-Governor of Bengal, which hits the income-tax harder than perhaps anything that has yet been written on the subject. The tone of humour which characterises it and half conceals the withering sarcasm of its suggestions, has, to our mind, a deep significance. It is things rather than men that the Minute is meant to scathe. Viewed in the light of a serious censure on the officers engaged in administering the tax, it would have been undignified. As a criticism on the tax and its circumstances, nothing could be more apt.

In the circumstances described in Section 2 of the Minute we see how the Act affects those who can help themselves. In Section 3 we see how it affects the helpless. The statistics regarding the assessment of the three professions explain themselves. We have no wish to enlarge upon them, but we cannot help pointing to them as a proof how high the demoralising influence of the tax reaches. When oppression makes a virtue of crime, we need not wonder that a sense of injustice produces considerable elasticity of conscience.

The circumstances described in the third paragraph of the Minute are most serious, and fully account for the estimate in which the tax is held by the mass of the people. To us it is a less grave question how much wrongful assessment the amount levied from the 34,375 cultivators represents, than how much simultaneous extortion was inflicted on ryots not assessed. Unless the profits of cultivation are taken at very much higher estimate here than in England, it is utterly inexplicable to us how these thirty-four thousand odd mere cultivators came to be assessed, except as a penalty for not feeling the anilah.

LAND REVENUE IN THE PUNJAUB.

(*Indian Public Opinion.*)

A Gentleman, who appears to be conversant with Revenue affairs, and with the wishes and intentions of the Settlement Commissioner has done us the honour of publishing a pamphlet in reply to the remarks which have from time to time appeared in this Journal as to the proceedings and position of the Settlement department. He writes with more asperity and warmth than we should have thought the occasion demanded, and somewhat weakens his argument, as it appears to us, by the introduction of irrelevant personalities. Rude words prove nothing but the irritation of the speaker. Good logic is none the less logical, he will allow us to observe, for being couched in the language habitual to gentlemen. This, however, is a matter of taste, and we are a great deal too well content with the matter of his reply to be disposed to take exception to its form.

What then are the points in issue between us? We asserted that there are between 30 and 40 lakhs (we ought to have said between 50 and 60) running on at old rates under expired assessments, and that the Settlement Commissioner computes the loss thus incurred at 20 lakhs annually. This we believe to be undisputed. We asserted that some 70 lakhs will expire in the course of ten years, and that the Settlement department on its present footing is entirely inadequate to complete the task of re-assessing this large sum within any reasonable time. So far from disputing this fact our assailant informs us that the Settlement Commissioner "has again and again brought the "matter to the notice of Government, and that the reply has always "been the same, that the revision of no more than four districts could "be taken up at the same time. With equal wisdom the pay of

"Settlement officers was arranged on a scale which enabled the Settle-
"ment Commissioner to command the services only of junior men; and
"even these have found it to be to their interest to get back as soon as
"possible to the regular line. We should have imagined that
"there was no department in which experienced men were more
"needed, but we believe that not one of the present Punjaub
"Settlement officers has ever assessed any other district than the one
"in which he is now employed, and that hardly one of them proposes
"to undertake another district. No doubt Settlement work affords
"admirable training for young officers, but the interests at stake are so
"great, that we can hardly hand it over as a *corpus vile* to them to ex-
"perimentalise upon. If the Government of India would place the
"department on a thoroughly efficient footing, no one would be more
"pleased than the Settlement Commissioner; as it is, much of that
"officer's time appears to be taken up in teaching his subordinates the
"mere details of their work, to the neglect, it is to be feared, of his
"own far more important duties."

This passage correctly and forcibly epitomizes what we have been endeavouring for months past to urge on the Government. The reports of Mr. Prinsep and his subordinates abound in complaints of the inadequacy of the means placed at their command: the inexperience of the officers concerned, the insufficiency and inefficiency of the ministerial staff, the slowness and badness of the work, are topics which again and again recur. Of course, no body imagines that Mr. Prinsep is responsible for this; on the other hand, it can be no matter of surprise that the Government should not be hasty to commit new Settlements to his charge, and to enlarge the scale of his operations, when the result of all the recent assessments has been so little encouraging. Mr. Prinsep's Settlements have already cost over 9 lakhs, and the Financial department may not unnaturally grudge so large an outlay when Mr. Prinsep will give them nothing, not even the meagre satisfaction of a report, in return?

Up to this point at any rate there is no disagreement between our critic and ourselves, and it is only on the question of the soundness of the recent assessments that we begin to differ. We stated that there has been "a positive present diminution of the revenue, and a "future increase quite incommensurate with the progress of wealth "and the increased value of land and agricultural produce." Let us take the figures of the Amritsur division and see if they bear out our assertion. We will let Mr. Prinsep speak for himself. "The total increase," he says, speaking in 1866 of the Settlement just concluded, "has been Rs. 70,000, the total decrease Rs. 2,50,310. *Thus then the "financial result of the revised Settlement has been a net decrease of "Rs.* 1,79,863. (Revenue Report 1865-6, p. 73). Apparently, it is a large "sum, but it is no more than the detailed scrutiny of each estate "has required after a very careful enquiry on the spot, and the real "pressure of taxation was considered in such assessment circles as "compared with the rates and fertility of other assessment circles "and surrounding districts. (Para. 44.) The largest remand has been "given in Goordarspore district which takes up Rs. 1,00,036 and is "a decrease of 8 per cent. on former revenue. Then comes Amritsur "Rs. 50,865 or 4 per cent., the greater part of which has been called "for in one pergunnah, Amritsur. In Sealkote the change has been "to the extent of Rs. 28,502 or 3 per cent. merely that of equal-"ization and lowering of taxation in the very highly cultivated estates "so as to make them more fit to bear a permanent jumma, as in the "best Churkaree estates of Sealkote and Pusroor or pergunnahs, and "some relief was found absolutely necessary in Zufferwal in the tracts "watered by the Dey stream (Para 55.) In the * first 3 pergunnahs "the pressure of taxation were too high in many places, having regard "to fertility, condition, and main desire, to make an "equal rating. In "the first two it is well known that at last Settlement sufficient relief "was not given."

	Amount of decrease.
* Battala	37,519 or 8 per cent.
Amritsur	36,882 or 8 per cent
Shukergurh	25,552 or 8 per cent.

The report goes on to say that in Battala, Goordaspore, and Pathankote sums aggregating to Rs. 17,217 represent "abatements for "lands watered by canal which were charged for extra fertility at last "Settlement," and which were now transferred to the canal account. Para. 48 gives a table showing progressive rates for 20 years, rising at last to 78,000; "so that though there is a decrease now of Rs. 1,79,403, "the real jumma will stand at 3,252,787 against 3,454,150 the old "jumma, thus reducing the decrease to one lakh, after expiry of 20 years, "or 3 per cent."

On this, Colonel Lake, the Financial Commissioner, observes:—

"Statement No. XI. exhibits merely the financial results of revised "assessments, and it will be observed that the result of the revision of "Settlement effected by Mr. Prinsep in the three districts of the Amritsur "division, is a decrease in the rent roll of rupees 1,79,863 per annum. "As since the last regular Settlement, cultivation has largely extended, — "the prices of agricultural products have risen,—reduction of the "government demand has been made from time to time in all "estates which were over-assessed, and the revenue has been collected "without difficulty for the past five years, it might be a question "whether so large a reduction was called for; but the Settlement "Commissioner, who is in a better position than the Financial "Commissioner, to determine this point, renders detailed explanation in "paras. 43 to 49 of his report, as to the circumstances which led "him to give relief in each sub-collectorate, and comes to the conclusion "that although the new Settlement is light, it is not too light. As "might be supposed, the landholders are delighted with the moderation "of the revised assessments; but some dissatisfaction prevails among "the members of the jagheerdar class, some of whom find their in-"come largely reduced, the necessity for which they are naturally "slow to admit."

The progressive rates mentioned by Mr. Prinsep, appear to have been subsequently raised, so as to amount to Rupees 2,16,000 at the end of 15 years, but the passages we have quoted leave no doubt as to what Mr. Prinsep and the Financial Commissioner considered was being done in 1866. It is quite clear that at that time Mr. Prinsep proposed to reduce the assessment, Rupees 1,79,000 with progressive rates amounting to 79,000 in 20 years, and that Colonel Lake, though surprised, acquiesced in the proposal on the ground that Mr. Prinsep was the best judge of the matter. Colonel Lake no doubt expected that the usual revenue report would be immediately submitted, in which the reductions would be explained, and Government be enabled to judge of their propriety; the gist of our complaint both against Government and the Settlement Commissioner is that five years should have elapsed without any report being submitted, and that in 1871, the Lieutenant-Governor should "not be in a position to form an opinion about" the very anomaly which surprised the Financial Commissioner in 1866. As his apologist says:—

"It is for him to explain to Government why he has done this. his "explanation may or may not be satisfactory."

We entirely concur; but the explanation, however satisfactory, will in our opinion be at least five years too late. Meanwhile we commend the following figures to the attention of the Government. In the first place how does the case stand as to increase of area. In Appendix 11 to Revenue Report for 1862-63, we have a table showing the increase of cultivation since annexation up to 1861. The area cultivated in the Amritsur division had during that time increased about 56,000 acres and stood at 21,65,000 acres; and there were 29,000 wells in use, about 1,400 more than at annexation. Now look at the state of things in 1868-9:—

Imperial Return I. F 2, No. XXVII.	Irrigated by Govt.	Irrigated by individuals.	Acres unirrigated.	Total.
	154,000	630,000	1,574,000	2,368,000

That is, over 2 lakhs of acres were under cultivation more than in 1865, and over 2¼ lakhs more than in 1849; of these 1¼ lakhs of acres have the advantage of canal irrigation, and yet we find the Commissioner calmly reducing the revenue, 1,79,000, and consoling us with the reflection that 20 years hence the reduction will be reduced to a lakh. Take the 2 additional lakhs of acres at only a Rupee per acre, here at once are a couple of lakhs of Rupees, which ought to figure somewhere or other in the Settlement Commissioner's Accounts. Where are they?

In the next place let us see how these 23¼ lakhs of cultivated acres are employed. We will not depend on the rent and produce statements continued in the revenue report, which are well known to be a loose approximation*; but we will simply state the average under each crop, as to which we imagine the revenue statements may be accepted as correct, and leave Mr. Hume and the new agricultural department to work out the sum for themselves.

The following crops were grown in the Amritsur division in 1869-70.—

	Acres.
Rice	225,000
Wheat	818,000
Other food grains	677,000
Oil-seeds	45,000
Sugar-cane	103,000
Cotton	84,000
Opium	1,700
Fibres	12,000
Tobacco	16,500
Vegetables	50,000
Gram	7,500
Miscellaneous 175,000	Total.. 2,209,000

(including rubbee and khurref.)

This was an exceptionally bad year, and the total under crops was a lakh below the amount in the previous year; the decrease being chiefly in wheat. Now considering that the British Government has, at the cost of 150 lakhs of rupees, run the Baree Doab Canal through the heart of this division, and has furnished 1¼ lakhs of acres with unfailing supply of water, that it has supplied it with admirable roads, and has opened up rail communication with Bengal on the one side, and Mooltan on the other, and thence river communication to Kurrachee; we believe our estimate of 318 lakhs of Rupees, as the average gross worth of the crops grown, to be in no way excessive. Do the revenue authorities really believe it to be so?

Test it as we will, we come to much the same result. Take for instance, the price of land; in 1869-70, there were in the division 295 transfers of land; 3,204 acres were sold for upwards of one lakh, Government meanwhile instead of half the net assets receiving only 4,400 Rs! Look again at the price paid for land taken up for public purposes, on which we have commented before; look at the prices which without any reference to revenue reports, all of us have known to our cost to have prevailed for years past, and look finally at the testimony of so good an authority as the Lieutenant-Governor himself as to the unprecedented prosperity of the agricultural class, making it in his opinion certain that the land revenue all over the Province can be enhanced 6 per cent., without causing discontent or distress. Or compare the results of the Oudh Settlements, which are increasing the revenue 32 per cent. with those of the Punjaub; and, to take a rough instance,

* Our critic need scarcely have been at so much trouble to prove that these returns were not dependable. *See* report for 1868-9-70 where the figures are stated to be "but an approximation and perhaps only a remote one to the truth. It was feared last year that the information could not be given in such a way as to be of any practical value, and the result has shown that these mis-givings were not unfounded .. .. .. The return is full of discrepancies, but as this is the first time the statement has been attempted, it will be better to direct the attention of officers to the necessity of greater accuracy, and in the meantime the figures may be taken for what they are worth." The report for 1869-70, para. 85 informs us that "these statements are full of anomalies and that the subject is under enquiry." But our estimate of the worth of the Amritsur crops, was we need hardly say, not based upon figures admitted to be so unreliable.

contrast the district of Lucknow with that of Amritsar The following table shows the resources of each :—

| | Cultivated. | | Uncultivated. | | | Assessment. | | |

question not directly bearing on the present point; but, whether it ever happens or not, I consider that we shall be safe in working up to a rupee unit of *account* in any decimalization of the sub-divisions of the Indian coinage.

The first thing that is apparent on looking into this subject is that a rupee being divided now into 16 annas, each of which is divided into 12 pies, the total number of pies in a rupee is 192. This number is so little different from 200, that there would be no appreciable difference, for purposes of retail trade, between 1 pie and one two-hundredth part of a rupee. Here a possible basis for a decimal sub-division at once appears.

But a little consideration is necessary before determining what shall be the exact system of sub-division adopted. My conclusion is that we should simply divide the rupee into 100 parts for purposes of *account*, calling them cents; 1 cent would thus be equal very nearly to 2 pies of the present scale. Hence 1 pie, if such a coin were retained, would be half a cent., and would be written ·005 rupee. Any smaller fraction than ·005 rupee could not be represented by coin, if the pi. were the lowest in the scale, and such smaller fractions would be disregarded as fractions of pie now are.

To suit the coinage to this arrangement, we should have the existing 8-anna piece equal to 50 cents, the 4-anna piece equal to 25 cents, the 2-anna piece equal to 12½ cents. These two last pieces are not proper members of a decimal coinage, but it would be expedient to continue them for some time, until the new decimal coins were familiar. The new silver coins eventually to be substituted for the 4-anna and 2-anna pieces would be a 20-cent and a 10-cent coin. The last would be easily practicable. The franc silver coinage of Europe has a 20-centime piece, which is only a little more than 8 cents of the Indian scale.

For amounts below 10 cents the coins would be of copper. The largest copper coin now struck is the half-anna, or double pice, equal to about 3 cents of the new scale. I should think a 5-cent coin should be given, supplemented by 2 cents, 1 cent, and ½ cent, the last of which would be the equivalent of the pie and the lowest in the scale.

But as a provisional arrangement, I think it would be well instead of the 2-cent piece, to coin a 1½-cent piece, which would practically be equal to the ¼ anna or common pice; the difference between the existing ¼ anna coin and a 1½ cent, would only be ⅛th of a pie, and may be better stated perhaps by saying that 64 of the old coins go to the rupee, instead of 66⅔ of the new ones.

I also think that if such a system as this is adopted, occasion might be taken to give a more independent position to the 8-anna piece, and to assign to it a specific name, and endeavour to bring it into use as a unit for *payments*. It has long been said by those who have considered the subject, that the interests of all classes of society in India suffer by the inconveniently large value of the coin on which all transactions are based, and in terms of which all payments are made. No doubt to make a change in this respect will not be very easy; but this, as I have said on other occasions, is all the more reason for setting about the thing at once.

The remedy would be a very simple and very innocent one, and I cannot conceive how the most tender conscience could be alarmed by it. All that is necessary is to give a *new* and *special name* to the 8-anna piece, or half-rupee. I would suggest as a suitable name the term '*Hind*,' which is a fair equivalent of '*Franc*.'

The enquiry that has been suggested as to the probability of being able to get a decimalized system of minor coins adopted in India without difficulty, though it might lead to the accumulation of some interesting facts of which we now know nothing or little, seems to me of no sort of practical utility in relation to the essential point at issue. It is altogether impossible to adopt any conclusions at all on such a subject, excepting on somewhat abstract grounds, and all experience proves that whatever coins are issued are in point of fact brought into use. The state of the Indian copper coinage does not, to my mind, in the least militate against the general assertion I thus have made. Where the British pice are properly treated and can be got, they are used with complete readiness, and so it will be with all coins.

What we have to do is to see that the coins we issue will really be convenient, and this can only be ascertained by appealing to reason guided by experience, and not by interrogating ignorance and its consequences.

It is always reasonable to consider how ignorant people can be best got to leave off habits the result of ignorance; but beyond this I, for one, will never be concerned in suggesting the adoption of anything which I know to be bad, only because it is in harmony with something else which I also know to be bad.

To summarize the specific proposals, I should desire to make:—

I.—The rupee, for purposes of account, should henceforth be divided into 100 parts, to be called cents. The lowest fraction of a rupee to be recognised in payments to be half a cent. or the two-hundredth part of a rupee.

II.—The silver subsidiary coinage to consist of pieces of 50 cents, 20 cents, and 10 cents only.

III.—As a provisional arrangement, and until the new coins are familar, 4-anna pieces of 25 cents, and 2-anna pieces of 12½ cents may still be struck. But they should before long be withdrawn.

IV.—The 50-cent coin should hereafter be called the '*Hind*,' and that name should be stamped upon it. This coin should be a legal tender on the same footing as the existing half-rupee.

V.—The copper subsidiary coinage should in future consist of pieces of 5 cents, 2 cents, 1 cent, and ½ a cent.

VI.—On the 5-cent piece, in addition to the inscription, '5 cents,' should be added '10 to 1 hind.'

VII.—As a provisional arrangement, instead of the 2-cent pieces, coins of 1½ cent should be struck, which would virtually be equivalent to the ¼ anna piece, and should be declared by law to be a legal tender for ¼ of an anna. The words '1½ cent or ¼ anna' should be impressed on these coins.

VIII.—Copper coins should be legal tender for all fractions of a '*Hind*.'

IX.—The relative values of the old and new coins should be declared to be as follows:—

8-anna piece ..	=	1	Hind 50 cents.
4-anna ,, ..	=	25	cents.
2-anna ,, ..	=	12½	,,
Double piece or ½ anna ..	=	3	,,
Pice or ¼ anna	=	1½	,,
Half-pice or ⅛ anna ..	=	1	cent.
1 pie	=	½	,,

As long as the old coins were in circulation, they should be receivable at the above rates, but the half pice or ⅛ anna should be withdrawn at once, as being not sufficiently near the 1 cent in value.

X.—As soon as the new coins are issued, the public accounts should be drawn up with the decimal sub-division of the rupee, and all sums due or claimable in the future, whether by the Government or private persons, should thereafter be dealt with under the new system on the foregoing basis.

PUBLIC WORKS—IRRIGATION.

THE ORISSA WORKS.

We some time ago read with surprise an article in the *Indian Economist* upon the Orissa Irrigation Works. Anything that is allowed entrance into Mr. Knight's valuable journal comes to us with a certain presumption in its favour. We regret, therefore, that a series of statements should have been palmed off upon the *Economist*, which individually misrepresent the truth, and which, as a whole, are calculated to imperil an undertaking on which the future safety of a long-inflicted province depends. For example, the writer states that the Orissa canals have cost, up to date, three millions sterling, while the truth is that the aggregate amount does not amount to one-half of that sum. One million was paid to the East India Irrigation Company for the works as they stood on the 31st December 1868, and during the succeeding two years and half, the total expenditure was estimated at thirty lakhs, and certainly does not exceed, including every head of disbursement, half a million sterling. Again, the article asserts that all sorts of irregularities occurred under the Irrigation Company in the accounts, and that "lakhs of rupees worth of stock are unaccounted for." This is an absolute falsehood. The only items with regard to which any serious sum has had to be written off are the sums due from the cultivators for water. This arose from the circumstance that the Government officers had found it impossible to systematically measure the land thus irrigated, and as the husbandmen disputed their liability, it was found impossible to enforce payment in the Courts. Still more injurious is the statement with regard to the class of engineers employed upon the works. The writer stigmatises these gentlemen as "the refuse of the Public Works Department, the Railways, and Madras shopkeepers. What need there was on the part of Government to take in this transferred lot of raw live-stock, with whom it would be always difficult for it to deal, we for one cannot understand!" One would scarcely suppose from this that the Government had found among "the transferred lot of raw live-stock," which it thus obtained in Orissa, the materials on which it has during the last two years found itself compelled to indent whenever it required a specially good man for any great enterprise of the same sort. The Company's chief servant has rapidly and deservedly risen through the post of Secretary in the Irrigation branch of the Public Works Department to the Local Government, to the Chief Secretaryship to the Government of India. Nor should it be forgotten that to another of these gentlemen, Mr. Faulkner, we owe it in concert with Colonel Rundall, that Orissa has now in False Point, the best harbour between the Húglí and Bombay. But the truth is, almost every statement of the *Economist's* correspondent is untrue. To take only one more instance, he states that the drainage of the country has been stopped. "About 50 miles either side of the canal the land has become so much saturated with moisture, which is owing to the bed of the canal being higher than the general level of the adjacent country, that village after village were (*sic*) deserted, being found too damp for human habitation." The writer does not condescend to specify

which of the four canals this statement refers to. With regard to three of them, the strictly deltaic canals which run eastward towards the sea from Cuttack, it is simply ridiculous. These canals keep along the banks of rivers, so that it is absolutely impossible that they should have saturated the country on *both sides*, for on one side they would drain directly into the adjacent river. With regard to the fourth canal, the high-level one now almost completed from Cuttack to the Brahmani, the statement is even further from the truth. The 25 miles which were opened last year not only did not cause the desertion of "village after village," but they saved the whole adjacent population from famine. After a severe and protracted drought, the cultivators took water for 98,000 acres, and obtained a crop of a million and a half hundredweights of paddy from lands which would otherwise have been burned dry for want of rain. The whole amount of rice which the Government succeeded in throwing into Orissa during the famine year of 1866, was only 298,535 hundredweights, and this miserable pittance cost the State £189,919. We shall return to the subject on an early occasion, for we believe that on the prosecution of these Orissa works the future safety of the province depends.—*Englishman.*

THE ORISSA CANALS.

We adverted the other day to a series of misrepresentations which have recently found entrance into the *Indian Economist* about the Orissa canals—misrepresentations that derive some weight from the journal in which they were allowed to appear, and that tend to discredit an enterprise on which the future safety of a great province depends. The value of the canals for traffic has been frequently explained, and it will be enough to repeat that the Kendrapárá one has alone sufficed, by connecting the tidal channels from False Point with the capital, to break through the isolation which for centuries has been the calamity of Orissa. The high level canal will provide communication with the Hugli at rates with which railways are wholly unable to compete, and will throw open another great food-producing province to the markets of the world In addition to this, it will irrigate the country through which it passes, and its route runs along the high levels near the foot of the hills, the very territory most subject to droughts and famine.

The facts about Orissa are briefly these Five great rivers collect the drainage of sixty-three thousand square miles of the hill country towards Central India, and dash down their consentrated floods upon the three thousand square miles of the Cuttack delta. Besides its own rainfall of about 65 inches a year the level strip between the mountains and the sea has to find an exit for the drainage of a territory twenty-one times its own area. In the rainy season the rivers davastate the delta, while, like other Indian streams rising among hills, they fail to yield a trustworthy supply in summer. An enormous mass of water, aggregating 2,760,000 cubic feet per second, is thrown down in time of flood ; while in the hot weather the total supply dwindles to 1,690 cubic feet per second.

This water supply is regulated and utilised by four canals which form in fact four great artificial rivers running along high ground, and intended both for navigation and irrigation. The high level canal starts from Cuttack, and as above stated is designed to provide a cheap trade route between Cuttack and Calcutta, as well as to supply water to the country through which it passes. It has been completed as far as the Brahmani river and when opened to Balasore, will irrigate 572,000 acres in Orissa alone. The Kendrapara canal also starts from Cuttack and runs towards the sea dropping into tidal waters at Marsagha, after a course of 42½ miles. This canal was opened throughout in May 1869, and is designed to supply water to 385 square miles. The Taldanda canal also runs to the Coast, and will, when finished, connect the city of Cuttack with the main branch of the Mahánadí within tidal range. The first two sections as far as Soupúr have been opened, and the canal will irrigate in its first section alone 18,000 acres. The Machhgáon canal branches off from the Taldanda canal at Bíbáti and proceeds to the mouth of the river. It has already been completed as fr aas Singapúr.

The commercial feature of these artificial rivers, as trade routes, will be dealt with hereafter. We propose this morning to deal with the accomplished facts as regards their irrigating powers. The Orissa husbandmen has been accustomed to use irrigation only for the more costly sort of crops, such as pan-leaf, sugar-cane, tobacco, and cotton. For such crops a field is generally selected, which has the command of a natural water-course ; and the highest form of irrigation known in Orissa has hitherto consisted in throwing water on to the fields by means of hollow palm-trees or basket scoops from a tank or dammed-up stream. The East India Irrigation Company at first fixed the rates for supplying canal water at five rupees an acre. This rate proved too high, and a graduated scale was afterwards introduced, by which leases for large areas were offered at reduced rates. Even this failed to induce the cultivators to buy the water, and a further concession was made, by which the separate husbandmen in a village might combine to take a general lease for their aggregate lands at the reduced rates.

Much confusion and many abuses followed, and practically the Company's rates were reduced to Rs. 2-8-0 an acre. The first year in which the cultivators availed themselves of canal irrigation was in 1866-67, when leases were executed for 667 acres at a total charge of Rs. 2,520. Of this, however, only Rs. 620 could be collected, and the rest had to be written off as a bad debt. Next year, 1867-68, leases were executed for 1,842 acres, at an aggregate charge of Rs. 3,660 ; but only Rs. 1,750 could be collected, and the balance had again to be written off. The remissions of these two years were rendered necessary partly by the unfinished state of the works, which disabled the Company from performing its share of the contract, partly by the inexperience of the Government officers, and partly by disputes on the part of the cultivators touching the validity of the leases. A large area was irrigated by stealth, and the smallness of the returns was chiefly owing to the difficulties incident to introducing anything new in Orissa.

These returns cannot, therefore, be taken as a test of the revenue capabilities of the canals. In 1868-69 a drought at the end of the rains awoke the fears of the husbandmen, and water was taken for 9,378 acres, at an aggregate charge of Rs. 22,880. The popular apprehensions culminated in a panic, and the demand for water became so urgent that it was found impossible to comply with the usual forms, and irrigation was granted in many cases without leases. In others, the husbandmen appropriated wholesale on their own account. However, after some opposition, the land which had actually received water was measured, and the people paid on the whole very fairly for what they took.

Last year, a long protracted drought thoroughly aroused the cultivators to the folly of neglecting irrigation. Until far on in October, it seemed that another famine in Orissa was inevitable. Still the people thought Rs. 2-8 an acre too high a rate; and it was not till the Commissioner, Mr. Ravenshaw, by insisting upon the terrible risks that the province ran, induced Government temporarily to bring down the rate to a rupee an acre, that water was taken on a great scale. Between 98,000 and 100,000 acres were immediately put under irrigation, and even this amount of land, although insignificant compared with the future capabilities of the canal would have sufficed to take the extreme edge off a famine . It represents at the very lowest estimate a total out-turn of about a million and a half hundredweights of paddy, or 750,000 hundredweights of rice. As we stated the other day, the total rice supply which the Government managed to throw into the province, amounted to only 298,535 hundredweights, at the enormous cost of £189,919, merely to land at the sea coast. This year we observe that the irrigation has increased by fifty per cent. even as compared with last year, when a panic occured. The truth is, that when once a village takes water, it finds the profits of irrigation so immense, that it never leaves it off.

SILK CULTIVATION IN EGYPT.

The steps taken by H. H. the Khedive to stimulate the growth of silk in this country have been successful. The plantation of the mulberry, under the direction of Mr. Maxwell Anketell, has been carried on energetically during the months of February, March, and April. The property selected to commence operations upon consists of about 1,000 acres, situated twenty-five miles from Alexandria, and is bounded on one side by the Cairo Railway.

About nine miles of straight roads have been opened out upon the property, double planted on both sides with mulberry. All the old crooked water-courses have been levelled and new ones made along the margins of these roads, so that the cultivation of cotton and cereals has not been interfered with, and special irrigation of the mulberry trees has been rendered unnecessary, inasmuch as the water for irrigating the cotton cultivation, &c., must pass through the water-courses along the banks of which the mulberry trees are planted. Nearly 90,000 trees have been put down ; and in the autumn the plantation will be continued upon adjacent properties.

Next season the cultivation of the silk-worm will be established on this property : and inasmuch as the efforts to produce cocoons in Egypt this year have been remarkably successful in every instance good results are anticipated. It is also estimated that the cuttings from the mulberry trees will be sufficient to supply the steam-engines on this property with fuel, so that coal will not be required.

The cultivation of silk in Egypt cannot be any longer considered as experimental. The mulberry trees in the gardens of His Highness, both in Cairo and Alexandria, have been turned to account this year, in order to test the capability of the country to produce silk, and without an exception, the result has been satisfactory and the cocoons produced of excellent quality. Several private cultivators have also been successful, and we hope ere long to see the noble example set by the Khedive followed up on an extended scale.—*Egyptian Messenger.*

PRICES OF FOOD THROUGHOUT INDIA.— JULY 1871—SEERS ($2\frac{3}{35}$ lbs.) PER RUPEE.

BENGAL. (Rice, the staple food.)		Rice.	Wheat.	Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27½	23	Seers.	₹ Rupee.
	Bancoorah	27½	19	,,	,,
	Beerbhoom	32	16	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	31	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam	Durrung	21	8½	,,	,,
	Goalparah	17	30	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	...	,,	,,
	Seebsaugor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	23	18	,,	,,
	Mymensing	22½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	24	23	,,	,,
	Sarun	22	20½	,,	,,
	Shahabad	24	23	,,	,,
	Tirhoot	23	21	,,	,,
Bhaugalpore ,,	Bhaugulpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	29	27	,,	,,
Sonthal Pergunnah.	Godda	...	.	,,	,,
	Nya Doomkuh	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	29	21	,,	,,
Presidency Division.	Calcutta	.	.	,,	,,
	Nuddea	..	..	,,	,,
	Jessore	25½	15	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 3-16	21 9-16	,,	,,
	Bograh	33½	15½	,,	,,
	Dinajpore	35	17½	,,	,,
	Maldah	30	28	,,	,,
	Morshedabad	28	25	,,	,,
	Pubna	23	20	,,	,,
	Rungpore	25 11-16	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazareebagh	25	20	,,	,,
	Manbhoom	32	16	,,	,,
	Singbhoom	86	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25		,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES (Wheat and Joaree, the staple food,)		Rice.	Wheat.	Joaree.	Bajra
Meerut Division	Dehra Dhoon	12	25	28	20
	Saharunpore				
	Moozuffernugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	10	16	...	...
	Gurhwal				
Rohilkund ,,	Bijnour	19	20	28	28
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
Agra	Toral Pergunnahs	26	1-1-4	...	25
	Muttra	16	26	27	25
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	12	30	31	28
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	15	24	25	17
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
	Goruckpore	23	22	27	20
	Bustee				
Benares ,,	Azimgurh	16	19	23	17
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	8	14	21	18

OUDH. (Wheat and Joaree, the staples.)		Rice.	Wheat.	Joaree.	Bajra.
Lucknow Division	Lucknow	18	27	28	18
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	18	34	23	24
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	20	28	34	15
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	18	24	...	...
	Sultanpoor				
	Pertabghur				

PUNJAB. (Wheat and Joaree, the staples).		Rice.	Wheat.	Joaree	Bajra.
Delhi Division.	Delhi	9	33	26	24
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	21	26	24
	Rohtuk				
	Sirsa				
Amballa	Amballa	13	25	38	31
	Ludiannah				
	Simla				
Jullundhur.	Jullundhur	14	31	46	20
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	11	27	26	20
	Sealkote				
	Gurdaspore				
Lahore.	Lahore	11	26	27	24
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	8	23	25	23
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	20	20	18
	Jhung				
	Montgomery				
	Mozaffnuggur				
Deera I. Khan.	Deera I. Khan	7	21	28	25
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	6	16	21	20
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree, the staple food.)		Rice	Wheat	Joaree
Nagpore.	Nagpore	1 6	19½	23
	Bhundara			
	Chanda			
	Wurdah			
	Balaghat			
Jubbulpore.	Jubbulpore	17	32	16
	Saugor			
	Dumoh			
	Mundla			
	Seonee			
Nerbudda.	Baitool	13	24	26
	Hoshungabad			
	Chundwara			
	Nursingpore			
	Nimar			
Chutteesghur.	Raepore	35	34	42
	Belaspore			
	Sumbulpore			
Upper Godavery.	Seroncha	9	12	25

MADRAS Rice and Cholum (Joaree) the staple food.		Rice	Joaree
Northern Section.	Ganjam	240	125
	Vizagapatam	311	166
	Godavery	194	107
	Kistna	272	160
	Nellore	235	133
Ceded Districts.	Cuddapah	294	157
	Bellary	286	131
	Kurnool	344	154
East Centre	Madras	207	184
	North Arcot	221	114
	South Arcot	207	91
Cauvery.	Tanjore	220	124
	Trichinopoly	232	127
Southern Section.	Madura	315	146
	Tinnevelly.	340	152
West Centre.	Combatore	201	137
	Neilgherries	427	213
	Salem	243	110
West.	South Canara	272	..
	Malabar	300	..

Quotations are—so many Rupees per Garce = 8,400 lbs.

2nd sort Rice quoted.

BOMBAY PRESIDENCY. (Price of Atta, 1st Sort)		Atta
Northern Division.	Ahmedabad	Rs. 4 seers
	Kaira	3½ ,,
	Surat	3½ ,,
	Tannah	,,
Southern Division.	Poonah	3½ ,,
	Ahmednuggur	
	Kulladghee	3½ ,,
	Rutnagherry	3 ,,
	Belgaum	3 ,,
	Dharwar	3 ,,
	Sattara	4 ,,
	Carwar	,,
Sindh	Kurrachee	,,
	Hyderabad	
	Sukkur	3

BURMAH. (Rice, the staple.)		Rice	
Arakan.	Arakan	2 4 0	Per maund of 82 lbs.
	Ramree		
	Sandoway		
	Northern Arakan		
Pegu	Rangoon	2 7 0	
	Bassein		
	Myanoung		
	Prome		
	Tounghoo		
Tenasserim	Amherst	2 0 0	
	Tavoy		
	Mergui		
	Sheveyeen		

No Returns since April 1870.

2nd sort Rice quoted.

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 7th day of June 1871.

Date.	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1871.							
7th June	30,09,460	15,49,640	21,42,300	58,45,600	22,69,000	3,03,42,000	4,51,58,000
22nd June	31,38,050	16,72,500	22,01,800	59,78,800	23,24,000	3,14,79,000	4,67,94,150
15th July	32,31,260	17,11,200	23,42,800	63,62,800	24,34,000	3,07,73,000	4,68,55,060
22nd July	31,52,260	17,19,040	22,93,600	61,25,600	25,08,500	3,06,30,000	4,64,29,000

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION, of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Returned by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
30th June 1871...	Calcutta	3,96,45,840	2,28,140	3,94,17,700	1,13,85,126	34,58,488	72,495	1,42,42,231	2,91,58,340
Ditto ...	Madras	1,22,08,270	10,18,380	1,11,89,890	71,00,836	...	...	17,28,404	88,29,240
Ditto ...	Bombay	4,73,02,790	82,52,400	3,90,50,390	2,75,70,345	24,11,531	...	1,31,49,861	4,31,31,740
Ditto ...	Allahabad	68,94,410	36,11,840	32,82,570	30,31,549	...	...	11,03,291	41,34,840
Ditto ...	Lahore	1,02,05,320	52,14,490	49,90,830	74,17,253	...	...	7,00,037	81,17,290
Ditto ...	Calicut	15,22,100	3,33,040	11,89,060	10,29,971	...	...	1,00,059	11,30,030
Ditto ...	Trichinopoly ..	13,29,280	10,06,810	3,22,470	10,50,221	...	...	1,00,059	11,50,280
Ditto ...	Vizagapatnam ...	2,95,530	33,890	2,61,640	73,661	...	...	1,00,059	1,73,720
Ditto ...	Nagpore	40,32,110	7,37,550	32,94,560	27,68,298	...	...	5,47,902	33,16,200
Ditto ...	Kurrachee	49,62,626	33,11,800	16,59,820	44,07,124	..	...	5,00,106	49,07,230
Ditto ...	Akola	53,70,250	17,24,920	36,45,330	42,46,350	...	...	...	42,46,350
	Total ...	13,37,68,520	2,54,73,260	10,82,95,260	7,00,80,734	58,70,022	72,495	3,22,72,009	10,82,95,260

SILVER received and coined in the MINTS of CALCUTTA, MADRAS, and BOMBAY, 1870-71.

	CALCUTTA			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants'	
January 1871.....	1,359	15,242	...	...	...	...	2,34,421	3,01,662	...
February.....	1,48,244	6,914	...	...	1,504	...	...	3,86,906	49,987
March	607	1,089	...	...	...	...	...	4,84,798	2,02,999
April	1,874	2,058	...	...	357	...	14,174	2,73515	50,474
May.....	493	536	...	...	...	...	...	1,73,804	2,00,456
June	56,025	12,866	...	...	...	...	15,964	1,31,480	2,03,382

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1870-71, contrasted with previous Years.

	Jan. 1871.	Feb. 1871.	March 1871.	April 1871.	May 1871.	June 1871.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	2,84,18,697	3,16,22,045	3,38,05,931	3,78,93,140	3,27,89,228	3,99,40,681
Bengal.....	1,75,89,650	1,49,37,750	2,41,86,769	2,11,85,561	2,01,22,711	2,15,32,913
British Burmah.....	21,54,993	28,50,376	37,85,196	32,70,156	32,61,744	30,62,151
North-Western Provinces.....	2,66,91,640	2,44,20,225	1,85,03,347	1,81,59,055	2,25,97,199	2,68,11,724
Oudh.....	65,27,100	56,89,247	49,59,323	43,00,459	54,07,392	65,09,676
Punjab.....	1,11,97,672	1,21,01,569	1,20,30,928	1,19,88,811	1,11,44,344	1,33,45,801
Bombay	2,36,81,651	2,90,87,843	3,45,16,819	3,66,21,588	4,09,67,211	4,31,38,454
Central Provinces.....	78,77,193	76,75,822	78,21,400	78,27,972	86,43,209	89,58,742
Madras.....	2,85,64,842	2,73,54,662	2,96,02,761	2,87,66,337	3,22,41,593	3,11,87,203
	15,27,03,438	15,57,39,539	16,87,12,414	17,00,13,079	17,71,74,631	11,81,90,260
The same month 1868-69.....	8,76,86,400	8,69,65,712	10,17,58,040	13,05,88,334	11,73,38,501	14,22,29,014
Ditto 1869-70.....	11,83,90,970	12,69 21,285	13,98,20,999	10,45,09,269	13,63,02,461	19,44,87,345

THE BANK OF BENGAL.

Statement of Affairs.	27th June 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,56,854 7 0
General Treasury Balance at Head Office	2,86,34,913 11 0
Do. Do. at Branches	2,04,02,627 15 4
Other Deposits at Head Office and Branches	2,46,97,644 3 2
Bank Post Bills, &c.	2,87,599 0 10
Cash Credits undrawn	1,10,26,392 0 0
Sundries	5,84,169 8 5
Total Rs.	9,81,63,808 13 9
Assets.	
Government Securities	1,04,85,398 4 0
Loans on Government Securities at Head Office and Branches	55,64,376 13 5
Accounts of Credit on do. do.	50,69,531 5 1
Mercantile Bills discounted at do.	1,77,41,003 10 6
Dead Stock	11,91,896 4 2
Stamps	11,569 11 0
Balances with other Banks.	6,87,369 9 2
Sundries	1,75,915 7 2
Cash and Currency Notes at Head Office.	2,74,80,632 7 3
Cash and Currency Notes at Branches	2,97,56,115 6 0
Total Rs.	9,81,63,808 13 9

THE NEW BANK OF BOMBAY.

Statement of Affairs.	29th July 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance	1,83,22,635 0 0
Deposits at Head Office	1,24,33,255 0 0
Deposits at Branches	72,09,267 0 0
Bank Post Bills outstanding	31,003 0 0
Reserve	4,15,000 0 0
Undrawn Cash Credits	4,81,155 0 0
Total Rs.	4,48,92,315 0 0
Assets.	
Government Securities	77,92,663 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	16,86,304 0 0
Credits Accounts do. do. on Gov. Sec.	44,13,537 0 0
Bills discounted and purchased at do.	87,93,934 0 0
Dead Stock and Less written off	4,87,490 0 0
Stamps.	6,258 0 0
Balance with Agents and Correspondents.	16,87,058 0 0
Overdrafts	10,175 0 0
Government Reserve Cash.	.....
Cash and Currency Notes at Head Office.	1,92,48,581 0 0
Do. do. at Branches.	.....
Bullion at Head Office and Branches	3,92,677 0 0
Total Rs.	4,48,92,315 0 0

THE BANK OF MADRAS

Statement of Affairs.	29th July 1871.
Liabilities.	Rs. A. P.
apital.	56,25,000 0 0
Public Deposits at Head Office	72,40,232 10 11
Do. at Branches.	53,97,789 1 9
Other deposits at Head Office and Branches	1,16,75,218 2 0
Cash Credits undrawn at do	1,06,020 9 0
Post Bills	43,326 10 2
Reserve Fund.	6,37,500 0 0
Rest	21,191 10 5
Total Rs.	3,07,46,278 12 3
Assets.	
Silver and Notes at Head Office	60,79,291 8 4
Silver and Notes at Branches	79,31,824 14 0
Government Securities	10,65,363 7 7
Government Reserve -Cash	47,40,232 10 11
Securities	.....
Loans at Head Office and Branches	16,01,896 8 8
Accounts of Credit at Head Office and Branches	4,12,460 0 0
Mercantile Bills discounted at Head Office and Branches	55,48,475 7 7
Dead Stock at Head Office and Branches.	2,26,225 10 7
Bills of Exchange do	21,84,352 8 7
Due by other Banks.	9,56,156 0 0
Total Rs.	3,07,46,278 12 3

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54.	4 per cent Loans.							4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
		of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	of 1856-57.	Transfer Loan dated 15th July 1870.	T. W. of 1854-55.	of 1856-57.		2 years.		3 years.		5 years.	10 years.	15 years.	
														Repayable Jan. 1869.	4½ per cent Transfer Loan.	Repayable Jan. 1871.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1888.	
31st Dec. 1870	53,100	34,133	2,347	19,59,468	41,43,100	1,52,55,100	1,23,52,500	1,83,26,100	14,500	48,78,100	87,700	5,96,27,700	4,88,75,900	.....	.....	33,63,000	.....	.....	33,46,000	36,81,000	17,80,14,048
28th Feb. 1871	53,100	34,133	2,347	19,58,935	41,45,000	1,52,22,200	1,24,02,100	1,84,22,500	14,500	48,84,500	82,700	5,99,10,100	4,86,76,300	.....	.....	1,65,000	18,60,000	33,87,000	33,46,000	36,81,000	17,82,40,315
15th March 1871	53,100	34,133	2,347	19,62,347	41,41,100	1,53,45,300	1,23,92,200	1,67,04,200	14,500	48,73,500	70,200	5,95,92,400	4,81,89,600	.....	.....	1,65,000	18,60,000	33,85,000	33,46,000	33,14,000	17,57,72,227
15th April 1871	53,100	34,133	2,347	19,62,347	41,34,600	1,51,66,400	1,22,97,800	1,59,07,500	14,500	48,28,100	69,700	5,78,69,000	4,81,63,400	.....	.....	1,65,000	18,60,000	33,15,000	33,46,000	36,50,000	17,29,43,227
30th April 1871	53,100	32,640	2,347	19,59,680	41,37,000	1,50,80,000	1,23,92,200	1,51,24,800	14,500	46,36,100	69,700	5,72,51,800	4,69,84,900	.....	.....	1,65,000	18,96,000	33,15,000	33,46,000	36,00,000	17,00,24,767
15th May 1871	53,100	32,640	2,347	19,59,680	41,10,000	1,51,16,000	1,22,97,800	1,46,77,700	14,500	45,49,900	69,700	5,67,07,900	4,67,64,800	.....	.....	1,65,000	18,60,000	33,16,000	33,46,000	36,00,000	16,86,43,067
15th June 1871	53,100	32,640	2,347	19,62,027	40,56,200	1,50,93,200	1,20,75,700	1,46,69,900	14,500	47,09,000	68,700	5,40,90,900	4,43,50,100	.....	.....	1,65,000	10,61,000	31,81,000	33,46,000	37,11,000	16,23,42,314
31st July 1871	53,100	28,906	2,347	19,57,653	40,95,300	1,49,21,600	1,23,24,700	1,42,85,600	14,500	39,43,700	67,700	5,30,05,900	4,36,00,100	.....	55,000	.....	.....	31,70,000	33,46,000	36,66,000	15,93,70,106

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Divid.	Quotations.
Banks			
Agra Bank, Limited A.	£10	2 p. c.	93 a 98
Ditto Certificates B.	...	.....	£4-15
Ditto B. Shares	415	.....	....
Agra Savings' Bank	100	....	115 a 120
Allahabad Bank, Limited	100	5 p. c.	105 a 108
Bank of Bengal	1000	4 p. c.	*see above.*
Bank of Calcutta, Limited, A	39½	3 p. c.	15 a 16
Ditto ditto B	50	3 p. c.	25 a 26
Bank of Upper India, Limited	100	6 p. c.	125 a 126
Delhi and London Bank, Limited	250	1¼ p. c.	132 a 135
Munsoorie Savings' Bank	100	6 p. c.	135 a 136
National Bank of India	£121½	*nil.*	97 a 98
Oudh and United Service, Limited	100	*nil.*	*in liqdn.*
Punjab Bank, Limited	100	4 p. c.	80 a
Simla Bank, Limited	500	5 p. c.	570 a 575
Uncov. Ser. Bank (Agra)	100	4 p. c.	90 a 92
United Bank (Simla)	100	5 p. c.	100 a
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	*nil.*	400 a 405
Ditto ditto	200	*nil.*	80 a 81
Bengal Coal Co, Limited	1000	5½ p. c.	1400 a
Bonded Warehouse Association	440	23 p. sh.	560 a 565
Bruuton's Press Co., Limited	300	4 p. c.	205 a
Burdwan Stone Co., Limited	100	*nil.*	5 a
Calcutta Docking Co, Limited	700	*nil.*	200 a 250
Ditto New Shares	350	*nil.*	100 a 125
Delhi Railway Co.	218-2-10	2½ p. c.	228 a 230
Eastern Bengal Indigo Co.	100	*nil.*	35 a 30
Eastern Bengal Railway Co	£20	2½ p. c.	240 a
Eastern Steam Tug Co., Limited	250	*nil.*	*nominal.*
East India Railway Co	£2½	2½ p. c.	251 a
Equitable Coal Co., Limited	250	4 p. c.	199 a
Goosery Cotton Mills Co.	200	5 p. c.	221 a
Gouripore Co., Limited	1000	6 p. c.	1260 a 1275
Ditto ½ Share	125	.....	157 a 160
Great Eastern Hotel Co.	250	6 p. c.	147½ a 150
Howrah Docking Co., Limited	500	*nil.*	196 a 200
India General S. N. Co., Limited	1000	2 p. c.	320 a 330
Ditto ditto, ¼	500	2 p. c.	160 a 165
Ditto ditto, ½	250	2 p. c.	81 a 82½
Landing and Shipping Co.	100	5 p. c.	40 a
Nasmyth's Pat Press Co.	500	2½ p. c.	600 a
Oriental Gas Co.	£5	1½ p. c.	68 a 70
Ditto (Contributory)	£2½	1½ p. c.	34 a 35
Oudh and Rohilcund Railway	£10	2½ p. c.	113 a 11⅞
Port Canning Land Co, Limited	1450	*nil.*	380 a 390
Sind, Punjab and Delhi Railway Co.	£20	2½ p. c.	228 a 220
R. Scott Thomson & Co	500	2 p. c.	140 a 150
Tirhoot Indigo Co, Limited	200	*nil.*	85 a
Tea Companies.		*Yearly.*	
Assam Tea Company	200	15 p. c.	320 a 325
Bengal Tea Co., Limited	100	*nil.*	73 a *77
Ditto (Contributory)	60	*nil.*	15 a
Bismauth Tea Co, Limited	200	15 p. c.	*265 a
Ditto (Contributory)	50	15 p. c.	68 a 69
Central Cachar Tea Co.	200	*nil.*	86 a
Dehing Tea Co., Limited	85	*nil.*	30 a
Dehra Doon Tea Co., Limited	100	*nil.*	25 a
Durrung Tea Co, Limited	100	1¼ p. c.	62 a 61
Eastern Cachar Tea Co.	100	8 p. c.	106 a 108
East India Tea Co, Limited	100	*nil.*	71 a
Julalpore Cachar Tea Co.	250	20 p. c.	450 a 500
Kachanpor Tea Co., Limited	1000	*nil.*	350 a
Ditto (Contributory)	375	*nil.*	*nominal.*
Kyrsoong and Darjeeling Tea Co.	250	2 p sh.	85 a
Ditto (Contributory)	200	1½ p.sh	61 a
Kuttal Tea Co., Limited	200	..	63
Lower Assam Tea Co., Limited	£5	*nil.*	*nominal.*
Monacherra Tea Co., Limited	100	*nil.*	58 a 60
Moran Tea Co, Limited	75	*nil.*	*nominal*
Muddenhaut Tea Co., Limited	250	*nil.*	*par.*
Muttuck Tea Co, Limited	125	*nil.*	38 a 40
New Golah Ghat Tea Co.	£10	..	120 a
New Mutwal Tea Co.	30	25 p. c.	117½ a 120
Punkaburee Tea Co., Limited	100	3 p. c.	72 a
Soom Tea Co., Limited	100	5 p. c.	110 a
Tuckvar Tea Co., Limited	200	*nil.*	108 a 110
Upper Assam Tea Co, Limited	£10	*nil.*	19 a 20
Victoria Tea Co, Limited	250	*nil.*	32 a

BOMBAY SHARE LIST.

Banks.	Shares.	Nomi. Value. per. Sh.	Paid up.	Last Div'd.	Rate Share.
		Rs.	*Rs.*	*per an.*	*Rs.*
Agra Bank	10,000	100	*all*	4 *pr. ct.*	98
Bank of Bengal	22,000	1,000	*all*	8 *pr. ct.*	1,400
Bank of Bombay (New)	10,000	500	*all*	5 *pr. ct.*	637½
" 2nd Res. issue	10,000	500	100	5 *do.*	182½
Bank of Madras	15,250	1,000	*all*	6 *pr. ct.*	1,400
Chartered Mercantile of I. L. and China	10,000	250	*all*	4 *pr. ct.*	270
Chartered Bk. of I. & C.	40,000	275	*all*	*nil*	150
National Bank of India	37,080	250	125	*nil*	101
Oriental Bank	10,000	250	*all*	12 *pr. ct.*	500
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	...	£20	218-3-0	*pr. ct.*	240
Do. New £20 shares	...	£20	109-1-5	*do.*	126
Bombay, B. & C. I. R Co.	...	£100	1,000	*do.*	1,100
Do. New shares	...	£18	198-5-1	*do*	225
Land Companies.					
Elphinstone Land	10,800	1,000	*all*	30	
Ditto New Issue	10,800	1,000	650	11-14	
Frere Land	8,000	150	*all*	*nil.*	146
Mazagon Land and R.	750	2,000	2,000	*nil*	925
Port Canning	4,000	2,000	1,450	*nil*	390
Colaba Company	4,000	3,000	*all*	70	1,660
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,850	225 *p. s.*	2,200
Albert Press Company, Kurrachee	200	2,000	1,100	75 *do.*	990
Alexandra Press Co.	250	3,000	850	*nil.*	430
Apollo Press Co.	150	12,000	11,000	200 *do.*	7,600
Bombay Press Co.	200	2,000	11	265 *do.*	2,390
Ditto (New)	200	500	*all*	66½ *do.*	600
Colaba Press Co.	500	1,880	*all*	*nil.*	6,500
East India Press Co	350	2,000	*all*	....	3,500
Fort Press Co	150	8,500	*all*	300	10,500
Framjee Cowasjee Press	300	2,000	1,800	..	1,010
Hydraulic Press Co.	200	6,000	6,000	*nil.*	2,850
Kurrachee Press Co.	200	5,000	2,000	100 *p. s.*	1,100
Mofussil Press & G. Co.	2,000	400	350	35	605
Prince of Wales Press Co.	120	2,500	*all*	350	2,675
Victoria Press, Madras	225	2,000	1,000	*nil.*	900
Spinning & Weaving Co's.					
Albert Mills Company	400	2,000	1,700	50	1,600
Alliance Spinning Co.	500	2,500	*all*	200	2,600
Bombay	100	5,500	*all*	25 *p. c*	2,800
Bombay United	900	1,000	1,000	45	970
Broach Mills	1,600	150	150	....	290
Do. New	300	150	50	....	..
Dhurumsey Spinning	320	5,000	*all*	....	2,625
Great Eastern	750	2,000	2,000	75	2,100
Manockjee Petit's	2,500	1,000	*all*	140	1,030
Oriental	800	2,500	*all*	350	2,625
Royal	600	2,500	2 400	.....	2,275
Shipping Companies.					
Bombay Shipping Co.	1,000	5,000	3,500	1,800	700
Kurrachee Landing and Shipping Co.	500	2,000	300	21 *p. c.*	170
Miscellaneous.					
Mechanics' Building Co	1,000	50	*all*	5 *p. c.*	34
Treacher and Company	2,000	500	*all*	25 *p. s.*	440

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	*Rs.*	*Rs. exd.*
Bank of Bombay	*Jan.* '66	200	500	85	20
Bank of China	..	4,000	95	19½	1
Bombay Presidency Bank	*Aug.* '67	40,000	250	.....	
Bombay T. and B Association	*Sept.* '67	20,000	200	35	6
Brokers' Banking Co	*Sept.* '67	20,000	200	40	15
Central Bank	*Mar.* '66	40,000	250	2	1
East India Bank	..	25,000		..	1
Indian Peninsula Bank	*Feb.* '67	25,000	200	13	1
Royal Bank of India	*May.* '67	50,000	200	70¼	2
Old Financial	*Apr.* '67	30,000	130	74	1
Companies.					
Back Bay Reclamation Co.	*Nov.* '66		5, 00	2,375	32
Bombay, and Bengal S. S.	.....	892	3,500	2,440	10
Victoria Spinning Co.		55	5,000	2,400	10

BANK OF BOMBAY (IN LIQUIDATION).

NOTICE is hereby given that an EXTRAORDINARY GENERAL MEETING of the Proprietors of the Bank of Bombay, in Liquidation will be held at the Offices of the New Bank of Bombay, Limited, in Elphinstone Circle, Bombay, on MONDAY, the second day of OCTOBER, one thousand eight hundred and seventy-one, at three o'clock in the afternoon, for the following purposes :—

First—To consider and determine as to the propriety of forthwith completing the Liquidation of the Bank, and distributing the surplus assets thereof, and dissolving the Bank, according to the provisions of Section XCV. (sub-sections 10 and 11), of Act XIX. of 1857, of the Legislative Council of India.

Second—To consider and determine on the course to be adopted in order to provide for the debts and liabilities of the Bank now still out-standing, the nominal amount of which is Rs. 2,06,540-10-9, according to the particulars stated below, out of which sum of Rs. 2,06,540-10-9 it is, however, estimated that not more than Rs. 61,635, will be established as payable.

Third—To consider and decide as to the adoption of a scheme whereby, in order to facilitate the dissolution of the Bank and to provide for the said out-standing debts and liabilities, it is proposed that the sum of Rs. 61,635 shall be placed in the hands of two or more Trustees, to be nominated or approved of by the Proprietors at the Meeting, Rs. 61,635 thereof being contributed by the Bank, and Rupees ten thousand, the remander thereof, being contributed by Mr. William Rodgie (the Liquidator of the Bank), upon trust that the said Trustees shall, out of the said sum of Rs. 61,635 pay all claims in respect of the said out-standing debts and liabilities of the Bank, which shall be satisfactorily established before the thirteenth of January, one thousand eight hundred and seventy-four, and that the said Trustees shall, after the said day, stand possessed of the balance of the said sum of Rs 61,635 then remaining in their hands (if any) in trust for the said Mr. William Rodgie, subject to any claim in respect of the said debts and liabilities, which shall have been made before that time, and that the said Mr William Rodgie shall enter into covenants with the Bank and the Trustees, for the payment by him of all claims in respect of the said out-standing debts and liabilities of the Bank, which the sum of Rs. 61,635, proposed to be placed in the hands of the Trustees, shall not be sufficient to pay, and also for the indemnification by him of the Bank and the Proprietors and the Trustees from all responsibility in respect of the said out-standing debts and liabilities of the Bank. Copies of the Deed the which it is proposed to carry the above scheme into execution, in case by same shall be approved by the Proprietors, may be seen at the Office of Messrs. Rimington, Hore, and Langley, Solicitors to the Bank, at Apollo Street, Bombay.

SCHEDULE OF OUTSTANDING DEBTS AND LIABILITIES

On 23rd June 1871.

Current Deposit Account	Rs. 84,944 0 10
Bank Notes	85,140 0 0
Unclaimed Dividends	21,505 0 0
Fixed Deposits	5,012 8 6
Bank Post Bills	5,961 7 10
Interest on New Capital	4,977 4 7
	Rs. 2,06,540 10 9

WILLIAM RODGIE,
Liquidator.

Bombay, 28th July 1871.

COMPTOIR D'ESCOMPTE DE PARIS.

NEW FRENCH LOAN.—The sixteen Monthly Instalments fall due on the First of each month, commencing from the 1st August 1871.

The amount due on each Instalment per 5 Francs Rente is Rs. 1-14-1 92-100.

The Coupons are payable on 16th August, 16th November, 16th February, 16th May.

During the payment of Instalment, namely, up to 31st October 1872, the Interest will be paid on the 1st August, November, February, and May, in order that the Coupons due may be received in part payment of Instalments.

Interest is payable on presentation of Stock Receipts, pending the arrival of the Stock from Paris.

NEW BANK OF BOMBAY, LIMITED.

CAPITAL Rs. 1,00,00,000, DIVIDED INTO 20,000 SHARES OF Rs. 500 EACH.

FIRST ISSUE 10,000 SHARES OF Rs. 500 EACH=Rs. 50,00,000 PAID UP.
RESERVED ISSUE 10,000 SHARES OF Rs 500 EACH, ON WHICH Rs. 100 PER SHARE HAVE BEEN PAID.

DIRECTORS.

A. J. Macdonald, Esq., (of Sir Charles Forbes & Co.)
Captain G. F Henry.
R. Valentine Reid, Esq., (of Messrs. Finlay Scott & Co.)
Dinshaw Manockjee Petit, Esq
Ahmedbhoy Hubibbhoy, Esq.
Kesshowjee Naik, Esq.
E. D. Sassoon, Esq

SEVENTH REPORT.

The Directors beg to submit to the Proprietors the audited Accounts for the half-year ended 30th June last

During the period under review money was plentiful, and low rates of interest generally prevailed.

The state of European Politics interfered during a great part of the season with the Cotton markets, on which the trade of the Port and the business of the Bank greatly depend The improvement, in political affairs in a great measure restored confidence in commercial circles, but the change, although advantageous to Head Office, came too late to benefit the business of the Branches in any material degree.

The Directors regret there is still nothing definite to communicate regarding the Charter of the other question, on which they are at issue with Government, but they trust their representations may be productive of good.

The Balance Sheet, including the sum brought forward from last half year, shows a net profit on the Bank's operations of Rs. 3,00,492-10-2, and agreeably to the Articles of Association, the Directors recommend the declaration of a dividend at the rate of 6 per cent. per annum, which will absorb ..... Rs. 1,80,000 0 0
A transfer in reduction of cost of Premises and Furniture of „ 15,000 0 0
And a transfer to the Reserve Fund of ..... „ 85,000 0 0
which will thus be raised to Rs. 5,00,000.
Leaving a balance to be carried forward of ..... „ 20,492 10 2
Rs. 3,00,492 10 2

Rs. 1,000 have been set aside to cover the only loss the Bank has sustained during the half year, and, to guard against possible contingency, the Directors have transferred to "Doubtful Debt, in Liquidation Account" a sum of Rs. 2,000 against a small claim in dispute

As mentioned in last half year's Report, an Officers' Guarantee Fund, based on the principle of mutual liability, has been organized with the sanction and approval of the Directors The scheme has been revised and approved by a competent Actuary, and has been provisionally in operation during the past six months It has worked satisfactorily, and the Directors will ask the shareholders to approve of what has already been done, and to sanction its continuance To strengthen the Fund at the outset, the officers have liberally subscribed an amount equal to 5 per cent. of the total guarantees, which, together with the premia, forms a satisfactory provision against probable risks. To enlarge and extend the objects of the scheme, the Directors will ask the shareholders to sanction a contribution to the Fund of Rs. 5,000 annually, for five years, out of the profits of the Bank, at the discretion of the Directors.

The shareholders will have to elect Auditors for the ensuing year, and to fix their remuneration. The gentlemen at present holding the office are eligible for re-election.

In terms of clause 72 of the Articles of Association, Mr. Dinshaw Manockjee Petit, and Mr. E. D. Sassoon, retire from office, and are eligible for re-election.

By order of the Board of Directors,
W. FRASER,
Officiating Secretary and Treasurer.

Bombay, 19th July 1871.

AUDITOR'S REPORT.

FOR THE HALF-YEAR ENDED 30TH JUNE 1871.

The following is our report of the Audit of the Bank's Books and Accounts for the half-year ended 30th June 1871.

We have compared the General Ledger Balances with those in the Balance Sheet, and have found them to agree. These balances have been further verified by an examination of the Stock Registers, of the Branch Ledgers, the Security Ledgers, and the statements rendered by agents and other correspondents.

We have examined the Securities held by the Bank for Fixed Loans and Cash Credits These consist of Government Paper, Guaranteed Railway Shares, Goods, and Shipping Documents, and we have found them in order.

We have examined the "Bills Discounted and Purchased"; they amount to the sum that appears under that head in the Balance Sheet.

The Government Securities and Specie belonging to the Bank are also in order, and are of the value stated in the accounts.

We have counted the Cash and Currency Notes at the Head Office; their amount is correctly stated in the Balance Sheet.

The Cash, as well as the Bills, Cash Credits, Fixed Loans, &c., at the Branches, are vouched for by their respective Agents, and their statements are correctly embodied in the Balance Sheet.

We have, as is customary, compared the Securities deposited with the Bank and in the Treasury, for safe custody, with the Registers of the same kept by the Bank, and have found them to correspond.

A list of the overdrafts in detail has been submitted to us; the greater part is secured by property in the Bank's hands, and we are satisfied that the remainder as well as the secured portion, will be promptly repaid.

The Abstract of the Balance Sheet prepared for publication is correct, and the Profit and Loss abstract shows the actual result of the half-year's operation.

(Signed) G. MANSON.
„ RAGHOONATH NARAYEN, } *Auditors.*

Bombay, 17th July 1871.

Dr. *Statement of Affairs on 30th June 1871.* *Cr*

	Rs.	a.	p.	Rs.	a.	p.
To CAPITAL—						
10,000 Shares of Rs. 500 each, paid up..	50,00,000	0	0			
10,000 „ „ 500 „ on which Rs. 100 per share have been paid up..	10,00,000	0	0			
				60,00,000	0	0
„ Reserve Fund				4,15,000	0	0
„ Current Deposits at Head Office and Branches				1,07,48,080	2	11
„ Fixed do do do				21,93,033	12	8
„ Government do Treasury General Balance				1,99,97,137	3	1
„ Do Branches				31,82,211	1	4
„ Bank Post Bills outstanding				32,444	15	9
„ Other Liabilities				2,33,880	10	7
„ Balance of Profit and Loss account				3,00,492	10	2
				Rs. 4,81,02,270	8	1

	Rs.	a.	p.	Rs.	a.	p.
By Government Securities..				80,50,235	5	6
„ Fixed Loans on Government Securities, Bullion, and Merchandise..				44,68,724	0	3
„ Cash Credits on do do do				17,3[illegible],887	1	9
„ Overdrawn Current Accounts..				5,408	1	9
„ Bills discounted and purchased				1,00,53,994	13	7
„ Balances with Correspondents..				13,23,046	15	2
„ Freehold premises situated in Elphinstone Circle, Bombay, and furniture thereon at cost price .. .. Rs.	4,59,000	0	0			
„ Do do at Oomrawuttee at cost price .. .. .. „	5,854	0	0			
„ Do do at Ahmedabad .. „	9,150	13	8			
	4,65,004	13	8			
„ Furniture at the different Branches at cost price ..	24,452	5	6			
				4,89,457	3	2
Less written off..				40,000	0	0
				4,49,457	3	2
„ Stamps				6,713	15	0
„ Stationery value on hand				4,600	0	0
„ Adjusting account, being interest due the Bank to date on Fixed Loans, Cash Credits and on Government Securities, also amount due by Government for conducting Public Debt Office, Treasury, and Savings Bank, less rebate of Interest and discount				83,257	12	5
Cash and Currency Notes and Bullion at Head Office and Branches				2,19,23,055	1	6
				Rs. 4,81,02,270	8	1

Dr. *Abstract of Profit and Loss on 30th June 1871.* *Cr.*

	Rs.	a.	p.	Rs.	a.	p.
To Salaries at Head Office..	78,618	8	0			
„ Auditor's Fees	2,000	8	0			
„ Director's Fees	8,895	0				
„ Rent, Taxes, and Insurance	5,335	7	0			
„ Income Tax	5,007	3	0			
„ Miscellaneous Charges, including cost of transit of Specie	15,022	1	7			
„ Salaries at Branches	61,794	4	11	1,14,788	3	7
„ Other Charges at Branches, including cost of transit of specie	13,702	6	9			
„ Brokerage account				75,496	11	8
„ Interest paid at Head Office and Branches.				2,161	0	0
„ Amount of Stationery used				45,870	9	8
„ Amount to Credit of Past Due Bills account.				5,737	13	11
„ Doubtful Debt in liquidation account				1,000	0	0
„ Net Profit to 30th June 1871				2,00,000	0	0
				2,80,366	7	3
				Rs. 5,25,430	14	1

	Rs.	a.	p.
By Interest received at Head Office and Branches.	1,01,239	5	7
„ Exchange Do. do.	2,09,486	8	3
„ Commission Do do.	47,747	9	11
„ Discount Do. do.	28,611	10	9
„ Interest on Government Securities.	83,277	15	11
„ Profit on Bullion Operations.	1,037	11	8
Rs..	5,25,430	14	1

Dr. *Profit and Loss account from 1st January to 30th June 1871.* *Cr.*

	Rs.	a.	p.
To Dividend for Half Year ended 31st December 1870 ..	1,80,000	0	0
Balance at credit of this account	3,00,492	10	2
Rs.	4,80,492	10	2

	Rs.	a.	p.
By Balance of this account on 1st January 1871	1,70,126	2	11
„ Net Profit for Half year ending 30th June 1871	2,80,366	7	3
Rs.	4,50,492	10	2

Examined and found correct.

G. MANSON,
RAGHOONATH NARAYEN, } *Auditors.*

E. & O. E.
Bombay, 17th July 1871.

W. FRASER,
Offg. Secretary and Treasurer.

ROBERT CLARK,
Chief Accountant.

A. J. MACDONALD.
G. F. HENRY.
R. VALENTINE REID.
KESSOWJEE NAIK.
AHMEDBHOY HUBIBBHOY.
DINSHAW MANOCKJEE PETIT.
E. D. SASSOON.
} *Directors.*

NOTICE TO HOLDERS OF ANNUITY OR ENDOWMENT CONTRACTS.

IN THE MATTER OF THE ALBERT LIFE ASSURANCE COMPANY ARBITRATION ACT, 1871.

ALL HOLDERS OF ANNUITY OR ENDOWMENT CONTRACTS issued by any Company named in the Schedule to this Notice, are hereby required to deliver to me, not later than the Thirtieth day of September 1871, the original contracts held by them, in order that the same may be examined, and that the direction of the Arbitrator may be taken thereon.

All communications relative to this Notice are to be by prepaid post letter addressed to me here.

Dated this 10th day of August 1871.

ALBERT LIFE ASSURANCE COMPANY,
CALCUTTA.

C. H. OGBOURNE,
Agent in India of the Joint Official
Liquidator of the several Companies in Liquidation.

THE SCHEDULE ABOVE REFERRED TO.

The Albert Life Assurance Company
The Western Life Assurance Society.
The Bank of London and National Provincial Insurance Association.
The Family Endowment Life Assurance and Annuity Society.
The Medical Invalid and General Life Assurance Society.
The National Guardian Assurance Society.
The Times Life Assurance and Guarantee Company.
The Beacon Life and Fire Assurance Company.
The Kent Mutual Assurance Society
The Indian Laudable Mutual Life Assurance Society.
The Metropolitan Counties and General Life Assurance Annuity Loan and Investment Society.
The St George Assurance Company.
The London and Continental Assurance Company.
The Manchester and London Life Assurance Association
The National Provincial Life Assurance Society.
The Merchant's and Tradesman's Mutual Life Assurance Society.
The Anchor Assurance Company.
The Falcon Life Assurance Society.
The Empire Assurance Company.
The New Oriental Life Assurance Company.

NOTICE TO POLICY-HOLDERS.

IN THE MATTER OF THE ALBERT LIFE ASSURANCE COMPANY ARBITRATION ACT, 1871.

ALL HOLDERS OF POLICIES OF ASSURANCE issued by any Company named in the Schedule to this Notice are hereby required to take Notice, that in pursuance of decisions of the Court of Chancery and of Lord Cairns (the Arbitrator appointed by the above-mentioned Act) they will (except as hereinafter mentioned) be deemed to have claims against the Albert Life Assurance Company only, and not to have any claim against the Company which issued the particular Policy or any other of the Companies named in the Schedule.

The following are the Policy-holders referred above to as excepted (namely)—those in whose particular cases it has been already decided by the Court or Arbitrator that they have a claim against the Company which issued the Policy.

If any person in whose case it has not been already so decided, claims to prove on a Policy against any Company named in the Schedule other than the Albert Company, and desires to assert that claim, he must send to me, not later than the Thirtieth day of September 1871, a notice to that effect, stating his name, address, and description, the full particulars of his claim, and the special grounds on which he claims against any such Company.

All communications relative to this Notice are to be by prepaid post letter addressed to me here.

Dated this 10th day of August 1871.

ALBERT LIFE ASSURANCE COMPANY,
CALCUTTA.

C. H. OGBOURNE,
Agent in India of the Joint Official
Liquidator of the several Companies in Liquidation.

THE SCHEDULE ABOVE REFERRED TO.

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The National Guardian Assurance Society.
The Times Life Assurance and Guarantee Company.
The Beacon Life and Fire Assurance Company.
The Kent Mutual Assurance Society.
The Indian Laudable Mutual Life Assurance Society.
The Metropolitan Counties and General Life Assurance Annuity Loan and Investment Society.
The St. George Assurance Company.
The London and Continental Assurance Company.
The Manchester and London Life Assurance Association.
The National Provincial Life Assurance Society.
The Merchant's and Tradesman's Mutual Life Assurance Society.
The Anchor Assurance Company.
The Falcon Life Assurance Society.
The Empire Assurance Company.
The New Oriental Life Assurance Company.

Holloway's Pills.—Indigestion, Stomach, and Liver Complaints.—Persons suffering from any disorders of the liver, stomach, or the organs of digestion should have recourse to Holloway's Pills as there is no medicine known that acts on these particular, complaints with such certain success. Its peculiar properties strengthen the stomach, increase the appetite, and rouse a sluggish liver. For bowel complaints it is invaluable, as it removes every primary derangement, thereby restoring the patient to the soundest health and strength. These preparations may be used at all times, and in all climates, by persons affected with biliousness, nausea, or disordered livers. For flatulency and heartburn they are specifics. Indeed no ailment of the digestive organs can long resist their purifying and corrective power.

TO STOCK BREEDERS.
CATTLE FOOD PHOSPHATES.

As the remarkable degeneration in the Bone, Muscle, and Strength of the Indian horse (no matter how well bred), commences *in Utero* and is entirely due to the grass, hay, and corn given to the Dam, being most detrimentally deficient in the Phosphates of *Soda, Potash, Lime, Magnesia,* and *Iron*, PRIVATE BREEDERS are advised to add them to the food. A Mare in Foal will require one ounce daily for ten months, and the same quantity till her Foal is weaned.

The Yearling will require one quarter of an ounce per diem, and the two and three year old COLT and FILLY, half an ounce daily, throughout each year.

The Cattle Food Phosphates will cost twelve annas per pound, for Horses, and eight annas for Cows—ready for use.

For further information, address LIEUTENANT J. F. POGSON,
Agents wanted for Bombay and Madras. SIMLA.

JOSEPH GILLOTT'S
CELEBRATED
STEEL PENS
SOLD
BY ALL DEALERS THROUGHOUT THE WORLD.

PURE OXIDE OF IRON PAINT.

USED BY H. M.'s DOCKYARD, THE MUNICIPALITY, THE G. I P. AND B. B. & C. I. Railways, Contractors, the P. & O. Co., and B. I. S. N. Co., &c., &c.

The best and cheapest paint to be obtained in the market. It is *peculiarly* adapted for iron work of all descriptions. Apply to
11, Hummum Street, Bombay. C. E. MITCHELL & Co.

SCHOOLS.

MRS. BIRCH'S SCHOOL, Woodbine Lodge, Nynee Tal.—A few vacancies for Boarder Pupils.

THE REVEREND H. SELLS receives private pupils at Hampton Court, Mussoorie, to prepare them for the Public Schools at home, or for Examinations in India.

GROVE PARK SCHOOL, WREXHAM.

PRINCIPAL,—J. PRYCE JONES, L. C. PREC.

ATTENTION is respectfully invited to the following facts:—1. The locality of the School is remarkably healthy. 2. The premises are extensive, and fitted up with due regard to the comfort of the Pupils. 3. Every facility for recreation is afforded by the large playground and cricket-field which adjoin the house. 4. There is a sufficient staff of well qualified Masters, including a Classical Master (B. A. in classical honours, Cambridge) and a resident Frenchman. 5. At the Examinations of the College of Preceptors and the Oxford and Cambridge Universities, Pupils from the School have taken Honours in several distinct branches of Education, *e. g.*, Latin, French, Mathematics, Book-keeping, and English. 6. At five examinations by the College of Preceptors, Certificates were awarded to one-third of all the Pupils in the School. 7. At five out of seven Examinations by the College the highest place in Book-keeping was given to candidates from the School. 8. The Principal earnestly endeavours to form in his Pupils a manly Christian character. 9. The Diet is liberal.

TERMS which are moderate, and inclusive with lists of successful pupils, on application.

THE SOUTHERN INSURANCE COMPANY, (LIMITED.)

REGISTERED CAPITAL—ONE MILLION STERLING.

Paid-up Capital .....£ 100,000
Reserved Fund .....£ 40,000

HEAD OFFICE—MELBOURNE.

The undersigned having been appointed Agents, are prepared to grant Policies by Marine Insurance.

Bombay, 19th June 1869. J. N. WADIA, SONS & Co.

THE STANDARD LIFE ASSURANCE COMPANY.—Established 1825,

WITH WHICH IS NOW UNITED

The Colonial Life Assurance Company.

COLONIAL AND FOREIGN ASSURANCES.

An amalgamation having been formed between the *Standard Life Assurance Company* and the *Colonial Life Assurance Company*, the business of the united companies will henceforth be conducted under the title of

THE STANDARD LIFE ASSURANCE COMPANY.

The annual revenue of the Standard Company is now upwards of £650,000, and the accumulated funds amount to upwards of £2,500,000 sterling. The new business transacted during the past year amounted to the large sum of £1,375,000 sterling, the corresponding premium amounting to £45,337 per annum.

Moderate rates charged for residence in the Colonies, India, and other places abroad.

Local Boards and *Agencies* in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where premiums may be received and claims paid.

Immediate reduction of premium on return to Europe, or other temperate climate, without medical certificate.

Profits divided every five years.

The new Colonial and Foreign Prospectus may be had on application at the chief offices of the Company, or to the Agents at home or abroad.

WILL. THOS. THOMSON, Manager and Actuary.
D. CLUNIE GREGOR, Colonial and Foreign Secretary.

BOMBAY BOARD.

H. Prentis, Esq. | W. Nixon, Esq.
A. R. Scoble, Esq. | A. E. Ashley, Esq.

Agents at Bombay.

The London, Asiatic and American Company, (Limited.)

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, SATURDAY, 21ST OCTOBER 1871. [No. 8.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden	From Bombay every Saturday at 3 P.M. from Mazagon.
Suez	
Brindisi	
Malta	
Gibraltar	
Southampton	
Galle	Thursday 12th and 26th October; 9th and 23rd November; 7th and 21st December at noon.
Madras	
Calcutta	
Penang	
Singapore	
Batavia	
Hong Kong	
Shanghai	
Japan	
King George's Sound ...	Thursday 26th October, 23rd November, 21st December at noon.
Melbourne	
Sydney ...	

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London and Liverpool.

A considerable reduction has been recently made in the rates of passage money.

For further particulars apply to
GEORGE F. HENRY,
Superintendent.

Bombay, 1st June 1871.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*.

PASSENGER RATES FROM BOMBAY.

	Cabin.	Deck with food.
To Aden	£ 16	£ 7-13
To Suez	,, 28	,, 13-7
To Port Said	,, 30	,, 14-6
To Trieste	,, 40	,, 19.

Cargo taken for Trieste, also for Venice, Constantinople, and Odessa, Aden, Egypt, England and the Continent generally.

There is also a weekly service by Mail Steamers between Alexandria and Trieste, in conjunction with the P. & O. Co.'s mail steamer to and from Suez. The Austrian Lloyd's mail steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 2 0 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4 to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers to Southampton, at a charge of 10s. per cwt. to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned Agent grants also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS ... ... £13 | SECOND CLASS £9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLASS, £7-10 per head.

Railway Tickets, from SUEZ to ALEXANDRIA, with all the privileges of passengers by the P. & O. Co.—FIRST CLASS, £3; SECOND CLASS, £2; CHILDREN over 3 and under 10 years at HALF FARE.

In conjunction with the Austrian Lloyd, cargo for Trieste and Venice can be booked through from Bombay by the P. & O. Co., and the Bombay and Bengal Steam Ship Co., and via Bombay from the various ports touched at by the steamers of the British India Steam Navigation Company.

TRANSHIPMENT SERVICE AT PORT SAID.

Goods for Trieste, Venice, Odessa, and ports on the Syrian, Turkish and Greek coasts, shipped by steamers under any Flag whatever from Japanese, Chinese and Indian ports bound to Mediterranean or British ports VIA Suez Canal, are received and transhipped by the Austrian Lloyd's Agent at Port Said, and forwarded to their destination by the Company's regular lines of steamers.

For further particulars, and for freight and passage apply to the Agency of the Austrian Lloyd's Steam Navigation Company.

A. C. GUMPERT,
Bombay, 2 Ash Lane, 2'th Feb. 1871. Manager.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.

MESSRS. R. RUBATTINO & Co.'s Italian Mail Steamers are running between GENOA and BOMBAY, calling at LEGHORN, NAPLES, MESSINA (occasionally ALEXANDRIA), PORT SAID, SUEZ, ADEN and *vice versa*.

PASSENGER RATES.

INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

	1st Class.	2nd Class.	3rd Class.	
To Aden	£22	£15	£4	Without food.
,, Suez	36	22	8	
,, Port Said	38	24	9	
,, Alexandria	30	25	9-10	
,, Messina	45	32	13	
,, Naples	47	33	13	
,, Leghorn	50	34	14	
,, Genoa	50	34	14 ...	
,, Marseilles (transhipment at Genoa)	53	35	14-10	

Including Wines.

Children under 3 years, free of charge. Children not above 10 years are free.

Passengers are allowed to *break the voyage at any of the abovenamed Mediterranean ports*, and are free to resume it by any of the Company's steamers to the port of destination marked on their tickets.

Passengers returning within six months of their departure from Bombay by the steamers of the Company, are entitled to a reduction of 20 per cent. on the return fare.

Berths may be secured in advance by depositing half the Passage Money.

For prospectus, rates of freight, and further particulars apply to
VOLKART BROTHERS.

Bombay, 19th December 1870. Agents, Rubattino Steam Navigation Company.

STEAM COMMUNICATION WITH THE PERSIAN GULF, VIA KURRACHEE.

Interchanging Cargo and Passengers at Bussora, to and from Bagdad, with the Euphrates and Tigris Steam Navigation Company.

THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, will despatch a steamer every 14 days to the PERSIAN GULF, touching at KURRACHEE, GUADUR, MUSCAT, BUNDER ABBAS, LINGA, BUSHIRE, FAO, MAHOMERAH and BUSSORAH.

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.

THE British India Steam Navigation Company (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days.

This route is the most expeditious and economical for passengers for the Neilgherry district, Bangalore and Madras, who can land at Calicut for Beypore, and proceed from thence by rail.

Passengers for Calcutta can take the same route, picking up the steamer at Madras.

Bombay, January 1870. W. NICOL & Co., Agents.

MESSRS NICHOLAS AND CURTIS.

PHOTOGRAPHERS AND ARTIST'S COLOURMEN.—Messrs. N. and Co.'s views of Madras, with the recent additions, now comprise the following. Taken on 12 by 10 Plates.

Price 3 Rs. each, or 30 Rs. per dozen unmounted.

The Cathedral.	The Surf.
The Pier.	Mount Road (2 Views)
Government House.	Royapooram Station.
Munro Statue.	Moorish Tombs.
Nott Statue.	The Light House.
Club.	Memorial Hall.
Napier Bridge.	St. Andrew's Church
Budgerows and Top Boats.	Moorish Mosque.
Venery Church.	Parthasardy Pagoda
Patchappah's Hall	Cocoanut Palms
Mess House, Fort.	Date. ,,
Government Office, Fort.	Palmyra ,,
The Flag Staff, Fort.	Areca ,,
Indian Well and Foliage.	Catamaran.

Panoramas of the Beach, the Fort, and Black Town, and a number of other subjects not specified. Also Views of Ootacamund and all the other stations of the Neilgherries, Bangalore, Seven Pagodas, Tirupatty, Conjeveram, Mysore, the Pulney Hills, Tanjore, Madura, &c.

Photographs illustrative of native character in Madras, also Burmese, Nicobarians, Andamanese, &c.

Detailed Catalogues of all the above may be had on application.

Customers residing in any part of India who have not an opportunity of selecting views for themselves may rely upon Messrs. N. and Co. sending the most interesting, when the selection is entrusted to them.

Madras, April 1870.

TO STOCK BREEDERS.

CATTLE FOOD PHOSPHATES.

As the remarkable degeneration in the Bone, Muscle, and Strength of the Indian horse (no matter how well bred), commences *in Utero* and is entirely due to the grass, hay, and corn given to the Dam, being most detrimentally deficient in the Phosphates of *Soda, Potash, Lime, Magnesia*, and *Iron*, PRIVATE BREEDERS are advised to add them to the food. A Mare in Foal will require one ounce daily for ten months, and the same quantity till her Foal is weaned.

The Yearling will require one quarter of an ounce per diem, and the two and three year old COLT and FILLY, half an ounce daily, throughout each year.

The Cattle Food Phosphates will cost twelve annas per pound for Horses, and eight annas for Cows—ready for use.

For further information, address LIEUTENANT J. F. POGSON,
SIMLA.

Agents wanted for Bombay and Madras.

COMMERCIAL UNION ASSURANCE COMPANY.

HEAD OFFICE: 19 & 20, CORNHILL, LONDON.

Capital fully subscribed ..... £2,500,000.
Amount paid up..... ..... £250,000.

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INDIAN BRANCH—CALCUTTA.

No. 1, HARE STREET.

DIRECTORS OF THE INDIAN BRANCH.

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G. M. BLACKER, Esq., Merchant.
J. C. MURRAY, Esq., (Messrs. Kettlewell, Bullen & Co.) Merchant.
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C. SANDERSON, Esq., (Messrs. Berners, Sanderson and Upton,) Solicitor and Registrar of the Diocese of Calcutta.
A. THORNDIKE, Esq., (Messrs. Atkinson, Tilton & Co.,) Merchant.

MEDICAL OFFICERS.

DR. N. C. MACNAMARA, 6, Russell Street. Hours 10½ to 12 A.M., Saturdays 3 to 4 P.M.
DR. W. PALMER, General Hospital. Hours 12½ to 2 P.M.

BANKERS.

The Oriental Bank Corporation.
The Chartered Mercantile Bank of India, London and China.

SOLICITORS.

Messrs. Berners, Sanderson, and Upton.

LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent. of the amount received upon whole life policies then in force, *after providing for all special values, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid, subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office.*

Yearly premium for the Assurance of Rs. 1,000.

Age next Birthday.	For the whole term of Life. without Profits.			With Profits.			Age next Birthday	For short periods, &c. For One Year.			For Three Years.			For Seven Years.		
	Rs.	a.	p.	Rs.	a.	p.		Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
30	35	0	0	39	0	0	30									
31	35	0	0	39	0	0	31									
32	36	0	0	40	0	0	32									
33	36	0	0	41	0	0	33	35								
34	37	0	0	41	0	0	34	&	28	0	0	28	0	0	20	0	0
35	38	0	0	42	0	0	35	under									
36	38	0	0	43	0	0	36	36	28	0	0	20	0	0	20	0	0
37	39	0	0	44	0	0	37	37	29	0	0	29	0	0	30	0	0
38	40	0	0	45	0	0	38	38	29	0	0	29	0	0	30	0	0
39	41	0	0	46	0	0	39	39	29	0	0	29	0	0	30	0	0
40	42	0	0	47	0	0	40	40	29	0	0	30	0	0	31	0	0
41	43	0	0	49	0	0	41	41	30	0	0	30	0	0	32	0	0
42	44	0	0	50	0	0	42	42	30	0	0	31	0	0	33	0	0
43	46	0	0	51	0	0	43	43	31	0	0	32	0	0	34	0	0
44	47	0	0	53	0	0	44	44	32	0	0	33	0	0	35	0	0
45	48	0	0	54	0	0	45	45	33	0	0	34	0	0	36	0	0
46	50	0	0	56	0	0	46	46	34	0	0	35	0	0	37	0	0
47	51	0	0	57	0	0	47	47	35	0	0	36	0	0	38	0	0
48	53	0	0	59	0	0	48	48	36	0	0	37	0	0	39	0	0
49	54	0	0	60	0	0	49	49	37	0	0	38	0	0	40	0	0
50	56	0	0	62	0	0	50	50	38	0	0	39	0	0	42	0	0

The above rates will compare favourably with the *ciral rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, at the Division of Profits, 31st December, 1867.

Age at entry.	Sum Assured. £. s. d.	Bonus Added. £. s. d.	Yearly Rate of Bonus per cent. on Sum Assured. £. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.*
Medical fees are paid by the company.
Claims are paid *one month* after satisfactory proof of death.
Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.
The office is a comparatively young one (first policy issued in 1862), and *is therefore free from old liabilities.*
It possesses a very large capital, *the whole of which is fully subscribed.*
Its investments are all *of a first-class character.*
The life funds are allowed to accumulate *in special trust* for the primary security of life policies.
The expenses of management are guaranteed by the deed of settlement *not to exceed 10 per cent of the premium income.*
The London Direction consists *of first-class city merchants, who look after the business themselves, who are all shareholders in the company, and nearly all of whom have been on the Board from the commencement.*
The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.
The first-class position which the office holds at home, *as shewn by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bulloch Brothers
Bankipore	W. Fraser, Esq., Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal.
Ditto	Bank of Upper India.
Ditto	T. Lucas & Co.
Chittagong	Messrs. Bulloch Brothers.
Chumparun	James Begg, Esq.
Chumparun Districts	E. C. Lamb, Esq.
Cochin	Peirce, Leslie, & Co.
Coconada	W. M. Abell, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Dhamie	Bazenjee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Watters, Esq., Bank of Bengal.
Lucknow	W. Dickson, Esq., Bank of Bengal.
Ditto	W. A. N. Langdon, Esq.
Madras	C. L. O'Brien, Esq., Secretary to the Local Board
Moulmain	Messrs. Bulloch Brothers.
Meean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nagpore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq., Bank of Bengal.
Purneah	P. H. D. de Dombal, Esq.
Rangoon	Messrs. Bulloch Brothers.
Rohilkund Districts	H. Costley, Esq.
Sylhet	E. G. Foley, Esq.
Sangor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Tirhoot	E. Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December 1870, exceeded £127,000.
Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built and tiled, or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months.	6 months.	3 months.	2 months.	1 month.
	as.	as.	as.	as.	as.
Private Dwelling Houses...	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building. from to)	10	7½	5	4	2½
Bonded warehouse, no hazardous goods	12	9	6	5	3
Jute and loose cotton..	8	6	4	3½	2
Presses or screw-houses cotton or jute (warranted no artificial light used.)	16	12	8	7	4
Without such warranty	20	15	10	8	5
	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,
No. 1, Hare Street, Calcutta, 31st March 1871.
C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. III. BOMBAY, SATURDAY, 21ST OCTOBER 1871. [No. 3.

The Indian Economist.

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LETTERS TO THE EDITOR.

THE OPIUM BLIGHT.

To the Editor of the "Indian Economist."

DEAR SIR,—In reply to the questions put in your letter to my address of the 27th ultimo, I beg to state that:—

(1). The effect of blight on the strength of the opium produced this season was *nil, for as soon as the plants were affected with it, they ceased to yield opium.*

(2). The blight has not in anyway reduced the strength of the drug, or affected its quality. This season's provision is as good as, nay perhaps better than, usual. The assertion made by the Editor of the *Pioneer*, in the leading article of that paper, dated 9th September last that "the quality of the opium this year is bad" is without foundation.

The out-turn of provision opium from this agency for season 1870-71 is 18,000 chests, against 21,172 in 1869-70.—I remain, &c., &c.

ROBERT JOHN RICHARDSON,
Officiating Opium Agent of Benares.

Ghazeepore, N.-W. Provinces, October 4th 1871.

THE HOME CHARGES.

BOOK DEPOT, BOMBAY.

To the Editor of the "Indian Economist."

SIR,—With reference to your recent remark that the home charges on account of stores ought to be sifted to the bottom, allow me to put you on the track of a job by which I venture to suspect that some one's pocket must have been amply lined.

Formerly, the Government Book Depôt at Bombay used to purchase books, published in England, from an agent who delivered them in Bombay at 19 per cent. under the published price, and accepted payment at the rate of two shillings to the rupee. The total discount allowed was therefore about 24 per cent.

Recently, however, it has been discovered, that this is an extravagant arrangement, and accordingly the Secretary of State buys all books, and despatches them from the India Office. He gets a discount of, I believe, 20 to 25 per cent. in England, and pays the cost of carriage, which cannot be less than 10 per cent., besides of course having to keep up an establishment in London. The cost of the books therefore when delivered in Bombay cannot be less than 90 per cent. of the published price. Who pockets the 9 per cent. I cannot say, but certainly it is not distributed amongst Indian taxpayers.

This is no doubt a comparatively trifling matter, but doubtless the same sort of dishonesty prevails in other departments too.

HONESTY.

ENHANCEMENT OF RENT.—I.

NORTH-WEST PROVINCES.

To the Editor of the "Indian Economist."

SIR,—I see that two of your correspondents have taken up a recent decision of the High Court, North-West Provinces, with reference to the question of suits for the enhancement of rent. With all respect to the Judges, I think I may say that it is much to be regretted that they did not state the law on the question before them with greater clearness. They talked as if it was necessary to look to Act X. for a decision of the issue, whether a landlord having sued to enhance a tenant's rent, say for the year 1275 Fusli, and the suit having been dismissed, could sue next year to enhance the rent for 1276 Fusli. The decision of this issue seems to me to have nothing to do with Act X. of 1859. It rests on a general and well-known principle of jurisprudence. The defendant pleads that the question of his liability to enhancement has already been determined in a previous suit. This is the first point for the Judge to decide. Suppose the plaintiff based his claim for enhancement on precisely the same grounds in both suits, then in the second suit (the first having been decided against him) it would I think be equitable to throw on the plaintiff the proof of altered circumstances amounting to a new cause of action. The subject of the suit is the same; the parties are the same; to all appearances, the cause of action and position of the parties (*conditio personarum*) are the same. It may be good law that such a plea should be proved by the party making use of it, but would it not be more equitable, seeing that *primâ facie* the substance of the plea is correct, to throw the *onus probandi* on the plaintiff? The great failing of our Courts of Common law at home is that they are divorced from Equity. There is no reason that such failure should be repeated in our Indian Courts, where Equity and Law are supposed to reign in harmony. Is it equitable to rule that a tenant shall be bound to contest with his landlord, year by year, almost precisely the same issue, and is it equitable that in such a contest the burden of proof should be thrown on him? I think few will be found who think so. If those who think it inequitable are right,—which with all humility I believe they are—then the principles on which the opposite opinion is grounded, must be wanting in equity. It seems to me that under all circumstances, the High Court are right in ruling that a demand for enhancement of rent is not barred by the plea that a demand for enhancement for the previous year has been decided. A claim for enhanced rent for 1275 is not necessarily the same cause of action as a claim for enhanced rent for 1276. The only thing I object to is the inequitable manner in which the *onus probandi* is thrown on the tenant. The question, I repeat, does not depend on Act X. of 1859, but on the principles of jurisprudence relating to the *res-judicata*. The weak point in the judgment of the Court is the stress which they lay on the fact of a claim for enhancement or abatement of rent being made for another year. I mean that they seem to regard a claim for enhancement or abatement for 1275, as necessarily different from the same claim for 1276, and that the mere difference of the year on account of which the claim is preferred, prevents the defendant from pleading that the suit has been already determined. Now in the case of Cheda *vs.* Nunhoo Bey, it would seem that the difference of the year was immaterial. In the second trial, the Court found that the evidence in the first trial was defective, and that the Court was in that trial misled. Consequently, the proceedings in the second Court amounted to a revision of the proceedings and judgment of the first Court. If this be legal, then as a correspondent suggested the Settlement Officer's proceedings in enhancement cases, are not only liable to reversal on appeal, but also to being modified, or upset, by other and inferior Courts in subsequent years. But in a question of the amount of rent which may fairly be assessed on a tenant, the year

on account of which the claim is brought is generally, though not necessarily, immaterial. I maintain that where it is immaterial, that is where the circumstances of the tenant, the state of his land, and so forth, have not altered since his rent was last judicialy decided, then the difference of the year is not such a difference as in anyway to affect the issue of the claim being or not being a *res-judicata*. In such case, it is not more material than a change in the name of the tenant's field would be. The law as now laid down should, in the interest of the agricultural community, be amended forthwith.

BARRISTER.

ENHANCEMENT OF RENT.—II.

NORTH-WEST PROVINCES.

To the Editor of the "Indian Economist."

SIR,—Your correspondent H. has fallen into one or two curious errors in his criticism of the working of Act X. 1859. He falls foul of the High Court Ruling that suits for enhancement may be brought year after year—a decision which, unlike some other decisions, has wisely broadened rather than narrowed the law. In a word, he wishes to see Government interfere more constantly and more authoritatively between landlord and tenant than it has been thought necessary to do. Now, however, shackled in this country by custom the law of supply and demand is in this direction at least tolerably free. No prudent zemindar will unnecessarily harass a good tenant. A few city-dwelling bunias—an increasing class of landholders just now—or a few dissolute Mussulmen, certainly sin in the persons of their Karindahs, the former chiefly through ignorance of agricultural affairs, the latter through carelessness and extravagance; but the mass of country squires and petty farmers (I do not mean temporary lessees) well know when they have a good tenant, and are glad to keep him And the ideal picture of the unlettered rustic oppressed by the awful presence of the Deputy Collector—sitting in a wooden chair at a wooden table, and surrounded by his Munshi and one old peon, and outwitted by the superior intelligence of his adversary, is a picture that has been drawn in far too florid a style, and coloured with much too lively a pencil. Many officers, moreover, *as a habit,* in adjudicating Revenue cases, lean too much to the side of the tenant; a habit that can only be stigmatized as most pernicious.

Again, H. states with great truth, that tenants as a rule admit the equity of an enhancement consequent upon a rise in the Government demand. Of course they do, in ninety-nine cases in a hundred. But beyond this the somewhat recondite idea that the law which directs Katú to pay for similar land as much as the average of his neighbours, is a just and fair one, has *also in its main features* penetrated the understandings of our N. W. P. Asiatis; and after all, Mr. Editor, Katú is not half so bucolic as Hodge of Wiltshire.

H. then, when he says that enhancements subsequent to a first one after settlement, are "*utterly unintelligible to the tenants and their protests most vehement,*" is stating the case incorrectly. The tenants well understand now-a-days that the power of the zemindar to enhance is only bounded by expediency and the veto of the Revenue Courts. What they do not understand is this, that the *mauroși* tenant should be enhanced. They had hugged to their hearts the idea that Government, when it declared a tenant of twelve years *mauroși*, intended that he should be happy for ever on a quit-rent; but this fond dream has now been pretty thoroughly dispelled. As to their "*vehement protests*" H. might as well call the charges of high-way robbery, rape, and hath ki-izzat, which any poor devil who has been hit on the head with a shoe brings against his assailant *vehement protests*. Indeed they are most vehement protests.

H. has a fanciful remedy for a fancied wrong. He proposes that Revenue Officers should stretch their powers under Section 76 of the Act, to their utmost limit in the tenant's favour, viz., assess him at a light rent, and fix it for ten years. I can imagine nothing more inept or more dangerous. Law officers would be found, however, to carry such a policy into practice. Besides, enhancement suits are, as a rule, brought before the Courts, not under Clause I. Section 23, but either under Clause IV. Section 23, after service of a notice of enhancement under Section 13, or under Clause III. Section 23, on receipt of such notice by the tenant: in neither of these cases is the question of the term of a lease at all before the Court.

Finally, H. winds up by generally recommending "*judicious* enhancements," and emphatically condemning "*vexatious* enhancements" in a peroration which most people will think approve. But not if his meaning be—that *vexatious* enhancements are the rule and not the exception, let him by all means prove his theory by statistics, Mr. Editor. The omniscient Assistant Collector of the period can always be called upon for a *naksha* which will set the matter at rest.

29th September 1871. J. W.

SIR GEORGE WINGATE

ON THE PERMANENT SETTLEMENT.

To the Editor of the "Indian Economist."

SIR,—I forward copy of a letter I have received from Sir George Wingate in reference to an article which appeared in the *Bombay Gazette* of the 16th June last, claiming him, at one time, an advocate of the Permanent Settlement. I have also this day forwarded a copy of the letter in question to the Editor of the *Bombay Gazette*.—Yours, &c.,

Bombay, 11th October 1871. W. C. ANDERSON.

[COPY.]

MY DEAR ANDERSON,—I am glad that you have sent me the article in the *Bombay Gazette* of the 16th of June last, which brings prominently before the public a remark made in my report on the re-assessment of Madeh, written upwards of 30 years ago, to the effect that *I was convinced of the superiority of a permanent over every other description of Settlement for India*; for I had forgotten that I had ever expressed this opinion in such decided terms.

I was then young at the work of Land Assessment, and though a Permanent Settlement of the land revenue, in favour of the actual occupants of the soil, is very different from the Permanent Settlement of Bengal, my convictions gradually changed with enlarged experience, and finally resulted in a decided preference for the Bombay system of long leases, which was that actually adopted in all our revenue Settlements. When my opinion of the superiority of a Permanent Settlement was formed, my experiences was limited to districts of the Deccan, where the ordinary application of capital to the improvement of the soil was limited to the construction of wells and other minor works, easily capable of being undertaken by individual effort, but I had not sufficiently considered the circumstances of other districts in which the works required for the development of the capabilities of the land, are of a magnitude far too great for private enterprise to cope with, in the present condition of Indian Society. Such are extensive works of irrigation, roads, and railroads, which must be undertaken by Government, in order to be executed at all. And I had also not sufficiently considered the peculiarity of the relations between the Home and Indian Governments, which compels the latter to accommodate its financial measures to the requirements of the English public, through which the customs, as a source of revenue to India, become of little account; and in order to find sufficient sources of revenue to provide for the progressive improvement of the country, the Indian Financier is unavoidably thrown back on the land.

For these and other reasons, I became convinced that the Bombay system of Settlement which fixes the Land Assessment on liberal terms for 30 years, and consequently divides proprietary rights in the soil between the occupant and Government, is that best adapted to meet all the exigencies of the case, and therefore most suitable to the present condition of India.

This became my more matured opinion, and still continues to be so.

Yours very truly,

Aberdeen, 10th August 1871. G. WINGATE.

SETTLEMENT OF SALEM,

MADRAS.

To the Editor of the "Indian Economist."

SIR,—Mr. Pedder's valuable paper has induced me to refer to the article in the *Calcutta Review* which he discussed.

The position of the 'Reviewer' is that rents can only be enhanced in proportion to a rise in prices: it may be worth-while to consider the case of Salem (Madras), the district whose settlement, according to the Reviewer, caused the Madras Government to revive the question.

By the way, the Reviewer erroneously states the basis of Settlement to be one-fourth of the gross produce: he should have said one-half the net produce.

Now the Settlement of Salem is a revision of that made by Colonel Read in 1807. The backbone of the scheme, the commutation rate, is practically identical in both cases, being 100 Rs. per garce of 16·665 ponce per bushel.

[I have here disregarded the allowances made for cartage and merchants' profit in the new Settlement scheme, and compared the net commutation rate as applied in calculating the assessment.]

This price was the price of the day in 1807, and is ruling now that the new Settlement is being introduced.

The contrast between the district now and then, is as follows:—

		1807		1870	
Population		16,25,000	....	6,25,000	Inhabitants.
Land	Cultivated	19,20,000	....	11,50,000	Acres.
	Waste	3,00,000	....	10,50,000	,,
Stock	Cattle	5,88,000	....	5,64,000	Head.
	Sheep	6,26,000	....	6,33,000	,,
Land Revenue	Permanently settled. Rs.	18,44,000	....	17,69,000	Rs.
	Ryotwaree ,,	4,44,000	....		
Taxes	Excise, stamps, income-tax, licenses, &c. ,,	5,05,000	....	1,87,000	,,

Two-sevenths of the district have been permanently settled in the interval. The remaining five-sevenths is the area to which the new Settlement is being applied, and contains 1,300,000 of acres cultivated, held by 175,000 puttahdars. This area is about the same area of cultivation as Colonel Read dealt with, for the new Survey has proved the true area to exceed that returned by the earlier Surveyors.

Many modifications of the original assessment have been introduced, all tending to reduce it. Irrigation has increased in strict proportion to the general increase of cultivation, and while no great works have been executed, much has been expended in repairs and extensions. Over a hundred miles of railroad intersect the district, and a network of roads in suitability to its wants, probably inferior to none in India, has been extended to every corner of the district.

Rents have not risen in Salem in these two generations, though no doubt the standard of living has risen. It is obvious that we draw ominously near the period of the exhaustion of our great reserve force stored up in our waste land. There is but little of what

remains worth cultivating, and much of it lies in valleys stricken with fever.

May we not expect that the standard of comfort among the peasantry will fall with the absorption of the remaining waste? Population is now increasing, apparently, about at the rate of 3 per thousand per annum. The increased produce which an increased population will demand will call for more skill and capital in husbandry, and many peasants will fall to the condition of labourers: that is, in a thickly populated part of India without manufactures, to predial slavery.

Peasant rents could not be studied in any district where these have a more perfect monopoly. There are practically no large holders, and nearly one in five of the agricultural population has a puttah.

In the mittahs (permanently settled tracts) the mittahdars retain about a third of their collections. Their tenants pay the originally imposed rates, and have not shared in the reductions from time to time granted by Government.

In para. 3 I compared the two commutation rates as they stand before the grouping allowances are made. But after, from the 1868 sanctioned rate, about 30 per cent. has been deducted from the district averages, on account of cartage, merchants profits, &c. These allowances are not universally necessary. The people grow no more grain (speaking roughly) than feeds them and the non-agricultural population, everywhere present to the extent of about 25 per cent. There is a weekly market to every seven or eight square miles, where the produce of the numerous gardens is sold or bartered, and where the cotton and hemp and flax is for the most part disposed of. Cholum, cumboo, and ragi, the staple grain crops, are not exported, but the only town, (population 35,000) Salem, imports its rice from the Cavery and from the Eastern Taluq of Ahtur. A little ragi is exported from the north. Of the secondary crops, a large quantity of oil seed, and horse gram are exported. *The profits of stock are to the 'dry' land farmer his sheet anchor*: the district has from time immemorial supplied large numbers of ploughing bullocks to the Delta districts, and evidence of the extent of the traffic may be gathered at any one of the numerous and well attended fairs.

It is to the improvement of their fodder crops that Salem farmers must look in future.—Yours obediently, C. S.

FAMINE IN INDIA.—II.

TAXATION IN KIND.

In our last issue, we stated that it had been a growing conviction with us for some time, that for the purpose (1) of rescuing the cultivator from the slavery in which he is held by the bunia over wide districts of the country, and (2) of forming Governmental reserves of food in the famine tracts of the country, it would be wise for the State to revert to the practice of its predecessors, and to take the land revenue of the country, for a time at least, in *kind*. We did not put the suggestion forward thoughtlessly. We believe it to be of importance, and that Government should give it careful attention, for we have a very strong conviction that we should find in its adoption a lever, powerful enough of itself, to lift the cultivating classes out of the misery in which they now toil without hope from childhood to the grave, while preparing what we are required to believe was the divinely-taught means of meeting the calamity of famine in ancient times, under conditions similar, at all events in some respects, to those in which we have to meet it here. In this and future articles, we purpose to shew the general nature of the action we recommend, and what results we think might be anticipated therefrom. It requires some courage in these days, when abstract conclusions of political science are pressed with so much vehemence, and so little understanding of their real use, to suggest that it might possibly be wise to revert to the practice of taking the land revenue in kind in parts of the country, but we shall not be deterred on this ground from "troubling the stagnant pool of thought" in a cause so momentous as that of the deliverance of the cultivator from the tyranny under which he now lives. But, first of all, what *has* political science really to say to the suggestion? Let the reader mark well, by way of preface, the following remonstrance addressed by Mr. Mill to no less a personage than the present Chancellor of the Exchequer, some three years ago, in the course of a debate in the House on the Irish land question, as to the real nature of political science:—

> There is another sort of preliminary objection; that which was made by my right honourable friend, the Member for Calne, in the name of political economy. In my right honourable friend's mind political economy appears to stand for a particular set of practical maxims. To him it is not a science, it is not an exposition, not a theory of the manner in which causes produce effects: it is a set of practical rules, and these practical rules are indefeasible. My right honourable friend thinks that a maxim of political economy, if good in England, must be good in Ireland. But that is like saying that because there is but one science of astronomy, and the same law of gravitation holds for the earth and the planets, therefore the earth and planets do not move in different orbits." So far from being a set of maxims and rules, to be applied without regard to times, places, and circumstances, the function of political economy is to enable us to find the rules which ought to govern any state of circumstances with which we have to deal—circumstances which are never the same in any two cases. I do not know in political economy, more than I know in any other art, a single practical rule that must be applicable to all cases; and I am sure that no one is at all capable of determining what is the right political economy for any country, until he knows its circumstances. My right honourable friend perhaps thinks that what is good political economy for England must be good for India—or perhaps for the savages in the back woods of America. My right honourable friend has been very plain spoken, and I will be plain spoken too. Political economy has a great many enemies, but its worst enemies are some of its friends, and I do not know that it has a more dangerous enemy than my right honourable friend It is such modes of argument as he is in the habit of employing that have made political economy so thoroughly unpopular with a large and not the least philanthropic portion of the people of England. In my right honourable friend's mind, political economy seems to exist as a bar even to the consideration of anything that is any but the old ways: as if science was a thing not to guide our judgment, but to stand in its place—a thing which can dispense with the necessity of studying the particular case, and determining how a given cause will operate under its circumstances. Political economy has never in my eyes possessed this character. Political economy in my eyes is a science by means of which we are enabled to form a judgment as to what each particular case requires; but it does not supply us with a ready-made judgment upon any case, and there cannot be a greater enemy to political economy than he who represents it in that light.

Bearing this eloquent and powerful remonstrance in mind, let us now see what Political Economists have to say upon this special subject of *Taxation in kind*. The French Economist, M. Say, appears to have exhausted the chief of the arguments against the practice, in his admirable treatise on the production, distribution, and consumption of wealth. The section is somewhat long, but we must quote it:—

> Taxation in kind is the specific and immediate appropriation of a portion of the gross product to the public service.
>
> It has this advantage, of calling on the producer only for what he has actually in hand, in the identical shape which it happens to be under. Belgium, after its conquest by France, found itself at times unable to pay its taxes, in spite of abundant crops; the war, and the prohibition of exportation, obstructed the sale of its produce, which the government enforced by demanding payment in money, whereas, the taxes might have been collected without difficulty had the government been content to take payment in kind.
>
> It has the further advantage of making it equally the interest of government and of the farmer to obtain plentiful crops, and improve the national agriculture. The levying of taxes in kind in China was probably the origin of the peculiar encouragement bestowed by its government upon the agricultural branch of production. But why favour one branch, when all are equally entitled to protection, because all contribute to bear the public burthens? And, why has not government an equal interest in supporting the other branches, which it takes the trouble of extinguishing?
>
> It has likewise the advantage of excluding all exaction and injustice in the collection; the individual, when he gathers in his harvest, knows exactly what he has to pay; and the State knows what it has to receive.
>
> This tax, which might appear at first sight to be of all others the most equitable, is, nevertheless, of all others the most inequitable; for it makes no allowance for the advances made in the course of production, but is taken upon the gross, instead of the net, product. Take two farmers in different branches of cultivation; the one farming tillage land of moderate quality, his expenses of cultivation amounting, one year without another, say to 8,000 *fr.*, and the gross product of his farm, say to 12,000 *fr.*, so as to yield him a net product of 4,000 *fr.* only: the other farming pasturage or wood-land, yielding a gross product of precisely the same amount of 12,000 *fr.*, with an expense of cultivation amounting, perhaps, but 2,000 *fr.*, leaving him a net product, one year with another, of 10,000 *fr.* Suppose a tax in kind to be imposed in the ratio of 1/12 of the annual product of land of all descriptions indiscriminately. The former will have to pay in sheaves of corn to amount of 1,000 *fr.*; the latter will pay, in cattle or in wood, an equal value of 1,000 *fr.* What is the result? The one will have paid the fourth parth of a net revenue of 4,000 *fr.*; the other but the tenth part of a net revenue of 10,000 *fr.*
>
> The revenue, that each person has for his own share, is the net residue only after replacing the capital he has embarked, whatever may be its amount. Is the gross amount of the sales he effects in the year the annual income of the merchant? Certainly not; all the income he gets is the surplus of his receipts above his advances; on this surplus alone can he pay taxes, without ruin to his concerns.
>
> The difficulty and expense of collection, together with the abuses to which it is liable, are another objection to taxation in kind. The immense number of agents must open a fine field for peculation. The government may be imposed upon, in respect to the amount collected, upon the subsequent sale and disposal, in respect to the quantity damaged, as well as in the charges of storing, preservation, and carriage. If the tax be farmed to contractors, the profits and expenses of number-

less farmers and contractors must all fall upon the public. The prosecution of the farmers and contractors alone would require the active vigilance of administration. 'A gentleman of great fortune,' says Smith, 'who lived in the capital, would be in danger of suffering much by the neglect, and more by the fraud, of his factors and agents, if the rents of an estate in a distant province were to be paid to him in this manner. The loss of the sovereign, from the abuse and depredation of of his tax-gatherers, would necessarily be much greater.'*

Various other objections have been urged against taxation in kind which it would be useless and tedious to enumerate. I shall only take the liberty of remarking the violent operation upon relative price, which must follow from so vast a quantity of produce being thrown upon the market by the agents of the public revenue, who are notoriously equally improvident as buyers and as sellers. The necessity of clearing the storehouses to make room for the fresh crop, and the ever urgent demands upon the public purse, would oblige them to sell below the level, to which the price would naturally be brought by the rent of the land, the wages of labour, and the interest of the capital, engaged in the agriculture; and the private dealers would be unable to maintain the competition. Such taxation not only takes from the cultivator a portion of his product, but prevents his turning the residue to good account.

Thus the taking of our revenue in kind would have, we are told, the advantages (1) of calling on the producer only for what he has actually in hand, in the identical shape which it happens to be under; (2) of making it equally the interest of Government and the farmer to obtain plentiful crops, and improve the national agriculture; (3) of excluding all exaction and injustice in the collection. Now look at the enormous importance in India of securing these advantages. Is it too much to say, that the advantages enumerated by M. Say, simply exhaust the objects we should have in view in our management of the land revenue? If we now turn to the *disadvantages* of this system of taxation, we find that M. Say resolves them into (1) the difficulty and expense of collection, and the liability of the State to be defrauded by its agents; (2) the injurious operation upon prices of throwing so vast a quantity of produce upon the market; and (3) that a tax in kind, imposed in any given ratio upon the annual product of all lands indiscriminately, is very inequitable in its incidence. We have here then the disadvantages of the system enumerated and exhausted. Political economy declares that there are *three* certain great advantages attending the system; and on the other hand, certain serious disadvantages. Political Economy has then said *all* it has to say on the subject, and it becomes the business of the administrator, the statesman, to consider how far these advantages and disadvantages would respectively be realized, or suffered, if we adopted the system here. Now the most cursory review of the subject shows that while the advantages enumerated are of enormous importance to us in India, and certain to be realized, the *disadvantages* have almost no weight whatever in our circumstances.

For the chief of these drawbacks is the injustice of taking in kind the same proportion of the produce yielded by lands of different quality. *That* is the chief disadvantage of the system, and in India, under British rule, it has no existence at all. It is a purely imaginary disadvantage. For under all our Settlements, the tax is fixed in a money standard upon full and careful review of the capacities of the land, and all our revenue officers would have to do in the event of our reverting to payment in kind, would be to take grain enough from the cultivator, at the ruling prices of the district, to pay the assessment. Say the amount of land revenue due by the village is Rs. 2,000, and the price of the staple grain of the district is 20 seers the rupee: the Collector will simply require the village headman, or whoever the native official may be, to send to the State Stores 40,000 seers of wheat, rice, or jowaree, as the case may be. Taking payment in kind instead of in money need not interfere with the Settlements in anyway whatever that we can see; so that the chief supposed disadvantage of the system would have no existence here at all. As little room is there for the objection that the operations of the State would interfere with prices, to the damage of the private trader. For it is necessary to remember that ours is not a needy Government, living from hand to mouth, and obliged by the necessities of its Exchequer to throw the grain of the country upon the market as quickly as it comes into the granaries. We propose that the experiment should be tried in districts where the ryots are miserably poor and indebted, and that the grain, instead of being sold, should be garnered in reserves in great central localities. The utmost extent of the experiment to be tried would be two or three districts at a time, yielding perhaps 10 or 20 lakhs of rupees a year. Bearing this fact in mind, it will be seen at once, that Political Economy has really no objection to raise to the experiment,—none whatever; the difficulty and expense of collection not being worth a moment's thought, in view of the purposes we are proposing to accomplish by the change. To understand what that purpose primarily is, let the reader try to realize the condition of our cultivators in Oudh at this moment, remembering that these men are the bread-winners of the community.

Two or three years ago, the Chief Commissioner of the Province circulated the following questions to all the Commissioners under him:—

1. What are the kharif and rabi crops grown?

2. How is the produce disposed of by, (1) the unindebted, and (2) indebted cultivators? [Note.—It is understood that in many cases the whole produce is made over to the mahajan; in others, the less valuable crops are retained for consumption; in others, sugar, oil, seeds, and cotton are sold in the market for cash; in others, they are sold at a discount to the mahajan.]

3. What are the terms of interest on which advances of seed, food, or money, are made?

4. When are the accounts made up, and in what form are they kept?

The reply to these enquiries was uniform, and heart-breaking. The cultivator consumes nothing of the produce of his labour but the very coarsest grain. *Everything goes into the hands of the bunia*, and deliverance seems hopeless. Well, having let down our plummet and sounded the depths of this misery, are we to sit still and look wistfully "to time and general laws," and coldly take leave of it? In the name of God, No! If the British Government can not alter it, it is no Government at all. In our next issue, we shall attempt to place the cultivator's exact position clearly before the reader, and to shew how we may redeem him from his misery, by resolving, amongst things, to take the land revenue for a few years from him, *in kind*.

DOES BOMBAY *TAP*, OR SUPPLY, THE NORTH-WEST, WHICH?

We are indebted to Mr. Rivett-Carnac for an elaborate and interesting Memorandum on the interchange of traffic by railway, between what he calls "the Bombay side" of India and the Presidency of Bengal, including under that designation all India eastward of the Jubbulpore junction. The Memorandum is based on the traffic statements of the G. I. P. Railway Company, and is intended to be the first of a series of similar analyses to be published every six months. The information which the analysis supplies is of considerable interest, but too much digging is required to get it for use. If Mr. Carnac, moreover, in future issues, will throw all, or nearly all, his returns into the shape of appendices, and refuse to allow the printer to resort to the abominable Indian practice of giving half a dozen folded maps and diagrams in the body of the work, he will facilitate reference thereto indefinitely, and get ten readers where he is now likely to have but one. This grievance of unwieldy maps and diagrams and tables, folded in all conceivable ways, thrusts itself so prominently before us in almost every Governmental publication, that we must have our growl out about it. It is sheer mechanical idleness, or want of skill in the printer that is its occasion. Not one time out of twenty, is resort to this nuisance of folded maps necessary. It is merely a habit into which Government printers have got, and may be avoided in almost all cases by a little dexterity of printing manipulation. Mr. Carnac's Memorandum is simply spoiled for use, by the great ugly maps and tables with which it is disfigured, and with which almost every Governmental report of the kind is bound up. The text is sprawled out over twice the proper space;

* *Wealth of Nations*, Book v., c. 2. art. 1.

the figured statements are given in type of twice the proper size; and to crown all, half a dozen great tabulated statements, folded two or three times crosswise, are imbedded in the work, making it, upon the whole, about as uninviting and disagreeable a task as one could well have, to master its contents. So much for the purely mechanical part of the Memo., and let no one think the criticism is unimportant. For the value of this Memorandum, on which much labour has been spent, is largely destroyed by the unskilful way in which it is printed. Had the letter press been compactly given in ten or a dozen pages, as it might very easily have been instead of being sprawled out over 55, you could have got Mr. Carnac's results almost at a glance. As it is, you have to turn the great clumsy tables and pages backwards and forwards, over and over again, to compare figures and statements that ought to have lain open before the eye on the same folio; and unless you are a very patient student, the chances are that you will pitch the Memorandum away, in sheer disgust at the trouble which it gives you.

Is Bombay going to *tap* the North-West Provinces of their raw produce? Or is it simply going to *supply* them with the piece-goods and metals which they have hitherto drawn from Calcutta? Or is it going to do both, or neither? Mr. Carnac's Memorandum is the first real contribution we have had to the solution of these questions. And it *is* a real contribution, though not perhaps quite so satisfactory a one, as Mr. Carnac might have given us, in spite of the imperfect information supplied to him, if he had kept these questions a little more vividly in mind. It is of very little interest to us what produce passes from the 200 miles of country on this side of Jubbulpore to the 200 miles on the other; in other words, the traffic between Bhosawul on this side, and Allahabad on that. What we want to know is whether the railway system which now connects Western India with the North-West, and which has cost the State so vast a sum of money, will really open communications between the two. Will it enable the growers of raw produce in the North-West profitably to send their produce to this port for shipment? And, on the other hand, will it enable them to draw their supplies of piece-goods and metals from Bombay cheaper than they have hitherto got them from Calcutta? The general conclusion at which Mr. Carnac himself arrives is expressed by him as follows:—

> The result of the opening of through-communication has apparently been to enable the districts of the Central Provinces, the Berars, and the Bombay Presidency itself to draw from the rich valley of the Ganges, large supplies of grain, sugar, ghee, and other articles of food, the accession of which has already had its effects on prices, and has to some extent at least reduced the cost of living at Bombay itself, and in the districts of Western India to which the railway line extends. The distances to which food grains have been carried are in some cases remarkable, and as a case in point the considerable supplies poured into Sholapore and the country to the South, from Cawnpore, 1,179 miles distant, and other markets of the N. W. Provinces, when recently the scanty rain-fall caused anxiety regarding the food crops in that quarter may be instanced. Of the effect on the export trade of Bombay the figures do not assist to form a very accurate judgment. But there can be very little doubt that the *large* supplies of grain, seeds, and the "sundries" drawn by Bombay from the Upper Provinces have already had some effect on the trade of the port. The return trade is *as yet small*, but the figures of the exports of piece-goods from Western India to the Upper Provinces show, it will be seen, a tendency to increase, and a still further increase may be expected to follow the promised reduction of the rates on the G. I. P. Railway.

A close inspection of Mr. Carnac's figures shows, however, that "the *large* supplies of grain, &c.," which came down to Bombay by the Railway are really not large at all, but very small; for if we understand paras. 55 and 91 rightly, the total weight of produce that passed through Jubbulpore for Bombay during the year 1870-71, was but 320,000 maunds in all:—

	Maunds.
Half-year ending 31st December 1870	109,815
" 30th June 1871	210,737
Total ..	320,552

These figures represent, we say, the total weight of the produce brought into Bombay during the 12 months ending 30th June last from stations beyond Jubbulpore; and this produce seems to have been, in the main, simply grain and sugar. The 210,000 maunds during the six months ending 30th June, seem to have arrived (page 38) from the following districts in the proportions stated:—

	Maunds.
Country between Jubbulpore and Allahabad	138,261
" " Allahabad and Calcutta	30,738
" " Allahabad and Delhi	20,773
" " Delhi and Mooltan	21,027
Total ...	210,737

The returns at this point break down, for Mr. Carnac is unable to tell us of what these 210,000 maunds really consisted. In the main they were grain, sugar, and cotton, the sugar coming chiefly from the Mirzapore districts, the cotton from the North-West, and the grain from the districts lying between Jubbulpore and Delhi. But what are 210,000 maunds weight of raw produce such as this? Literally nothing. Suppose the whole of it were grain, it would only represent about ten days' food for Bombay, while it is doubtful if more than one-half the quantity was grain. When therefore Mr. Carnac speaks of "the *large* supplies of grain, &c., drawn by Bombay from the "districts beyond Jubbulpore, and of the arrival of these sup- "plies has having had, as is well known, a marked effect in "decreasing the cost of buying in Bombay" (para. 56), we think he is altogether mistaken as to fact. If Bombay really received no more than 210,000 maunds of coarse raw produce from the districts beyond Jubbulpore during the period named, all notion of Bombay *tapping* the North-West by means of the G. I. P. Railway must, we fear, be abandoned as a dream. If we knew *exactly* of what this produce consisted, we could estimate its money value, but in the absence of such information, we can only approximately guess it. Were it wholly of grain then, and we value it at 30 lbs. (15 seers) per rupee, the amount would be but £57,400. If one-third the quantity consisted of *sugar*, the value may perhaps have been £100,000.

But if Bombay does not *tap* the North-West by the G. I. P. Railway, does it supply it thereby with piece-goods and metals? Here again the returns completely break down. All that we know is that against the 210,000 maunds of raw produce which it drew *from* the North-West, Bombay supplied the North-West with 80,607 maunds of goods, of which the chief items were, according to para. 40:—

	Maunds.
Piece-goods and twist	15,913
Raw silk	633
Cotton	4,875
Metals and Hardware	7,623
Stock, &c.	7,053
Spices	3,[illegible]65
Dried fruits	1,911
Cocoanuts	4,913
Tobacco	9[illegible]8
Wines, spirits, and beer	6,203
Sundries *(sic)*	20,7[illegible]1

We do not venture to estimate the money value of these consignments, but it must be enormously in excess of the value of the 210,000 maunds of grain, sugar, and cotton received *by* Bombay. Instead, therefore, of saying with Mr. Carnac that "the return trade is as yet small," we should rather say the return trade is greatly in excess of that which Bombay receives. And we could hardly expect it to be otherwise. For while manufactured goods may possibly bear the very high rates of carriage charged by the Railway, raw produce even at 8 pies per ton per mile can hardly be carried with profit to distances of 900 to 1,400 miles. Bombay at present certainly *seems*, from this Memorandum, more likely to *supply* than to tap the North-West; and its merchants should steadily urge upon Government the necessity of opening the market further, by compelling the G. I. P. Railway to reduce its preposterous rates of carriage to the scale obtaining on the E. I. Railway.* We thank Mr. Carnac heartily for this Memo. and trust he may supply us with a long series of them, only let him wake up the printer a little. We have never once yet in the *Indian Economist* allowed a folded page to appear. The device belongs to printing of the 16th century.

* Since this article was in type, we observe a reduction in the rates has been announced.—ED. *I. E.*

"LET US DO SOMETHING MY BRETHREN, THAT WE CANNOT POSSIBLY UNDO."

In our last issue, we stated with as much clearness as we could, what the issue really is, between ourselves and the *Indian Observer* and the *Pioneer* upon the great question of the land revenue. We pointed out that the State was taking almost the very same amount as revenue from the land ten years ago as it is now, although the value of theharvests for years past has been double what it was then. We showed that the comparison stands nearly thus :—

	1861		1871
Value of Harvest	£200,000,000	.....	£400,000,000
Land Revenue	19,600,000	.....	20,500,000

We further pointed out, that in the ten years which have gone by, the State has made an outlay of £100,000,000 to £150,000,000 upon Railway communications, and other great works for improving the land, the interest charge upon which is £5,000,000 to £7,500,000 a year. We venture to say that there is no reply to this statement, and accordingly we got none. We complain that our contemporaries refuse to see the dilemma in which we stand: a gigantic income-tax on the one hand, or a natural, just, and easy increase in the land revenue on the other. Our contemporaries passionately denounce the income-tax, and yet will not listen to an increase of the land revenue. For that *is* what they are really doing, and as the ablest by far of our opponents, we single them out for special challenge upon the issue. It is mere casting of dust in men's eyes, to be harping upon Mr. Knight's "theory of rack-renting the ryot" and "destroying proprietary rights in the soil." Mr. Knight has been just about as guilty of that, as the *Indian Observer* itself. We see clearly, and have seen for several years past, that the State must cease all expenditure upon works for improving the soil, or look *to* the soil to defray the cost of those works. It is no service to public interests to misrepresent our writings, by persuading the world that we want to oppress the cultivator and destroy the landlord. There is a very broad margin to be travelled over in these days, before the pressure of the land revenue will do either; and we have therefore persevered in our demand, and mean to do so, through good report and evil. The generation that will come after us, will look with different eyes from the present one upon the service we have wrought the country in this matter.

The Permanent Settlement despatch of 1862 is withdrawn while we now write, and the folly of these modern Settlements at a twentieth of the produce, will by and bye dawn upon men's minds just as the folly of the Permanent Settlement has done. We do *not* want to rack-rent the cultivator. We do *not* want to destroy the landlord. What we *do* want is that the State shall hand down to those who come after us, intact and uncompromised, those ancient rights of the people in the soil which we cannot tamper with, and cannot alienate, without treason against the future of the country. We rejoice to find Sir Richard Temple openly declaring that "our only reliable field for taxation" is an improved agriculture. That after the experience of the last few years, Sir Richard Temple will hold fast by this conviction, we have no doubt; and it has become at last so general, that it will take more than unfair representations of our doctrines to bring them into discredit. The Land Improvement Bill before the Supreme Legislative Council is a pledge that the Government will no longer trifle with State interests in this matter, but will direct all its powers henceforward to make the cultivator prosperous, the land prolific, and the tax-gatherer useless. The whole future of India depends upon the wealth and prosperity of its agricultural classes, and if we wisely reserve the right of the Commonwealth to share in that prosperity, the task of governing the country will be shorn of nine-tenths of the difficulties we have hitherto encountered therein. All that the Government is asked to do in connection with these rights—is to *Let them alone*. If we could but make it learn that lesson, a nightmare would be lifted from us. The old Permanent Settlement folly is abandoned; but now it is to be a Permanent Settlement in corn! In the name of Heaven, *Let it alone*! Why do anything? Attack, tinker, potter, over anything else you will, but in the name of heaven, leave your land revenue alone! You have given the people leases such as are unknown in any other country in the world, and if they do not grow wealthy under these, they will grow wealthy under no arrangement the ingenuity of man could devise. Let the question be hung up in Council for ten years to come. We shall all be clearer-headed, and have got a good deal more experience by that time. The passion of doing something that shall be "permanent," that we shall never be able to undo—surely it is an outcome of the very lowest folly. "Let us do something my brethren that we cannot possibly undo, though the Heavens fall": the very *last* proposition it seems to us that a generation with any self-knowledge would entertain.

We had written thus far when the *Indian Observer* of 7th instant reached our hands, containing the following notice of our challenge:—

"Returning to the subject of Mr. Knight's recent criticism of the *Pioneer* and ourselves, it is perhaps worth-while to point out the very transparent error involved in the principal argument by which he endeavours to justify what we must continue to call his rack-renting policy. He begins by saying that the last ten years' harvests have been twice the value of the preceding ten, when he should have said that they have been twice the price; and as the rise in prices has been general and not at all confined to agricultural produce, this is an important error. Putting this aside, however, we go on to consider the main argument used.

"It runs as follows :—Assuming that the population of British India amounts to 150,000,000, and that every man eats 1½lbs. of food a day, it is clear, as India feeds herself, that the total amount of the harvest cannot be less than 95,000,000,000 lbs. Taking the price even so low as 60lbs. to the rupee, the total amount would be Rs. 1,600,000,000. And to this must be added, Mr. Knight observes, not only the exports, but all the forage of the country, the agricultural stock and wool, the fruits, vegetable, condiments, and spices, the cotton and silk used for home consumption, as well as sugar, tea, coffee, indigo, and a hundred other products of the land. What share of all this, he asks, does the State get? What increase of land-revenue has resulted from the enormous rise in the money value of this vast amount of agricultural produce?

"Now we look on all general argument of this kind as radically wrong in method, and practically worthless; but it may be as well to point out the error involved in the present instance, in order that the matter may be finally disposed of. The case is perfectly simple, if we recollect that the agricultural classes must eat and drink like their neighbours. From the total amount of produce, therefore, we must deduct what is consumed by the agricultural classes, or, in other words, by a very large majority of the population before Mr. Knight's arguments could possibly apply. If a man produces 30 maunds and requires 25 for the support of himself and his family, it is only the prices of the remaining 5 maunds which can possibly affect the amount of land-revenue which he is capable of paying; and these five maunds must go in part to pay for manufactured articles, the price of which has risen like that of corn. Independently, therefore, of the radically wrong method followed, the figures on which Mr. Knight's arguments rest are absolutely worthless."

The reply is unworthy of our contemporary. Does he really suppose that we require to be informed that the assessment has to be paid out of the surplus produce in the cultivator's hands after he has met the wants of his own family? Our "method" which he declares to be 'radically wrong' and "practically worthless," is simply irrefragable, admitting of no answer. Do we need to be told that the agricultural population has to feed itself first of all, and that it is out of the surplus produce that the assessment comes? And was not *that* just as true ten years ago as it is now? The £19,600,000 paid as land revenue in 1861 came out of surplus produce then as the £20,500,000 comes out of it now? And the question is what was the *value* of the surplus produce then as compared with its value now? Let the quantity be what it may, it is admitted by the supposition that it is twice the money worth now than it was then. Our contemporary is somewhat disingenuous. He knows, we suppose, that the urban population of India number about 2-5ths of the people, and that it is out of the produce with which the ryot supplies the cities for their food, and the seaports for their exports, that he pays his land assessment. Now the exports alone are £50 to 60 millions a year, and the standard of living in the cities much higher than in its villages. The surplus produce then upon which the ryot relies for his assessment, is 2-5ths of the harvest of grain, *plus* the exports, and *plus* the varied produce which he grows for consumption by the com-

[*Extra Supplement to the Indian Economist.*]

Will be published on the 1st of January 1872.

The Gazette of Asia.

EDITED IN CHIEF BY MR. KNIGHT.

THE project of a new daily Paper in Bombay having been very favourably received, the first number of the journal will appear on the First of January, under the title of the "*Gazette of Asia*," if Mr. Knight is able in the interim, to secure a staff of collaborateurs strong enough to make the new paper what he thinks it should be.

The present Bombay journals, regarded merely as newspapers, may fairly challenge criticism. It is their editorial columns that are unsatisfactory, and unless a staff of writers can be obtained for the "*Gazette of Asia*" strong enough to make it really influential, it will not appear.

The daily newspapers of the age, moreover, are all working up to the same ideal, which is believed to be faulty ; and as with numberless persons the newspaper is all the reading they get, the importance of raising the standard of this class of our literature needs no enforcement. The French *feuilleton* is the deliberate degradation of a standard already too low, and an effort will be made in the "*Gazette of Asia*" to make it a real instrument of educating the people.

The journal will contain a faithful record of what is taking place in India and around it, with an impartial commentary thereon ; and an effort will be made to make it contain something *more* than this.

The Staff will be paid, and those who desire to see a journal such as Mr. Knight contemplates established in India, and who think they can assist him in the work, are invited to place themselves in communication with him. Correspondents will be wanted on the Staff, and will be liberally paid.

The "*Gazette of Asia*" will not be quite so large as the leading daily journals of India, and will be original in form.

The practice of displaying Advertisements will not be allowed, advertisers being placed upon a footing of equality in respect of type and position in the journal

The Subscription will be Rs. 36 a year, payable in advance ; the cost to Mofussil subscribers Rs. 48 including postage. Soldiers' Reading Rooms and Native Libraries will be supplied at Rs. 36, including postage.

_____ 1871.

To Mr. KNIGHT,

BOMBAY.

SIR,

You may Register me as a Subscriber to the GAZETTE OF ASIA, and address the Paper as under.

Yours obediently,

_____

Address. _____

_____

NOTE.—Gentlemen who have already sent us their names, need not fill in this form.

paratively wealthy urban classes of India. If we suppose the harvest of food therefore to be £400,000,000 a year, and it cannot possibly we think be so little, the surplus produce in the ryot's hands for sale, after meeting his own wants, will compare at the two periods respectively as follows :—

	1861. £	1871. £
3-5ths of food (used by cultivator).	.....	.....
2-5ths " " by towns ..	80,000,000	160,000,000
Value of exports	23,000,000	53,000,000
Garden crops, forage, &c	.....	.....
	£103,000,000	£213,000,000
Land Revenue	19,600,000	21,500,000

The objection therefore raised by the *Observer* to our 'method' simply recoils upon himself. So irrefragable is it, that Lord Mayo has himself, we observe, adopted it in his late despatch on the permanent settlement question, as the only certain one, and we cannot but regret that our contemporary has not shown more candour in dealing with it. We sometimes wonder when we see the attitude of contemporaries toward simple calculations of this order, how they ever find courage to trust themselves to an addition sum. Admit that the land revenue has been stationary all these years, while the value of the harvest has indefinitely increased, and it is *impossible* to contest the general conclusion that the land is under-assessed. For comparing the weight of the assessment at the two periods respectively, you must either *halve* the amount of the assessment, or double the value of the harvest, since by the supposition what was £20,000,000 in 1861, is only £10,000,000 now. And the State in the meanwhile has incurred an annual liability of £5,000,000 to £7,000,000 for interest upon railway and other works for improving its value. "Nature admits no lie; "most men profess to be aware of this, but few in any measure "lay it to heart. Fail by any sin or any misfortune to discover "what the truth of the *fact* is, you are lost so far as that fact "goes. The *fact* will not obey you, will silently resist you; "and ever with silent invincibility will go on resisting you, till "you do get to image it truly instead of falsely. No help for "you whatever, except in attaining to a true image of the *fact*."

Mr. NARRAYEN WASSOODEW'S ESTATE.

It will be remembered that in reply to our strictures upon the Soopa Settlement and the general statement made by us that the land revenue of British India does not absorb a twentieth of the gross produce of the soil, Mr. Narrayen wrote a letter to one of the Bombay daily journals, of which the opening sentence ran thus :—

"You have done a public service by exposing the mischievous doctrine of Mr. R. Knight. As a rule he is not particular, in his extreme anxiety to furnish facts and figures, about their accuracy, and I cannot help thinking that Mr. Knight is doing a grievous injustice to the ryots of this country when he asserts with some confidence that the land-tax amounts to one-twentieth of the produce of the land."

As Mr. Narrayen is, we believe, at last convinced that our estimate is nearer the truth than he supposed, we shall make no further complaint of his somewhat rude challenge of the general accuracy of our 'figures'. The letter went on as follows :—

"I have some 450 acres of paddy land not far from the Tanna Railway station, which I annually let to a large number of small cultivators, under the distinct understanding that they are to have half the actual produce of the land, I on my part agreeing to pay the Government assessment and all expenses of repairing the bunds, &c., besides providing a certain number of watchmen when the harvest is being gathered.

"The total yield last year was one hundred and sixty-seven candies of paddy, of which some 200 cultivators took their share, aggregating 83½ candies, leaving eighty-three-and-a-half more as my share. The sale realized Rs. 1,768, out of which I had to pay Government Rs. 1,026 for the tax upon the land, and the expenses of repairing the various bunds of the batty fields, and the wages of watchmen, amounted to Rs. 831, leaving a deficit of Rs. 89 to be made up by me."

It turns out upon enquiry, that this land of Mr. Narrayen's is what is known on this coast as *khar* land, or black batty, salt marsh that has been reclaimed at some time or other from the sea, and put under a precarious cultivation with rice. Poor as the land is, however, it yields upon the average a very different out-turn from that stated by Mr. Narrayen. He bought the land, he tells us, in "November 1867, from one Hemraz Morar for Rs. 12,001," and the return of the four years since has been as follows :—

1868	..	..	Net yield	..	..	...	...	.. Rs. 704
1869	..	...	do.	..	..	..	...	.. " 815
1870	..	...	do.	..	..	..	...	.. " 930
1871	..	..	Net deficit	..	..	...	●	.. " 89

During the short time therefore that it has been in this gentleman's possession, the average annual yield has been as follows :—

Ryots.	*Half produce.*	..	.. Rs.	...
Government ..	.. Annual assessment..		.. "	1,026
Mr. Narrayen, ..	.. Average profit	..	.. "	892

Before we could arrive at any conclusion worth having concerning this land, we plainly required to know (1) whether the land was originally reclaimed by private capital; and (2) what the average out-turn had been for a series of ten or fifteen years. Unfortunately, we can obtain no information on either point. Mr. Narrayen cannot even tell us the *quantity* of the yield since 1867, and knows nothing whatever concerning the harvest of previous years. He believes that Hemraz Morar reclaimed the marsh at his own cost, but the man is dead, and being a soucar, we should think this very unlikely. Of course, if he *did* reclaim the land, he would have a right to charge the cultivator what rent he pleased, but in that case the estate has no interest for us whatever in the enquiry we have been conducting, and Mr. Narrayen should not have brought it forward. We have found it impossible to identify the greater part of the land at all, but have received the following report of one part of it:—

"As far as I am able to ascertain the land belonging to Mr. Narrayen Wassoodew Kharkar, in respect to which he writes, is a plot of khar land, (salt marsh land), measuring 100 acres, situated at Oombreh in the Callian Talooka, near the Dhewa Station, beyond the terminus near Tanna on the Railway line. It originally belonged to Hemraz Morar, a bunia of Callian, and was purchased privately by one Dhondo Sukkaram, for a sum of Rs. 900, and subsequently purchased about 5 or 6 years ago by Mr. Narrayen Wassoodew, for the sum of Rs. 4,500.

So uninformed is Mr. Narrayen himself about this estate, that he imagines it to be "permanently settled" at its present rental, whereas we are semi-officially informed that it is simply the occupancy right that he has bought, and that he is liable to a higher assessment when the present 30 years leases fall in. We have made enquiries concerning the other plots of which the estate seems to consist, but can get no information concerning them, and the estate is of so exceptional a character that we can get nothing worth notice out of it. The one fact of interest is the disclosure that while Mr. Narrayen objects strenuously *in behalf of the ryot* to our demand that the State should raise its assessment to a somewhat higher demand than one-twentieth of the produce, he has himself a "distinct understanding" with his own ryots that they must give him *one-half* the produce. That one-half the gross produce of the land is being commonly exacted from the cultivator under British rule in India for permission to cultivate at all, is a deplorable fact; but it is not the State that is the landlord in these cases, but the middleman, who like Mr. Narrayen Wassoodew, is the product of our administrative weakness and want of insight.

Concerning this *Khara* cultivation along our coast, we have ascertained a few facts in the course of our inquiries which we may as well record. It seems then that the rice cultivation of the low Concan lands near the sea is of two kinds, *chowka* or white rice called also *gora*, and *khara* or *rutta*, *i.e.*, salt or black batty (paddy) cultivation. The *chowka* cultivation is subject to very little variation from the seasons, while the *khara* is precarious in the extreme. The annual assessment on both, under the Portuguese and Mahrattas, was half the produce, while the famous Salsette *onion* lands paid only a third. Our own earliest assessments (1794) appear to have been one-third the produce, but one-fourth the yield of all fruit trees was further taken as an equivalent for lowering the rate. In addi-

tion to this rack-rent, the unhappy cultivator seems to have been burdened with a multitude of cesses, payable to the patels or farmers who collected 'the revenue.' Some of our old records display a minute acquaintance with the village customs and agriculture of the times unknown, we fear in these days. Thus it may interest Mr. Narrayen to learn that poor as his *khara* estate is, it is worth looking after, the people themselves distinguishing such land into four distinct classes, the average yield of which, respectively, is declared in old Governmental papers to be as follows :—

Yield of Khara or Salt batty lands.

No. 1—14	Pharas (07½ lbs.)	=	945 lbs.	per acre.
2—12	,, ,,	=	81[illegible]	,, ,,
3—10	,, ,,	=	675	,, ,,
4—8	,, ,,	=	540	,, ,,

Or an average yield, for all qualities, of 745 lbs. per acre. If therefore Mr. Narrayen's estate yielded but the average produce of *khara* soil, his annual harvest ought to be

450 acres × 745 lbs. = 3,35,250 lbs.

Now the Bombay candy of paddy weighs 512 lbs, and the Estate should therefore yield 655 candies, which at 13 Rupees the candy means a gross yield of Rs. 8,515 or Rs. 19 per acre. The balance sheet of the Estate would then stand thus :—

Yield and apportionment of the produce.

450 acres = 655 candies paddy value			Rs. 8,515
Ryots, half the produce	Rs.	4,278	
Government assessment	,,	1,026	
Mr. Narrayen (the Middleman)	,,	3,211	
			Rs. 8,515

So that Mr. Narrayen should receive Rs. 3,211 a year, as interest upon his investment of Rs. 12,000; while the State gets 1,026 Rs. out of a produce of Rs. 8,515. How 450 acres of land, cultivated at all with rice, can yield no more than an average harvest of 4,000 Rupees a year, we cannot understand, while the old records of the Government shew the yield to be vastly greater.

AKBAR'S MAUND.

A CORRESPONDENT enquires of us as follows :—

"The Ayeen Akbary table, reproduced in your article [August 1870] from Captain Harvey Tuckett's work upon the revenue system of India, seems a very valuable one, but it appears doubtful whether the produce given in the table in maunds and seers has been accurately reduced into lbs. avoirdupois. At page 111 of 'Prinsep's useful tables edited by Thomas, the maund or *mun* of Akbar's reign is said to have been according to Abul Fuzl, the 40 seers of 30 dáms ; each dám being five tánks. The tánk is in another place defined as 24 ratis : the másha of eight ratis has been assumed from the weight of Akbar's coin to be 15·5 grains troy. This would make the Emperor's mun = 34¼ lbs. av. In one part of the Ayin-i Akbari, the dám is called 20 máshas 7 ratis, which would increase the mun to about 47 lbs. In the absence of better evidence it may be safe to reckon it in round terms at one-half of our present standard mun.' If the maunds and seers given in your table are Akbar's, then the equivalent given in lbs. av. must be at least double what it should be."

Captain Harvey Tuckett was well aware of the difficulty of determining with precision the weight of the Emperor's maund, and although silent upon the subject in his work upon the land revenue which was quoted by us, seems to have discussed the matter at length in the pages of the *Meerut Universal Magazine*, of which he appears at one time to have been editor :—

"The Ayeen Akbery was examined with a view of gaining a comparison with the above results. The copy procured was an imperfect one, not having the detailed statements filled up ; but this was the less to be regarded, as time would have been wanting to follow them out.

In the copy procured it was stated that :—

8 Ruttees make 1 Masha,
21 Mashas, 1 Dam,
30 Dams, 1 Seer,
40 Seers, 1 Maund.

"Prinsep's useful tables were not then published—and the weight of the ruttee or masha* was wanted. The "ruttee" was said to be the same as a little red seed plentiful all over the country, called "soorkha" or "goongchee :" a number of these were carefully weighed :—

100 seeds weighed 193½ grains : one seed then weighed grs.			1·9325
25 do.....	48½	.....	1·93
12 do.....	23½	.....	1·9375
The whole together	367	.....	1·93489

"These appearing very much the same, it was supposed or hoped that the seed was pretty generally of an uniform weight, so that having nothing better to go upon, the weight of the ruttee was taken at grains 1·933. Prinsep's useful tables give the weight of the masha at 15½ grains, which carefully divided by 8, affords grains 1·9375 for the weight of the ruttee, so that we may feel sure of being correct on this point.

"If anyone will multiply grains 1·933 by 8, and by 21, and by 30, and by 40, and divide by 7000, he will find that the weight of Akbar's mun was lbs. 55·68—But there is not the same satisfactory corroboration.

"Abul Fuzl defines the mun of Akbar's reign to be 40 seers of 30 dams, each dam being 5 *tanks*. The tank, in another place, is described as 24 ruttees. The masha of 8 ruttees has been assumed, from the weight of Akbar's coins, to be 15½ grains troy. This would make the Emperor's maunds = 34¾ lbs., agreeing pretty well with that of Central and *Western** India (?) The tank as now existing in Bombay is 72 grains, in Dharwar it is 50 grains, in Ahmednuggur 168 grains. Its present weight, consequently, affords no clue to the verification of the above estimate, however desirable it may be to determine the point. In one part of the Ayeen Abkery, the dam is called 20 *mashas* 7 *ruttees*, which would increase the maund to about 47 lbs." (?) *Prinsep's useful tables, p.* 77.

But though the weights arrived at by Prinsep do not substantiate the above result, it is some consolation to find that they do not condemn it. The copies of the Ayeen Akbery consulted, must have differed—and insolvable I suppose would be the attempt to find which was right. In the mean time let us take lbs. 55·68 as the weight of Akbar's maund.

It would be tedious to narrate, even shortly, the dispute which occurred as to the length of Akbar's yard whether it was 31½ English inches or 33 English inches. The big-endian and little-endian contest was not more warmly carried on; and the misfortune is that the decision was at last an arbitrary one so that though it was decided that the yard in future *should be* 33 inches, yet, as just now we want what it *was* in the past time, this is not satisfactory. The weight and the measure are therefore both uncertain. 3,025 square yards have been taken as Akbar's beegah, and with this the following table is worked out.

Produce per beegah in maunds and seers, taken from the Ayeen Akbery as the results of 19† years' experiments conducted over the whole of India.

	Highest.	Middle.	Lowest.	Average.	In lbs. per acre.
	Mds.	Mds.	Mds Srs.	Mds. Srs.	
Wheat..	18.	12.	8.35	12.38	1,155
Barley,.....	18.	12.20	8.15	12.12½	1,097
Gram.....	13.	10.20	7.20	10.13½	921
3 sorts of rice	1.32½	15 1½	8.8¾	15. 0¾	1,338
Goor	13.	10.20	7.7½	10. 9	911
Masha	10.20	7.20	5 10	7 30	690
Cotton (unpicked..).....	10.	7 20	5 2¼	7.2¾	670
Joar	13.	10.20	7 23	10.11½	920
Sesamum	8.	6.	4.	6.	534

These results, as also those of the Bareilly experiments, do not, at all events, shock one's pre-conceived notions of the inferiority of Indian to British agriculture, and so far they are agreeable.

The usual mode of calculating the value of land, among the natives, was that Malgoozaree land was worth one year's *rent* ; Maafee land, 10 years' *rent* per beegah. On an examination of 66 transfers of estates by private sale in the Bareilly district, it was found that the average price paid was 3 rupees 1 anna 7 pies per acre of cultivated land. So much land has been measured since the period spoken of, that it would be a very interesting subject for Collectors to pursue : and tracing, in their records, the prices paid for estates, and having by late measurement the amount of land in cultivation, the selling price per acre could be readily found, and would give us a good insight into the actual value of land. The result *ought* to be *more* than what is above given.

The ground-work of the process by which the produce in Akbar's time has been estimated has been carefully given ; and with that assistance (or other data which might be preferred) it would be curious if not useful, to trace out prices and rents in his day.

Dr Oldham, in his interesting Memoir of the Ghazeepore district, arrives at the same result as Captain Tuckett, and concludes that the maund of Akbar was about 27 of our seers. The passage is so interesting that we reproduce it :—

"Before we can make much progress in any comparison of the past with the present, we require to know what was a maund, what a beegha of Akbar's time, and what the intrinsic and relative value of a rupee.

"We must ascertain the area of what was then in the district, and the revenue which is now collected from it. To the investigation of these problems I now turn :—

"It appears to me that a maund of Akbar's was equivalent to about twenty-seven of our seers. A maund contained 40 seers ; each seer weighed 40 dams ; a dam weighed 1 tolah ; 8 mashas 7 ruttees ; there were 8 ruttees in a masha, and 12 mashas in a tolah : a seer consequently consisted of 52 tolahs 2 mashas and 2 ruttees. A rupee of Akbar's weighs 11¼ mashas *or* 175 grains troy. A tolah therefore weighs 186·6 grains troy ; and a seer must have weighed 9,742 grainst troy. (48.)

*The weight of the masha could have been got from the Goldam'ths, but it would have been open to the objection common to all weights not fundamental once—*vide* lower down the beautiful uncertainty touching the weight of the "*tank*."

*The *catcha* maund of several Pergunnahs, in the Bareilly district, was found to be 53¼ lbs.

† During which period, being a lunar cycle, the seasons are supposed to run through all their variations.

"A seer now weighs 14,400 grains troy, *i. e.*, 80 tolahs of 180 grains each.

"A seer of Akbar's time was therefore ·676 of the present seer, or 54 tolahs 22 grains; and in the same proportion a maund must have been 27 *seers* and a little less than one chittack; and for practical purposes a maund of Akbar's may be considered two-thirds of a maund of the present day.

"A beegah was fixed by Akbar to contain 3,600 *Illahee gus*. Wilson states that the *Illahee gus* was, as nearly as can be ascertained, 33 inches long; (49.) a beegah, therefore contained 3,025 square yards, and was ·625 of an English statute acre.

"A rupee, according to Wilson, contained 175 grains of pure silver in Akbar's time. (50.) At present it contains 165 grains of pure silver. Akbar's rupee was therefore intrinsically worth 1 rupee 1 anna of the rupees now current.

"According to the prices current given in the *Ayeen Akbery*, a rupee in the days of Akbar would purchase, at the very lowest computation, about four times the amount of agricultural produce that can now be bought for a rupee. (50A.)

Wheat cost 12 dams a maund; in other words ninety of our seers per rupee.

Barley was 8 dams per maund or 175 of our seers per rupee.

Millet of the spring harvest, 6 dams per maund, or 180 of our seers per rupee.

Millet of the autumn harvest was the same as barley, 175 seers per rupee.

Milk, 25 dams per maund, or 43 of our seers per rupee.

Ghee, 105 dams per maund, or 10 of our seers per rupee.

Brown Sugar, 56 dams per maund, or 19 of our seers per rupee.

We should like to take advantage of this article to reproduce a somewhat long extract from Dr. Oldham's memoir comparing the present agriculture and assessment of the district with those of Akbar's time. We must defer doing so however, and in the mean time content ourselves with a notice of Dr. Oldham's conclusions, according to the *Pioneer*:—

"A comparison," says our contemporary "between the revenue of the district as it is now and as it was in Akbar's time is curious and instructive. From Mr. Oldham's very careful analysis it would appear that then only one-sixth of the district was cultivated as against five-sixths at present. The Government revenue averaged two rupees per cultivated acre, and two rupees of that time were equal in purchasing power to eight rupees of present money. The revenue now averages one rupee eight annas per cultivated acre, *ergo* Akbar's assessment was more than five times ours. But, Mr. Oldham proceeds to explain, this startling difference is not altogether real. In the first place, Akbar's assessment was only on an estimate of income and an over-estimate, the amount that might be collected in prosperous years. In the second place, as only the best lands were cultivated in Akbar's time, the comparison, by cultivated acre, is illusory: for example, the present general average of one rupee eight annas per acre might be considered as in reality an average of say, three rupees, on the very best land, the land chosen for cultivation in Akbar's time, and an average of one rupee two annas on the inferior four-sixths since taken into cultivation. But even allowing Akbar an actual collection of only six rupees per acre, and comparing it with an assumed assessment on equivalent land at present of three rupees, the fact would appear to remain that Akbar's revenue was at least double of ours. Most of this large difference is an actual annual loss to the present Government, through the mistake of the Permanent Settlement. Yet Akbar's land revenue does not appear to have been oppressive; and all vexatious taxes, all those minor taxes in fact, were abolished, which now-a-days must be resorted to in order to raise a fraction of the difference sacrificed at the Permanent Settlement."

WHAT IS THE HOUSE-TAX OF THE ECONOMISTS?

BOMBAY A BEACON.—III.

THE discussion that has been going on for years in Bombay as to the merits of its system of Municipal Finance has been enlivened in the past month by the publication of a letter from Mr. Mill upon the subject. The letter is a reply to a communication addressed to that gentleman by the Editor, apparently, of the *Times of India*, who publishes Mr. Mill's answer, but refuses to produce his own letter. Mr. Mill's reply shows plainly that great misrepresentation has been used to snatch a judgment from him adverse to the views which we have urged upon the Municipality with so much earnestness and persistence. Mr. Mill has been imposed upon and Mr. Knight misrepresented, and as a consequence, the letter is not producible. Mr. Mill's letter is as follows:—

DEAR SIR,—I have just received your letter of July 11. I cannot imagine how the passage quoted from my Principles of Political Economy can be supposed to give any support to the imposition of Town Duties. It is true I object to "calling upon one tax to defray the whole or the chief part of the public expenditure." But the local expenses of the town of Bombay are a very small part of the share of public expenditure falling upon its inhabitants. A house-tax appears to me one of the most equitable of all taxes, not only in so far as it falls on the occupier, but also, in a thriving town) as far as it falls on the ground landlord, from whom it merely intercepts part of the unearned increase of income which he derives from the general prosperity of the place. An octroi, on the contrary, to be productive, must be levied on the necessaries of life, or at least on articles generally used by the mass of the people, and is therefore one of the most unequal and most burthensome of all ways of raising a revenue. I do not say that in a country like India, where it is difficult to levy any tax to which the people are not used, financial necessity may not sometimes justify having recourse to such a tax; but I am sure it should only be adopted in extremity.—I am, &c.

Avignon, August 26, 1871. J. S. MILL.

Mr. Mill "cannot imagine" how the passage quoted from his Principles of Political Economy can be supposed to give any support to the imposition of Town Duties; nor can we. It is clear, however, that he has been told that "Mr. Knight" quoted the passage in support of town duties. Now here is exactly what was said by Mr. Knight, as reported in the local journals in July:—

"But first about the house-tax. Here then is what Mr. J. S. Mill says upon that"—

"In so far as the house-tax *falls on the occupier* (Remember it is levied here on owner without power of recovery) it is one of the fairest and most unobjectionable of all taxes, * * * but even a house-tax has inequalities and consequent injustices, no tax is exempt from them, and it is neither just nor politic to make all the inequalities fall in the same places by calling upon one tax to defray the whole, or the chief part of the public expenditure."

"Bombay house-owners are paying now 6 per cent. I remember the "time when Mr White, the Advocate General, came down here for the "express purpose of opposing me on the question of a ten per cent. "house-tax, and a partner of Mr. Forbes on that occasion supported the "proposal to increase the house-rate. Mr. Forbes owes it to me that "the house-tax to day is not 10 per cent. instead of six. Mr. Forbes "and all Bombay have to thank me for having fixed the house-tax at "6 per cent. instead of ten. But nothing could be more explicit than "these remarks of Mr. Mill on the injustice of such taxation."

The speech did not contain another word of reference to Mr. Mill, but we are declared to have been guilty of great dishonesty for not stating that the two quotations divided by the three asterisks occur at an interval of some pages from each other; and that the word 'but' should be 'besides.' The charge is simply contemptible. The most casual reader will see that the legitimate and sole use which we made of the extracts in question was to show that the so-called *house tax* of Bombay violates both conditions which Mr. Mill lays down for the equitable imposition of such a tax.

In the first place, we have repeatedly pointed out that the house-tax of Bombay is not what Mr. Mill and economic writers mean by a house-tax at all. For they all mean by a house tax, a tax upon *expenditure*, a tax upon the amount of money which every man expends for rent; in other words, a tax upon the occupier. But the house-tax of Bombay is a tax upon *income*, being simply Schedule A of the English Property and Income-tax, disguised under the name of a house-tax. The tax concerning which Mr. Mill writes is a different tax altogether from the *pseudo* house-tax of this island, which is simply an income-tax upon one description of income alone, viz., that derived from property in houses, and lands, and we affirm that when Mr. Mill understands the real nature of the Bombay impost, he will disclaim the application thereto of what he has written upon the house-tax.

Mr. Dudley Baxter, in his work on the *Taxation of the United Kingdom*, declares the house-tax of England (which is 9*d.* in the pound upon all houses above £20 rental) to be a tax upon expenditure (*p.* 30), and classifies it accordingly with the assessed taxes upon men-servants, carriages, horses, and armorial bearings. Mr. Mill uses the term in a somewhat wide sense, but still confines it to taxes or rates paid by the tenant, not by the owner.

He uses the term generically for all direct rates calculated upon the rental of houses. In the sense in which Mr. Mill and all other economists use the term—it is the police and lighting rates of Bombay that are the house-tax of the island, the so-called house-rate of Bombay not being a house-tax at all in Mr. Mill's sense of the word. Thus he says: "a large portion "of the taxation of this country [England] is raised by a house-"tax" [page 503].

Now that would be untrue, if the meaning was a house-tax on the income derived by owners from their houses, for there is no such tax in the kingdom. Schedule A of the income-tax is the only tax levied upon the owners of houses, and that in common with all other incomes. Mr. Mill leaves us in no doubt whatever as to what he means by a house-tax, for he proceeds to explain his statement as follows:—

"The parochial taxation of the towns entirely, and of the rural districts partially, consists of an assessment on house rent. The window tax, which was also a house-tax, but of a bad kind, was exchanged in 1851 for a house-tax properly so-called."

Now, how is it possible to acquit those gentlemen of dishonesty who, in the face of statements of this kind, persistently apply to the Bombay tax what Mr. Mill has said about a house-tax. Mr. Mill says that A is one of the fairest of all taxes. In Bombay they levy B, but call it A, and then declare that Mr. Mill is a great supporter of their tax. A house-tax, in the generic sense of the term, means any tax levied upon the *occupier* of a house, in proportion to the rental thereof, and at home includes the poor's rate, as in Bombay it includes the police and lighting rates. No intelligent person can read Mr. Mill's writings upon this subject and have a moment's honest doubt as to his meaning.

Mr. McCulloch, by the term 'house-tax,' means precisely what Mr. Mill, and Mr. Baxter, and all other economists mean—namely a tax upon the occupiers of houses, assessed upon the rent they pay, and the tax is declared to be one of the fairest of all taxes, because the rent which a man pays is "a pretty fair index to the income which he enjoys."—[*McCulloch, p.* 69.]

"There can be no solid objection" says this writer "to the "tax, provided it be equally imposed. It is neither unfair nor "unjust for Government to lay it down that *individuals occu-"pying houses* of a certain value shall be charged with certain "duties."—(p. 69).

Let the reader observe the words we have italicised. Mr. Greg uses the term with precisely the same meaning and says: "of all taxes, a house-tax fairly levied on the assessable "value of the buildings * * unites most merits, and is open "to fewest objections * * since the value of the house in which a "man chooses to live, offers a criterion of what he can afford to "expend, (and therefore to pay) not indeed perfect and univer-"sal, but certainly more accurate than any other test."—(p. 274.)

The Bombay publicists are in dense darkness as to what the house-tax of the economists really is, for they do not yet discern the *principle* upon which is it so much favoured by authorities. The rent a man pays for his house is a good index to his income, and instead of taxing his income, say the economists, where he can evade you at will, tax him upon the *rent* he pays where evasion is impossible. We have now given the true, the only, meaning of the term house-tax, and shewn the philosophy on which it rests.

The tax commonly called a house-tax in India is misnamed. Wherever a so-called house-tax is levied in India on the owner, without power of recovery from the tenant, let it be well understood that it is not a house-tax at all, but a disguised income-tax upon landlords, and where not balanced by special taxation upon other kinds of income, is, in Mr. Mill's words, "a very easy form of plunder."

"The strongest objection, "says Mr. Mill," to raising the whole "or the greater of a large revenue by direct taxes is the impossi-"bility of assessing them fairly. * * In the case of an income-"tax * * this is in fact admitted by most of the advocates of "direct taxation, who I am afraid generally get over the difficulty "by confining their projected income-tax to realized property, *in "which form it certainly has the merit of being a very easy form "of plunder.*"—(p. 523.)

Now this is exactly what is being done in Bombay. Under the name of a house-tax there has been introduced an income-tax confined to realized property. Mr. Mill declares such taxation to be a very easy form of plunder, and we have constantly declared it to be so too. If the so-called house-tax of Bombay is really an income-tax in disguise, as we affirm it is, then is it simple 'plunder' for the reason given by Mr. Mill, that instead of being a general income-tax, it is confined to real property only. They dub the impost a house-tax, and then appeal to Mr. Mill's assertion that a house-tax is one of the fairest of all taxes. You cannot alter the tax by changing its name. You might as justly call it a tax upon tobacco or piece-goods. The tax is neither more nor less than a special tax upon incomes derived from real property, and in Mr. Mill's words, is simply "a very easy form of plunder." If the Municipality is in honest doubt upon the point, let the Judges of the Court be asked to point out the difference between Schedule A of the English income-tax and this so-called house-rate of Bombay. We owe the blunder, in the first instance, to the Regulation of 1794; in the second to the mistake of the Legislative Council in 1865; and its continuance to the ignorance that refuses to be enlightened upon the point. The tax is a special income-tax upon one kind of property, and as such is simply 'plunder,' and it matters nothing whether you call it a house-rate or a tobacco duty. The issue between ourselves and the supporters of the tax is so simple, that it is next to impossible to credit our opponents with honesty in the discussion.

THE SO-CALLED "HOUSE TAX" OF BOMBAY.

ITS INCIDENCE.

"WHATEVER difficulties may occur," says McCulloch, "in esti-"mating the incidence and practical operation of taxes on pro-"perty and income, there can at all events be no question in "regard to the principle on which they should be imposed." (p 113).

Now let the reader mark well what this principle is. "It "is agreed on all hands that they [taxes on property and "income] should be made to square with the first of Dr. Smith's "general maxims, or be assessed so that they may fall on dif-"ferent individuals '*in proportion to their respective abilities*, or "*in proportion to the revenue which they respectively enjoy under*" "*the protection of the State.* Thus far everything is obvious." But in Bombay instead of the Municipal income on property-tax being levied in this way, everyone is exempted from the tax but the owners of houses and land. Mr. McCulloch would almost seem to have had Bombay in his mind when he proceeded thus:—"Suppose two individuals have each £500 "or £5,000, and that the one vests his money in land, the "other in a ship; could anything be more unjust than to tax the "property of the former, and to allow that of the latter to "escape. Would this be making them contribute to the wants "of the State 'in proportion to the revenues they respectively "enjoy under its protection'? It has been said in vindication "of this inequality that the properties are of a different de-"scription; that the land will last for ever, whereas the ships "will speedily be worn out, &c., &c."—(p. 118, *Principles of Taxation*).

What is all this but an exact description of what is being ignorantly done, and ignorantly defended, in this island, under the belief that Political Economists approve these differential taxes? Mark the following passage again, and see how exactly it pourtrays the state of the question at this moment in Bombay:—

The greatest possible misconception prevails among the great majority of the manufacturing, mercantile, and monied classes, with respect to the situation and circumstances of the owners of land. The possessors of great estates are but few in number. Insomuch, however, as they fill high stations and stand prominently forward, [*e. g.*, the Sassoons and Mungaldass Nathooboys—Ed. I. E.], they

engross the attention of the careless observer, and prevent his fixing his eye on the mass of obscure petty land-owners who make up the great bulk of the class. The land belonging to opulent proprietors, bears in fact a sort of proportion to that which belongs to persons of middling and very small fortune. Nothing can be a greater mistake than to suppose, as is generally done, that the land-owners are an extremely opulent body.—(p. 119.)

Now, however true this may have been of our own land, it is absolutely true of Bombay. Landlords are an unpopular class everywhere. Coming into contact with the people several times a year with a bill in their hands, they share the odium of the tax gatherer, the tax collector, and the landlord, being the constant terror of the people. The result is that the most absurd prejudices exist against the class, and landlords are looked upon by the vulgar as enemies, and oppressors of the poor. Now look at the facts. Of the 22,000 landlords of Bombay, about 6,000 are the owners merely of the huts they live in, and it was upon property like this, that the Municipal burden was being placed down to 1868, when we succeeded in getting this description of landlords exempted from the rates. But look at the others, the 15,000 or 16,000 owners that remain. *Of the whole number, there are but* 120 *men whose property is of the value of* 1,000 *rupees a year and upwards.* 13,300 *out of the whole* 15,000 *are landlords of property not yielding* £10 *a year.* Behold "the mass of capitalized selfishness, the brute force of wealth and numbers" which the *Indian Economist* 'championizes.' Our local patriots would prefer, however, probably to hear Mr. McCulloch speak; so let them listen once more:—

"Though the landlords were generally as rich and luxurious as is imagined, or at least represented *by the demagogues in manufacturing towns*, the plan for laying exclusive taxes on their property would be too grossly partial and unfair to entitle it to much attention. When, however, instead of being rich, the great majority of landlords are either poor or in but very indifferent circumstances, the inequality of the proposal becomes still more glaring. To suppose that it should be established by law would be a libel on Parliament; and to suppose that such a law, if enacted, would be submitted to, would be a libel on the people of England.* * Surely those who imagine that, if attempted, such enormous injustice would be tolerated, mistake altogether the character and feelings of Englishmen."—(p. 120.)

But the thing has been actually *done* by Englishmen here in Bombay, ignorantly *done*, of course. The guilt of such conduct begins the moment that its real nature is discerned. We verily believe that the people of Bombay are at present ignorant of the real character of the system set up in 1865; but its journalists are without excuse. They are sitting in the chair of the learned, and must be judged by the responsibilities they have undertaken. Almost as little excuse can be pleaded for the Legislative Council of 1865 which abolished the Town Duties (the only possible way of taxing the people fairly) and set up this monstrous system in their room.

Take the common case of a house-owner possessing property that cost him a few years ago £10,000. In common with most owners of his class, the man has sustained heavy losses in trade in the last few years, and has been compelled to mortgage his property up to the hilt, say 60,000 or 70,000 Rs. He is a fortunate man, if in the present position of house-property in the island, he gets a return of 4 per cent. or 4,000 Rs. in the shape of rental from his houses, while the mortgage rate being 12 per cent., his houses are the occasion of a direct loss to him of Rs. 3,000 to Rs. 5,000 a year. And yet it is upon the class which he represents that the Act of 1865 casts the chief burdens of the place.

For, be it observed, that in the present depressed condition of the island, the police and lighting rates which are borne in the first instance by the occupier, really fall in a vast number of instances upon the owner. Competition for houses having altogether disappeared, owners must now take for their houses what tenants are willing to give, and the amount the tenant will offer is determined by the amount he can afford to pay. But for the police and lighting rates, he could afford to pay, and would be willing to pay more. The real incidence of taxation is one of the most difficult problems of our times at home as well as here. Let the reader mark, however, that while at home the direct rates are levied upon the occupier, and are intended to fall upon him, their effect upon rents is so palpable that their ultimate incidence is believed to be with the owner. Thus Sir G. C. Lewis, speaking some years since of these direct rates upon houses, says:—

I have no doubt that ultimately, in the great majority of cases, the incidence of the rates is upon the owners.—(*Quoted by Mr. Baxter.*)

Mr. Dudley Baxter, who has given greater attention to this subject than perhaps any other living statesman, says:—

I come to the conclusion, in which I have the concurrence of men of great practical acquaintance with the subject, that on the average of house-property the incidence of rates may be estimated at about two-thirds on the landlord, and one-third on the tenant where the rates are paid by the tenant; but that the landlord pays a larger proportion where they are compounded for by him. —(*p.* 66, *Taxation of U. Kingdom.*)

In proof of these conclusions, Mr. Baxter notices the case of houses of exactly similar character standing on opposite sides of the street, or even side by side, but in different parishes, where the rents are £20 or £30 a year higher, or lower, in exact proportion to the difference of rates. Finally, Mr. Goschen's Committee on Local Taxation, in their Report presented 15 months ago to the Commons, write as follows:—

Property in houses is subject to this disadvantage as compared with other property, that the owner has only one market and one use for it. If the business of letting his house becomes unprofitable if the rents fall, and if on any increase of rates he is obliged to let his house at a further reduction of rent, he cannot take his capital out of the business, he must bear the burden of increased rates, without escape. When capital sunk in immoveable property is taxed, as is the case with house-property, the owner cannot shift the burden when the demand for the use of his property falls off.—(*p.* 19.)

Now this is asserted, be it remembered, of direct rates at home where the *occupier* pays them; and is the result of a protected Parliamentary enquiry. The question as to the incidence of these rates, as between owners and occupiers, gave rise to a considerable conflict of opinions among those who gave evidence before the Committee, but the verdict of the Committee was as follows:—

There can be no doubt whatever that a portion of the rates does ultimately fall upon the owner; what is in dispute is the amount which falls upon the occupier. It is held by some that all rates fall ultimately upon the owner; by others that a large proportion is borne in fact as well as in form by the occupier.

The evidence taken before your Committee shews that in many cases the burden of the rates which are directly paid by the occupier, falls ultimately either in part or wholly upon the owner.

What can be more conclusive than this? Mr. Palgrave, in his Prize Essay on Local Taxation, [1871] says:—

The only point of uniformity is that the rate, in almost every instance, is paid by the occupier in England. A portion of the tax however beyond doubt is ultimately paid by the owner.—(*p.* 130.)

Now the publicists of Bombay declare, on the other hand, that not only are the direct rates (police and lighting) borne wholly by the occupier, but that even the so-called house-tax of Bombay, which is levied upon owners without power of recovery, falls ultimately upon the occupier. In other words, "water runs up hill" in Bombay, whatever it may do in London; and all "economists" we are told "agree that by whomsoever a house-tax "is borne in the first instance, its ultimate incidence is upon the "occupier." A more impudent statement could hardly have been ventured. In England, where all the rates are paid by the occupier, it is demonstrated to conviction that their ultimate incidence is largely upon the *owner*. In Bombay the process is altogether reversed, and we are told that not only does the occupier pay the rates levied upon himself, but in some way or other, totally inconceivable, he pays also the Municipal income-tax (for that is what it really is) levied upon the owner. Water runs up hill in India, and Mr. Knight is a grossly dishonest writer for questioning the fact. At home, they doubt whether the occupier really pays any part of the rates at all, *here* it is held that he pays the whole of them, and the tax levied upon the owner as well! And we are told that "Economists all agree" in the preposterous statement.

We now quote a native paper, the *Gujarat Mitra*:—

We never thought that any man would seriously think that the house-tax does not fall upon the occupiers. Yet the *Indian Economist* does so. The writer might as well urge that the salt-tax does not affect the masses, that it is not paid by those who consume the salt as to say that because the occupiers do not directly pay the house-tax the tax does not at all touch them. The masses do not directly pay the

salt-tax, yet the tax touches them; the house-occupiers do not directly pay the house-tax, and yet the tax does not touch them! Curious logic this!

The *Bombay Guardian* writes to the same effect:—

If the State imposes a new additional customs' duty on piece-goods, the importer will take good care that his profits do not suffer by the amount of duty levied; the price of the goods will be raised the very day the new tariff comes into operation. If he alone had to pay the duty and other importers were exempt, he would not be able to recoup himself by enhancing the price; but as the duty falls on all importers, the enhancement follows at once. The newspaper proprietor acts on the same principle; and if the rate of postage is altered, if there is a great change in the price of paper, or in the wages of compositors, it is confidently expected that there will be a change in the terms imposed on subscribers. But when we come to landlords of houses we are told that the case is different, and that they never dream of recovering from their tenants the amount of the assessments levied upon them. This, if true, is very remarkable; and one is at a loss to understand why such a singular exception should present itself. Why does the principle, on which the landlord proceeds in his demand of rent, forsake him entirely the moment that a Municipal assessment appears among his expenses? For our part, we fail to understand it.

The two leading dailies of Bombay reproduce this stuff for the *instruction* of their readers, one of them describing the *Guardian's* speculation as "a common sense" view of the case. Were these 'common sense' gentlemen not profoundly ignorant of the subject they are writing about, they would know that their objections have been raised and answered time out of mind. The supply of houses admits but of very slow diminution and increase. In settled communities, the increase of houses will seldom be one per cent. per annum, while the supply can only be diminished by fire, earthquake, or age. The consequence is that where a place is declining, and the supply of houses is at all in excess of the demand, landlords must take what rents they can get; and taxes imposed upon such property in such circumstances fall wholly upon the landlord. They fall in the same way upon him, even where the place is *not* declining but stationary, if the rents are determined by competition as they almost always are. All that can be said upon the other side is, that if rents do *not* rise in proportion to the new taxes, houses will cease to be built, and that so, *after many years*, matters will adjust themselves to the new taxes. But *in the meanwhile* the taxes fall upon the landlord alone. Even where places are prospering and growing rapidly, new taxes upon houses still fall largely upon the owner, for it is he who would benefit and not the tenant, by their repeal in the great majority of cases. On top of all this in Bombay, we have a state of matters so peculiar when once understood, that it is certain that the so-called house-rate falls wholly upon the owner, and even the direct rates, we are persuaded, very largely.

The *Bombay Guardian* seems to be about as well-informed on this subject, as on some of the theological questions which it treats with so much narrow bitterness. Let it listen for a moment or two to a true analogy in place of the false one it has set up concerning piece-goods. Suppose, then, that piece-goods were as indestructible as are houses, and that the supply in Bombay was as unalterable in quantity for years together as the supply of houses: that there were no means on the one hand of diminishing the supply, except by burning it, nor of increasing it on the other, but at the rate of 1 per cent. per year. Suppose further, that piece-goods, instead of being bought and sold, were let out for hire by their owners at so much per piece per year. We have now got something like a real analogy, and not the delusive one supposed by our contemporary. Let the State now put a special tax for municipal purposes, not upon the piece-goods—as the *Guardian* falsely supposes—but upon the *income* which the owners of the goods derive from their hire. Suppose, lastly, that the quantity of piece-goods in the island is somewhat greater than the people in their altered circumstances can afford to use—Upon whom now does the *Guardian* suppose the tax will fall? Upon the people, or upon the owner who has no means of forcing his goods upon them, but must take what they can afford to pay, or keep them idle in his stores? Here is the real analogy opposed to the false one, which our contemporary sets up with so much sarcastic self-complacency. Upon the supposition that the supply of piece-goods was too narrow, and that the people were paying something of a scarcity price for their use the tax would still fall upon the owner, since the price he obtained would not depend either upon the cost of the goods, or the weight of the tax, but upon the strength of the competition for them. It is very unpardonable, we must be permitted to say, when men who have plainly paid no attention to such studies, venture to talk so confidently about them as our contemporary has done in this case. It is in this way, and from the utter confusion such writings breed in the public mind, that great interests are injured, and the public welfare so much retarded. The *principle* is that goods like houses, the supply of which can neither be increased nor diminished, but by very slow processes, should be subjected to changes of taxation with the utmost possible caution, and should be the last commodities singled out for *special* taxation, which must always in the first instance, and for indefinite periods, fall upon the holders and not the consumers of such goods.

In America, the local revenues of the States are raised by direct taxes upon *property* alone. No enquiry is made as to a man's income: he is simply required to state of how much property he is possessed. If he have nothing, he pays nothing: but if he possess any property whatever, it matters not of what that property consists, land, money, houses, goods, he is assessed so much per cent. upon its total amount. In England the local revenues are raised by taxes upon *expenditure*, (direct rates as they are called), and are calculated upon the rental of the house which the tax-payer occupies. Thus they have a consolidated rate and a sewers rate, and a lighting rate, and a poor rate, each of so much in the pound upon the rental of the house the man lives in, and he, and not the landlord, is expected to pay these rates.

Now what we have done in Bombay is this:—We have ignorantly taken a part of the American system, and a part of the English, and blended the two together. Thus we levy a tax of 5 to 10 per cent. upon *property* (our so-called house-tax); but instead of equitably levying this tax as the Americans do, upon *all* descriptions of property, we fasten it upon one kind of property alone, land and houses, which we oddly called 'capital.' Money, goods, stock-in-trade, shares, Government paper, according to this notion, are not capital at all. Mr. White even wanted the Council [1865] to empower the Justices to raise the tax upon 'real property' in the island to 20 per cent., in other words, an income-tax of four shillings in the pound. Now if we had adopted the American system, and levied a tax upon *all* capital, upon all property in the island, the house-owners would have had no grievance; but when we exempt all property but this one description, and openly avow that we mean to look to this source to meet the growing expenditure of the place, we enter upon a plain course of confiscation. At this moment, there is an income-tax upon landed property in Bombay of 6 per cent. or nearly 16*d.* in the pound; and the Municipal Act contemplated its going up to 2*s.* in the pound. Mr. White thought it ought to go up to 4*s.* The wrong is so patent, the injustice so plain, that it cannot last when the discussion has run its course. Put *all* incomes in the island under an income-tax for Municipal purposes, and no one will complain of injustice. But why is the income of the house-owner, any more than that of the banian or shroff, or the English merchant, to be mulcted in this special way? The house-owner is liable to every other tax levied in the place, but in addition to his contribution thereto, we fasten an income-tax upon his shoulders for the benefit of the rest of us. Suppose we single out the lawyer class of the community for a tax of the same order, a class who could afford far better than thousands of the so-called landlords of Bombay to pay an income-tax—what would be said to a proposal that we should fasten an income-tax of 2*s.* to 4*s.* in the pound upon the lawyers alone leaving the doctors and merchants free? The Bombay house-tax got misnamed, a great many years ago, and unconscious of the wrong which its levy inflicts upon the house-owner, we have tried to make it the backbone of our new fiscal system. If this so-called house-tax were really such, the case would be different, but we have ignorantly imposed the income-tax of Schedule A

upon the island, under the belief that it is a house-tax. The odium and unpopularity of this exposure are nothing to us. We have as much pity for the poor as any of our opponents, but we remember that the same authority that bids "us open our "mouth and plead the cause of the poor and needy," bids "us judge righteously," and not "to respect the person "of the poor in judgment." As a matter of fact, it is *we* who are advocating the cause of the poor. Who are they that are now 'groaning' under the weight of the Municipal burdens, but the few thousand men upon whose shoulders we have unrighteously fastened it? There is but one way to ease the burden, and that is to distribute it by a system of Town Duties over the shoulders of all alike.

OCTROI IN INDIA.

BOMBAY A BEACON.—IV.

THE position to which the Municipality of Bombay is reduced by the system of taxation set up in the island in imitation of a foreign model impossible of application thereto, is most instructive. It is admitted by the supporters of this folly, that no one in the island is conscious of the existence of the Town Duties, and the complete success of their introduction is made a constant objection to their increase, and even continuance. So far from the island suffering from the Town Duties, the two daily journals that denounce their levy, make it a ground of objection that "no one feels them," while they simultaneously declare that the direct rates are so heavy and so oppressive that the people "groan" under them. We are not misrepresenting these perverse writers in the least, we are simply quoting the expressions with which they themselves furnish us. They both contend moreover, and truly, that the Municipal income for several years past has shown an immense deficit, while neither of them is able to suggest any reduction whatever in the Municipal expenditure, the fact being patent to everyone who knows the condition of the island, that a revenue of 50 lakhs instead of 30 is indispensable. Well, what is to be done? If you really believe, as you profess to do, in the fairness of what you call your house-rate, and your police and lighting rates, then give expression to your conviction. Send the house rate up to 10 per cent. and double your police, lighting, and water rates. Says one of these mischievous twaddlers :—

"This 80 or £90,000 deficit will have to be paid off within a few months at most. If it is to be met by raising the rates all round, and "pushing up the taxes on food and trade—which the Commissioner and his "economic" ally are quite ready to do any month—the pressure on our struggling classes will be fearful."—*Times of India.*

The very same journal is telling us about once every week that it is an objection to the town duties on food that "no one feels them," and yet in its perverse folly now declares that to increase this inappreciable burden would make the pressure on the struggling classes of the island fearful. The struggling class is the miserable class whom the direct rates are pursuing, and against whom 12,000 distress warrants were issued last year. Is that true or false? We do verily in our conscience believe that a more scandalous exhibition of disingenuousness and disregard of public interests has seldom been shown than by these journals, who seem to have but one object, to bolster an utterly false, unjust system, because it is *we* who have pointed the matter out. Even journalists up-country who take but little interest in our local affairs can discern this.

A revenue of 20 lakhs a year may be raised from the Town Duties with as much ease, and as little consciousness on the part of the people, as the present five, while the increase is demanded by every consideration of equity, statesmanship, *political economy*, and common sense. It is a curious and striking fact, that while in this country the system of raising Municipal revenue by direct rates has for some years past been unfortunately looked upon as the only correct one, a precisely opposite conviction seems to be growing up at home on the same subject. *Here*, where objections to the system are really insuperable, we have a large body of men bent upon introducing it. *There*, where everything is in favour of the system, they are complaining that it is intolerable, and are even openly recommending an octroi of some kind or other to relieve the burden of the rates. Thus in the *Taylor Prize Essay* by Mr. Inglis Palgrave, published a few months ago, that gentleman complains that "the State while entrusting to the "local authorities the duty of raising a sufficient revenue, "restricts the method in which the tax shall be levied to one "particular head of property." And he goes on to complain that "the advantages enjoyed by the Chancellor of the Exchequer *in "the power of levying indirect taxation* are denied to the authority "whom we may term the Chancellor of the borough." And yet we are told by the political doctors of this country that we ought in India to imitate this folly, and to restrict our Municipalities in the same way to rates upon "one particular head of property." The *Economist* emphatically exclaims :—

"The radical defect of the present system of local revenue is its de-"pendence on a single source and its emphatic want of elasticity. The "owners of property and the occupiers of taxable houses are only a "part, and not the larger part perhaps, of the locality to be dealt "with. *The thing to be sought after is a local revenue from several "kinds of consumption, something corresponding to the excise and "customs' duties of the National Exchequer.*"

Does not this describe the position of Bombay to the letter? And yet although we have a customs' machinery in our hand to collect the impost at an all but nominal cost, and although the people are so abnormally housed (60 to 80 in a single dwelling) that it is impossible to tax them by direct rates; we are told that it is contrary to principle to tax them by town duties! The *Spectator*, in an article which we give further on, declares the rates to be intolerable, and says that an *octroi* is what is really demanded to redress the evils of the present system. The truth is that men in India are generally 20 years behind the current convictions of the day at home, just as the notions of most Englishmen concerning India are out of date by the same period. In London they have a heavy *octroi* upon coal, an *octroi* which yields £200,000 to £300,000 a year. In Bombay, Town Duties of £50,000 are a giant iniquity, although it is as clear as the Sun in the heavens that unless the people are taxed in this way they cannot be taxed at all.

The only passage we know of, in which Mr. Mill has expressed any opinion upon the subject of Town Duties is that at page 520 of the people's edition of his Principles of Political Economy, which runs as follows :—

In France, Austria, and other countries where direct taxation is much more largely employed by the State, the local expenses of towns are principally defrayed by taxes levied on commodities when entering them. These indirect taxes are much more objectionable in towns than on the frontier, because the things which the country supplies to the towns are chiefly the necessaries of life and the materials of manufacture, while of what a country imports from foreign countries the greater part usually consists of luxuries. An octroi cannot produce a large revenue without pressing severely upon the labouring classes of the towns, unless their wages rise proportionally, in which case the tax falls in a great measure on the consumers of town produce, whether residing in town or country, since capital will not remain in the towns if its profits fall below their ordinary proportion as compared with the rural districts.

Now, as we have frequently pointed out, Bombay happens to be a *frontier* town. However just, therefore, Mr. Mill's general views upon this subject, they plainly have a very modified application here. In the second place, Mr. Mill trips when he says that 'an octroi *cannot* produce a large revenue without pressing 'severely upon the labouring classes of the towns.' The statement is untrue, and no authority can make that true which is false. Mr. Mill was looking at the Paris octroi, and his objection was really levelled at *that*. An *octroi* upon sugar, tea, tobacco, fermented liquors, none of them necessaries, may produce a very large revenue without burdening the labouring classes in the least, and where the State relies chiefly upon direct taxes for imperial wants, such an *octroi* is the very best mode of supplying Municipal wants. Again a minute *octroi* upon grain will produce a very large revenue, as we see in India, while instead of 'pressing severely' upon the labouring classes, its weight is inappreciable, as in Bombay, where it is about four annas per

head per year, and yet produces £20,000 per annum. As we have more than once shown, it is possible to raise £200,000 to £300,000 a year in Bombay with ease by *octroi* duties, without burdening the poor in the least, and we must choose one horn or other of the dilemma, either to let the labouring classes go untaxed altogether, or tax them in this way. Since Mr. Mill's *Principles* were written, moreover, the subject of local taxation has commanded an amount of attention before unknown. Large funds are required for effecting sanitary improvements, and so heavy a strain is the direct rate system found to be upon the people, that they are impatient under it, and both the *Economist* and *Spectator* are suggesting the propriety of town duties, to redress the inequality of the system. Mr. Mill is a great authority, but are we to prostrate ourselves before his name, when he has treated the subject in the most incidental way only in his works? The Duke of Argyll's deliverance upon the subject is a far truer and more statesmanlike presentation of the case, than abstract reasoning upon the subject, regardless of the circumstances of the communities to which it is applied :—

"I do not concur [says the *Duke of Argyll*] with those who speak of entertaining a very strong feeling as to the morality of taxing such an easily and widely-produced necessary of life as salt. The justification which has been suggested as the only one for this tax is the only justification of any tax, namely, that the produce is spent for the benefit of the people, and that it is so levied as to be as little oppressive as possible on all grounds of general principles. Salt is a perfectly legitimate subject of taxation. It *is impossible in any country to reach the masses of the population by direct taxes. If they are to contribute at all to the expenditure of the State, it must be through taxes levied upon some articles of universal consumption.* If such taxes are fairly adjusted, a large revenue can be thus raised, not only with less consciousness on the part of the people, but with less real hardship upon them than in any other way whatever."

To show how unintelligently Mr. Mill's views concerning *octroi* are reflected in the Bombay press, we may mention that even he himself declares the old shilling duty per quarter on corn, lately repealed at home, to have been "scarcely felt as a burthen" by the people (p. 525). Now the Bombay Town Duty of 4 annas per candy on corn is about equivalent to 3½d. per quarter, while the English duty, which was nearly four times that weight, Mr. Mill himself declares to be scarcely felt as a burthen. This shilling duty was repealed a year or two ago, not because it was a tax upon bread, but because it operated as a bounty upon home grown corn. There has been neither intelligence nor candour in the conduct of this controversy at any stage of it, on the part of the leading Bombay journals. When Mr. Mill knows what our *octroi* really is, he will disclaim the application thereto of what he has written concerning the Continental octroi.

At present we stand towards this subject in India as follows :

In March 1867, the Calcutta Chamber of Commerce memorialized the Supreme Government upon the levy of Town Duties in the Central Provinces, praying that they might be disallowed. The memorial of the Chamber was forwarded to Nagpore for report, and on the 31st May 1867 the Chief Commissioner replied thereto as follows :—

"So far as it is possible to guard against octroi tax becoming a transit duty precaution is in these Provinces taken.

"Bonded warehouses are established at the principal railway stations, where goods brought by railway can be stowed without paying octroi duty and whence they can be despatched to outlying markets. And further, no goods in transit, under any circumstances whatever, are liable to octroi if they do not break bulk, or do not halt more than 24 hours within the limits of an octroi town."

In forwarding this explanation to Government, the Commissioner summed up his views upon the subject in the following propositions :—

I.—Municipal funds of considerable amount *must* be obtained.

II.—The octroi tax yields such funds with less dissatisfaction to the people, and less interference with Imperial imposts, than any direct tax.

III.—The inconvenience and restraint on trade accruing from this tax can, by good supervision, be reduced to a minimum.

The Government of India accepted this statement as satisfactory, and in forwarding a copy thereof to the Calcutta Chamber of Commerce, communicated thereto its refusal to interfere with these duties, in the following terms :—

"It will observed that the octroi duty is generally admitted, so far as the people are concerned, to be the least objectionable impost, and as it does not interfere with the consumption of British cotton goods either by diminishing demand or causing them to compete at a disadvantage with indigenous manufactures, the Governor-General in-Council can see no reason with interfering with the present practice, so long as it is introduced and is maintained in towns and cities in accordance with the general wish of the inhabitants, and so long as it is guarded in its incidence as in no case to assume the form of a transit duty.

The precautions taken in the Provinces to prevent the dues degenerating into transit duties were—that the dues were not permitted to be levied, unless (1) the goods halted 24 hours in the town, or (2) broke bulk therein. So long as these precautions are observed, the Government of India sees no reason for interfering with the present practice, and wisely.

EDITORIAL NOTES.

We have the pleasure to announce that we have opened a suite of Reading Rooms at the Office of the *Indian Economist*, the premises being singularly adapted for the purpose. Mofussil subscribers to the journal, and strangers passing through Bombay, will be welcome to the Rooms at all times, where they will find every office convenience, and the latest *Official Gazettes* and news from all parts of the world.

A contemporary demands "Is there any other country in the "world of which it can be said only £2 per annum is the income "of every person? We maintain that taxation of even 1*s.* 10*d.* "per head on an average income of £2, or 4·58 per cent. is a "crushing amount of taxation, since it represents a serious and "tangible aggravation of the general poverty."

Instead of £2 per annum, we are persuaded that the average income of the people of British India is nearer £6. How Mr. Grant Duff could have got hold of this £2 notion, we are unable to divine.

A correspondent of the *Delhi Gazette*, writing from Bombay under date of 27th September, says, that to his "dull brain" our arguments concerning the Municipal taxation of the island are "sufficiently clear," and that he cannot "for the life of him" understand why there should be any question about the advantages of spreading the taxes over a larger number of payers. He arrives finally at the conclusion that "it is hard to understand "why this idea should be so strenuously opposed, unless indeed "it is because the idea is Mr. Knight's." He has divined the real reason. The Bombay journalists are quite clear-sighted enough to see the force of what we have urged. They simply do not choose to be taught by us, let the public interests suffer as they may. One of these gentlemen has never once, for the last 12 years, been able to see any public question whatever, in the same light as ourselves. The other saw *every* question in the same light down to 1868, and since then finds the same difficulty in agreeing with us, as the other.

The system of direct rates is ill-suited to this country altogether, but in Bombay it is pre-eminently so. The number of houses in Calcutta, as ascertained at the census of 1866, was 15,975 and of huts 42,917, a total of 58,892, or about 6 persons to a house. But these *huts* ought to be excepted from the rates altogether, when there would remain merely the owners of the 15,975 dwelling-houses to bear the whole burden of the Municipal taxes. The direct rate system applied to this country is simply a grievous blunder, and when introduced into a city like Bombay, where the people are crowded together at the rate of 80, or 100, or even 120 in a house, it becomes simply monstrous, as everyone will see by and bye.

The Committee appointed by the Government to investigate into the financial position of the Municipality of Bombay, have arrived at the conclusion that Rs. 21,92,860 will be required by the 31st December "to meet immediate cash demands and also "replace amounts unauthorizedly taken from the deposit ac- "accounts." In these circumstances, wise men would begin to review their fiscal system, to enquire how it is that a paltry revenue of £300,000 cannot be raised in a city so vast and wealthy without the people 'groaning' under it. And

the moment enquiry is undertaken, the disclosure is made that by 'the people' we must understand that minute fraction of them upon whom the taxes fall. It is not the *people* at all who are 'groaning', but some 12,000 or 15,000 men who have been singled out by the Act of 1865 for sustaining all the burdens of the place. Place the taxes fairly upon the whole population, and no one will know that he is being taxed at all, though you double them. You have got the burden fastened round the neck of the horse, and cannot be made to understand that it must be shifted to his loins. The position is simply ridiculous—800,000 people with a vast amount of wealth 'groaning' under a burden that no other people in the world would deem a burden at all.

In noticing a suggestion in our last issue that Government should probably form reserves of food in the famine tracts of the country, as a measure of precaution against a recurrence of the calamity, the *Indian Daily News* says :—

"Famine can scarcely be said to have permanent head centres in India at which it may with certainty be calculated on to appear from time to time, or after specified periods of time. In the face of this uncertainty, the erection of permanent food reserves in particular portions of the country would not only involve tremendous sacrifices of money, but would also draw away food grains from portions of the country in which they might be most urgently needed, but to which, in the present state of internal communications, it would be impossible to transfer them in time. A wiser plan would surely be to entrust the local authorities with absolute power to purchase food, and to store it in sufficient quantities in localities in which the appearance of famine has been placed beyond all doubt. When this is done, but not a moment before, it would be just, as the *Economist* proposes, to hold the local authorities responsible for the loss of every life."

Our contemporary has not thought out for himself the conditions under which the step should be taken. We have dealt at some length with the question above, and as we believe it to be of great importance, shall return to it in our next issue.

According to the *Indian Daily Examiner*, the Lieutenant-Governor of Bengal proposes to substitute the following taxes throughout the Municipalities of Bengal, for those at present subsisting there :—

"(*a.*) An assessment on persons residing in, or owning, property in the Municipal limits, according to the circumstances and the property to be protected of the persons liable to the same : provided that no person not residing shall be assessed according to his circumstances, but only in regard to the property which he possesses in the Municipality : and that the average annual assessment on each holding shall not exceed Rs. 4 in Municipalities of the first class and Rs. 2 in Municipalities of the second class.

"(*b.*) An assessment not exceeding 7½ per cent. on the letting value of houses exceeding Rs. 6 per annum, to be paid by the owners.

"(*c.*) Duties on articles entering the Municipality, on a table of rates sanctioned by the Lieutenant-Governor, and subject to such rules and exceptions as the Lieutenant-Governor shall direct.

"(*d.*) Tolls on vehicles and beasts of burden entering the town, according to a scale sanctioned by the Lieutenant-Governor.

"(*e.*) Tax on carriages, horses, elephants, and carts, as in Act III. of 1864.

"(*f.*) Tax on trades and callings, as in Calcutta.

"(*g.*) Tax on processions, marriage ceremonies, and other public ceremonies not religious, and requiring the attention of the police.

"(*h.*) Tolls on ferries within Municipal limits."

With reference to (*a*) and (*b*) we would take the liberty of directing Mr. Campbell's attention to what we have written above concerning the house-rate of Bombay, the practice of America, the general conclusions of economic authorities upon such taxes, and the feeling growing up at home concerning them as reflected by the *Economist* and *Spectator*.

"We are startled says the *Amritsar Bazar* to find the *Economist* putting the financial dilemma of the Empire thus :—'The dilemma is simply the land or a giant income-tax. Our contemporaries refuse the land and then denounce the income-tax.' This is no doubt very clearly put, and the *Economist* no doubt accepts the former, but why does Mr. Knight lose his temper when reminded that he is not a friend of the poor cultivator? The whole brunt of the land revenue falls upon the poor, and the increase of such revenue means the increase of their burden, while the tax upon incomes is a tax upon the rich alone. The *Economist* would tax the poor and save the rich, and then take credit for being a friend of the former."

But the *Economist* distinctly recommended the retention of the income-tax upon the rich, as a sort of equivalent to the salt-tax upon the poor. *The Amritsar Bazar* is in error in supposing the land revenue to be a tax upon the poor. It is a tax upon no class whatever. Our contemporary sees around him nothing but a rack-rented tenantry under the private landlords of Bengal. Now our simple object is to prevent *that* system growing up anywhere else in India. Unduly low assessments necessitate a general income-tax, while they directly tend to create the middleman class that ruin agriculture wherever they exist.

If, says the *Delhi Gazette*, "the people of Agra, Allahabad, or any other town prefer indirect taxation, why insist upon direct? If the tax on grain be, say, one anna per maund, and realises, say, Rs. 20,000, and the revenue of the Municipality falls off in consequence of the late Government orders by Rs. 10,000, why not raise the tax on grain to an anna-and-a-half per maund, and the deficiency is made up without further trouble by a method the people would prefer to a house-tax. If funds are needed and must be raised, surely it is the wiser plan to realise them in a way most agreeable to the people. If the tax on grain were raised even ten per cent., we feel sure they would prefer it to paying half that by *direct* taxation. They abhor and dread the visits of the tax-gatherer,—and who can blame them! Taking a commonsense view of the matter, and bringing into calculation the protection and the wishes of the people who have to be taxed, there can be no truthful denial from experienced people that indirect and not direct taxation should be the rule in India. As a case in point, how hateful to the natives in Cantonments is the one-anna tax, but if it were realised by an increase of the grain-tax they would pay their one anna each per month without a murmur."

Is there any reply to this? We confess that we know of none : and as to the economists, we affirm positively that they *justify* the demand of the *Delhi Gazette*. The authorities of the science would not dream of forcing direct taxes upon a country like this, and were they appealed to, and the case exactly stated, would to a man recommend reliance upon indirect sources. The way in which the abstract principles of the science are ridden to death in India is simply shocking.

According to the fifth number of the "Statistical Abstract" relating to British India, the total value of Imports and Exports, including treasure by sea, from and to foreign countries, during the last ten years, has been as follows :—

Years ended.		Imports.	Exports.	Total.
		£	£	£
30 April.	1861	34,170,797	34,09[illegible],154	68,26[illegible],947
	1862	37,272,417	37,000,397	..
	1863	43,141,[illegible]91	43,970,785	..
	1864	60,1[illegible]8,171	66,895,884	..
	1865	42,514,275	69,471,791	..
	1866	56,156,229	67,656,475	..
31 Mar.	11 Months. 1867	43,275,679	44,291,467	..
	1868	47,128,291	51,527,588	..
	1869	5[illegible],953,191	53,7[illegible]8,830	..
	1870	16,882,386	53,513,727	..
		£457,593,983	£527,125,128	

Two facts lying upon the surface of these figures seem worthy of remark. In the first place, the exports of the last ten years have averaged it seems nearly £53,000,000 sterling a year, while the gross amount of the land revenue during the same has been but £20,000,000. Thus the land of India has yielded sufficient produce to maintain :—first of all, its own producers, the agricultural 3-5ths of the population ; in the next place, it has yielded supplies enough to maintain the urban population of the country about 60,000,000 in number ; and in addition to all this, it has yielded between fifty and sixty millions a year of produce for export to other lands. And yet the land revenue must be stationary, and cannot be increased without oppression. The second remark is the fact that the imports have fallen short of the exports by £70,000,000, or seven millions sterling a year. In reality, the deficit is more than double that sum. For from the imports must be deducted

the whole of the Railway Capital imported during the period; the amount of public debt incurred in England during the ten years; and the amount of the debt of India transferred from India to English holders. And yet with these facts staring us in the face, we have a party amongst us who affect to regard the expression of any concern about the deficiency as needless, if not disloyal to the regime under which the phenomenon arises.

THE last *Spectator* to hand, contains a striking testimony, and we think a very alarming one to the deadly mischief being wrought in the country by the attempt to force the system of direct taxation upon the people. A correspondent signing himself *Anglo-Indian* sends the following translation of a Bengali song to our contemporary, assuring him that it is being widely disseminated amongst the people of the Lower Provinces. Let the reader note the words we have italicized, and call to mind the Lieutenant-Governor's recent minute upon the shockingly oppressive manner in which the income-tax is being levied upon the ryot:—

The fruit of so much labour, the blood of the bodies of the people—
Taking this to preserve their rule—what sort of greatness is this?
This is killing a cow to supply a Brahmin with shoes;
The cry of the Ryots is like that of a frog in the mouth of a snake.
The assessors are their grandfathers' fathers. Instead of a handful, they fill their arms;
Coming on the poor, like the King of Death; they go from village to village.
As a water-melon which may be held in the hand, contains seven handfulls of seeds,
So these clever fellows get ten rupees, when the income-tax is one rupee only.
The tax used to be on the land; then it fell on water, and oh, mother! what will the end be?
Thus thinking the wind flew away in terror, saying, "By and bye they will seize me too by the hair of the head."
If this be so in time of peace, when war comes our very lives will be taken;
If the watercourses are dry in winter, summer will bring death;
When the word is given our fortunes flow to the treasury,
As a child might to its nurse's arms when she calls.
Lord Lawrence's reign being over, we thought that trouble was past.
Past is it? or but coming? Any one may see,
The dark age is only beginning,—what will be our fate hereafter?
Lord Mayo's voice is heard. The soul trembles with fear.

When the grievances of the people begin to take this form, danger is not far off. And what is it all for? The astounding folly of attempting to substitute the barbarous finance of our own land, for such it really is, in lieu of the ancient fiscal system of this country. "The tax" say the ballad singers "used to be on the land. Now they tax "water," meaning everything, and let loose "the assessors" upon us. Do the advocates of an income-tax and a house-tax understand the people's meaning? Or will they discern it only in the light of a new rebellion? "The tax used to be on the land". And we are a public enemy for advising that it should remain there.

THE *Pioneer* misreads the article upon Indian banking in the last number of this journal, and uses the word 'discount' in a sense foreign to its technical meaning. Our contemporary seems to confound the conduct of the internal exchanges of the country with what mercantile men mean by the business of 'discount'. Thus he vindicates the State Banks by saying that "they have supplied a great commercial want is evident * * "from the great fall in the rates of discount on bills, which "has taken place since up-country branches of these Banks "were established." No doubt. The substance of our complaint is that while the State Banks do little or nothing but internal *exchange*, and the Joint Stock Banks little or nothing, but foreign *exchange*, banking business proper—that is the circulation amongst the *workers* of the community of the unemployed money, which every man thinks it necessary to keep in hands for his immediate wants—is unknown in this country. The amount of idle money thus utilized and turned to account at home, is estimated at £400,000,000, while in India no attempt whatever is made to utilize it, as a stimulus to industry. All the banking the country knows, in so far as Europeans are concerned, is Exchange banking, or advancing on Government securities; while the native industry of the country is held in bonds by a race of native sowcars, called bankers by courtesy, who charge anything from 15 up to 500 per cent. interest for their advances.

America at present seems to be the only country that understand the enormous producing power that a nation possesses, when its workers are given the means of *working*. Good banking means, we think, the careful and intelligent and courageous assistance of the worker; and it is simply unknown in India. The Government is happily going to begin a reform, as the great landlord of the country, by means of its *Land Improvement Bill*, under the provisions of which, the enterprising cultivator—the skilled human brain and human hand—will set to work to build himself a well, or a bund, or some other work, for want of which his industry is now foiled, and himself reduced for half the year to idleness. What the Government is thus going to do for the land it is the business of enlightened banking to do for the city. Losses must, and of course will come, but in the main every interest will gain by such enterprise, for "in all *labour* there is profit." It is "the talk of the lips" that tendeth to poverty, not the hard work of a man, however misdirected his energies may sometimes prove to be.

THE correspondence that has been opened with Mr. Mill on the subject of the Municipal taxes of Bombay suggested to the editor of this journal the propriety of the dispute being officially referred to recognized authorities at home, and we are glad to say that the Municipal Commissioner, Mr. Crawford, has consented, at our request, to submit the whole question of our Municipal taxation to the authorities to whom we have ineffectually challenged the *Times of India* to appeal. The case for opinion will not be sent in the dark to Mr. Mill, nor to any other authority for the purpose of snatching a judgment from them by misrepresenting the true state of matters, but will be placed in the hands of the Justices for approval before it is submitted. "The mass of capitalized selfishness," and "the brute force of wealth and numbers" [*e.g.*, the 6,000 hut-owners] that we have "championized" so long, are now, it may be hoped, in a fair way to their final overthrow. The refusal of the *Times of India* to publish the letter addressed to Mr. Mill upon this subject, is certainly suggestive of anything but what is creditable.

Our contentions concerning the Bombay Municipality, as everyone knows who has paid any attention to the dispute, have been, and are simply these:—

I.—That the house-tax of Bombay is not the house-tax of political economists at all, but an income-tax upon one description of property only, and therefore unjust.

II.—That were it a house-tax (1) it ought not to fall on the owner but the occupier; and (2) that it ought not to be screwed up in the way contemplated by the Municipal Act.

III.—That the statistics of our population prove in the most absolute manner that we cannot tax our community equitably by the system of direct rates, but by indirect taxation only.

IV—That both the wheel-tax and water-rate are levied in the same unjust way as the house-tax.

V.—That the Municipal expenditure, so far from being excessive, requires to be indefinitely increased, for

(1.) Providing the island with a proper rate supply:
(2.) The following Sanitary measures:—
(*a*) Removal of the cocoanut plantation.
(*b*) Giving lungs to the native towns.
(*c*) Filling up the fever swamps at Worlee.

VI.—That while these works should be set about instantly, their original cost should be defrayed by loans.

Now we are quite ready to submit these six propositions and their proof to the judgment of any authorities in England that may be nominated, and the Municipal Commissioner, with a proper sense of the responsibility resting upon him, has agreed to this reference. Both the Bombay Journals meanwhile declare the appeal to be "a wild goose-chase," and oppose it. Very creditable certainly. The *Star of India*, the Cinderella of these ancient, ugly sisters, has throughout the controversy maintained an independent and honest attitude of enquiry, and will have its reward in the respect of the local public.

LOCAL TAXATION.

INCIDENCE OF THE RATES IN ENGLAND.

(From the Spectator.)

THERE is another formidable difficulty in the nature of the local revenues. We suppose it is quite sound as a matter of theory that in adjusting the taxation of a country where certain charges are made local and others Imperial, the whole may be considered together, and only the general incidence of the combined burden thought of in striving at equality. But as a matter of fact, with the charges in different localities varying in intensity, it becomes necessary to adjust Imperial taxation equally by itself, and then adjust local taxation in a similar manner. But this is a literal impossibility, and as regards local taxation is not even attempted by our present system. An income-tax is the most obvious expedient, but the practical difficulties of a local income-tax have made it fail everywhere—in Scotland, in America, and in past times in England, the original intention in fixing the basis of the poor-rate having obviously been to strike equally at every source of income. Perhaps an octroi in large towns would be the best agency, and we do not see, at any rate, why an octroi on *alcohol* levied with an Imperial tax, and perhaps a duty on one or two other articles of general consumption or luxury, should not succeed; but we suppose an octroi of any sort is too much discredited to be considered. *There remains only the rating tax on real property, to which the objections are innumerable,—the most dangerous, we believe, being just this, that there is no popular agreement respecting its incidence, while, according to the best theory, its real incidence is very different from that intended by the law. The law intends that the burden shqild fall on the occupier*, but taxes on rental, say economists, fall on *the owner*, only touch the occupier remotely and indirectly, and in the case of property occupied for business will fall on the consumer, who may not reside in the locality at all, if the owner's rent is not diminished. How can a tax of this description answer any purpose of a local tax falling equally, and stimulating the inhabitants of a locality to look after its administration? The mischief of waste in administration may be prevented so long as the belief is general among the occupiers in a locality that they pay the rates, but *the inequalities on this theory are unendurable*, while the excitement and discontent are aggravated by the inconsistent complaint of the owner that he is the real sufferer. In large towns, we fear, specially in the metropolis, the actual mischief of waste does arise, because the occupiers, as a class, are finding out that they have little real interest in the rates. The whole burden is little compared with the rent and other charges which occupation of a house involves, and they get rid of the subject most easily by thinking of rates as rent. We see, then, in this unsatisfactory nature of the only local form of taxation we have or can devise, another danger of local self-government. Unless there is a good equal tax, a principal object of leaving certain matters for government to localities will not be answered at all, and the present rates, though the arguments against them would not justify their total abolition—they might be retained for State purposes—are hardly defensible as local impositions.

Note—We commend this article and in particular the words we have italicised to the attention of the local publicists of Bombay.—ED. *I. E.*

OCTROI IN THE NORTH-WEST PROVINCES.

(From the Pioneer.)

THE action of Sir William Muir's Government in this matter is beyond candid censure. There is danger in everything, to escape which our only resource is *precaution*. The question is really whether the North-West Government has, or has not, made reasonable provision against the abuse of the *octroi*? And on this count we believe any competent jury in these Provinces would give the Government a verdict of acquittal without leaving the box. Sir William Muir has in the first place framed very stringent rules (for the exemption of articles not intended for use or consumption within the bounds of the Municipality or re-exported within a reasonable interval) which if obeyed quite preclude the possibility of the abuse in question; and in the next place a very stringent test is applied to ascertain that they actually are obeyed. Speaking generally, the Codes of the North-Western Provinces' Municipalities provide that, when goods are brought to the barrier, the importer shall be called on to declare whether they are designed for consumption or exportation, immediate or eventual. If the goods are declared for immediate exportation, they are allowed to pass the barrier without payment of duty under the protection of a pass, in which the time allowed for carriage through the town, generally 48 hours, is entered. If the goods are to be detained for any length of time in unbroken bulk, the Committee provide bonded ware-houses in which the merchant can store his property, paying a fee just sufficient to cover expenses. Lastly, if the importer, having paid duty on articles declared for use or consumption, should subsequently change his mind and re-export any portion of the consignment, he has nothing to do but to satisfy the Committee that he has paid duty on the goods re-exported, when a draw-back must be granted. The above is of course a mere outline of the usual rules. Details vary according to the circumstances of the Municipalities. But whatever may be the opinion as to the possibility of confining *octroi* duties to articles of use or consumption only, it must be allowed that, if a merchant ever does pay tax on goods in transit under the system here described, or if, having paid the duty, he fails to demand a refund for goods re-exported, the blame rests not with the Committee, or with the Government, or with the rules, but with the merchant himself; and the only explanation can be that in most cases the duty is so trifling that the merchant does not care whether he pays it or not, at any rate that prefers to pay it rather than comply with the few very simple formalities required to obtain exemption. Certainly if the levy of *octroi* duties were any appreciable check on his trade, there would be no such indifference on the part of the trader. The *second* precaution is, as we have said, the application of a test, to see whether the *first* has been carried out. *Octroi* receipts are carefully examined and compared year by year, place by place, article by article. If the accounts of a Committee show that more food is supposed to be consumed, or more cloth used, than would suffice for the wants of the known population, we plausibly infer that goods in transit are taxed. Then, either the rules are made more stringent, or the goods are struck out of the tariff. Of course, the value of the supplementary precaution mainly depends on the care with which Municipal returns are examined in the central office. But as each Committee is well aware that suspicion of neglect in these particulars would be enough to deprive the Municipality of the principal sources of its income, Government enlists on the side of free trade the local interests which would otherwise be opposed to it. Moreover, it is certain that, if the rules restricting the imposition of *octroi* were ineffective, or those checks which provide redress were so complicated as to be burdensome, the native journals, which have quite a genius for complaining, would not be coy to raise their voices in piteous lamentation; but as a matter of fact not one single shriek of the many which every week are piercing the heavens, has ever been raised on this subject. It is therefore generally believed in these benighted North-West Provinces that such transit duties as escape the stringency of the rules, the vigilance of the Government, and the efforts of the Committees themselves, are so insignificant as to exercise no influence whatever, good or bad, on the internal trade of the country. *De minimis non curat lex.*

THE PERMANENT SETTLEMENT.

SUSPENSION OF THE ORDERS OF SIR CHARLES WOOD AND SIR STAFFORD NORTHCOTE.

AN extra supplement to the *Gazette of India* publishes some highly important papers relating to the proposed extension of the Permanent Settlement throughout India.

No. 24, dated India Office, London, the 20th July 1871.

From Her Majesty's Secretary of State for India, to the Government of India.

I have considered in Council the despatch of your Excellency in Council, numbered 7, and dated the 26th of May, with which you transmit a collection of very important papers on the settlement of the land revenue in the North-Western Provinces. You refer me especially to your despatch to the Lieutenant-Governor of the North-Western Provinces of the 26th May, for the reasons which led you to concur with Sir William Muir in the opinion that it has been clearly proved that the conditions hitherto laid down for the admission of districts in India to a permanent settlement are insufficient, and if acted on would lead "to most serious and certain injury to the future interests of the public." You inform me that you have thought it necessary to request the Lieutenant-Governor to reconsider the whole question, and you express the hope that I shall agree with you that the orders contained in Sir Stafford Northcote's despatch of the 23rd of March (No. 15) 1867, should be held in abeyance.

After a careful perusal of the despatch to which you have referred me, Her Majesty's Government has no hesitation in assenting to the proposal of your Excellency in Council, and authorises your Government at once to suspend all proceedings towards the permanent settlement of any district, until the results of the reconsideration, in all its bearings, of this momentous question, together with the opinions of your Government thereon shall have been laid before me.

No. 26, dated India Office, London, the 27th July 1871.

From Her Majesty's Secretary of State for India, to the Government of India.

Referring to my despatch on the 20th instant, No. 24, expressing my readiness to agree to the proposal of your Excellency in Council for suspending the orders severally issued by Secretaries Sir Charles Wood, Earl de Grey and Ripon, and Sir Stafford Northcote, which allowed the introduction of a permanent settlement on certain conditions in such districts as might be fit for it, I have to inform you that the Select Committee of the House

...f Commons on Indian Finance, in the report which they have laid before the House of Commons, have stated :—

"Your Committee have, however, been much impressed with the evidence which has been laid before them respecting the directions which were given by the Secretary of State for India in Council, in the year 1862, to extend the system of permanent settlement of the land revenue prevailing in some of the Bengal provinces to other parts of India.

"They have not yet been able to receive the evidence of those by whom the directions were either recommended or issued. Whilst, therefore, they abstain from expressing any opinion on the question, they think it right that the attention of the Secretary of State for India in Council should be called to this evidence, in order that he may reconsider the subject, and in the meantime determine whether steps should not be taken to suspend any further proceedings to carry out the despatch of his predecessor."

I need not impress upon your Excellency in Council the importance of Her Majesty's Government being placed in a position to form a judgment upon this important subject, so soon as you shall have fully weighed the additional evidence which is to be furnished to you by the Lieutenant-Governor of the North-Western Provinces.

CURRENCY AND EXCHANGE.

THE INDIAN BULLION BUSINESS.

[*From the Financier.*]

THE business with India in bullion, particularly bar silver, being a very extensive one, some remarks upon it, with special reference to the weights, calculations, and the London market, may be of interest.

The weights for gold and silver in British India are as follows :—

1 Tola	..	= 12 Mashas
1 Masha	..	= 4 Rutics.
1 Rutie	..	= 4 Dhans.

One tola is equal to 180 grains of troy, or ·375 decimal of one ounce troy, being the exact weight of one silver rupee, which, at the price of silver at 60⅜d., would be, without mintage and other charges, 22·529 pence, according to the following formula :—

Query—How many pence	=	1 rupee.
1 rupee weighs	=	375 ounces troy.
12 ounces	=	11 ounces fine Indian standard.
37 "	=	40 " English "
1 ounce costs	=	60⅜ pence.

The "Company's" standard is thus $\frac{11}{12}$, or $\frac{916\,66}{1\,000\,00}$ fine, both for gold and silver; and, as far as gold is concerned, is therefore equal to the English standard. Silver, however, is 2 pennyweights worse, or 220 Indian standard against 222 English standard, or $\frac{916}{1000}$ Indian standard against $\frac{925}{1000}$ English standard.

The Calcutta Mint makes a charge of 1 per cent. to private persons for coinage of gold. The seignorage of silver rupees is equal to about 2 per cent., and the melting charges are 1 per mille. The remedy for gold is 2½ per mille, and for silver 3 per mille, for fineness and weight; 106¼rs. are paid by the Mint against every 100 tolas of fine silver. The value of the Mohur in gold is 15rs., and is equal in weight and fineness. Its actual value, without consideration of charges, would be about 1*l.* 9*s.* 0½*d.* sterling, according to the subjoined formula :—

Query.—How many shillings	=	1 Mohur.
If 1 Mohur weighs	=	37½ ounces.
1 ounce troy costs		77¼ shillings.

The following is the formula for finding the rate of exchange through the price of bar silver :—

Query—How many pence	=	1 Rupee
106¼ Rs.	=	100 Tolas fine silver.
1 Tola	=	0375 ounces
37 ounces fine	=	40 ounces standard.
1 ounce	=	60⅜ pence.

Making the price 23·132 pence.

The next formula gives the reversed operation, through the medium of the exchange for "sight" paper.

Query—How many pence	=	1 ounce standard.
40 ounces standard	=	37 ounces fine.
0·375 ounces	=	1 Tola.
100 Tolas	=	106¼ Rupees.
1 Rupee		2⅜ Pence.

Giving about 60⅜ pence.

These calculations being without consideration of freight, insurance, &c., it is necessary to apply them as follows, if they are to be included :—

Seignorage	..	say	2 per cent.
Freight	..	"	1·25 "
Insurance	..	"	·50 "
Melting	..	"	·10 "
Remedy	..	"	·03 "
Sundry expenses	..	"	·07 "
			3·95 per cent

Deduct herefrom 1/111th, representing the "worseness" of the Indian Standard in comparison with our own; then multiply the result by 180/480 grains, thus :—

Charges	..	3·95 per cent.
"Worseness" 1/111th, or 9 per mille	..	·90 "

Then add to London price of silver—

60⅜	..	= 60·375
3·05 per cent., or	..	1·049
		61·424

Multiply by 180/480 = ⅜ = 23.424 exchange on India.

THE LAND.

VICEREGAL LEGISLATIVE COUNCIL OF INDIA.

THE Council met at Simla, on Thursday, the 28th September.

PRESENT.—His Excellency the Viceroy and Governor-General of India, K.P., G.M.S.I. presiding; His Excellency the Commander-in-Chief, G.C.B., G.C.S.I.; the Hon. John Strachey; the Hon'ble Sir Richard Temple, K.C.S.I.; the Hon'ble J. Fitzjames Stephen, Q.C.; the Hon'ble B H. Ellis; Major-General the Hon'ble H W. Norman, C.B.; the Hon'ble F. R. Cockerell and the Hon'ble R. E. Egerton.

LAND IMPROVEMENT BILL.

The Hon'ble Mr. Strachey moved that the report of the Select Committee on the bill to consolidate and amend the law relating to advances of money by the Government for the improvement of land be taken into consideration. He said that this bill was essentially the same as when it was published some months ago, when it was referred to a Select Committee. But there had been one important change. It was formerly proposed that it should be applicable to Northern India only, whereas the Committee now recommended that it should be extended to the whole of British India.

The Council would remark that the Lieutenant-Governor of Bengal, in a former debate upon this bill, expressed a wish that it should apply to that Province. The Bombay Government had stated its approval of the bill, and its desire that it should be extended to the Bombay Presidency. The Madras Government, while retaining the general objections to the measure which it formerly urged, had stated that if the bill was made applicable to the rest of India, it wished to be made applicable to the Madras Presidency also. Under these circumstances the Council would probably have no hesitation in accepting the recommendation of the Committee, and in extending the bill to the whole of British India.

He need not say much about the objects of the bill, because they had been fully stated on former occasions. In regard to the main principles of this measure, there was no novelty in it. It was a consolidation of the old tuccavee laws, with some important amendments.

It ought, he thought, to be remembered to the credit of the British Government of the last century in India, that it recognized by law the principle now acted upon with so much advantage at home, under the Land Improvement Acts, that it was the duty of the State to make use of its resources in encouraging and developing agricultural improvement. The old regulations for which it was proposed to substitute the present bill, had not, he believed, in any Province, been applied on any defined and organized system. Their application had mainly depended on the opinions or zeal of individual officers of the Government. Nor would it have been easy to introduce such a system, for the provisions of the existing law were, to some extent, unsuitable and obsolete. For instance, if the law were strictly acted upon, which he believed it never was, they would have to charge twelve per cent. interest on all advances. What they required was a well-organized system under which the Government should encourage, by loans granted on the security of the land to be improved, the construction of simple works of agricultural improvement, such as wells, tanks, minor water-courses, and so forth. The Government was now gradually covering India with great works of irrigation on a scale unknown in any other part of the world, but no proper provision had hitherto been made for the encouragement of the humbler but hardly less valuable class of works to which this bill referred—works which would be constructed by the landed proprietors and occupiers themselves.

The present measure brought with it no financial risk, and imposed no charges whatever on the revenues of the State. Government would make advances at a somewhat increased rate of interest over that which it itself had to pay, but still at a lower rate than money could be borrowed at from other parties, and he presumed that these advances would ordinarily be made, or might, with perfect propriety, be made from the money borrowed for reproductive works.

Those works would be so simple that there could be no doubt, under proper management, of their reproductive character. The security for re-payment would, in almost every case, be the land itself on which the improvement was made. He only wished that they had some such sort of local and well-defined security for the repayment to the State of the charges incurred on the great works of Canal irrigation executed by the Government itself. There was no doubt that they ought to have such security, and he believed that at some future time they would get it. This, however, was not a question he need dwell upon now, as it might perhaps, before long, come up for consideration before the Council, when the Canal bill was being proceeded with.

Hitherto, advances of this character had only been made to the proprietors of the land to be improved. Under the present bill, advances, under certain circumstances, might also be made to tenants; but the consent (either expressed or implied) of the landlord would be always necessary, unless the Collector should be satisfied that the tenant possessed in the land an independent and transferable interest which would furnish by itself, without reference to the landlord, a sufficient security for the re-payment of the loan.

The Government would make rules as regards all details not expressly provided for in the bill.

The practice laid down in the old regulations which had been found perfectly successful in protecting the Government against loss, was also introduced into this measure, namely, that advances would be recoverable as arrears of land-revenue.

He hoped that if this measure became law, it would prove the starting point of a system under which benefits of the greatest possible value might be conferred upon the country.

In conclusion, he had only to say that he desired to thank his Hon'ble friend, Mr. Cockerell, for the very great assistance which he had given in framing and in improving this bill. From the time when it was first brought forward, his Hon'ble friend had taken much interest in the measure, and they had in a great degree to thank him for the satisfactory form in which he (Mr. Strachey) thought it was now placed before the Council.

The Hon'ble Sir R. Temple said that he entirely agreed in the remarks of his Hon. friend, Mr. Strachey. The Financial Department concurred heartily in the bill. The advances provided under the bill would be made, of course, from the cash balances, and the cash balances consisted partly of the results of imperial taxation and partly of sums raised by loan. Now, how was it possible to spend such balances more properly than in stimulating and assisting agriculture—the only reliable field for taxation? The security for these advances was the best possible—the very land that was to be improved. He agreed that it was highly desirable that similar security should be provided in the case of Canals; any such proposal would certainly have his (Sir R. Temples) support. As to the rate of interest it would always be such as to fully recoup the Government for all expenses connected with the loan; no fraction of any such expenses would fall on the general tax-payer. In former times some small advances might have been made without interest, on the principle, he supposed, that land-revenue not expended might, with propriety, be spent on the land-owner from whom it was derived. But the principle was one that obviously could not be generally carried out. Those who borrowed should, as a rule, pay interest; and this being so there was no need for the short periods in which under the old system these loans were re-payable. These short periods had, to a great extent, neutralized the value of the advance, because an agriculturist found himself obliged to repay the loan before he began to reap any advantage from the improvement effected. Now that a man would pay fair interest, there would be no need for any such hurry. It was far better that the people should borrow of Government than from their own countrymen on what in any civilized country would be regarded as exorbitant rates. It was a great duty to encourage saving and to lead tenants, as well as landlords, instead of hoarding their savings, hiding them in a napkin, melting them down into ornaments, or burying them in the ground, to apply them as capital to reproductive purposes, in compliance with the sound principles of political economy.

His Excellency the Commander-in-Chief wished to say a few words on a measure which he cordially approved. It was fair, he thought, to credit the officers of the Irrigation Department with the credit of having started the system of Government advances for agricultural improvements. Thirty or forty years ago, Canal officers had appreciated the wants of the country in this particular, and had inaugurated the system of advances which he was happy to see was now about to be made the subject of express legislative enactment. It was honourable, he thought, to the Irrigation Department thus early to have recognized and endeavoured to meet the wants of the people in so important a particular.

His Excellency the President said—"I cannot allow the bill to pass without expressing my satisfaction at the prospect of its immediately becoming law.

"Ever since I have been in India I have been most anxious that the system under which tuccavi advances have for years been made, should be systematized and rendered more beneficial.

"I may say that one reason why I have taken such an interest in the matter as regards India, is that during a great part of my life, I have been engaged either in legislation on cognate subjects, or in the direct working of similar laws to that which we are now passing.

"In Ireland, a system of Government advances has been in operation for many years to the great benefit of the country. I may say for the satisfaction of my Hon'ble colleague, the Financial Member of Council, that the system has been carried on throughout the entire period of the famine without the smallest loss to the Government, as well as I recollect. From the last returns I see that the sum now advanced is considerably more than two millions, and the arrears of principal and interest amount to something like £550.

"The whole system works like clock-work, with great advantage to the country, and without the smallest risk of present or future loss to the State.

"In England, where it has not been thought necessary to establish a Government system of loans, many Acts of Parliament have been passed to enable private individuals and companies to carry out almost the same system; and to companies which make these loans, the same facilities for recovery, and the same securities are given as the Government would have thought necessary to enact for its own loans.

"I happened to be connected a little with a company of that kind, and the result was precisely the same as in the case of the Irish Government loans.

"The sums of money negotiated were exceedingly large, but the re-payments are made to the day, and I do not believe that the company with which I was connected had ever to complain of having a single bad account.

"There are several other companies of the same kind that have been engaged in the same transactions, and, with the exception of some which were not very well managed, the same satisfactory results have generally been obtained.

"It seems to me that such a system which has worked so well in other countries, and which is so well known and has been so long in existence in India, must be an immense benefit to the country, and that if the local Government take up this measure in the spirit that I have—no doubt they will—it will be found easy to establish a small and inexpensive organization for working the provisions of the bill, in case the district officers have not time to give to it due attention.

"I think in districts where the transactions may not be large, and where the system is well known, it may be found that the district officers can do all that is necessary; but in other districts, where numerous or large work may be desired, and the proprietors are willing to undertake them, that some small special organization may be necessary for a certain class of works, and that there will be no difficulty in arranging for their proper supervision and completion.

"There is only one other remark that I wish to make, and that is, that the Council will perceive the bill is strictly limited to loans made for agricultural improvements.

"I have heard it stated that, by the passing of this bill, the Government have announced their intention of withdrawing permanently advances for agricultural purposes that may not strictly come under the head of agricultural improvements. I can only say that this is not the intention of the Government, and it is possible that there still may be certain loans necessary, particularly under pressure of famine and distress, such as have been given in former years under the tuccavi system, which it is absolutely necessary that we should make. There is nothing in this bill to prevent this still being done.

"The whole object of the bill is to put on a more systematic footing the system of loans for permanently agricultural improvements, which can have no other effect except that of adding permanently to the value of the land and increasing the value of the property.

"I commend this bill to the attention and consideration of local Governments, believing that it will not only have the effect of benefitting the people, but it will also bring the Officers who are engaged in carrying out its provisions into a most agreeable contact with the people, and increase those kindly feelings which ought to exist between the rulers and the ruled."

The Hon'ble Mr. Stephen observed, with reference to the observations which had fallen from His Excellency the Commander-in-Chief, that the principle of the bill was by no means a new one.

It has been recognized and acted upon in the early days of the British administration. The present bill was in fact a consolidation measure, and replaced parts or the whole of no less than ten regulations which were scattered about the Statute book in an inconvenient manner, and were, in some instances, not adapted to the present requirements of the country. The bill asserted no new principle; it merely provided for working the old system more conveniently and efficaciously.

THE INDIAN WEIGHTS AND MEASURES OF CAPACITY BILL, 1871.

(Gazette of India, September 9.)

THE following Bill was introduced into the Council of the Governor-General of India for the purpose of making Laws and Regulations on the 5th September 1871, and was referred to a Select Committee with instructions to make their report thereon in four weeks :—

***A Bill** to regulate the Weights and Measures of Capacity of British India.*

Whereas it is expedient to provide for the ultimate adoption of an uniform system of weights and measures of capacity throughout British India ; it is hereby enacted as follows :—

I.—Preliminary.

1. This Act may be called "The Indian Weights and Measures of Capacity Act, 1871," and extends to the whole of British India.

II.—Standards.

2. The primary standard of weight shall be called a seer, and shall be a weight of metal in the possession of the Government of India, equal, when weighed in a vacuum, to the weight known in France as the *kilogramme des archives.*

3. The units of weights and of measures of capacity shall be :—

for weights, the said seer:

for measures of capacity, a measure containing one such seer of water at its maximum density weighed in a vacuum.

4. The Governor-General-in-Council may, from time to time, by notification in the *Gazette of India*, declare the magnitude and denominations of the weights and measures of capacity other than the said units, to be authorized under this Act :—

Provided that every such weight or measure of capacity shall be an integral multiple or integral sub-multiple of one of the units aforesaid.

The Governor-General-in-Council may, in like manner, revoke such notification :

Unless it be otherwise ordered in any such notification, the sub-divisions of all such weights and measures of capacity shall be expressed in decimal parts.

5. The Governor-General-in Council may, from time to time, by notification in the *Gazette of India*, define the limits of districts for the purposes of this Act.

The Local Government may, from time to time, by notification in the *Official Gazette*, define the limits of sub-districts for the purposes of this Act.

6. The Governor-General-in-Council may provide for such districts as he thinks fit, proper primary standards and sets of the said authorized weights and measures of capacity.

Such standards shall, for the purposes of this Act, be deemed the standards for such districts.

7. The Local Government may provide for such sub-districts as it thinks fit, copies of such of the said authorized weights and measures of capacity as shall be necessary to serve as local standards in such sub-districts.

Such local standards shall be deemed correct, until they are proved to be otherwise.

III.—Use of new Weights and Measures of Capacity.

8. Whenever the Governor-General-in-Council considers that proper standard, weights, and measures of capacity have been made available for the verification of the weights and measures of capacity to be used by any Government Office, or Municipal Body, or Railway Company, the Governor-General-in-Council may, by notification in the *Gazette of India*, direct that, after a date to be fixed therein, all or any of the weights and measures of capacity, authorized as aforesaid, shall be used in dealings and contracts by such Office, Body, or Company; and may, in like manner, from time to time, alter or revoke such direction.

9. After the date fixed in any notification under section eight, all dealings and contracts had and made by the Officers, Bodies, or Companies, mentioned in such notification, for any work to be done or goods to be sold or delivered by weight or measure of capacity shall, in the absence of a special agreement to the contrary, be deemed to be had and made according to the weights or measures of capacity directed in such notification to be used by such Officers, Bodies, or Companies.

IV.—Wardens.

10. The Governor-General-in-Council and the Local Government, respectively, shall appoint Wardens for the custody of the primary and local standards and sets of authorized weights and measures of capacity hereinbefore mentioned.

The Governor-General-in-Council, or the Local Government, respectively, may, at any time, suspend or remove any such Warden and appoint another.

11. The Governor-General-in-Council may, from time to time, make rules consistent with this Act for regulating the following matters :—

(*a*)—The appointment of Wardens ;

(*b*)—The guidance of Wardens in all matters connected with the performance of their duties ;

(*c*)—The provision, replacement, custody and use of the standards;

(*d*)—The method of verifying local standards and weights, weighing machines, and measures of capacity authorized under this Act, and balances, and of certifying such verification : provided that such verification shall not be required to be made oftener than once in two years ;

(*e*)—The errors which may be tolerated in weights, weighing machines, and measures of capacity authorized under this Act, and in balances ;

(*f*)—The shapes, proportions, and dimensions to be given to weights, weighing machines, and measures of capacity authorised under this Act, and to balances, and the materials of which they may be made ;

(*g*)—Marking weights and measures of capacity authorised under this Act, with their several denominations ;

(*h*)—The conditions under which Government Offices, Municipal Bodies, and Railway Companies, shall be subject to inspection and verification of the weights, weighing machines, and measures of capacity authorised under this Act, and of the balances used by them ;

(*i*)—The fees to be paid for verifying, correcting, and certifying the verification of weights, weighing machines, and measures of capacity authorised under this Act, and of balances.

12. Such rules shall be published in the *Gazette of India.*

And the Governor-General-in-Council may, by notification in the *Gazette of India*, declare that, from and after a day to be named therein, all or any of the said rules shall come into force in respect of any Government Office, Municipal Body, or Railway Company, and thereupon to the extent specified in such notification, such rules or rules shall have the force of law.

13. All Officers of Government, Municipal Officers, Officers and servants of Railway Companies, shall comply with such rules so far as they concern them, and pay such fees as the said rules shall prescribe.

14. The Warden may deface, or render incapable of use, or refuse to verify, correct, or mark anything so brought, which appears to him unfit for verification or correction.

15. Any of the powers and duties conferred and imposed by this Act on a Warden may be exercised and performed by any other Officer whom the Local Government may, from time to time, appoint.

16. Whoever knowingly counterfeits any mark used by a Warden under Section fourteen, shall be punished with imprisonment for a term which may extend to three years, and shall also be liable to fine.

17. The Local Government may, from time to time, prepare tables of the equivalents of weights and measures of capacity, other than those authorized under this Act, in terms of the weights and measures of capacity so authorized, and the equivalents so stated, after notification in the local *Official Gazette*, shall be deemed the true equivalents.

STATEMENT OF OBJECTS AND REASONS.

The Indian Weights and Measure's Act, 1870, having been disallowed, it is now proposed to re-enact such portions of that Act as were not objected to by the Secretary of State. The present Bill is therefore practically a re-enactment of Act XI. of 1870, with the omission of the provisions which referred to measures of length and area, or authorized Government to compel the adoption of the new weights in particular cases.

THE FISHERY DIFFICULTY.

(From the Englishman.)

THE recently appointed Inspector of Fisheries has a very difficult task before him. The havoc which as of late taken place among the finny tribes of India has been sufficiently attested by official reports from every Province of the Empire. But though the fact is now admitted, the remedy is by no means clear. In districts where the fishermen have been accustomed to pay an annual rent for the waters, and where they consequently understand the necessity of certain restrictions upon the wasteful destruction of a marketable commodity, the difficulties in the way of a Fishery Law will not be insuperable. But in a large proportion of Indian districts the right of fishing is free to everyone, without restriction of any kind. In such districts, fishing passes sooner or later from the professional fisher castes into the hands of the

general population, and especially into those of the women and children. A general scramble takes place every year during the rains, each family trying to get more than its neighbour by using nets of a smaller mesh, and each reckless as to how many thousand small fry (which would in time grow up into good sized fish) is swept into its pot. In short, where the fisheries are free to all, only the conscience of the fisherman stands between him and this wasteful greed; and, as might be expected, conscience in such a case pleads ineffectually.

In some districts the fisheries have during the past few years been thrown entirely open to the people. At first the local fisher castes were greatly pleased at having no longer to pay a rent, but the general scramble for fish soon began to denude the waters, and the fisher castes steadily grew poorer and poorer.

The general population found that it could fish as well as the hereditary fishermen, and the latter have in some cases been driven to other employments. Shortly after the monsoons set in, as soon as the young fish begin to move about, the peasants send their wives and children out with hand-nets and baskets to search every pool and sheltered spot for the young fry and breeding fish. Every device that can be imagined is put in force; nets which would not permit a musquito to pass; cotton cloths; wicker-work traps; baskets; and every piscatory engine that hunger can suggest. No sooner do the breeding fish begin to pass up the small streams and channels from the main rivers, then the openings are stopped with a wicker trap. The breeding fish are taken without mercy, and if they were noxious reptiles their destruction could not be more eagerly composed. The few which escape lay their spawn in nullahs and quiet places among the rice-fields, but no sooner do they commence their return-journey, then they find the wicker traps reversed, and gaping for them in every water-course or channel. The same traps likewise catch the small prey as they attempt to make their way to the rivers, and if they linger in the field their destruction is equally certain. In irrigated tracts, where the husbandman throws the water from a lower to a higher level, a basket is placed to receive it, and, as it were, strains out all the small fry just like a sieve. Nets of the most diverse forms are also employed, some fixed, some held in the hand, and some worked in the mud of the rice-fields until not a minnow escapes.

These effects of throwing open the fisheries without restriction to the whole population have of late years been carefully observed and registered in Madras. Some time ago the village tanks of that Presidency were handed over to the people without restriction as to fishing. The result is, that the villagers now complain that "they never knew so few fish, and that the decrease is yearly becoming more apparent, and the water more depopulated." This effect is not confined to one locality, but is predicable of entire tracts, such as the territory watered by the Kalerun river and the whole deltas of the Godavari and the Krishna. Proceeding northward, a similar diminution of fish is found in Orissa. Notwithstanding the check given to the consumption by the price of fish having risen 300 per cent. within the past few years, the fishermen state that there is not one-eighth of the fish in the rivers now than there were formerly. From a paper written some time ago by Dr. Day, we notice that several attempts which he made to ascertain the comparative quantity and the species of the river fish in Orissa, ended most disastrously. For example, in the Brahmani river, with the help of twenty-five fishermen using nets of great length and of very small meshes, only three fishes, weighing 4½ ounces were taken in a day's work. The river fishermen ascribe the ruin of their craft to the universal destruction of the breeding fishes, and the small fry in the paddy fields, where they are trapped without mercy by people belonging to other castes who have rented the fishing for this purpose. These latter, however, recriminate against the river fishermen, and allege, as the cause of the admitted extirpation of the finny tribes, the incessant use of the great river net, 120 yards in length, *and with a mesh only three-quarters of an inch in circumference!*

In British Burmah the fish fare even worse. A huge triangular basket is harnessed to a pair of buffaloes, and dragged across the swampy rice-fields, so that not an inch of water escapes. In short, the fish are regularly harrowed. The Burmese peasant goes on the principle that if he spares the small fry, his neighbour will not In this way thousands of minnows, which in six months would grow to be fine fish, are swept away in a single basket, and devoured at a couple of meals. If let alone, these same small fry would maintain a dozen peasant families for a month in the cold weather. If just sufficient restriction could be placed upon the Indian fisheries to save the small fry from waste and slaughter, a vast addition would be made to the wealth of the country. In some of the Delta districts—for example, in Orissa, which is now suffering from a fish famine—the water would become as valuable as the land for producing food. At present the universal creed of the Indian fisherman, to whatever caste or religion he may belong, is to catch everything that he can to-day, irrespective of the season, the condition, or the size of the fish, and entirely oblivious of the next year's supply.

It is only fair to add that in England a similar recklessness at one time prevailed. The common law was very easy on the subject, and the owners along the river-banks might catch all the fish they could and by whatever means they pleased, so long as they did not absolutely destroy their neighbours' share in the common piscatory right. They used accordingly to resort to all kinds of the "weirs, dams, and fixed engines, with a view to driving every living inhabitant of the waters into their own net, regardless of the impoverishment of their neighbours." These are the words of the greatest writer on English Fisheries, and although such practices were, strictly speaking, illegal, yet a long series of stringent statutes were required before they could be put a stop to. It was not till the decay of the fisheries threatened to deprive the inland population of an important article of their food, that the English Legislature interfered. At first, indeed, any interference seemed a hardship, and only the absolute necessities of the case convinced Englishmen that Government was bound for the public good to restrict the right of land-owners along the river-banks to do as they pleased with what they had always considered their private property. In short, a Government in such cases merely substitutes the knowledge and impartiality of the Legislature for the ignorance and the greed of the private individual. Similar restrictions have from time immemorial been found needful in the pearl fisheries, and are now accepted as legislative necessities in all thickly-populated States.

MINERAL RESOURCES.

COAL IN SOUTHERN INDIA.

Report from Dr Hunter on the search made in several quarters in Southern India, for indications of coal.

Proceedings of the Board of Revenue, dated 20th June 1871.

Read the following letter from A. Hunter, Esq., M.D., Superintendent School of Arts, to the Acting Secretary to the Board of Revenue, dated Madras, 19th May 1871, No. 619:—

I have the honour to inform you that for the last few months a careful search has been continued for indications of coal in several directions in Southern India, in localities where the minerals, metals, and the fossils which have been found, appeared to give such indications as are worthy to be followed up. These are chiefly enormous deposits of sandstone and freestone, accompanied by conglomerates of black limestones, bandiron, and claystones, interspersed with sulphurets of lead, iron, copper, sulphates of lime and barytes, and other indications of deposition from sea water. The search for coal indications has been commenced amongst the soft sandstones to the north-west of Naggery, Pootoor, and Triputty, and continued amongst the fireclays, sandstone, and black limestones extend from the Cheyar river by Coodoor, Cuddapah, Tadputtry, and Gooty to the north-west, and in a continuous and almost uninterrupted succession through Nelloro, Guntoor, the Palnaad, and the Kistna to Juggiapett, Bezwarra, and Dowlaishwaram, through all of which districts, the sandstones run, accompanied through their whole course by nearly the same succession of minerals and metals. These inquiries, which have been kindly aided by the Board of Revenue, seem to have operated most favourably in a way which was not expected, for it has enlisted the sympathies of a good many intelligent officers of the Engineering corps, the Department of Public Works, with a host of young Assistant Collectors who have in several instances taken a very lively interest in the search for coal and for useful minerals and metals. When I studied Mineralogy and Geology in Edinburgh, under Professor Jamieson, and along with Doctors Forbes, Percy, Carpenter, Bennett, George Wilson, and others, who have since risen to eminence, we were accustomed on Saturdays to make excursions through the Lothians, Peebleshire, Roxburgh and Fife, collecting minerals, metals, and fossils, particularly those of the coal formations and the strata both above and below them. In this way I collected many important minerals, metals, and fossils, the best of which I brought to India carefully named, labelled, and their uses and localities described. On re-visiting England and Scotland twelve years ago, I made a point of inspecting many of the coal fields and adding some choice specimens of coal fossils to my collection. I also brought out with me several boxes full of duplicate specimens, both of coal fossils and of the minerals and metals which accompany them. A good many of the fossils were engraved and impressions of them were distributed along with the sandstones, fireclays, shales, limestones, and ironstones in districts where the latter appeared to be promising. The results of those enquiries are so far satisfactory, that they have led to the discovery of several important beds of fossils, a great variety of sandstones, black limestones, and crystalline white and coloured marbles, with several gems and metals in their matrix.

The sandstones which are perhaps the most important of the above, both for building purposes and as whetstones, commence

within ten miles of Madras at the Red Hills, in thin tracts accompanied by fireclays and bandiron with traces of manganese. At Streepermatoor and Kuttapaukum, 27 to 30 miles west of Madras, the shales, fireclays, and sandstones occur in beds of 8 to 12 feet in thickness, and amongst these have been found on the surface silicified wood, the bones and teeth of elephants, and amongst the dark superficial black and blue clays, several trees imperfectly silicified and impregnated with sulphuret of iron. At Streepermatoor the trees were perfectly white, dense and silicious in the fracture. Nearer Madras they resembled lignite, but would not burn. At the depth of 28 to 30 feet, some very beautiful impressions of fossil Neuropterios and Dictyopteris were found, and subsequently at Alicoor, Messrs. King, and G. B. Foote of the Geological Survey discovered impressions of several other plants of coalbearing strata as Taeniopteris, Palaeozamia, Poacites, Taxodites, Pterophyllum and Peiopteris, similar to the plants of the Rajmahal and Cutch coal fields. One or two small shells bearing a strong resemblance to spirefers were also found by me embedded in strata of soft aluminous shale; on the strength of these discoveries a boring was made by me fourteen years ago at Streepermatoor in search of coal, and five thin seams of black bituminous shale were bored through, but no good coal was struck in boring to a depth, of 180 feet. At Rajah's choultry thirty-six miles from Madras, the bituminous shale was found nearer the surface, resting upon sandstone; at Conjeveram the sandstones attained a greater thickness and the same beds appear to extend by Arcot to the vicinity of Vellore, where the sandstones become harder and denser from the proximity of gneiss, trap, basalt, and primitive rocks; between Conjeveram and Vellore the Chucklers and Carpentors of Madras procure several varieties of whetstone and sandstone for sharpening their tools, but the grandest and most important beds of sandstone commence at Naggery, Pootoor, and Triputty. At Naggery the altered and hardened sandstones which are many hundred feet thick seem to have been upheaved in bluff perpendicular precipices by rock of gneiss and granite intersected here and there by dikes of trap and veins of serpentine. The sandstones about Naggery and Pootoor are of very different colours, chiefly pale red, yellow, and white, both in large and small grains, some like quartzite of flinty hardness, and others coarse grained and too hard for general use as a building stone. In fact they bear a strong resemblance to the quartzites and sandstones of table mountain at the Cape of Good Hope, both in the general outline of the hills and the mineralogical character of the sandstones. Now it is of great importance to bear this fact in mind, for since I visited the Cape on my homeward journey in 1858, extensive beds of coal and diamond conglomerates and plum-pudding stones in the trial or new red sandstone formations have been discovered some miles to the north of table mountain. At Triputty, 86 miles from Madras, there is a similar bluff nearly perpendicular hill of 800 to 1,000 feet of altered sandstone apparently upheaved by gneiss 3½ miles; to the north-west of this there is an extensive bed of soft sandstone or freestone several hundred feet thick and runing in a North-west direction for two or three miles. This sandstone is remarkably like the freestone of Midlothian and of Mirzapore, both of which occur on the borders of coal fields. Blocks of it can be procured of great length or breadth, but few of the parallel strata exceed 8 to 10 inches in thickness alternating with layers of rolled pebbles, shales or fireclays and frequent repetitions of soft sandstone. This seems to be well suited for building purposes and as a circular grindstone for tools or a filtering stone. Search is being made in this vicinity by the Collector of North Arcot for fossils. In the canal cuttings, 7 miles north-east of Cuddapah, Mr. Boyle, the Assistant Collector, has lately found a great variety of sandstone, slates, shales, clay, iron-stones with rolled pieces of jasper, hornstone, and hardened limestone from Admunayapalli, in the same vicinity he has sent four or five fossils which are apparently Silurian, viz, Echinosphaerites punctatus. Another Echinosphaerite or hollow ball surrounded by radiating scales, an echinite and several portions of a Cyathophyllum truncatum. A few miles further north of Cuddapah pieces of old red sandstone, purple, and gray sandstone porphyry, conglomerates, jaspers and mud-coloured agates have frequently been sent to the School of Arts by former pupils now employed in the Railway Telegraph and Revenue Survey Departments. These fossils and sandstones probably show that the black slaty limestone from the vicinity of Cuddapah, which is now coming into extensive use for building purposes in Madras, is older than coal bearing strata. Between Cuddapah and Gooty Mr. W. S. Foster, and Mr. J. Kelsall, Assistant Collectors, have found four extensive beds of black marble alternating with beds of sandstone and whetstone. The largest bed seems to extend from Tadputtry to Talapodatoor. This is the softest and most uniform of these black marbles; it has been extensively used in both the pagodas at Tadputtry, and blocks of it can be quarried of five or six feet in breadth by 18 or 20 feet in length. It is a beautiful marble for fine carved ornamental work, and resembles the lucullite of Italy. At Khondopalpaud another bed of black marble occurs on the side of a hill tilted up at a considerable angle and dipping under an extensive bed of black conglomerate, both of these emit a fætid smell when pieces of the marble are rubbed together; they resemble the black stink stone of Fife and Derbyshire and are accompanied by a petrifying spring a chalybeate spring and thick deposits of black alluvial soil; from below this soil there ooses a dark bituminous substance which separates on standing into two layers, one tough and elastic like India rubber, the other like pitch, both of these substances burn like Petroleum but emit a fætid smell. The natives say that many thousand bullocks were slain on this level plain to appease the anger of some deity, and that the mud oil which comes out of the soil is the blood of these bullocks I have had two chatties full of the substance sent to me, the first several years ago by Major Bisset, the second about six years ago by Mr. Smart, formerly Chief Engineer of the railway, who collected in the same vicinity some very delicate impressions of petrified stems and leaves of plants and some black, purple, and red conglomerates like those of the diamond formations. These specimens were sent to the Museum. Two other beds of black marble occur between Royelchervoo and Talapodatoor and near Gooty. The former are soft and pass into shades of purple, green, red, yellow, and white, but the marbles are too uneven in texture to be of use for building or ornamental purposes, and the colours are dull and earthy. In the vicinity of Gooty the marbles again become hard, slaty, and flinty from the proximity of the granitic and trap dikes by which they are tilted up. They are also traversed by veins of green and yellow serpentine and white bands of calcareous spar. In this vicinity there seems to have been a great deposit of sandstones, diamond conglomerates, and iron ores. These extend into the Kurnool district, and I think it is of great consequence that search should be continued under these beds of black marble and diamond conglomerates for coal, as I believe, the sandstones of this series belong to the Trias or new red sandstone just above coal. I have tested the black marbles of the Ceded districts, and I find that the colouring matter in them is chiefly carbonaceous, as they burn to a white and contain very little iron; they also contain magnesia and silica in variable proportions, but they are not so hydraulic as the greenish gray magnesian limestones of Kurnool. I have lately heard from Colonel Orr that there is an extensive bed of fossil shells between Kurnool and Sultanpore on the Tumboodra, and that it is probable that they are jurassic, and that it was likely to have been in this vicinity that Major Bisset and the late Dr. Cole found their fossil shells. Major Mullins and Colonel Applegath have sent me fine collections of true jurassic shells from Rajahmundry, Poongady, and Kartairy, and last week Colonel Farewell sent me a very important fossil impression of a plant like a calamite between black bandiron and sandstone. This was found by Captain Hasted, of the Engineers, at Dowlaishwaram under thick beds of hills of sandstone. I have written to recommend immediate search to be made under the black bandiron, as it and the sandstones are very similar to those of the Fife and Midlothian coal fields, where I have gathered very delicate impressions of calamites and lepidodendra above coal. Colonel Farewell has also found black bandiron and sandstones with limestones in the Coimbatore district and an important bed of fossils about five miles from Coimbatore; these I hope to examine shortly during the holidays. Mr. J. Boswell has sent a great variety of sandstones, shales, fireclays, limestones, and bandiron from Palnaad, Guntoor, and Datchapilly; and at Chebrole, in Guntoor, there seems to be an extensive bed of old red sandstone and some very fine granular white marble, samples of these are in the Museum. I have also received from the vicinity of Ganjam a great variety of sandstones apparently, both the old and new red, with millstone grit, conglomerates and whetstones. The same appear to extend to Rumbah on the Chilka lake. Mr. F. Minchin has also sent from the vicinity of Gopaulpore the fossil tusk of a very large elephant silicified. Mr. G. Toynbee, Assistant Collector of Cuttack, has also got for us a fine collection of the coal fossils, accompanying sandstones, and strata which have lately been found at the upper end of the Chilka lake. From the similarity which most of these sandstones bear to those of other coal bearing stratas in Bengal, and in Great Britain, I am strongly impressed with the belief that coal will be found in Southern India, and not improbably below some of the softer sandstones and black limestones and along with the clay ironstones. I would therefore recommend that the Collectors of North Arcot, Cuddapah, Guntoor, Kurnool, and the Ceded districts, and Colonel Farewell, and Captain Hasted be requested to continue their search amongst the soft sandstones, especially where horizontal beds of ironstones are found resting upon them. I have to return thanks to the officers who have already so willingly assisted in the search, and to the Board of Revenue for their kind co-operation. Some very important additions are promised to the collections of coal formations and the strata above and below them from different parts of Scotland, the central countries of England and Wales.

These will all be named, arranged, and classified along with the different coal series of India at the School of Arts.

The Board are much obliged to Dr. Hunter for his interesting communication. They are glad to see the names of several Revenue Officers who have turned their attention to this useful enquiry, and resolve to circulate these Proceedings to all Collectors and request them to aid Dr. Hunter in the collection of useful minerals. There are no doubt rich stores of them scattered about the country which may prove of great value for building purposes, as well as for pottery and sculpture.

(A true Copy and Extract.)

F. BRANDT,
Acting Sub-Secretary.

Read Proceedings of the Madras Government, Revenue Department, No 1158, of 4th July 1871, sanctioning the grant to the Society of a donation of Rs 500, to enable them to give off as usual, extra prizes for special products at the Exibition in 1872.

Resolved that the thanks of the Committe be communicated to Government for this liberal gift.

THE WARDHA VALLEY COAL-FIELDS.

In a recent letter of Mr. Rivett-Carnac's to the Bombay Chamber of Commerce, we saw a notice of operations in the Chanda coal-fields, and we have since been at the pains to ascertain how far the coal country has been explored, and what are the prospects of coal-mining in Chanda. Since the Geological department withdrew from coal explorations in the Wardha Valley, the Governments of Nagpore and Berar have been tracing the coal measures westward along the Wardha Valley towards the G. I. P. Railway. The borings have shown that thick seams of coal are very constant all over the sandstone area. The nearest point to the railway at which workable coal has yet been found is Warora, a town in the Chanda district some twenty-six miles south-east of Hingunghat, and forty-seven miles distant from the Wardha station of the G. I. P. Railway. The coal at and round Warora seems to be practically inexhaustible, and the Government of India has decided on making a narrow gauge railway from the G. I. P. station of Wardha through Hingunghat to Warora. A branch from this line will cross the Wardha river into the Woon district, and will thus bring the Edlabad cotton and the Woon coal to the G. I. P. Railway by the shortest route. The cost of a narrow gauge railway from Wardha to Warora is estimated at 25 lakhs, or a little over £5,000 a mile. This line will find a large cotton and salt-trade ready to hand, and it will put Chanda coal on the G. I. P. Railway at a cost of about Rs. 8 per ton.

During the past open season coal-mining in a small way has been going on at the Ghugus coalpit, which was opened by Lord Mayo in 1870, and has since been called the "Mayo Colliery." This pit is about 90 feet deep, and goes down into the coal seams discovered by Major Lucie Smith in 1867. About 80 or 90 tons of coal have been raised from this pit per month and the coal has been distributed to the G. I. P. Railway, to the Bombay Gas Company, to the Local Public Works Department, and to cotton factories at Wardha. It has also been used largely in the steam-borer and at the smithies attached to the coal-boring department. The Mayo pit coal did not succeed at the gas works: it proved to be no good at all as a gas coal though the Mokpani (Nerbudda Coal Company's) coal, which was put in the Gas Company's retorts about the same time turned out good gas and plenty of it. On the G. I. P. Railway engines 100 tons of the Mayo pit coal have been burnt, and the coal has turned out much better than was expected. Everyone who sees it says it is wretched stuff until he tries it; but it seems to improve on acquaintance. For three weeks it was burnt in the G. I. P. Railway engines, between Nagpore and Budnaira, with an average consumption of 51 lbs. per train mile—the average consumption of English coal on the same Section of the G. I. P. Railway is 38 lbs. per train mile—the average cost of English coal on the Nagpore branch of the G. I. P. Railway is about Rs. 35 a ton; so that Mayo pit coal would be cheaper than English coal, if it should be put down at Wardha station for Rs. 25 a ton.

But next year the "Mayo Colliery" will probably be closed, and the Warora coal only will be worked. A pair of pits are being sunk to this coal, and it is expected they will be in working order by December 1871. The Warora coal, so far as can be judged from the assay of pieces brought up by the steam-borer, is 30 or 40 per cent. better fuel than the Mayo pit coal. It yields one-half more carbon, or 66 per cent. as against 44 per cent; while it contains only about one-half as much water as the Mayo pit coal. If the seams turn out to be as good in bulk as the small specimens assayed by Dr. Lyon, this Warora coal will probably be as good fuel as the best of our Indian coals. The pits now being sunk at Warora will probably be worked for the present by Government, though there is ample coal for any number of private collieries. The cost of the Warora Colliery, with its upcast and downcast pit, machinery and buildings complete, wil probably be about £9,000. And when the workings are fully opened, this colliery ought to turn out at least 2,000 tons a month. The consumption of coal on the Nagpore line (235 miles) is about 30,000 tons per annum, while the annual consumption of coal on the proposed Raipore Railway ought to be about 20,000 tons. The saving between English coal at Rs 35 a ton and Warora coal at Rs. 8 a ton ought, if the Warora coal does two-thirds the duty of the imported fuol, to be 4¾ lakhs of rupees on the working charges of the G. I. P. Railway, and 3¼ lakhs on the Raipore State Railway. This saving will do very much more than cover the interest on the Warora Railway outlay. So we hope that the line to Hingunghat and Warora may be at once begun and pushed on as rapidly as possible.

It will be some years before the Raipore Railway requires 20,000 tons a year, but the G. I. P. Railway will take its full 30,000 tons a year directly the Warora Railway shall open. The cotton factories and other industries in Berar and Nagpoor will of course take Warora coal in preference to English coal or wood fuel, and the Government Colliery will hardly be able to furnish the full required supply. We anticipate, therefore, that one or more private collieries would find a good opening. It has been conjectured that iron works will some day be set up near the Chanda coal-pits for smelting and rolling iron from the rich Chanda ores. Perhaps some such works may be ready by the time the present stock of English rails has been worn out. But such a time is probably far off. Still there are enough facts about the Central India coal fields to make their early opening of great interest to the public tax-payer, and we think the public ought to have had earlier information on the matter.—*The Pioneer.*

The Government of India in the Department of Revenue Agriculture, and Commerce, has addressed the following important communication to the Government of Bengal:—

"It was proposed in a recent case of the grant of a license to mine for coal to attach to such grant the condition that the license should in no way interfere with any rights in or to the surface of the tract included within his license, and should make his own arrangements with the owners and occupiers of the surface soil, in order to obtain access to the coal and facilities for efficiently working it.

Upon this the Secretary of State made the following observations:—

From this it would appear that although the Government is exclusive owner of all minerals below the surface, and can convey to whom it will be the power of working those minerals, still the right so conveyed can be virtually cancelled wherever the surface is private property, and the owner thereof chooses to deny access to what lies below the surface.

"If this be really the present state of the law, it plainly requires to be amended to the extent of making it obligatory to owners of surface land, on receipt of adequate compensation from lessees of the minerals below, to afford them full facilities for getting at the minerals.

"What, however, is no less essential is, that a native land-owner should not be left to settle as he best may with a European lessee the terms of compensation for the latter's entrance on his property. In such a transaction, natives will be at a great disadvantage, unless some direct Government agency interposed, first to ascertain and record, and subsequently to defend their rights, and I am anxious that the expediency of making provision for these purposes should be considered."

Search among the records of the Government of India has not discovered sufficient to enable the Governor-General-in-Council to come to a decision on the questions here raised. The cases involving those questions, which have actually occurred, are few in number, and confined to the Central Provinces.

I am therefore to request that His Honour the Lieutenant-Governor will favour the Government of India with information on the following points:—

(*a.*)—How far in fact Government has in Bengal acted upon this principle that all mines when not expressly granted away belong to the State, and on what grounds Government has so acted.

(*b.*)—What has been the law or practice in regard to access to mines over land which is private property? Does Government theoretically or practically possess such a right, and can it assign such a right to others?

The Governor-General-in-Council will also be glad to receive an expression of His Honour's opinion as to the necessity of amending the existing law, and the direction which such amendment should take."

The Local Government has sent the above to the land revenue department of the Board of Revenue, for report.—*Indian Daily Examiner.*

CHANDA IRON ORES.

Note on the Iron Ores at Goonjwai, Lohara, and Dewulgaon, in the Chanda District, by M. FRYAR, ESQ., *Mining Geologist to the Government of India,—dated the 30th March* 1870.

I. THE village of Goonjwai is 50 miles E. N. E. from Chanda, and the mines or small diggings for iron are one mile south of the village. At the foot of a hill, holes from two to six feet in depth have been dug in moorum or ferruginous earth for small pieces of ore which, from appearance, tell plainly of being fragments of some larger mass. From these diggings I ascended the hill, and found in the ascent, a distance of about 50 yards, that every piece of stone I could pick up from the grass and shrubs of the thick jungle, were pieces of weighty iron ore are highly magnetic. At the top of the hill the wall of a lode of this rich ore was clearly discernible, consisting of a finely laminated gneissose sandstone, and the lode itself I found to be traceable for about 50 yards and to be full of iron ore in large masses. The native smelters dig at the bottom of the hill, in order that they may obtain small pieces of the ore and thereby save themselves labour in breaking fragments of suitable size for their smelting furnaces.

What I have said about the quantity of ore to be seen exposed is a fact which speaks for itself as to the, practically speaking, inexhaustible yield to be anticipated. The ore is highly magnetic and is, in my opinion, equal in quality to the rich magnetites of Norway and Sweeden. If so, it is then one of the richest ores that can be met with, and surpasses in yield of metallic iron any ore which has yet been discovered in useful quantity in the mining districts at home.

II. Lohara mines are 50 miles north east of Chanda. Here, as at Goonjwai, there is a hill of magnetite. Making my way through jungle, I ascended the hill, a distance of about 100 yards, and could find no other stone than pieces of rich magnetite : the "expression" of the place appeared to me to excel that of Goonjwai, as regards the immense quantity of ore easily obtainable.

III. Dewulgaon is 68 miles E. N. E. of Chanda, and is on the east side of the Wyngunga river. Here is a large lode of megnetite clearly traceable for at least 150 yards. The cardinal lode filled up with massive ore is about 10 feet wide, but from this there are many branches, and small pieces of ore are scattered over the country for some acres in extent ; it is from these scattered fragments mainly that the supply of ore for the native smelting work is obtained.

IV. *Remark.*—From the Mayo Colliery to Goonjwai or to Lohara is 65 miles. The roads are good for native carts, and save during the rains, the ore could easily be carted from the mines to the coal at Googoos. Carts regularly engaged in the work of carriage would convey the ore this distance for 12 shillings per ton. To this sum something would have to be added for breaking the ore at the mines and for filling the carts. A very large quantity of ore is obtainable in fragments, and to load this into carts would not cost more than a few pice per ton ; but for breaking the large blocks, drilling machinery and blasting would have to be resorted to, the cost for which would, in my opinion, be covered by two shillings per ton. This would make the cost of the ore at Mayo Colliery 14 shillings per ton, or about half of what would be given for this quality of ore at home.

Report on certain samples of iron ore from the Chanda district, Central Provinces of India, by* DAVID FORBES, ESQ., F. R. S. &c.,—*dated 4th August* 1871.

IN conformity with your request I have submitted the four samples of iron ore placed in my hands to a careful examination, in order to arrive at a correct estimate of their value for iron-making, and, with this object, have made complete chemical analysis of the three samples considered by you as of most immediate importance.

The results of the above-mentioned analysis when placed in a tabulated form, show the percentage chemical composition of these three iron ores to be as follows :—

	I	II	III
	Lohara.	Dewulgaon.	Goonjwai.
Iron, metallic	69·208	70·006	70·134
Oxygen, in combination	29 376	28·670	28·739
Sesquioxide of manganese	0·090	0·084	0·108
Silica	0·823	0·813	0.545
Alumina	0·432	0·367	0·396
Lime	0·054	0·026	0·055
Magnesia	trace	trace	trace
Sulphur	0·012	0·013	0·020
Phosphorus	0·005	0·001	0·003
Total....	100·000	100·000	100·000

The characters of the ores are as follows :—

I.—*Lohara.*—Very compact crystallined hematite or specular iron, containing some admixture of the magnetic oxide of iron, as was evident from its being in some parts very faintly magnetic. The sample was nearly pure oxides of iron, containing no admixture of rock or other mineral matter visible to the eye.

II.—*Dewulgaon.*—A granular admixture of magnetic oxide of iron with some specular iron ore and rusty oxide, strongly magnetic, and showing no appearance of rock or other admixture.

III.—*Goonjwai.*—A granular mass of crystallized hematite or iron glance, containing some admixture of magnetic oxide and rusty oxide of iron, in parts very faintly attractable by the magnet ; free from admixture of stony matter.

IV.—*Ambagurh Chowky.*—A coarsely crystallized magnetic oxide of iron, containing 72 per cent. metallic iron nearly pure, and quite free from other mineral matter, as far as could be detected by the eye.

A glance at the results of the chemical examination of these ores will show that they are not only extremely rich in iron, but also that the amount of the deleterious ingredients, sulphur and phosphorous contained in them, is the minimum known in even the best iron ores of Sweeden and Russia.

The quantity of phosphorus present was so small that it would be overlooked, except by employing the most searching tests for its presence ; whilst the insignificant percentage, or rather trace, of sulphur would be dissipated in calcining the ores.

These ores resemble strongly some of the very richest deposits of iron ore occurring in Sweeden ; and if the general mass of the lodes is equal in quality to the samples already placed in my hands for examination, there cannot be, in my opinion, any doubt as to their producing, if smelted on the large scale, an iron equal in quality to the best Swedish or Russian brands so much sought after and well adapted also for the manufacture either of Bessemer or any other variety of steel.

Owing to the density and compact nature of the ores, they should, previous to being charged into the blast furnance, be submitted to a preliminary roasting, or calcination, in order to render them more porous and open in texture, for thereby to facilitate their reduction by the gases of the furnace.

On account of their extreme richness in metallic iron, they are naturally deficient in slagforming ingredients, and these will consequently have to be added to the charge of calcined ore, either in the shape of a small quantity of poorer ore, or of other mineral containing silica in combination with the earth, in conjunction with the usual limestone (or burnt lime), which, by acting as a flux, will furnish the amount of slag essential in iron smelting to economical working of the blast furnace.

In conclusion, I would only express my opinion that these ores, if smelted with either charcoal or coal of good quality, are extremely well adapted for the production of first class iron, whether in pig or bar, or intended for conversion to steel.

* Received through Major Lucie Smith.

PUBLIC WORKS.—IRRIGATION.

The following abstract of the Quarterly Progress Reports of the principal works of irrigation under construction from loan funds in the different Provinces is published by Order of His Excellency the Governor-General-in-Council for general information : a statement of the revenue derived from the same class of works will be similarly published annually :—

	Estimates of works in progress.	Expenditure during quarter ending 31st March 1871.	Expenditure during official year 1870-71.	Total expenditure incurred.
	Rs.	Rs.	Rs.	Rs.
Godavery Delta	20,19,134	37,409	81,707	4,36,078
Kistna Delta	14,72,743	38,916	94,371	8,84,553
Survapully Channel	4,20,060	17,819	66,980	2,55,802
Madras Water Works	10,50,000	....	....	9,10,000
Vellaur Anicut	1,98,235	10,623	36,834	36,834
Tanjore Delta	3,71,130	18,315	36,897	1,76,123
Streviguntum Anicut	8,31,600	3,131	94,314	5,54,898
Krishna Canal	6,87,978	....	....	5,75,443
Lakh Canal	2,19,409	....	....	2,33,893
Palkhair Canal	98,416	....	....	80,831
Jamda Canals	6,13,391	....	....	6,89,269
Mooktee Nullah Reservoir	1,97,714	....	....	2,91,716
Ekrookh Tank	9,4 .,613	....	....	8,50,430
Moota Project	37,47,273	....	....	17,97,909
Hathmuttee Canal	3,4 ,,06	....	....	40,348
Shadadpoor Canal	7,29,820	....	....	7,08,256
Begarre Canal	4,04,824	....	....	1,76,163
Taldundah Canal	4,35,397	2 ,294	....	2,74,913
Do. Distributaries and Branches	1,0 ,083	6,539	....	12,160
Machgong Canal	1,22,280	15,204	....	78,920
Do. Distributaries	1 59,516	364	....	364
High Level Canal	11,74,852	80,705	....	9,28,075
No. 6 Distributary	2,36,205	9,288	....	1,08,187
No. 7, 9, & 10 Distributaryies	3,00,000	28,070	....	2,27,921
Midnapoor Canal	20,52,293	81,726	....	19,34,485
Distributaries	3,13,000	5,850	....	1,45,213
Tidal Canal	7,96,386	41,991	....	6,26,868
Range of Workshops	75,772	751	....	73,544
Dehree and Baron Works	16,53,528	82,319	....	2,66,015
Tramway and Quarries	99,320	8,334	....	56,659
Western Main Canal	7,86,520	88,883	....	3,16,285
Eastern Main Canal	2,44,265	37,620	....	1,82,234
Workshops	1,26,800	30,367	....	62,730
Northern Division Falls	28,697	6,769	24,160	24,261
Jani-khoord Escape	1,82,530	2,265	18,643	1,45,259
Boolundshuhur Rajbuhas	1,26,611	7,133	32,158	1,09,989
Allygurh Canal	6,404	542	2,234	6,405
Cawnpoor Bridges	1,67,965	15,502	33,425	1,49,979
Etawah Rajbuhas	2,37,696	3,030	11,042	2,17,217
Eastern Jumna Canal	69,361	6,235	12,768	57,517
Agra Canal	19,43,658	2,01,906	5,62,394	15,74,288
Rohilkhund Canals	1,56,123	4,166	23,611	1,05,894
Baree Doab Canal	29,28,783	2,88,253	4,56,800	6,86,404
Western Jumna Canal	5,89,496	12,788	46,022	1,69,766
Sirhind Canal*	....	1,27,465	2,96,316	3,22,319

* Branches.	Probable cost.
The Hansi	Rs. 28,24,488
The Sirsa	,, 43,71,667

MADRAS.

Godavery Delta.—This project, which was commenced in the year 1847, has been carried on from year to year as funds from the ordinary revenues of the country became available. It being desirable to complete a scheme which has proved of such benefit to the Godavery district, and yielded large profits to the State, estimates, amounting to over 26 lakhs of rupees, have of late been sanctioned from loan funds for works necessary to complete and perfect the system of irrigation and navigation in the eastern and western sections of this Delta. In the central portion like works are eventually to be undertaken at a probable expense of six lakhs. During the last quarter of the year the improvements in progress to the Akeed and Samulcottah canals, in the eastern section, were completed at an expense of nearly 2½ lakhs of rupees. On the latter canal 30 miles of earth-work have been executed, and 41 bridges and culverts built. Satisfactory progress was also made on improvements to the Coconada canal. In the western section the following progress has been made :—

Ellore main canal and low level channel	One-third completed.
Mid level channel	One-half ditto.
Canal from Ellore high level channel to the River Weyaroo	One-quarter ditto.
And the Nursapoor Canal	One-sixth ditto.

Some progress was also made on the Attili canal. Of the drains under construction, chiefly in the western section, the Pandikodu was nearly finished at a cost of over half a lakh of rupees, and satisfactory progress made on other minor ones. There are about 10,00,000 acres of arable land in this Delta, and the irrigation works have proved very profitable.

Kistna Delta.—The works in this Delta have been estimated to cost about 60 lakhs of rupees, of which more than half has been expended since the year 1851-52 in which they were commenced up to the close of the year 1869-70. Of the expenditure yet to be incurred estimates for about 5½ lakhs have as yet been sanctioned, leaving others to be yet submitted to the extent of about 19 lakhs of rupees. The works undertaken during the year consisted chiefly of improvements and extensions to the Ryves and Masulipatam canals on the left bank, and the Commamore channel on the right bank of the Kistna, as well as the excavation of several subsidiary irrigation channels comprised in the scheme. The acreage irrigated in 1869-70 was :—

	Acres.
In the Eastern Delta	64,928
„ Western „	64,395
Total.. ..	128,323

while the *additional* acreage that will ultimately be irrigated by the works now in progress is as follows :—

	Acres.
In the Eastern Delta	206,072
„ Western	165,605

In the *Nellore* district the Survapully channel, which is the main duct, let off from the anicut built across the Pennair at Nellore, is being improved at an estimated expense of about 4½ lakhs of rupees, of which 2½ lakhs of rupees has already been incurred, and will bring under wet cultivation 25,500 acres of land. The outlay noted provides for the completion of the irrigation canals in the Ponnair Delta to the mouth of the river, with embankments to protect the irrigated lands from inundations.

On the water-works, *Madras*, over 9½ lakhs have, up to date, been expended. This project is of a mixed character, providing for the irrigation of between 8,000 and 9,000 acres of waste land, as well as the water-supply of the city of Madras. It has not as yet been finally classed as a loan work.

For an *anicut* across the river *Vellaur*, in South Arcot, at Pelandorai, about two lakhs of rupees have been sanctioned, one-fifth of which was expended in its construction during the year. Irrigation will be supplied from this work to 16,650 acres.

In the *Tanjore* Delta, the proper regulation of the several rivers has long been represented as a matter of necessity to ensure a more equable distribution of the water. The regulating works sanctioned in March last for the improvement of the river Cauvery have all been completed, while satisfactory progress has been made on similar works authorized for the principal branches of the river Vennaur. The supply of the river Coleroon is also to be regulated. The total cost of the entire scheme of regulation is estimated at about ten lakhs of rupees.

In the *Tinnevelly* district, the construction of the Streevigun-tum anicut or weir on the Tambrapoorney river, which falls into the sea a few miles south of Tuticorin on the east coast of the Peninsula, is progressing satisfactorily. This weir will command an area of about 120 square miles, and the channels to be taken off from it will not only serve for direct irrigation of the lands on both banks of the river, but will feed some large tanks which occupy the higher level of the land to be irrigated. The works will also supply water to the town of Tuticorin, which is one of the chief parts of Southern India, and is at present ill-furnished with fresh water for domestic purposes.

In addition to these works several extensive projects are under investigation, from the Rooshkolia and Chicacole river in Ganjam, the river Pennair in Nellore, the Perryaur in Madura, and others which it is unnecessary to detail at present.

BOMBAY.

Krishna Canal.—This canal, which has under command 44,000 acres of irrigable land in the Sattara District, has been completed. The chowkies or inspection-houses are now in progress.

In the Amednuggur District, the *Lakh* canal, 21 miles long, and which will irrigate 17,000 acres, is under construction, and will very shortly be completed.

The *Palkhair* canal, 11½ miles long, also progresses satisfactorily and has as much as 20,000 acres of land under command.

In *Khandeish*, the Jamda canals, which are capable of irrigating 50,000 acres, have been nearly completed, as also the Mooktee Nullah Reservoir. The latter is situated on a tributary of the river Panjra, and has about 10,000 acres of culturable land under command.

In Sholapoor, the Ekrookh tank, which has been under construction since 1866, and with its channels, will irrigate about 22,000 acres of land, will shortly be completed. The perennial canal, from the Adeela river is to be commenced immediately.

In Poona, an extensive scheme of irrigation is in progress, termed the Moota project. It consists of a dam across the Moota river with a canal on the right bank, 100 miles long, and also a small canal to Kirkee on the left bank, and will irrigate eventually 70,000 acres.

In Guzerat, the Hathmuttee canal is being constructed for the irrigation of about 35,000 acres : the first five miles have been nearly completed.

In addition, complete plans and estimates for the Bhokur tank and canals from the river Taptee have been submitted to Government, and plans and estimates for a project from the Saburmuttee are at present under review by the local authorities.

A canal, 129 miles in length from the Neera, has also been projected. The area under command will be about 437 square miles, the irrigable area being about three-fifths of this. The object of the proposed work is to relieve the locality from continuous drought.

SINDH.

During the past year, the Thurr canal, 24 miles long in the direction of Oomercote, and the Mitrow canal, 87 miles in the Eastern Narra district were completed at an expenditure of about eight lakhs of rupees. The former irrigates 42,000 acres, and the latter 160,000 acres.

A canal, 63 miles in length, has for some time past been in progress from Sukkur to Shadadpoor, and is now approaching completion. All the masonry works and several Rajbuhas have been completed. Irrigable area under command 85,500 beegahs. Satisfactory progress has also been made on the scheme for improving the Begaree canal, and extending it for the irrigation of Seer lands—irrigable area 57,000 acres. The Pinyaree and Goongrah improvement project has been completed and is under review at present. An extensive canal from Roree to the vicinity of Hydrabad has also been projected, and the scheme is at present under the consideration of the Government of India.

BENGAL.

Orissa project.—Full particulars of this project will shortly be published in the *Gazette*.

Its estimated cost amounts to 277½ lakhs of rupees, of which 117 lakhs have already been expended, and the eventual net revenue has been estimated at 44½ lakhs or 16 per cent. on outlay.

The following facts were reported in October 1869 :—

"The Kendrapara canal, 40 miles long, connecting Cuttack with the Port of False Point and having under command 270,000 acres of culturable land, has been completed.

"Also 23 miles of the first section of the high-level canal between Cuttack and Calcutta to the point where it touches the trunk road ; the remaining 10 miles of the first section are in full progress, and the second and third sections, measuring 31 miles, are about to be commenced. Seven miles of the Taldundah canal are on the eve of the completion, and 20 more are in progress, also eight miles of its main branch to Machgong." Of the Midnapoor series, 24 miles of navigation between the Hooghly and the Cossye at Panchkoorah have been opened, and the earthwork of ten miles from Midnapoor towards Panchkoorah has been excavated to a surface width of 60 feet, and is conveying water for irrigation purposes. The remaining 15 miles are in full progress. Two reaches of the Tidal canal between the Roopnarain and the Russoolpoor, measuring 26 miles, have also been completed, and of four locks, one has been finished and a second is in progress. There are thus 123½ miles of canal open, 7 more nearly finished, and 74 miles in progress. Moreover, all the great head-works, consisting of anicuts and sluices,

viz., the Naraje at the bifurcation of the Mahanuddy and Katjooree, the Mahanuddy and Beropa at Cuttack and the Cussye at Midnapoor, are now completed as far as present requirements are concerned.

"Of distributary channels, 136 miles had been opened in Cuttack and 57 miles in Midnapoor; in the former district water could be conveyed to 120,000 acres, and in Midnapoor to 74,000 acres, or to 194,000 acres in all."

The progress made during the past year was as follows :—

Taldundah canal.—Earthwork completed and canal ready for admission of water. Navigable as far as Sonepoor lock, a distance of 15 miles from Cuttack and ready for irrigation as far as the 27th mile. It commands, with its branches and distributaries, an area of 400 square miles or 232,000 culturable acres. Fair progress made on its distributaries.

Machgong canal.—Earthwork completed, locks and falls in progress. This canal is a branch of the Taldundah and will irrigate an area of 82,000 acres. Distributaries just commenced.

High Level canal.—Range 1. Very satisfactory progress made in excavation of canal up to 25th mile, and provision of locks, aqueducts, and bridges. The irrigable area commanded amounts to 89,000 acres included in an area of about 150 square miles.

Distributaries.—No. 6 distributary cut for 6 miles, No. 11 completed to end, and Nos. 7, 9, and 10 put in thorough order; five new head sluices built.

Distributaries from Kendrapara canal.—Thirteen distributaries completed.

High Level canal from Midnapoor to river Hooghly.—Main canal in first, second, and third reaches completed to full depth and width. Five locks and three falls constructed. As a line of navigation from its proximity to Calcutta, &c., this is the last and most important of the seven sections of the high level canal, and it will irrigate an area of about 180,000 acres.

Distributaries.—Eighty miles completed, 11 miles now under excavation, and 20 more ready to be put into hands of Contractors.

Tidal Canal.—Nearly completed. Two locks finished and two in progress. This canal is intended mainly for navigation.

A range of workshops was also built.

Sone project.—This project has been estimated to cost 377½ lakhs, but if extended beyond the rivers Kurumnassa on the west and Sukree on the east of the Sone, the cost is likely to exceed 400 lakhs. The area embraced is 2,611,000 acres altogether. The estimates yet sanctioned for the works amount to about 90 lakhs of rupees. Full particulars of the scheme were published last year in the *Gazette*. The following is a brief account of the works in progress at present :—

Weir across Soane and head works at Dehree and Baroon.—Work was commenced on the anicut in October last, but an unexpected flood occurred and threw it back. Since then satisfactory progress has been made in its construction and also in that of the head sluice and lock at Dehree.

Tramway and Quarries.—Single line of road is open all the way from the quarries to Baroon on the east side of the river and locomotive engines and trains of stone are running regularly. Several bungalows have been built for the establishment employed on the works.

Western main canal.—About nine-thirteenths of the earthwork in the first four miles of the heavy cutting at the head are out to the 50 foot base and three-eighths of the rest to the 22nd mile. Satisfactory progress made on three bridges.

Eastern main canal.—First mile seven-ninths of work done, 2nd to 7th mile almost completed to 60 feet base, diverted drainage channel widened, and culvert finished.

Workshops.—Several buildings completed.

Survey operations.—The Buxar canal has been set out, as also nearly all the Arrah canal distributaries. Cross levelling of the country to Chunar well advanced.

North-Western Provinces.

Remodelling Ganges canal.—Estimates amounting to over 36 lakhs have hitherto been sanctioned for this purpose, of which a great portion has already been expended. The remodelling operations consist partly in alterations and improvements to the bed of the canal, so as to allow of its conveying with safety the full volume of water, for which it was designed, and for increasing the efficiency of the main canal as a line of navigation. During the past official year several falls and rajbuhas, &c., were remodelled, and a number of bridges and chowkies constructed.

In the Northern Division two falls were improved, and the Tanaipoor rajbuha remodelled. The works undertaken to increase the facilities of the Jowalapoor navigation channel were also completed, and some additional inspection-houses erected.

In the Meerut Division the Jani-Khoord escape was nearly completed, and the Jansuth rajbuha was disconnected from the Futtehgurh branch canal.

In the Boolundshuhur Division some rajbuhas were completed, and several inspection-houses and bridges, &c., constructed.

In the Allygurh Division a canal office was completed.

In the Cawnpore Division alterations to 22 bridges were in progress, and are fast approaching completion.

In the Etawah Division five rajbuhas were constructed, two others commenced, and some bridges widened and improved.

Eastern Jumna canal.—The Yarpore rajbuha was extended, and an inspection-house built.

Agra canal.—This canal, which is to be 110 miles in length, will utilize the water of the Jumna and irrigate and supply water communication between the districts of Agra, Bhurtpore, Muttra, and Delhi. It has been estimated to cost approximately 57½ lakhs of rupees, of which detailed estimates for over 20 lakhs have already been sanctioned. Its capacity will be sufficient for the conveyance of 1,100 cubic feet per second, sufficient for the irrigation of an area of from 270,000 to 300,000 acres. Considerable progress has been made in the excavation of the whole length of the canal. The excavation up to the 50th mile has been nearly finished, and further on the works are far advanced; several inspection-houses and subsidiary works connected with the canal have already been built.

Rohilkhund canals.—This scheme, which is likely to cost about 50 lakhs of rupees and is of a somewhat complicated character, consisting of no less than nine different sets of canals, is to be dealt with in separate portions. Lately estimates amounting to 4½ lakhs have been sanctioned for canals from the rivers Paha, Kylas, and Kitcha. The project is not, however, to be carried out from loan funds, until satisfactory proof has been afforded to the Government of India of its proving remunerative. This point is now under consideration.

Two other extensive canals have been projected in the North-Western Provinces, *viz.*, the East Ganges canal, estimated to cost about 100 lakhs of rupees, the project for which is at present under revision; and the lower Ganges canal, the estimates for which amount to over 180 lakhs, and are now under the consideration of the Government of India. Surveys are also in progress for the extension of irrigation in Bundelkhund, &c.

Punjab.

The Baree Doab canal.—This canal has been estimated to cost 177 lakhs of rupees; the total expenditure incurred on it up to 1st May 1868 amounted to 116 1/7 lakhs. In May 1870, estimates amounting to 27 lakhs were sanctioned for the Kussoor and Sobraon branches, on which great progress has since been made. Above 200 miles of canal are already open. The Kussoor branch is to be 90 miles, and the Sobraon branch 64 miles long. The total length of the main canal and branches, when completed, will be over 350 miles.

Western Jumna canal.—This project which has been estimated to cost 150 lakhs, had just been under consideration by the Government of India. The works consist of the rectification of the existing line of canal, the edition of new branches with some navigable channels and the provision of proper drainage. The entire scheme has been referred to Her Majesty's Secretary of State for India for approval and sanction.

Sirhind canal.—This canal is taken out from the Sutlej, and is estimated to cost upwards of two millions sterling. In June 1870, estimates amounting to 87½ lakhs of rupees were sanctioned by the Secretary of State for the first 37 miles of the canal, the progress in the excavation of which has been satisfactory, as also on the preliminary works and on the buildings necessary for the shelter of all engaged on the works. On this canal prison labour has been employed with advantage. Nearly 1,000 prisoners have till now been engaged, and their number will shortly be increased to 3,000. Satisfactory progress was also made in lining out further sections of the canal.

Oudh.

An expenditure of Rs. 2,56,188 has been incurred in this Province chiefly on preliminary operations connected with the projection of a canal from the river Sardah. The details of the project are now under the consideration of the Government of India.

Central Provinces.

In the Central Provinces a scheme of irrigation from the Kanhan river has been projected, estimated to cost 72 lakhs of rupees, and is also now under consideration. This project will provide for the irrigation of a highly fertile extensive and well-populated tract of country, and for a supply of water to the city of Nagpoor, and to the important Cantonment (and grain mart) of Kamptee.

British Burmah.

In British Burmah an extensive system of embankments for the protection of the country from inundations is in gradual process of construction. The expenses will be recovered from the lands which will be brought under cultivation in consequence of the works.

Ajmere and Mysore.

In Ajmere and Mysore the restoration of numerous existing tanks, which have been allowed to fall into decay, is to be gradually carried out.

COCHINEAL.

PROPOSED INTRODUCTION OF THE COCHINEAL INSECT INTO MYSORE.

From Captain T. G. Clarke, Officiating Secretary to the Chief Commissioner of Mysore; to the Secretary to the Government of India, Foreign Department,—No. 2008—75 R, dated Bangalore, the 20th July 1871.

Letter from Lieutenant-Colonel Boddam, with two enclosures, dated 17th July 1871.
Letter from Lieutenant-Colonel Boddam, with one enclosure, dated 17th July 1871.

In forwarding, for submission to His Excellency the Viceroy and Governor-General-in-Council, the accompanying copies of correspondence as per margin, relative to attempts that have been lately made by Lieutenant-Colonel Boddam, under the orders of the Chief Commissioner, for the introduction of the cochineal insect into Mysore, I am directed to state that Colonel Meade has satisfied himself that, so far as can be ascertained, the conditions as regards climate, temperature, and the cactus on which the insect subsists, are favourable to the success of the experiment, and that he deems it of very great importance to the interests of the Province that the measure shall, if possible, receive a fair trial.

Till within the last few years, a large proportion of the lower class of Mahomedans residing in Mysore, have maintained themselves by the cultivation of the silk-worm; but the disease that has here become chronic amongst these insects have at length completely destroyed this branch of industry, notwithstanding the efforts made for its recovery by the Government by the importation of fresh stock from Japan, and other means.

The cultivation of the cochineal would, if successful, probably be found specially suitable to the class that has thus been deprived of its natural means of livelihood, and most of the members of which appear to be incapable of turning their attention and energies to agriculture or other employment; and as Colonel Boddam has failed in his efforts to procure a supply of the cochineal insect from Teneriffe, the Chief Commissioner ventures to solicit the assistance of Government in obtaining the same, if possible, through Her Majesty's Secretary of State for India, the cost of course being borne by the Mysore Government.

In connection with this subject, I am directed to solicit attention to Colonel Boddam's suggestions for improving the plant cases referred to by him, if used for the conveyance of cochineal insects for the purpose proposed in this letter.

Should it be the wish of His Excellency in Council that such matters in connection with Mysore should be referred direct to the new department for agriculture, instead of to your office, I am directed to solicit the favour of instructions on the subject.

From Lieutenant-Colonel E. Boddam, on special duty; to the Officiating Secretary to the Chief Commissioner of Mysore,—dated Bangalore, the 17th July 1871.

I have the honour to state, for the information of the Chief Commissioner, that I have received no replies from Mr. Campbell, of Santa Cruz, Teneriffe, to my applications for cochineal insects, and would therefore venture to suggest that the Government of India be moved to apply for the aid of the Secretary of State in procuring the insects. A copy of my Memorandum on cochineal culture, which is to form portion of my agricultural report, now nearly completed, is forwarded as showing exactly how the matter stands at present.

Memorandum by Lieutenant-Colonel E. Boddam, on special duty.

Sericulture, which was carried on to a great extent in the neighbourhood of Bangalore and adjacent districts, has fallen off greatly, owing to the disease among silk-worms, and the people following the trade have been mostly ruined. I suggested that cochineal culture should be attempted as a substitute, being easy, light work, fit for the class of men, women, and children, who tend silk-worms.

Brazil and Mexico have always largely supplied Great Britain with cochineal; of late years it has been extensively cultivated in Madeira and the Canary Isles, as well as in Spain. During the year 1870, many new plantations were established in Teneriffe, and the neighbouring Isles, in all of which the cultivation is proving most remunerative, a large amount of capital being thus employed, and so large are the profits (25 to 30 per cent.*) that every available piece of land was being laid under cactus cultivation for production of cochineal to the exclusion of all other branches of field produce. I put myself in communication with Mr. Grattan, Her Majesty's Consul at Santa Cruz, Teneriffe, who sent me a treatise he obligingly prepared for me† on the culture of the cochineal there. One hundred years ago, the Hon'ble Court of Directors attempted to introduce cochineal culture in India, and offered a reward of £2,000 to anyone successfully importing it. In 1795, a Naval Officer secretly imported some cochineal insects from Brazil, which were distributed over India, and cultivation fostered by the Court of Directors. After expending two lakhs of rupees, it was discovered that the wrong insect had been got. There are two sorts of cochineal insects,—the Silvestre or wild one, the *Grana-fina*, or domesticated one, the latter only producing the cochineal of commerce. It unfortunately was the Silvestre that had been imported, and was not worth the trouble of cultivating.* The *Grana-fina* has never been successfully imported. From time to time desultry attempts to bring it to India have been made, but I can hear of but one since the invention of Wardian cases, which have done so much to facilitate the transmission of plants from one country to another. Two years ago a young gentleman brought some cochineal insects alive to Bangalore from Kew, but he had no cactus to feed them on, and they died. Whether they were the *Grana-fina* he did not know. Besides getting the true insect, the proper cactus for their support is necessary; the common *opuntia ficus indica*, or prickly pear, will not suit the domesticated kind. It must be *opuntia cochinellifera* or *opuntia tuna*. Referring to Kew as to the correct cactus, authorities differed; there appears great confusion in the botanical nomenclature of the cactus family. After much correspondence this point was settled, and I got the true cactus *cochinellifera*, compared the plants so named growing at the Botanical Gardens in Calcutta, Madras, and Bangalore, and found them identical, corresponding with the description of cactus at Teneriffe.

A mass of information on the original and subsequent attempts to introduce cochineal insects into India will be found recorded in the 6th volume of the transactions of the Agri-Horticultural Society of India, A. D. 1839, Appendix pp. 1 to 111.

The climate of this part of Mysore seems much like that of Teneriffe; we have a mild rainy season and no extremes of cold and heat as in other parts of India. The flora of Brazil and Mexico do remarkably well at Bangalore. The cactus grows without trouble.

* See end of Consul Grattan's report on cochineal.
† Forwarded to me by Her Majesty's Foreign Secretary, Downing Street.

From Lieutenant-Colonel E. Boddam, on special duty, Bangalore; to the Officiating Secretary to the Chief Commissioner of Mysore,—dated Bangalore, the 17th July 1871.

In my Memorandum on cochineal insects I referred to Mr. Bull's plant cases. I have now the honour to forward drawings and specifications of his patent. One of these cases was sent with Lieutenant-Colonel Sankey, full of plants, to Melbourne, to the Superintendent of the Government Gardens there, who reports that every plant arrived safely without a single failure. I had made a few improvements in the case which I will mention below.

It is well known to all cultivators acquainted with the conditions of plant life that those sent in Wardian cases on long voyages suffer more than from any other cause, from the excessive amount of condensed moisture in the cases. This steaming heat Mr. Bull has made efforts to obviate in his patent case, but only partially so. If precautions are so necessary for the preservation of plants from this condensed vapour, it will be doubly necessary to successfully transport delicate insects like cochineal living on the cactus.

Having once fixed themselves on the cactus leaf they never quit their position; they cannot shift from an exposed to a shady side of the plant; they must not be exposed to a broiling sun. Therefore, in any case made by Mr. Bull, or after his plan, I consider it will be necessary to make the following alterations, which have proved so useful in the case of plants sent to Melbourne:—

1*st*.—One or both of the glass sides as well as the louvre shutters should be made moveable, to slide and admit light and air in fine weather, to be fastened by thumb-screws.

2*nd*.—The cap should also be fastened down by the same means, so as to be left off in fine weather, but as screws are liable to get loose from the incessant motion of the vessel, I would have a stout flat bit of India-rubber nailed tightly at each end and fastened to the case.

3*rd*.—Instead of iron handles, I would have strong screwed wooden block handles with ropes, which would brace the case ends inwardly, and admit of greater power with proportionately less risk in lifting the heavy case from the ship's deck by machinery or by hand.

4*th*.—A short sharp iron peg fastened in the centre of each foot of the case would enter the wood of the deck on which it stands and prevent it moving when the ship rolls. The openings for ventilation, recommended by Mr. Bull, should be closed with perforated zinc netting to prevent cockroaches getting into the case; on one occasion when cochineal insects were shipped in a case, some cockroaches were let to get in and devour the cochineal insects.

I have had considerable experience in Wardian cases, and corresponded with many plant importers, and can confidently recommend the above suggestions.

No. 317 A, dated Simla, the 12th September 1871.

Endorsed by the Foreign Department.

Transferred to the department of agriculture, Revenue and Commerce, for disposal, with an intimation that the Chief Commissioner of Mysore has been instructed to address that department direct on similar subjects.

CANARY ISLANDS.

Report by Mr. Consul Grattan on the method of rearing Cochineal in the Canary Islands.

The cochineal insect is a species of coccus about the size of a pea; it has a silvery grey appearance, the body being reddish black and covered with fine white dust. When first brought forth the insect moves about freely, but as it grows it fixes itself to the leaf from which it derives its nourishment. There are several varieties of the prickly pear plant on which the cochineal feeds, but that most generally cultivated for the purpose of breeding is the common hardy cactus *opuntii*. In a wild state this plant brings forth abundance of fruit, and it formerly supplied one of the principal articles of food to the inhabitants of the Canary Islands. The fruit is found to debilitate the plant when used for the purpose of rearing cochineal, it is therefore carefully removed as fast as it buds. The cactus plant is so hardy as to grow luxuriantly on rocky spots, where there appears to be scarcely soil enough to fill the crevices; but in this state it cannot serve for the rearing of cochineal for more than one or two seasons. In rich soil, and with abundance of manure and water, the same plants will continue to yield excellent crops for from 10 to 12 years.

The best soil is that which is found in volcanic countries, where pumice stone and black scoria abound. Where no artificial irrigation can be obtained, a layer of black scoria called here "picon," covering the ground to the depth of several inches, is found greatly to improve the plant, by retaining the moisture of the soil and protecting it from the heat of the sun, and also by preventing the growth of weeds, thereby keeping the land constantly clean. In those parts of the Canary Islands where the soil has been overrun by lava, and on which the vegetable growth is confined to lichens, mosses, and here and there small ferns or weeds, the preparation of the land for cultivation of the cactus is a long and costly process. The rocks and stones which cover the surface being removed from a given space, the earth and mould buried beneath them is carefully collected into a mount; the rubbish is then replaced, forming a flat surface, and the earth is spread on the top to the depth of at least three-quarters of a yard The expense of this process varies according to the hardness of the rock, to the abundance of sub-soil, and to many other circumstances. When the lava streams of older date, and the crumbling action of the elements has softened and rendered the stone porous, the mould beneath being found in sufficient abundance, the average cost of preparing the land for cactus planting is about 90*l.* to the acre. Where there is abundance of earth on the surface, and the preparation consists only in levelling the ground for the facility of planting and of irrigation, the cost is much less; but a thorough upturning and airing of the soil is found to be essential to the successful cultivation of the cactus. The cactus plant is propagated by the leaves, which should be broken off sharply one at a time, and be exposed to the heat of the sun for about three weeks before they are planted; if the leaf is put into the ground fresh and moist as at first gathered, it is almost sure to rot; but when laid in the sun and allowed to dry until slightly bent, it will strike root and bud with the greatest facility During the summer months, leaves so dried will be found to bud in ten days or a fortnight with great profusion, as many as eight or ten new leaves bursting forth at the same time. The leaves should be planted in furrows at about a yard apart, either edgeways, as close as possible, or about four inches apart if placed across the furrows. This plantation being made in May or June, the new leaves will have grown to their full size in four or five months, and the plants will then be ready for transplanting into the ground to be finally allotted to them. Here the furrows should be at least two yards apart, in order to admit of a free passage to the labourers amongst the plants after they have grown to their full size; and each plant should be placed in the furrow at half a yard from that on either side of it, in order to allow sufficient space for their full development, which will take place in the month of February or of March. Each leaf buds with about from 5 to 15 shoots, according to the nature of the soil and to the quantity of manure and water supplied to it. In handling these plants great care must be taken to avoid bruising the main trunk; if by accident the hoe should be struck against it, the only way of saving the plant is to cut out the injured piece with a sharp knife, the fresh cut will then probably dry, and the plant will be none the worse; a bruise, on the contrary, gradually causes the whole trunk to become soft and putrid. A considerable quantity of ordinary manure or of guano is required to bring the plants to perfection, the latter is dangerous without abundant irrigation, the plants being subject to a peculiar disease when there is not sufficient water to dissolve the guano, but with plenty of water, as much as 20 cwt. of guano can be applied to each acre of cactus plants with the best results. In all cases, however, it is found advantageous to make use of ordinary manure as well as guano, in order to lighten the soil, which should be thoroughly dug four times a year, and oftener, when weeds are plentiful.

Having by these means obtained by the end of May or June well grown cactus plants consisting of four or five branches, springing from each trunk, with a good supply of rich dark-green leaves, when the fleshy spines and prickles have fallen from them, the plantation is ready to receive the insect. The growers on the south side of the Island of Teneriffe cultivate the cochineal in the winter so as to bring it to maturity in time for the great crop which is planted from the latter end of May to the end of July or August; the insects being carried to the north of the island in boxes supplied with trays, in which they are laid to the depth of two inches. Each box is constructed to hold about 40 lbs., and is carried on a man's shoulders over the mountains during the night, so as to be as little exposed to the heat of the sun as possible. In Grand Canary the most extensive planters reserve a portion of their land for the production of "madres" (or mothers), as will be hereafter explained. The state of the weather during the growth of the "madres" and the temperature at the time of spawning, has so great an effect upon the amount of seedlings produced, that it is impossible to fix the quantity of "madres" required per acre; but for such a plantation, as has been described, about from eight to ten boxes, that is from three to four quintals, would be considered a fair average. The mothers are put into small bags made of a material called "renque" (a sort of gauze), about eight or nine inches long, and shaped somewhat like a sausage, in each of which is put about a table-spoonfull of "madres," and then hung over a leaf in the cochineal plantation. The young, as they are born, walk out of the bag on to the cactus, and spread over the surface of the leaf. The quantity of insects spawned in a given time will vary according to the heat of the weather and the age of the "madres"; with fresh "madres" and in warm weather, a couple of hours will be enough to cover the leaf sufficiently with old "madres"; and in cool weather, the bags may be left on the leaves as long as 60 hours, or even two days; the leaf, on removing the bags, should be moderately and evenly covered with insects. If the insect is allowed to spawn too freely on each leaf, the crop will be damaged in quality, and if the bags are removed too soon, the crops will be deficient in quantity. The obtaining of a fair average number of insects on each leaf is therefore one of the most important points to be looked to in the cultivation of cochineal, and one which requires experience and constant supervision on the part of the grower. There are other ways of conveying the spawn to the leaves; that most in practice is the following: the "madres" are spread on shallow trays which are slid into shelves round a room, each tray being about 4 or 5 inches long and 2¼ inches wide; some use them entirely made of wood, others a framework of wood with a bottom of "medio brin," or thin canvas, nailed on so as to prevent the escape of the young. The "madres" being laid thinly over the surface, so as to lie closely side by side, but not one over the other; pieces of rag, about half a yard long by five inches wide, are then spread over the whole surface of the tray; in a short time these become covered on the underside with the young insects, and being removed, are conveyed to the plantation in baskets; they are one by one pinned on to the leaves, on which the young insects soon fix themselves; fresh rags are then laid over the "madres" to be again covered with the young It is found that white rags are best, black and dark colours are *disliked* by the insect. The same difficulty, as to the number of insects conveyed to each leaf, exists in this method of planting as well as in the former with a new element of difficulty, *viz.*, that the production of the young varies with the amount of light admitted into the room. To insure the greatest quantity of spawn in the shortest time, it is therefore necessary to have a skylight to the room, and it is not improbable that the preference for white rags is owing to their admitting more light to the insect. After pinning the rags to the leaves they are left for a longer or shorter time, according to the state of the weather; in fine and warm weather 24 hours will suffice, but when the weather is cold and damp they should not be removed for three, four, or more days. In the winter season the rags used formerly to be left upon the plants until the time for gathering the crops, in order to protect the young insect from the inclemency of the weather, but experience has shown that this object is better obtained by other means. It may be as well to mention here that for a winter crop the insects should be allowed to spawn far more copiously on each leaf than in summer, as the cold rain and winds of that season, destroy a great many.

When the "madres" have exhausted their powers, which occurs sooner or later, according to the temperature to which they are exposed, and which is known by the young being born black instead of white, they are collected from the bags or trays in which they have been spawning, and put into an oven for drying. This process, and the treatment used in preparing the "madres" for market, is so similar to that gone through with the full-grown silver cochineal of the principal crop, that both subjects may be considered together.

The young insect takes more or less time in coming to maturity, according to the weather. Those planted in June are often ready to be gathered in 70 days, or even earlier, whereas those planted in October and November are not ripe till late in February, or early in March. Those planted in the latter season, which are intended exclusively to serve as "madres," should be allowed to ripen thoroughly before they are gathered, and should not be taken off the plant until there are some young to be seen crawling over the leaves. On the other hand, the cochineal planted in March or April for "madres" spawns with such astonishing rapidity in June or July, under the influence of the heat of those months, that, as soon as the first leaf in a plantation which has taken three or four days to cover with insects, is seen to have young upon it, the whole should be gathered, for even those that require some hours before arriving at maturity, will ripen in warm weather.

The cochineal planted in June and July being the great crop of the year, prepared principally for drying at once into silver cochineal, should be gathered before it commences to spawn. Thus, during August and September, the grower watches for the first symptoms of spawning, and as soon as they appear, not a moment is lost in proceeding to immediate gathering, for the weather being then quite as warm and bright as in June, the same rapidity in ripening is observable, and the loss of weight is serious, if the spawning is allowed to proceed for even a few hours. The proper manner of gathering varies according to the object to which the plants are devoted; but, as a general rule, the leaves on which the bags are placed are sharply cut off with a knife close to the branches, and the cochineal is swept off then into broad baskets, closely woven, to prevent loss. After

the leaves are all cut off and swept they are dropped into the ridges, *where they are left*; another set of gatherers carefully scrape off the insects which have passed into the branches or trunk of the plant; leaving even one or two insects on these branches is fatal to the health of the plant, as they spawn, most probably, in hidden spots and shortly afterwards the strength of the branches which is required to produce new leaves for the ensuing year, is absorbed by the surreptitious growth of insects, and this is fatal to the future crop. It is therefore a most important point to be attended to by the overseer. To prevent any young insects remaining on the plants after gathering, it is necessary to sweep the branches several times every two or three days. By this means such as may escape the first or second sweeping, having both grown and changed their position, will be removed on the third or fourth application of the broom. It must be borne in mind that a small insect will grow in a few weeks into a "madre," and will propagate several hundreds of young which will eventually much weaken the plant. The leaves which have been cut off at the gathering of the crop should now be chopped up into small pieces and dug into the ground, as they serve to lighten it, and by their fermentation they warm the roots of the plant and act as excellent manure; guano should also be applied freely. It is found that as much as 15 quintals of guano per 1½ acres can be applied with benefit to the cochineal; a grower at Grand Canary used as much as 25 quintals on one occasion, and was rewarded by a return of from 11 to 12 quintals of cochineal, or nearly double the average crop. To prevent so much guano injuring the plants, artificial watering must be freely resorted to if necessary, a good soaking being given to the ground every three weeks. The cactus cannot bear much water when not strengthened with manure, neither can it bear much manure unless it is copiously watered. When a plantation is reserved for the production of a winter crop, the leaves should be covered with cochineal in the month of October or November; by planting the young cochineal at this season, it ripens and is ready for gathering at the latter end of February or of March. Another plantation of cacti is reserved for receiving the seed at this season; but as the plants cannot be forced to bud during the winter, the seed must be planted in March upon last year's leaves, which have the disadvantage of being tough for the insect, and this renders a winter crop more precarious than one obtained in summer: however, the sale of "madres" in June brings a quicker return than the dry crop of August or September.

The wind and rain during the winter months frequently destroy half the crops, and in summer a hot south wind ("levante") will often kill many of the insects. In order to prevent the losses thus occasioned, light covering of cotton gauze is spread over the whole plantation upon stakes and wires, at a height of about 7 feet. Mats have been used for the purpose, and also calico, but these materials are found to injure the insects during the winter by keeping off the sunshine, and in summer by preventing the free circulation of air.

Some growers protect insects by merely throwing mats loosely over the plants when the weather threatens to be very hot or stormy, removing them when the danger has passed. But these are only make shifts, and are less efficacious than the first-mentioned plan. The evil effects produced by the heat during a south wind in summer may be much diminished by a copious watering early in the morning, for the moisture which evaporates from the wet soil saves many of the insects. As the cochineal is collected, care should be taken that the baskets do not remain long filled, the insects that lie at the bottom being injured by the weight. The person in charge should immediately empty the baskets on receiving them from the plantation, and spread out the cochineal on trays, or even on a sheet on the ground, not deeper than from two to three inches, otherwise the grain will assume a reddish tinge, which considerably diminishes its value. The cochineal gathered during the day is collected in this way, and towards evening it is put into an oven heated at about 150° Fahrenheit, there it is left for four or five hours, the temperature being carefully kept up; afterwards the oven is allowed to cool gradually until the morning, when it will be found that the insects are still moist. Exposure to the sun for a few days in summer will complete the drying, and it is found that there is less loss of weight when the cochineal is dried in this manner, than would occur if subjected to greater heat, or if left a longer time in the oven in order to dry it at once; even in winter many growers prefer to let their cochineal dry slowly in the air rather than by the heat of the oven, the loss of time being of less importance than the loss of weight. Some growers do not use the oven; a tablespoonfull of wood ashes is spread over a pound or two of cochineal, it kills it in a couple of hours; the dust and ashes are then shaken off from the grain in a sieve and the cochineal is dried in the sun. Others prepare the cochineal by putting it into sacks in moderate quantities; two men grasp the sacks at each end and shake the grain briskly backwards and forwards; this process gives the cochineal a brilliant polish, and though less weight is finally obtained from a given quantity of green cochineal, the price it commands in the London market compensates for the loss of weight. But the best processes for preparing this polished cochineal are known only to a few, who keep the secret jealously; the oven is therefore still almost universally used for drying.

After the grain is thoroughly dried, it is well sifted in order to free it from a white powder which to the last clings to it; numbers of prickles which have fallen from the leaves have also to be removed. Excellent machines have been invented for this purpose both in England and America. The cochineal being thus dried and cleaned, it is packed for exportation into bags containing about 150 lbs. each, which are carefully sewn up. This is done by the trader who buys it off the cultivator, the latter rarely exporting the grain on his own account. The results obtained by different growers of cochineal vary so much, in consequence of the peculiar circumstances to which the crops are exposed in different localities, that it is impossible to fix upon the actual value of an average yield per acre; but it is universally admitted by the land-owners in the Canary Islands, that no other branch of agriculture is as remunerative. The average temperature in the southern part of the Canary Islands is about 80° to 85° Fahrenheit, and it rarely falls at night below 56° or 60°. At Laguna and at Orotora, and other places in Teneriffe, where cochineal is cultivated at a height of nearly 2,000 feet above the level of the Sea, the climate is temperate. The thermometer rising to 72° or 78° in the summer, and falling at times during winter nights to 45°.

In all these places the cactus thrives, and cochineal can consequently be reared successfully.

Rain falls in Teneriffe (more plentifully on the high lands than on the coast) from the month of October to April, often in heavy showers which continue at intervals for two or three days, these are generally followed by two or three weeks of dry weather. The rains are seldom excessive, the winds rarely amount to gales. From May to October the weather is constantly dry. There are no tables of rainfall during each month to be obtained here.

The following account, showing the amount of the first outlay and of the annual expenses and profits per acre of a cochineal plantation, has been given by a grower in the middle lands of the valley of Orotora, Teneriffe:—

	£	s.	d.
Purchase value of land per acre	60	0	0
* Preparation of land and cost of planting and growing cactus for the first year before receiving the cochineal crop	90	0	0
Bags, baskets, and other utensils	10	0	0
First outlay	160	0	0
Annual Expenses.	£.	s.	d.
8 Boxes of "madres" at 2s. per pound . ..	32	0	0
Wages for planting, gathering, and preparing cochineal	30	0	0
12 quintals of guano at 13s. 4d. per quintal ..	8	0	0
Digging, weeding, watering, and general expenses ..	18	0	0
Total	88	0	0
Annual Profits.	£	s.	d.
50 lbs. of black "madres"	8	0	0
8 quintals of silver cochineal at 3s. per lb.	120	0	0
Total	128	0	0
Net Profit	40	0	0

The average price at which the "madres" can be obtained varies much at different times, falling as low as 9d., and frequently rising to 2s. 6d., and even 3s. per pound.

The management of the insect gives employment to a large number of women; it can almost exclusively be conducted by them. The larger proprietors employ most of their hands during the whole year, so as to command a full number when the labour of the season comes on. The wages of the women in the valley of Orotora is 6d. per day, or 3s. 6d. per week for the best workers. Day labourers receive at the rate of 6s. 3d. per week for digging and planting, &c., &c. The successful culture of the cochineal requires experience and patient attention on the part of the grower; he will receive his reward by obtaining a return of from 25 to 30 per cent upon the capital employed.

Teneriffe, 1871.

DECIMALIZATION MOVEMENT.

Mr Molesworth summarises his arguments for Decimalization thus:—

(1.)—The decimal sub-division of the rupee has been approved for Ceylon.
(2.)—India offers special facilities for its adoption.
(3.)—The change necessitates no alteration whatever in the existing silver coinage.
(4.)—All that is necessary is to mint a small quantity of copper tokens.
(5.)—The change may be made gradually.
(6.)—No sudden alteration is necessary in the accounts, stamps, or tolls
(7.)—The natives will receive the new tokens as readily as they receive the existing tokens.
(8.)—The great objections urged against the adoption of decimals in England are inapplicable here.
(9.)—The lower classes have no attachment to the existing copper tokens.
(10.)—The copper circulating medium in India is virtually not even "binary," but fluctuating.
(11.)—The adoption of decimal coinage will harmonize and work well with the proposed decimal weights and measures.
(12.)—The coinage I propose is free from the objections urged against that proposed for England, both as regards the number of subdivisions and denominations.
(13.)—The introduction of decimal tokens will not affect retail transactions.
(14.)—The decimal system will be a valuable auxiliary in education.
(15.)—The natural aptitude of natives for figures will facilitate the adoption of decimals.
(16.)—The native mind is not averse to decimalization.

His coinage would be:—

Rupee	=	100 cents.
8-anna-piece	=	50 ,,
4 ,, ,,	=	25 ,,
2 ,, ,,	=	12½ ,,
1 cent.	=	1, and
½ ,, ,,	=	nearly to one pie of the present coinage.

This innovation does not look very formidable, and its success would everywhere facilitate the enforcement of the Indian Weights and Measure's Act.

* This great expense is caused by the space to be cultivated in this locality, being composed of rock and other hard substances which it is necessary to excavate or to remove, the soil being brought from considerable distances by beasts of burden.

PRICES OF FOOD THROUGHOUT INDIA.—SEPTEMBER 1870—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

BENGAL. (*Rice, the staple food.*)		*Rice*	*Wheat.*	Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27½	22	,,	,,
	Bancoorah	27½	19	,,	,,
	Beerbhoom	32	18	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	21	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam ,,	Durrung	21	8½	,,	,,
	Goalparah	17	30	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	...	,,	,,
	Seebsaugor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	23	18	,,	,,
	Mymensing	22½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	26	23	,,	,,
	Sarun	22	20½	,,	,,
	Shahabad	24	22	,,	,,
	Tirhoot	23	21	,,	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	29	27	,,	,,
Sonthal Pergunnah.	Godda	..	..	,,	,,
	Nya Doomkah	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	29	21	,,	,,
Presidency Division.	Calcutta	..	..	,,	,,
	Nuddea	..	..	,,	,,
	Jessore	25½	16	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 8-16	21 9-16	,,	,,
	Bograh	33½	15½	,,	,,
	Dinapore	35	17½	,,	,,
	Maldah	30	28	,,	,,
	Morshedabad	28	25	,,	,,
	Pubna	27	20	,,	,,
	Rungpore	25 11-16	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazareebagh	35	20	,,	,,
	Maunbhoom	32	16	,,	,,
	Singbhoom	66	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25	..	,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES. (*Wheat and Joaree, the staple food.*)		*Rice.*	*Wheat.*	*Joaree.*	*Bajra*
Meerut Division	Dehra Dhoon	13	36	30	29
	Saharunpore				
	Moozuffernugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	9	16		8
	Gurhwal				
Rohilkund ,,	Bijnour	19	29	28	26
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
	Terai Pergunnahs	35	36		
Agra	Muttra	15	26	28	25
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	9	30	36	28
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	15	24	25	17
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
Benares ,,	Goruckpore	22	36	..	..
	Bustee				
	Azimgurh	16	19	21	19
	Mirzapore				
	Benares				
	Ghaseepore				
Ajmere ,,	Ajmere	8	14	21	18

OUDH. (*Wheat and Joaree, the staples.*)		*Rice.*	*Wheat.*	*Joaree.*	*Bajra.*
Lucknow Division	Lucknow	18	26	40	15
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	18	34	23	22
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	18	31	34	16
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	17	24	..	..
	Sultanpoor				
	Pertabghur				

PUNJAB. (*Wheat and Joaree, the staples*).		*Rice.*	*Wheat.*	*Joaree*	*Bajra.*
Delhi Division.	Delhi	9	33	33	29
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	21	26	23
	Rohtuk				
	Sirsa				
Ambalta	Amballa	12	24	37	32
	Ludianah				
	Simla				
Jullundhur.	Jullundhur	13	29	40	32
	Hoshiarpore				
	Kangra				
Ameitsar.	Amritsar	9	26	32	27
	Sealkote				
	Gurdaspore				
Lahore.	Lahore	10	23	25	29
	Ferozopore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	8	23	28	25
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	20	23	21
	Jhung				
	Montgomery				
	Mozuffnuggur				
Deera I Khan.	Deera I. Khan	7	23	29	25
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	6	19	25	11
	Kohat				
	Huzara				

CENTRAL PROVINCES. (*Wheat and Joaree, the staple food*)		*Rice.*	*Wheat.*	*Joaree.*	
Nagpore.	Nagpore	16	19	22	2nd sort Rice quoted.
	Bhundara				
	Chanda				
	Wurdah				
	Balaghat				
Jubbulpore.	Jubbulpore	16	31	22	
	Saugor				
	Dumoh				
	Mundla				
	Seonee				
Nerbudda.	Baitool	12	22	21	
	Hoshungabad				
	Chindwara				
	Nursingpore				
	Nimar				
Chuttersghur.	Raepore	32	35	42	
	Belaspore				
	Sumbulpore				
Upper Godavery.	Seroncha	8	12	25	

MADRAS *Rice and Cholum (Joaree) the staple food.*		*Rice.*	*Joaree.*		
Northern Section.	Ganjam	246	125	Quotations are—so many Rupees per Garce = 8,960 lbs.	2nd sort Rice quoted.
	Vizagapatam	211	166		
	Godavery	194	197		
	Kistna	272	187		
	Nellore	235	133		
Ceded Districts.	Cuddapah	294	157		
	Bellary	286	131		
	Kurnool	344	154		
East Centre	Madras	260	186		
	North Arcot	221	114		
	South Arcot	207	91		
Cauvery.	Tanjore	220	124		
	Trichinopoly	232	127		
Southern Section.	Madura	315	146		
	Tinnevelly	340	152		
West Centre	Coimbatore	291	127		
	Nellgherries	427	213		
	Salem	243	110		
West.	South Canara	272	...		
	Malabar	340	...		

BOMBAY PRESIDENCY. (*Rice, Bajra, and Joaree, the staples.*)		*Rice.*		*Joaree.*	
Northern Division.	Ahmedabad	Rs. 4	No Returns since January.	Rs. 2½	Rupees per maund of 82 lbs.
	Kaira	3½		2½	
	Surat	3½		2½	
	Tannah				
Southern Division.	Poonah	3½		2½	
	Ahmednuggur				
	Kulladghee	3½		1½	
	Rutnagherry	3			
	Belgaum	3		1½	
	Dharwar	3		1½	
	Sattara	4		2½	
	Carwar			2½	
Sinde	Kurrachee			2½	
	Hyderabad			2½	
	Sukkur	3		2½	

BURMAH. (*Rice, the staple.*)		*Rice*		
Arakan.	Arakan	2 4 0	Per maund of 82 lbs.	No Returns since April 1870.
	Ramree			
	Sandoway			
	Northern Arakan			
Pegu	Rangoon	3 7 0		,,
	Bassein			
	Myanoung			
	Prome			
	Toungboo			
Tenasserim	Amherst	2 0 0		
	Tavoy			
	Mergui			
	Sheveygeen			

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	4 per cent Loans.								4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
	2½ per cent. Loan of 1853-54.	of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1863.	of 1856-57.	Transfer Loan dated 15th July 1870.	P. W. of 1854-55.	of 1856-57.		2 years.		3 years.		5 years.	10 years.	15 years.	
														Repayable Jan. 1869	4½ per cent Transfer Loan.	Repayable Jan. 1871.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1883.	
15th March 1871.	53,100	34,133	2,347	19,62,347	41,41,100	1,53,45,300	1,23,92,200	1,67,04,200	14,500	48,73,500	70,200	5,95,92,400	4,81,89,600	.....	.....	1,65,000	18,60,000	33,85,000	33,46,000	33,14,000	17,57,72,227
15th April 1871..	53,100	34,133	2,347	19,62,347	41,34,600	1,51,66,400	1,22,97,800	1,59,07,500	14,500	48,28,100	69,700	5,78,69,000	4,81,63,400	.....	.....	1,65,000	18,60,000	33,15,000	33,46,000	36,50,000	17,29,43,227
30th April 1871...	53,100	32,640	2,347	19,59,680	41,37,000	1,50,80,000	1,23,92,200	1,51,24,800	14,500	46,36,100	69,700	5,72,51,800	4,69,84,900	.....	.....	1,65,000	18,96,000	33,15,000	33,46,000	36,00,000	17,00,24,767
15th May 1871 ...	53,100	32,640	2,347	19,59,680	41,10,000	1,51,16,000	1,22,97,800	1,46,77,700	14,500	45,49,900	69,700	5,67,07,900	4,67,64,800	.....	.....	1,65,000	18,60,000	33,16,000	33,46,000	36,00,000	16,86,43,067
15th June 1871...	53,100	32,640	2,347	19,62,027	40,56,200	1,50,93,200	1,20,75,700	1,46,69,900	14,500	17,09,000	68,700	5,40,90,900	4,43,50,100	.....	.....	1,65,000	10,61,000	31,81,000	33,46,000	37,11,000	16,23,42,314
31st July 1871 ...	53,100	28,906	2,347	19,57,653	40,95,300	1,49,21,600	1,23,24,700	1,42,55,600	14,500	39,43,700	67,700	5,30,05,900	4,36,00,100	.....	55,000	.....	.....	31,70,000	33,46,000	36,66,000	15,93,70,106
15th Aug. 1871 ...	53,100	28,906	2,347	19,52,213	40,87,200	1,49,36,200	1,23,50,000	1,42,71,000	14,500	39,24,200	67,700	5,23,95,600	4,30,37,100	.....	55,000	.....	31,70,000	33,46,000	36,76,000	8,72,000	15,82,39,066
15th Sept. 1871...	53,100	28,906	2,347	19,52,213	40,88,700	1,49,79,900	1,22,53,300	1,41,22,000	14,500	33,32,800	10,700	5,09,77,100	4,32,52,800	.....	26,600	.....	.....	27,03,000	33,46,000	36,76,000	15,56,91,366

COMPARATIVE ABSTRACT OF TRAFFIC ON INDIAN RAILWAYS FOR THE 1ST AND 2ND QUARTERS OF 1870-71.

Quarters.	East Indian.				Eastern Bengal.		Calcutta and south-Eastern. (State).		Oudh and Rohilkhund.		Punjab and Delhi.		Madras.		Great Southern of India.		Carnatic.		Great Indian Peninsula.		Khandesh Branch.		Dumraon Branch.	Bombay, Baroda, and Central India.		Sindh.		Total.	
	Main Line.		Jubbulpoor Line.																										
	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1871.	1870.	1871.	1870.	1871.	1870.	1871.
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
First Quarter.																													
Total earnings	718,404	658,700	36,986	40,188	41,869	34,986	2,023	2,774	6,572	6,668	96,271	84,813	127,741	119,924	17,330	16,012	837	729	510,207	526,916	151*	951	433†	142,436	123,769	19,779	16,504	1,710,606	1,633,368
Mean mileage open	1,131	1,279	223	223	113	156	25	28	42	42	530	567	707	805	168	168	19	19	1,063	1,258	7	7	5	312	312	106	106	4,449	4,875
Average receipt per week	55,262	50,669	2,845	3,091	3,221	4,230	156	213	505	528	6,636	6,524	9,826	9,225	1,333	1,232	64	56	39,247	41,532	50	73	72	10,957	9,521	1,521	1,270	131,632	122,736
Average receipt per week per mile open	48·8	39·6	12·8	13·9	28·5	27·1	5·6	7·6	12·0	12·6	12·5	11·5	13·9	11·5	7·9	7·3	3·4	3·0	36·9	32·2	8·4	10·4	14·4	35·1	30·5	14·3	12·6	29·6	25·6
Second Quarter.																													
Total earnings	703,584	576,605	33,143	36,209	39,069	52,126	1,915	2,352	6,016	7,617	96,905	79,780	125,258	127,392	18,233	17,162	1,150	1,246	541,330	540,198	775	965	699	171,727	162,396	23,741	17,871	1,761,946	1,622,870
Mean mileage open	1,131	1,279	223	223	113	156	28	28	42	42	554	567	707	832	168	168	19	19	1,184	1,289	7	7	5	312	318	106	106	4,584	5,019
Average receipts per week'	54,122	44,354	2,473	2,785	3,005	4,010	147	181	463	586	7,454	6,135	9,635	9,799	1,403	1,320	88	96	41,641	41,554	60	74	53	13,210	12,492	1,826	1,375	135,527	124,813
Average receipt per week per mile open	47·8	34·7	11·1	12·5	26·5	25·7	5·2	6·5	11·0	14·0	13·5	10·8	13·6	11·8	8·4	7·9	4·6	5·1	35·2	32·7	8·6	10·6	10·4	42·3	39·3	17·2	13·0	29·5	24·9

* Receipts for two weeks and four days.

† Receipts for six weeks.

Advertisements.

NOTICE is hereby given, that the Annual Auction Sales of Mysore Sandalwood will be held at the various Kothis on the dates below specified :—

Shimoga	Kothi..	13th November 1871.
Saugur	,, ..	27th do
Cowlidroog	,, ...	12th December
Seringapatam	,, ..	4th do
Hoonsoor	,, ..	18th do

The quantity exposed for Sale will be 2,000 candies (500 tons) more or less.

2. Copies of revised rules for Sandalwood Auction Sales can be obtained free by application to the undersigned.

G. J. VAN SOMEREN, Captain,
Bangalore, 6th October 1871. Conservator of Forests, Mysore and Coorg.

GREAT INDIAN PENINSULA RAILWAY.

TEAK TIMBER.

TENDERS are invited for the supply of such quantities as the Company may require for one year of well seasoned MOULMEIN or and RANGOON TEAK TIMBER, in Square Logs, sound and straight, not less than 12 inches square and 2 feet in length, to be delivered at the Company's Stores Depôt, Byculla, at the rate of not less than between 250 and 300 tons per month, commencing from the 1st day of January 1872

Specification and form of Tender may be obtained on application at the Storekeeper's Office, Byculla, Bombay.

Sealed Tenders endorsed, "TENDER FOR TEAK TIMBER," and which must specify whether of Moulmein or Rangoon, and the rate per ton of 50 cubic feet, delivered at the Stores Depôt, Byculla, will be received by the Agent at the Company's Offices, Elphinstone Circle, Bombay, up to noon on THURSDAY, the 30th November next.

The person whose Tendor shall be accepted will be required to enter into a Contract, and, for the due fulfilment of the same, to find security amounting to 10 per cent on the estimated value of the contract.

The Agent does not bind himself to accept the lowest or any Tender.

(Signed) W. WARDEN MORICE,
Storekeeper.

Stores Office, Byculla, 11th October 1871.

NOTICE

IS hereby given, that Timber Sales will take place at the Ghaut Depots of the Canara Zillah in the month of December next.

2. The sale at the Hullial Depot, in the Soopa Talooka, will commence on *Monday*, the 11th December, and will continue there till the whole is disposed of.

3. The sale at Yellapoor Depot, in the Yellapoor Talooka, will commence as soon as possible after the Hullial Depot is finished (about the 3rd January 1872), and will be continued at the neighbouring Branch Depots till the whole is sold.

4. The sale at the Katoor Depot, in the Sircy Talooka, will likewise commence as soon as possible after the Yellapoor Talooka sales are finished, and will be continued at the neighbouring Branch Depots till the whole is sold.

5. The probable quantity of Timber put up for Sale will be as follows :-

	Teak.		Black-wood.		Jungle-wood		Teak Poles.	
	Logs.	Candies.	Logs.	Candies.	Logs.	Candies.	Logs.	Candies.
Soopa Talooka, Hullial Depot.	8,062	6,050	200	173	1,300	1,080	1,800	474
Yellapoor Talooka, Yellapoor Depot	1,700	1,400	45	40	700	600	..	..
Sircy Talooka, Katoor Depot	50	41	15	11	850	949	..	..
Total....	9,812	7,491	260	226	2,850	2,629	1,800	474

6. For any further information that may be required apply to H. BARRETT, Esquire, Deputy Conservator of Forests, Canara.

W. PEYTON, Major,
Conservator of Forests, Southern Division.

Conservator's Office S. D., Camp Poona, 28th September 1871.

TIMBER SALE IN NORTH CANARA.

NOTICE is hereby given, that the undermentioned quantity of Timber, the property of Government, will be sold by Public Auction in November 1871, at the Ports of GUNGAWULLY, CARWAR and SEDASHEGUR :—

	Teak best Southern.		Blackwood.		Jungle-wood.		Firewood.	Date of Sale.
	Logs	Candies.	Logs.	Candies.	Logs.	Candies.	Tons.	
Gungawully ..	210	249	33	29	5	5	..	15th Nov.
Carwar	2,408	4,843	13	10	378	859	158	28th ditto.
Sedashegur	..	..	...	...	1	9	..	ditto.
Total..	2,618	5,092	46	39	384	873	158	

The whole will be arranged in convenient lots.

Terms :—

On the day of sale the buyer to deposit 15 per cent. of the purchase-money.

The balance of sale price is due on or before the 1st March 1872.

All the lots to be removed from the Depot before the 1st April 1872.

Further particulars of Sale and Rules may be obtained at the Office of the Superintendent of Timber Depot, Carwar.

(Signed) W. PEYTON, Major,
Conservator of Forests, S. D.

Conservator's Office, Dharwar, 20th September 1871.

(True copy.)
GEO. U. PARKER, Lieut., I. N.,
Superintendent Timber Depot.

NOTICE.

CHARTERED BANK OF INDIA, AUSTRALIA, AND CHINA.

ON and after 1st November next, this Agency will resume payment of Interest on Current Deposit Accounts.

JAMES DOUGLAS,
Bombay, 9th October 1871. Agent.

COMPTOIR D'ESCOMPTE DE PARIS.

NEW FRENCH LOAN.—The sixteen Monthly Instalments fall due on the First of each month, commencing from the 1st August 1871.

The amount due on each Instalment per 5 Francs Rente is Rs. 1-14-1 92-100.

The Coupons are payable on 16th August, 16th November, 16th February, 16th May.

During the payment of Instalment, namely, up to 21st October 1872, the Interest will be paid on the 1st August, November, February, and May, in order that the Coupons due may be received in part-payment of Instalments.

Interest is payable on presentation of Stock Receipts, pending the arrival of the Stock from Paris.

SOUNDY & CO.,

BOMBAY,

SOLE IMPORTERS OF ALEXANDRE & SONS', AND DEBAIN'S HARMONIUMS.

HARMONIUMS Manufactured for India, from Rs. 100 to Rs. 800.

"SYMPATHETIC" PIANOFORTES, in solid Mahogany or Rosewood, guaranteed for India, from Rs. 75.

THE "INDIAN" SQUARE PIANOFORTE, in solid Mahogany, guaranteed for India, from Rs. 550.

BROADWOOD AND SONS' PIANOS, from Rs. 300 to Rs. 1,200.

COLLARD AND COLLARD'S PIANOS, from Rs. 350 to Rs. 1,000.

PIANOFORTES FOR HIRE.

PIANOFORTES AND HARMONIUMS REPAIRED AND REPOLISHED EQUAL TO NEW, BY A STAFF OF EXPERIENCED EUROPEAN WORKMEN.

Arrangements made for Tuning Pianos by the Half-Year or Year. Terms on application.

SOUNDY & Co.,
PIANOFORTE SALOONS,
BOMBAY.

Holloway's Ointment and Pills.—Chest Preservatives.—At all seasons of the year the rate of mortality from diseases of the lungs is very great. Holloway's Ointment well rubbed upon the chest, aided by his Pills, arrests all mischief. These cleansing medicaments exercise a most salutary and restorative influence over the entire contents of the pectoral cavity. Air tubes, nerves, blood vessels, and all other tissues feel the wholesomely potent power, more particularly in their thoroughly purifying both venous and arterial blood by promoting the free circulation of air. Neither Ointment nor Pills contain any noxious ingredient whatever, but their balsamic nature nourishes rather than irritates the system, and kindly subdues all untoward symptoms, till all is well once more.

THE SOUTHERN INSURANCE COMPANY, (LIMITED.)

REGISTERED CAPITAL—ONE MILLION STERLING.

Paid-up Capital .....£ 100,000
Reserved Fund .....£ 40,000

HEAD OFFICE—MELBOURNE.

The undersigned having been appointed Agents, are prepared to grant Policies by Marine Insurance.

Bombay, 19th June 1869. J. N. WADIA, SONS & Co.

THE STANDARD LIFE ASSURANCE COMPANY.—Established 1825.

WITH WHICH IS NOW UNITED

The Colonial Life Assurance Company.

COLONIAL AND FOREIGN ASSURANCES.

An amalgamation having been formed between the *Standard Life Assurance Company* and the *Colonial Life Assurance Company*, the business of the united companies will henceforth be conducted under the title of

THE STANDARD LIFE ASSURANCE COMPANY.

The annual revenue of the Standard Company is now upwards of £650,000, and the accumulated funds amount to upwards of £3,500,000 sterling. The new business transacted during the past year amounted to the large sum of £1,375,000 sterling, the corresponding premium amounting to £45,337 per annum.

Moderate rates charged for residence in the Colonies, India, and other places abroad.

Local Boards and *Agencies* in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where premiums may be received and claims paid.

Immediate reduction of premium on return to Europe, or other temperate climate, without medical certificate.

Profits divided every five years.

The new Colonial and Foreign Prospectus may be had on application at the chief offices of the Company, or to the Agents at home or abroad.

WILL. THOS. THOMSON, Manager and Actuary.
D. CLUNIE GREGOR, Colonial and Foreign Secretary.

BOMBAY BOARD.

H. Prentis, Esq. | W. Nixon, Esq.
A. R. Scoble, Esq. | A. E. Ashley, Esq.

Agents at Bombay.

The London, Asiatic and American Company, (Limited).

THE INDIAN LIFE ASSURANCE COMPANY (*Limited.*)

REGISTERED UNDER ACT X. OF 1866.

Head Office—MEERUT.

DIRECTORS.

Chairman, W. McLeavy, Esq. .. *Manager, Bank of Upper India, (Limited.)*
C. J. Collins, Esq.
R. R. Dean, Esq. ... . *Manager, Allahabad Bank.*
W. Hobson, Esq. ... . ,, *Mussoorie Savings' Bank.*
J. C. Parry, Esq. .. .. *Late Genl. Manager, Delhi & London Bank*
F. Peterson, Esq. ... . *Manager, Simla Bank Corporation.*
C. W. Stowell, Esq. ... ... ,, *Uncovenanted Service Bank*
E. Warner, Esq. .. .. *Barrister-at-Law.*
Sheikh Ellahee Bux

MEDICAL ADVISER.

William Moir, Esq., M.B., Civil Surgeon, Meerut.

SECRETARY.

D. Lancaster, Esq.

AGENTS.

Hill, Billman, & Co., Calcutta.

This Company was formed towards the end of 1869, and has already received substantial patronage from the public.

The object for which it was established with a full direction in India was to secure the Indian public against a repetition of such heavy losses as have recently been sustained by the collapse of certain Assurance Offices in England, where the entire management of those institutions was located.

Security.—To ensure absolute security, the funds of the company are invested *only* in Government securities. The company is strictly prohibited from making advances on house or landed property or on stocks, shares or obligations of any company whatever, though such advances are usually extensively made by other Assurance companies.

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the assured. Policies are also granted for short terms from one to ten years at moderate rates.

The Proposal Form is simple in its terms and the *conditions* of the *policies* are liberal, all *unnecessary restrictions having been removed.*

The rates of premium are made as moderate as is consistent with *complete security* of the assured.

Advantages of Assurance.—It secures by a small monthly, quarterly, half-yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the borrowers' property from claims and sureties from loss

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscriber loses the benefit of all he has paid, whereas in the case of a policy it still ensures and may be made available for any other purpose.

Forms of Proposal, tables of rates, and all further information may be obtained by letter or on application to any of the Agents or to the Secretary.

ANNUAL PREMIUMS

Required for an assurance of Rs. 1,000 for the whole term of life.

Age.	Civilians				Military and Naval			
	Without Profits.		With Profits.		Without Profits.		With Profits.	
	Rs.	As.	Rs.	As.	Rs.	As.	Rs.	As.
20	31	9	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	9	50	15	57	14
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

D. LANCASTER,
Meerut, 12th November 1870. *Secretary.*

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782

UNLIMITED.

The importance of this company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 9,000,000*l.* sterling as losses under insured risks and without a single call on its proprietors whose liability is unlimited.

The undersigned are authorised to issue policies in Bombay and the Mofussil at the tariff rates of all the old established company, which are as low as the nature of the risks can justify.

The rates on bungalows in the Mofussil, and residences, offices, and godowns in Elphinstone Circle, have been lately much reduced. Particulars on application at the Agency office. A. C. BRICE & Co.,
No. 6, Rampart Row, Bombay, 1870. Agents.

THE QUEEN INSURANCE COMPANY

FIRE AND LIFE.

HEAD OFFICE.—*Queen Insurance Buildings, Liverpool.*

CAPITAL.—(£2,000,000) Two Millions.

Trustees.—Sir Thomas Edwards Moss, Bart., Christopher Bushell, Esq., and Edward Heath, Esq.

DIRECTORS.

Chairman—Bernard Hall, Esq.
Deputy Chairman—R. W. Kelly, Esq.

John Bateson, Esq.
John Bingham, Esq.
T. Ridgway Bridson, Esq.
William Forbes, Esq.
Andrew Galbraith, Esq.
Charlton R. Hall, Esq.
William Hind, Esq.
Patrick Hunter, Esq.
Peter Maxwell, Esq.
Peter McLagan, Esq., M.P.
James Morton, Esq.
John T. Fagan, Esq., J. P.
John Sharp, Esq.
N. W. J. Strode, Esq.
J. B. Thomson, Esq.
Geo. B. Kerferd, Esq.

Actuary and General Manager.—J. Moncrieff Wilson, Esq.
Sub-Manager.—Thomas Walton Thomson.
Bankers.—The Liverpool Commercial Bank, and the National Provincial Bank of England.
Auditors.—Messrs. Harmood, Banner & Son, Accountants.
Physicians.—James Turnbull, M.D., Liverpool; J. E. Pollock, M.D., London; and F. S. Stedman, M.D., Bombay.

The rates of premium for *Fire* and *Life* Insurances will be found as moderate as those of other first-class offices. Policies are issued under the *Life* branch of this Company recently established in Bombay, on civil lives and military lives in civil employ.

For further information and particulars, and for prospectuses, &c., regarding Fire and Life Insurances, apply to

LAWRENCE & Co.,
Bombay, 1st January 1871. Agents in Bombay.

THE BOMBAY FIRE INSURANCE COMPANY (LIMITED.)

THE undersigned are prepared to accept risks and issue policies covering merchandize, goods in godowns, warehouses, dwelling houses, or other insurable property, on favourable terms.

Apply to
FORBES & Co.,
Bombay, 1st February 1871. Secretaries and Managers.

SUN FIRE OFFICE.

ESTABLISHED 1710.

POLICIES opened on warehouses and shops, merchandise, dwellings, household furniture, and other insurable property, in Bombay and the Mofussil, at current rates by
Bombay, 1871. PEEL, CASSELS, & Co., Agents.

ALLIANCE BRITISH AND FOREIGN LIFE AND FIRE ASSURANCE COMPANY.

ESTABLISHED 1824.

CHIEF OFFICE;
Bartholomew Lane, Bank, London, E. C.

BOARD OF DIRECTION.

PRESIDENT—Sir Moses Montefiore, Bart., F.R.S.

DIRECTORS.

James Alexander, Esq. (Alexander, Fletcher & Co.)
Charles George Barnett, Esq. (Barnett, Hoare, Hanbury, and Lloyd)
George Henry Barnett, Esq. Clympton Park.
James Fletcher, Esq. (Alexander, Fletcher & Co).
William Gladstone, Esq. (Thomson, Bonar & Co).
Right Hon. George Joachim Goschen, M.P.
Samuel Gurney, Esq.
James Helme, Esq., (Director of the Provincial Bank of Ireland)
Sir Curtis Miranda Lampson, Bart.
Sampson Lucas, Esq (Lucas, Micholls & Co)
Elliott Macnaghten, Esq., (Member of the Indian Council)
Thomas Masterman, Esq. (Director of the Bank of England)
Joseph Mayer Montefiore, (Director of the Provincial Bank of Ireland)
Sir Anthony De Rothschild, Bart, New Court.
Baron Lionel Nathan De Rothschild, M.P.
Thomas Charles Smith, Esq Oxford Square, Hyde Park.,

AUDITORS.

Lord Richard Grosvenor, M. P.
Hugh Colin Smith, Esq
Richard Hoare, Esq

FIRE RISKS

of an eligible character are accepted at minimum current rates

LIFE DEPARTMENT.

The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorised to decide upon Proposals submitted, to issue Policies, and to settle claims.

The Life Reserve Fund is over

NINETY-FOUR LACS OF RUPEES

which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund), being about 30 per cent of the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

FIVE CRORES OF RUPEES

coupled with the personal responsibility of a numerous body of wealthy Proprietors. For detailed Prospectuses, Forms of Proposal, &c., apply to

REMINGTON & Co,
Agents for the Presidency of Bombay.

CHURCH OF ENGLAND ASSURANCE INSTITUTION.

ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic., Cap. XCII.

CAPITAL—One Million Sterling.

Life Assurances of every description granted.
Retiring provision combined with Life Assurance.
Free Policies issued which can never altogether lapse through non-payment of Premium.
No extra charge for sea-passage.
Reduction to European rates without Medical examination.
Premium may be paid annually, half-yearly, quarterly, or monthly, as desired.
Parsee and Armenian lives insured.
For detailed Prospectus, &c., apply to

REMINGTON & Co., Agents.
Bombay, 12th July 1870.

LIVERPOOL, LONDON AND GLOBE INSURANCE COMPANY.

Liability of Shareholders Unlimited.

Capital £2,000,000 Accumulated Funds £3,301,005

Revenue		*Invested Funds.*	
Fire Premiums	£ 830,816	Capital	£ 391,752
Life Premiums	,, 250,039	Life Reserve	,, 1,873,020
Interest	,, 162,680	Reserve Fund	,, 971,410
		Undivided Profit	,, 64,823
	£1,240,535		£3,301,005

Fire Department.

Policies of Insurance against fire upon dwelling houses and other buildings in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the company.

The rate on pucka-built bungalows situated out-side the Fort of Bombay, or in any part of the Bombay Presidency, is now reduced to (6) six annas per cent. per annum.

Life Department.

This company offers the advantage of Fixed Bonuses accruing after five years annual payment of premium, *uncontingent* on profits. Policies are indisputable after five years. Claims are payable thirty days after admission. Annuities are granted on very favorable terms. The undersigned will issue Policies on behalf of the Company.

Agents in Bombay—RITCHIE, STEUART & Co.
Agents in Calcutta—GILLANDERS, ARBUTHNOT & Co.

NORTH BRITISH AND MERCANTILE INSURANCE COMPANY.

Incorporated by Royal Charter and Special Acts of Parliament.

Paid up Capital	... ...	..£250,000
Fire Reserve Fund	..	297,153 10 10
Fire Premium Reserve	.	138,514 15 1
		435,668 5 11
Total Accumulated Funds		2,838,118 18 11
Annual Income from Fire, Life and Investments.		801,801 12 9

Agents in Bombay,
W. NICOL & Co.

ESTABLISHED IN 1820

C. LAZARUS & Co.,

Incorporated with Shearwood & Co.,

CABINET MAKERS, UPHOLSTERERS, BILLIARD AND BAGATELLE TABLE MANUFACTURERS.

BY APPOINTMENT TO

His Excellency the Viceroy, Governor-General of India,

AND TO

His Royal Highness the Duke of Edinburgh,

CALCUTTA.

C. LAZARUS & Co., while thanking their numerous constituents for the solid support extended to their Firm since 1820, attribute their success to the following maxims which continue to guide their business transactions, *viz* —

Good Work with unadulterated materials
Skilful and trustworthy Workmen
Uniform Sale of Charges
Strict and competent Supervision.

NEW ILLUSTRATED CATALOGUE

There are a few special features in connection with the expensively executed Catalogue, to which C. L. & Co. would ask their customers' attention

1. The *newest* and *most elegant* designs only find a place in the volume. Many of these designs, it should be mentioned represent an original result, that is to say, they have been elaborated with special reference to the household requirements of this country. In working to this end reference has been had to the latest models of the first Cabinet Manufacturers of Europe. All that was recherche in style, or chaste in pattern, has been taken advantage of in the production of C. L. & Co.'s special designs for India; these desiderata, however, being combined with others which C. L. & Co.'s long experience has shown to be of the utmost importance. These it is scarcely necessary to detail, yet it may be observed as a general principle, in modifying home designs to suit Indian requirements that substantiality should never be sacrificed to a too slender elegance, and this principle has been steadily kept in view. Indeed, in the manufacture of Cabinet Ware in India this is a prime consideration, as climatic effects not to speak of other agencies, have a most marked action in deteriorating such articles. It remains only to add, therefore, that, while all that is chaste, tasteful and elegant has been freely appropriated from the sources indicated in the production of C. L. & Co.'s designs, regard has been had, at the same time, to the requirements of strength and substantiality, a judicious blending of both, in fact, has been aimed at, and, as C. L. & Co. humbly believe, has been most successfully accomplished.
2. C. L. & Co. have had each article of their stock photographed. The diagrams have been engraved at considerable expense in England from these photographs, and represent, therefore, each article with artistic fidelity.

PRICES.

C. L. and Co. are alive to the necessity that exists in these altered times for reasonable prices. The supplying, however, of a *bonâfide* reliable article is the first consideration with a respectable and old established firm. Regard being had to this, and also to the fact that C. L. & Co. warrant every article that issues from their manufactory, they can confidently state that their charges represent only a slender margin of profit over and above actual cost of production.

IMPORTANT TO MESSES AND BILLIARD CLUBS.

THROUGHOUT INDIA, CHINA, BURMAH, CEYLON, AND THE STRAITS.

Consequent on the numerous applications that C. LAZARUS & Co. have lately had from parties, residing at a distance from Calcutta to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the Tables to Calcutta for that purpose is attended with great delay, thereby occasioning much inconvenience, C. L. & Co. have been induced to keep in stock of Cushions on their new principle always on hand, which can be fitted to any Table, the accurate length and width of the slate bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

BILLIARD AND POOL BALLS.

Billiard cloths, Cues, Billiard and Pool Marking boards, Tips, Chalks and every requisite for the Billiard Table. Billiard cushions renovated. Billiard Table repaired and re-cushioned on their new principle, thereby making an old Table as good as new.

B B B

In accordance with their established practice of introducing novelties to the Indian public, C. LAZARUS & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusement, by importing the popular B B B Tables. The peculiarity of these is that on the one Table the three favourite games of BILLIARD BATTUE, and BAGATELLE may be played, thus affording a pleasing variety of amusements, concentrated on a single board at little more than the cost of one. Anticipating that the demand for these Tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, it being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

THE ALEXANDRA BILLIARD TABLE

C. LAZARUS & Co. beg to state that, with a view to procure for India one of the latest Home novelties, they have made up, on their own premises, a number of the new "Alexandra" Billiard Tables, so commonly patronised in Fashionable Circles at this time in England.

It is now shown that Ladies may, with perfect propriety, take part in a game where their naturally quick perception and power of skilful manipulation contributes, not only to the pleasure of this noble game, but enables them to compete for its honours with the more practised hands of the ruder sex.

The "Alexandra" Table, or which has now received the distinguishing epithet of the "Ladies' Table," and most in favour with the fair sex is in every respect adapted to develop the fullest resources of the game. The size of the Tables is six feet by three, the height being so regulated, and the Cues and other requisites so specially arranged, as to admit of easy and graceful manipulation by a lady.

C. LAZARUS & Co.,

Calcutta.

GEORGE W. WHEATLEY & Co.,

Established 1836.

ARMY, BANKING, TRANSIT, AND GENERAL AGENTS.

Offices .. LONDON { 156 Leadenhall St. / 33 Regent St. W.
,, .. BOMBAY. 20 Sassoon's Buildings.

AGENTS IN ALL PARTS OF THE GLOBE.

ARMY DEPARTMENT —Military, Regimental, and Mess Indents of all kinds promptly and economically executed.

BANKING DEPARTMENT —Pay, Allowances, and dividends drawn, and Remittances and investments effected upon favorable terms. Interest allowed on Current as well as Fixed Deposit accounts.

GENERAL DEPARTMENT —Indents for goods of every description executed. The Bombay Agency undertakes local indents of all kinds, and executes through the London House all orders for European or American goods.

N. B.—Constituents are requested that time, trouble, and frequently expense are saved by instructions being made full and complete in the first instance. Where a margin is intended to be given the limits should be stated.

TRANSIT DEPARTMENT —THE GLOBE PARCELS EXPRESS undertakes the forwarding of goods and parcels by the quickest, safest, and most economical routes throughout India, Europe, and the World.

SPECIAL AGENCIES.

GEORGE W. WHEATLEY & Co. are Sole Agents in Western India for the following firms —

Hills's (Patent)	ARNOLT & NICHOLL	Birmingham
General Joiners	SAML. WORSNAM & Co.	London
Haberdashery	D. NICHOLSON & Co.	London
Hardware	DAVIS JONES	Birmingham
Ink Printing	SHARPE & EDWARDS	London
Jewellery ..	HARRISON & Co.	London & Birmingham.
,,	FARADAY & DAVEY	London
Lamps, Punkahs ..	MADDIN & SON	London
Lithographic Presses	MACLURE MACDONALD, MACGREGOR	
Marine Engines	JACKSON & WATKINS	London
Machinery, Saw Mills &c	SAML. WORSNAM & Co.	London
Needles ..	ADEL MORATT	London
Printing Presses	HOPKINSON & COPE	London
Type	V. & J. HIGGINS	London
Sewing Machines	J. WEIR	London
Shoe Thread	CLEATHORPE & Co.	London
Watches	DENT & Co.	London
Wines	LOWENTHAL & SOLMS	Frankfort
,,	STANDRIDGE & TURNER	London.

Select parcels of Watches, Jewellery &c. are now on hand. Consignments of choice Wines, Printing Presses, and Inks, Printing Paper, Sewing Machines, &c. are daily expected.

Bombay, 1st August 1870. J. L. MADDEN, Agent.

THE CALCUTTA MUSICAL ESTABLISHMENT.

12, GOVERNMENT PLACE.

BY APPOINTMENT.

LATE BUCKINYOUNG & Co., A.D. 1814.

Indian Pianofortes.

Broadwood & Sons new Cottage 7 Octaves, with three Unisons throughout
New Cottage Grand, with three Unisons in Tenor and Treble
New Semi Grand, ditto ditto ditto ditto ditto
COLLARD & COLLARD'S Sympathetic quare Semi Grand 7 Octaves
Semi Grand 7 Octaves with three Unisons Treble
Boudoir Grand 7 Octaves three Unisons throughout

Sympathetic Pianofortes.

A consignment of the above expected very shortly from Germany. These instruments are made expressly for India and will be sold at 20 per cent. below the usual price charged for similar Instruments in Calcutta.

Sheet Music.

Among the present extensive stock of the above firm will be found the best modern as well as the most admired classical productions of the best masters. Constituents are respectfully informed that for *immediate* Cash payments the publisher's marked price will be charged for single pieces, and for every six pieces purchased, a seventh one of equal value will be added to the number without additional charge.

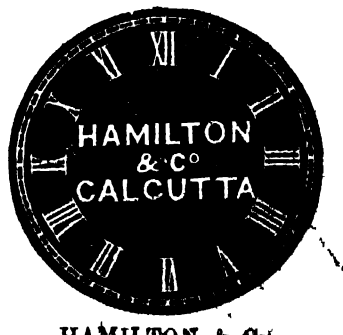
C. GOULD,
Proprietor.

Calcutta, April 1870.

THE EXHIBITION ENGLISH LEVER WATCH.

IN FINE SILVER, double-bottomed, engine-turned hunting case, of medium size, and with a first-class full plate Lever movement.

Rs. 50 Cash.



Rs. 50 Cash.

HAMILTON & Co.

Begs to state that for some years past, their endeavour has been to introduce to their Constituents a good, reliable, English Silver Watch, at a really moderate price. Owing to recent valuable improvements in the Watch-maker's art, by which the aid of machinery has been brought to bear with marvellous success, they are now enabled to offer the above Watch, which they guarantee to be entirely English-made throughout at the hitherto unprecedented price of Rs. 50 cash and the same Watch in Gold Engine-turned hunting case, at Rs. 100 cash.

NOTE —*Our new Illustrated Watch Pamphlet can be had free on application.* Orders respectfully solicited.

HAMILTON & Co.,
Watch and Clock Manufacturers,
Jewellers and Silversmiths in ordinary to His Excellency Earl Mayo, K. P.
8, Old Court House Street, Calcutta.

BOMBAY:—Printed and Published for the Proprietor at the *Economist Press*, by G. L. F. CONNELL, Manager.—21st October 1871.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, TUESDAY, 21ST NOVEMBER 1871. [No. 4.

Will be published on the 1st January 1872.

THE

Gazette of Asia.

EDITED IN CHIEF BY MR. KNIGHT.

THE *Gazette of Asia* is not intended to be a mere *newspaper*, and local affairs therein will be strictly subordinated to those which are of general interest. The purpose is to furnish the country with a daily organ, in which the circumstances and the wants of the various Provinces may be represented and discussed by writers specially qualified by their local knowledge for the work. It seems to the Editor desirable that the administrative system of each Province, with its difficulties, disadvantages, and drawbacks, should be understood in every other, and the attention of the Empire concentrated by turns upon the problems that are arising now in the Punjab, now in Southern India, now in Bengal, and now in Bombay. The administrative service of the country is *one*, and instead of the interest of its members being exhausted by the special work in which they are engaged, it is hoped that the *Gazette of Asia* may be the means of widening their knowledge and extending their sympathies. Provincial jealousies are happily extinct in the country, and the new journal will, it is believed, help the consolidation of the great Anglo-Indian services into one body of administrators, animated by common information, sympathies, and ambition.

The purpose can be secured only by co-operation on the part of the Services themselves, and this they are earnestly invited to give. While the editorial columns will aim at preserving some homogeneity of views, all shades of belief and opinion differing therefrom may be freely expressed in the journal, impersonally or otherwise, according to the taste of the writer. No letter, or other communication, will ever be suppressed on the ground that it makes against the views which are advocated editorially. There is treason against truth in such suppressions, and if the editorial writers are wrong, they will allow full opportunity for the proof of their error in their own columns, where it was promulgated.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*.

PASSENGER RATES FROM BOMBAY.

	Cabin.		Deck with food.
To Aden	£ 16		£ 7-13
To Suez	„ 28		„ 13-7
To Port Said	„ 30		„ 14-6
To Trieste	„ 40		„ 19.

Cargo taken for Trieste, also for Venice, Constantinople, and Odessa, Aden, Egypt, England and the Continent generally.

There is also a weekly service by Mail Steamers between Alexandria and *vice versa*, in conjunction with the P. & O. Co.'s mail steamer to and from Suez. The Austrian Lloyd's mail steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 200 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4½ to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers to Southampton, at a charge of 10s. per cwt. to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned Agent grants also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS .....£13 | SECOND CLASS £9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLS, £7-10 per head.

Railway Tickets, from SUEZ to ALEXANDRIA, with all the privileges of passengers by the P. & O. Co., FIRST CLASS, £3; SECOND CLASS, £2; CHILDREN over 3 and under 10 years at HALF FARE.

In conjunction with the Austrian Lloyd, cargo for Trieste and Venice can be booked through from Bombay by the P. & O. Co., and the Bombay and Bengal Steam Ship Co., and via Bombay from the various ports touched at by the steamers of the British India Steam Navigation Company.

TRANSHIPMENT SERVICE AT PORT SAID.

Goods for Trieste, Venice, Odessa, and ports on the Syrian, Turkish and Greek coasts, shipped by steamers under any Flag whatever from Japanese, Chinese and Indian ports bound to Mediterranean or British ports VIA Suez Canal, are received and transhipped by the Austrian Lloyd's Agent at Port Said, and forwarded to their destination by the Company's regular lines of steamers.

For further particulars, and for freight and passage apply to the Agency of the Austrian Lloyd's Steam Navigation Company.

A. C. GUMPERT,
Bombay, 2 Ash Lane, 27th Feb. 1871. Manager.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870. W. NICOL & Co., Agents.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden ... ...
Suez ... ...
Brindisi ... ...
Malta ... ...
Gibraltar ... ...
Southampton ... ...
} From Bombay every Saturday at 3 P.M. from Mazagon.

Galle ... ...
Madras ... ...
Calcutta ... ...
Penang ... ...
Singapore ... ...
Batavia ... ...
Hong Kong ... ...
Shanghai... ... ...
Japan ... ...
} Thursday 12th and 26th October; 9th and 23rd November; 7th and 21st December at noon.

King George's Sound... ...
Melbourne ... ...
Sydney ... ...
} Thursday 26th October, 23rd November, 21st December at noon.

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London and Liverpool.

A considerable reduction has been recently made in the rates of passage money. For further particulars apply to

GEORGE F. HENRY,
Bombay, 1st June 1871. Superintendent.

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.

MESSRS. R. RUBATTINO & Co.'s Italian Mail Steamers are running between GENOA and BOMBAY, calling at LEGHORN, NAPLES, MESSINA (occasionally ALEXANDRIA), PORT SAID, SUEZ, ADEN and *vice versa*.

PASSENGER RATES.

INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

	1st Class.	2nd Class.	3rd Class.	
To Aden	£22	£15	£8	Without food.
„ Suez	36	22	8	
„ Port Said	38	24	9	
„ Alexandria	39	25	9-10	
„ Messina	45	32	12	
„ Naples	47	33	13	
„ Leghorn	50	34	14	
„ Genoa	50	34	14 ...	
„ Marseilles (transhipment at Genoa)	52	35	14-10	

Including Wines.

Children under 3 years, free of charge. Children not above 10 years are free.

Passengers are allowed to *break the voyage at any of the above-named Mediterranean ports*, and are free to resume it by any of the Company's steamers to the port of destination marked on their tickets.

Passengers returning within six months of their departure from Bombay by the steamers of the Company, are entitled to a reduction of 20 per cent. on the return fare.

Berths may be secured in advance by depositing half the Passage Money.

For prospectus, rates of freight, and further particulars, apply to

VOLKART BROTHERS,
Bombay, 19th December 1870. Agents, Rubattino Steam Navigation Company.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.

THE British India Steam Navigation Company (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days.

This route is the most expeditious and economical for passengers for the Neilgherry district, Bangalore and Madras, who can land at Calicut for Beypore, and proceed from thence by rail.

Passengers for Calcutta can take the same route, picking up the steamer at Madras.

Bombay, January 1870. W. NICOL & Co., Agents.

COMMERCIAL UNION ASSURANCE COMPANY.

HEAD OFFICE : 19 & 20, CORNHILL, LONDON.

Capital fully subscribed.....£2,500,000.
Amount paid up..... £250,000.

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DR. W. PALMER, General Hospital. Hours 12½ to 2 P.M.

BANKERS.

The Oriental Bank Corporation.
The Chartered Mercantile Bank of India, London and China.

SOLICITORS.

Messrs. Berners, Sanderson, and Upton.

LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent., of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid. Subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office*

Yearly premium for the Assurance of Rs. 1,000.

Age next Birthday.	For the whole term of Life. without Profits.	For the whole term of Life. With Profits.	Age next Birthday.	For short periods, &c. For One Year.	For Three Years.	For Seven Years.
	Rs a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.	Rs. a. p.
30	35 0 0	39 0 0	30			
31	35 0 0	39 0 0	31			
32	36 0 0	40 0 0	32			
33	36 0 0	41 0 0	33	35		
34	37 0 0	41 0 0	34	&	28 0 0	28 0 0	20 0 0	35 &
35	38 0 0	42 0 0	35	under				under
36	38 0 0	43 0 0	36	36	28 0 0	29 0 0	20 0 0	36
37	39 0 0	44 0 0	37	37	29 0 0	29 0 0	30 0 0	37
38	40 0 0	45 0 0	38	38	29 0 0	29 0 0	30 0 0	38
39	41 0 0	46 0 0	39	39	29 0 0	29 0 0	30 0 0	39
40	42 0 0	47 0 0	40	40	29 0 0	30 0 0	31 0 0	40
41	43 0 0	49 0 0	41	41	30 0 0	30 0 0	32 0 0	41
42	44 0 0	50 0 0	42	42	30 0 0	31 0 0	33 0 0	42
43	46 0 0	51 0 0	43	43	31 0 0	32 0 0	34 0 0	43
44	47 0 0	53 0 0	44	44	32 0 0	33 0 0	35 0 0	44
45	48 0 0	54 0 0	45	45	33 0 0	34 0 0	36 0 0	45
46	50 0 0	56 0 0	46	46	34 0 0	35 0 0	37 0 0	46
47	51 0 0	57 0 0	47	47	35 0 0	36 0 0	38 0 0	47
48	53 0 0	59 0 0	48	48	36 0 0	37 0 0	39 0 0	48
49	54 0 0	60 0 0	49	49	37 0 0	38 0 0	40 0 0	49
50	55 6 0	62 0 0	50	50	38 0 0	39 0 0	42 0 0	50

The above rates will compare favourably with the *civil rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits,* 31*st December,* 1867.

Age at entry,	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	£. s. d	£. s. d.	£. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.* Medical fees are paid by the company.

Claims are paid *one month* after satisfactory proof of death.

Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.

The office is a comparatively young one (first policy issued in 1863), and *is therefore free from old liabilities.*

It possesses a very large capital, *the whole of which is fully subscribed.*

Its investments are all *of a first-class character.*

The life funds are allowed to accumulate *in special trust* for the primary security of life policies

The expenses of management are guaranteed by the deed of settlement *not to exceed* 10 *per cent of the premium income.*

The London Direction consists *of first-class city merchants, who look after the business themselves, who are all shareholders in the company, and nearly all of whom have been on the Board from the commencement.*

The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.

The first-class position which the office holds at home, *as shewn by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bulloch Brothers
Bankipore	W. Fraser, Esq , Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R Bain, Esq.
Bombay	Messrs. G. W Wheatley & Co.
Cawnpore	W. Neill, Esq , Bank of Bengal
Ditto	Bank of Upper India
Ditto	T Lucas & Co.
Chittagong	Messrs Bulloch Brothers.
Champaran	James Begg, Esq.
Champaran Districts	E, C. Lamb, Esq.
Cochin	Peirce, Leslie, & Co.
Coconada	W. M Abell, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq , Bank of Bengal.
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Jhansie	Bazenjee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D Watters, Esq., Bank of Bengal.
Lucknow	W Dickson, Esq., Bank of Bengal.
Ditto	W. A. N. Langdon, Esq.
Madras	C L. O'Brien, Esq., Secretary to the Local Board
Moulmain	Messrs. Bulloch Brothers.
Mecan Mer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nagpore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
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Sylhet	E. G. Foley, Esq.
Saugor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Tirhoot	E Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December 1870, exceeded £127,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built and tiled, or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months	6 months.	3 months.	2 months.	1 month.
	as.	as.	as.	as.	as.
Private Dwelling Houses...	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building. from to)	10	7½	5	4	2½
	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton,,	16	12	8	7	4
Presses or screw-houses cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2. By order of the Directors of the Indian Branch,

No. 1, Hare Street, Calcutta, 31st March 1871. } C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, TUESDAY, 21ST NOVEMBER 1871. [No. 4.

The Indian Economist.

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LETTERS TO THE EDITOR.

To the Editor of the "Indian Economist."

MY DEAR SIR,—Volume 4, No. 5 of the Revenue Reporter, published under the orders of the Board of Revenue, North-Western Provinces, dated 1870, is filled with some reports of the Settlement Officer and the Assistant Settlement Officer of Bareilly, on certain portions of that district.

The Settlement Officer, Mr. Moens, talking of the pergunnah of Serowlee, states that 55 per cent. of its cultivated area is bhoor; and only 17 per cent. is irrigated.

On the same page he describes the soil, and says, the light surface soil had been blown off. Again he says "every thing however depends on irrigation. A branch from the Ranigung, a canal passing through the pergunnah, would change it into a garden, &c." Now I doubt the correctness of the premises laid down by Mr. Moens, and I will again quote parts of his report, and also of the Administration Report of the North-Western Provinces for 1870. On page 220 of the Revenue Reporter, the succeeding page to that above quoted, Mr. Moens says—"Imagine the godsend, a canal which would enable the village to irrigate their whole rubbee by flow in three or four days." Here Mr. Moens enlarges on the benefits he thinks would accrue from irrigation. In paragraph 4, page 221, of the same Revenue Reporter, Mr. Moens states that the irrigated cultivated area has increased. Before going any further, I ask you to say whether the term "godsend" as used by Mr. Moens, is not a mistake, and that the word had not better been altered to a "devilsend?" Is it, or is it not, the fact that wherever irrigational canals have been made in Upper India, or even where irrigation has been carried on from wells or jheels, the climate of the country has deteriorated? Still we find the Government of India inclined to tax the country to pay for the cost of irrigational works. Again, in the above-quoted paragraph, he says, "the irrigated cultivated area has increased."

What has, so far, been the result of increase of irrigation, except an increase of disease?

What caused the increase of irrigation?

I believe it was simply caused by pressure put on the people through the European officials of the different districts who had an idea, crops could not be grown, without being swamped.

This idea seems to me to be rather contrary to the laws of nature. I think we have had in the North-Western Provinces sufficient proofs of the ill-effects of irrigation.

Take, for instance, the old military station of "Karual" previous to the Sutledge campaign. This was considered one of the most healthy stations in Upper India. It had to be given up as a Military Station being found unhealthy, *after a canal had been dug past it for irrigational purposes.*

Similarly the districts of Seharunpur and Mozuffurnugger, and a great part of the Meerut district, which have been flooded by irrigation, and were formerly considered the healthiest parts of these provinces, now, from the so-called "godsend" of irrigation, are nothing more than pest houses where no human being can live in health. On page 200 of the above-mentioned Revenue Reporter, Mr. Moens states, "I have entered all land as barren which is so poor as not to be likely, under any circumstances, to be brought under cultivation, its poverty being gauged by the simplest test, the growth of the grass.

The question here arises, was not the simple test above described, a little too simple.

On page 262, Mr. Moens states with reference to the comparative produce per acre of ordinary cereals in parts of the Bareilly district and England, "my experiments show that there is no reason why we should not grow as good wheat here as in England, at a lower cost, and also how large is the margin, for possible improvement in produce by scientific agriculture." I quite agree with Mr. Moens, that there is no reason why we should not in India grow as good wheat as in England, and at a smaller cost, and in fact, there is no reason why we should not, with the more suitable climate of these provinces, grow a very superior description of grain to what can be grown in the precarious climate of England.

In the next sentence, Mr. Moens says "I doubt, however, whether this improvement will ever take place." "Our landlords are useless honey-eating drones," &c. Mr. Moens is here quite right again, but if the present landlords are such useless drones, could not a little encouragement be given to a better description of landlord.

In the next paragraph, page 262, we have "turning from the curious to the useful, there is one more point in these experiments deserving notice, and that is, *the very small difference in the amount of produce, between the irrigated and dry lands*"! This seems to be at variance with the opinion previously expressed by Mr. Moens that a canal would be a godsend. If the unirrigated lands produce as much as the irrigated or even nearly as much, what then I ask, is the good of irrigation?

Irrigation costs money, and why should it be kept up, or why should canals be dug, if they do not increase the produce of the country.

Yours truly,

North-West Provinces, October 1871. AGRICOLA.

1 Nov.

FAMINE IN INDIA.—III.

TAXATION IN KIND.

OUDH produces no precious metals, while we require the people to pay their taxes in silver, and take from the province every year no less a sum than £550,000 in this shape, as its contribution towards the Imperial charges of the country. At this rate, we should not be long in draining the province of all the money it possesses, were it not for two causes: (1) the exports of produce which it makes to surrounding territories, and for which the province receives payment in silver, and (2) for our military expenditure therein. Now, simple as these considerations are, they have never to our knowledge been used as they ought to have been by the State, to ascertain the precise economic effects of our rule upon the various provinces of the Empire. For the same considerations apply to every district of the country, and long since ought we to have informed ourselves exactly of the effects of this drain upon the economic condition of the people. Our rule is continually abstracting masses of silver from the currency of every province, and were that currency not replenished by the exports of the province, or by our military expenditure therein, money would disappear from the country altogether, and we should be *compelled* to take payment of the taxes in kind, from sheer impossibility of the people to find money. Take the case of a remote territory like Chatteesghur which is nearly isolated from all intercourse with the districts around it from want of 'communications,' as we technically call them. The district produces neither gold nor silver. Every rupee found therein has been imported, and the district can have obtained these imports only in one of two ways:— (1) by the expenditure of the State upon the civil and military establishments therein; or (2) by contriving to

sell some of its surplus produce to surrounding territories in exchange for silver.

It is matter of keen regret that Indian statesmen have so little understanding of these simple economic facts of our condition. Thus the fact that we are abstracting every year for Imperial charges, a vast amount of *silver* from provinces which produce none, gives no anxiety, and raises no question as to how the people manage to pay it. Instead of the process being clearly apprehended and its phenomena carefully watched and recorded for purposes of enlightened Government, we make the demand and expect it to be satisfied as a matter of course. But in an Empire like this, an exhaustive and statesman-like exposition ought to be made every year, of the condition of every province therein, and an effort made to understand and describe the effects thereon of our whole system of administration. Every year should we be told, the exact amount of produce exported by the several provinces, and the mode in which they were paid for these exports; the amount of money raised by taxation therein; the proportion thereof expended upon the civil and military establishments upon the spot, and the amount abstracted as contributions towards the Imperial Treasury. We have a strong suspicion in the case of Oudh, that the comparative cheapness of grain therein, arises from the heavy annual drain of silver we make thereon for Imperial wants. It is not that grain normally is cheaper there than in the Dooab, but that silver is more scarce. It is all very well to call Oudh the granary of the North-West, but what if it is our exactions that force the province to part with its superior grains to obtain silver to meet them! The standard of living would seem to be poorer in that unhappy province than in almost any other in the country, and if this is occasioned by our administrative system, it is only by a cruel irony that it is termed the granary of the surrounding districts. Precise enquiry ought long since to have been made as to the following points :—

1. The total amount of money raised by taxes in the Province.
2. The way in which that money is expended.
   (*a*) Upon local establishments, civil and military.
   (*b*) Export for the Imperial Treasury.

If our demand upon the province for the Imperial Treasury trenches upon the amount of currency which is required for the internal exchanges of the people, we can easily account for the comparative cheapness of food in the province, and the miserable condition of the cultivator. Wherever we find a people dependent upon other provinces for their supply of money, the question of *cash assessments* therein becomes one of great economic importance. Such a people may be able to pay with ease an assessment in kind, which, if demanded in silver, would simply beggar them, and we complain, that, to this hour, our statesmen have never fully grasped these considerations, nor carefully sought an exact understanding of their bearing upon the welfare of the people. We are not affirming that Oudh *is* being impoverished by our system of taking the revenues in cash, but the indebtedness of the cultivator, and the low standard of living with the class, suggest the necessity of close and jealous enquiry into the matter. If we are abstracting more money from the province that the people find it easy to import for replenishing their currency, our revenue system is then undoubtedly the main occasion of the low scale of prices prevailing therein. And were Government wise, it would make full enquiry into the point. The facts are not within *our* reach; and we can but point out what the State ought to do. It is a terrible reflection that after all it may simply be our administrative system that is impoverishing the masses of the people. It should never be forgotten when we speak of the misrule of the Native Princes of the country, that their revenues, however squandered, were still spent within the province itself. The evil and danger of our system is the abstraction of masses of money therefrom for foreign use, or what we call Imperial expenditure.

We noticed in our last issue that the Chief Commissioner of the Province in 1868 invited an answer to the following questions concerning the indebtedness of the cultivator, from the Commissioners under him :—

1. What are the kharif and rabi crops grown?
2. How is the produce disposed of by (1) the unindebted, and (2) indebted cultivators? [Note.—It is understood that in many cases the whole produce is made over to the mahajan; in others, the less valuable crops are retained for consumption; in others sugar, oil, seeds, and cotton are sold in the market for cash; in others, they are sold at a discount to the mahajan.]
3. What are the terms of interest on which advances of seed, food, or money, are made?
4. When are the accounts made up, and in what form are they kept?

Amongst the replies which the circular elicited was one from the Assistant Settlement Officer of Seetapoor, who after answering the specific questions propounded, wrote as follows :—

"To answer these questions has been easy, but it is very difficult "indeed to offer any suggestion for rendering the cultivators more "independent. I cannot believe the cultivators themselves will ever "materially improve their condition by their own exertions and "frugality,—at least within the present generation,—so far as to "be clear of debt. It might be effected by a sudden flood of pros-"perity produced by perfectly exceptional circumstances, such as "the high price of cotton in Berar during the last two or three "years of the American war. I believe that the cultivators in "that province completely freed themselves from the trammels "of the money-lender, and have since shown no tendency to "become again involved. There is no chance of anything of this "sort ever happening in Oudh, but there can be no doubt that if "the Oudh cultivators were once freed from the money-lenders, "they would never again become so involved as the majority of "them are at present.

"In the opinion of natives, Government ought to interfere "authoritatively, not perhaps by fixing the rate of interest, for it "is acknowledged that in that case the mahajans would withold "advances altogether, but by the medium of the civil courts, "which should be directed never to award higher interest than the "'deorah hisab;' *i. e.*, after a year instead of six months, and "should make the decree-money payable in long instalments. I "have, in the last two months, talked to many natives of all ranks "on this subject, but have found none who recommend anything "else.

"There is no doubt a general idea that the zemindars are bound "to help their tenants by liberal advances of takavi, but these ad-"vances are not popular among the cultivators. Many zemindars "make advances to their cultivators on the same terms as the ma-"hajans, and exact the same profits. The peasantry prefer the "money-lenders to their landlords, for the simple reason that the "latter have much greater facilities for realizing the debt to the "last farthing than the mahajans have. The zemindar would "take everything due to him before it left the field; the maha-"jan can be indefinitely put off; and if he is quite overbearing, "the cultivator can leave him for another man: in short the latter "borrows from his mahajan hoping to cheat him, but he knows he "cannot cheat his landlord. I do not think it often happens that "a ryot leaves his mahajan to go to another one; if so, there "would be competition to a considerable extent among the money-"lenders, and the rates of interest would fall. At present there "is apparently hardly any, and one mahajan to every four or five "or more villages is a fair average. Still the thing is possible and "occasionally happens, and the fear of it practically does lower the "rates, for when a cultivator's debt is too large for him to pay, it runs "on for years, and the mahajan eventually accepts some compromise. "Of course here, as everywhere else, interest must be regulated by "the relation between the supply of capital and the power of "employing it advantageously, and must vary according to the "security for the repayment of the principal and the duration of the "loan. A deal of the interest charged by mahajans is a bonus to "compensate them for the risk of losing the principal itself. It "would be curious to know what amount of bad debts these men "have. In any case Government could not interfere with the "mahajans. *If a landlord can get under our rule, the highest rates "offered for his land*, why should a capitalist be fettered and "restricted in the employment of his stock?

"I think, however, Government might interfere in another way. "As landlord of an estate under the Court of Wards, it might set "an example which other landlords, especially talukdars, should "be advised to follow. A single estate might be taken at first for "the experiment. The cultivators might be given liberal advances "of takavi at a very moderate rate of interest payable at harvest "time, and Government might take upon itself the gra-"dual payment of the debts due by them to the mahajans "at the beginning. There would be no risk of loss, for the "advance would be repaid before the crop left the field. "Natives assure me that if such an experiment were tried, and "official pressure brought on great talukdars and others to induce "them to follow the example, there is no part of this district "where the cultivators would not be completely out of debt in "four or five years. Unless the peasantry are in some way assist-"ed, it will take more than one generation to effect this result, "even though their condition is even now somewhat better than "it was twelve years ago. The time when Government has "voluntarily undertaken to aid impoverished talukdars in "getting rid of the encumbrances on their estates, would appear

"a favourable one for some such experiment as I have suggested. "Surely the moral obligation of Government to assist the cultivators, is as great as in the case of the other class for whom so "much has already been done."

We cannot conceal the expression of our own conviction that it is quite within the power of the Government by means of the Court of Wards, and by a re-adjustment of the process by which the Land Revenue is collected, to rescue the people from their misery. We do not believe the ryot to be the thriftless, improvident creature, he is so commonly declared to be. We believe the picture to be untrue, and that in the main, the cultivator is frugal as well as industrious. It is a terrible reproach to our rule that the class should be so miserably oppressed under us, and we refuse to believe that their redemption is hopeless. Give to us a single district in the province, with power but for six years only to bind the hands of the bunia, to make *takkavi* advances to the people, to collect the land revenue in kind, and in *arrears* instead of advance, and we would stake our existence upon the promise to shew you at its close a district full of prosperous yeomen, without the sacrifice of a single rupee of revenue in the end.

In reply to our suggestion that the State would probably do wisely to prepare reserves of food as a precaution against dearth in the famine tracts of the country, the *Pioneer* points out (1) that the scale of storing to be of real service in famine would have to be enormous, so large indeed as seriously to affect the price of grain in time of plenty; (2) that the storing of grain is a very expensive and difficult process; and (3) that the Government, by selling grain cheap, or distributing it gratuitously in the day of necessity, would be interfering with the market and interposing between the buyer and the seller. Our contemporary tells us further that "many years ago a granary was constructed at "Patna for storing rice against the emergency of a famine. It "was a huge building of the shape of a beehive, and cost £12,000. "The walls though 21 feet thick at the bottom, still bulged out "and gave way in that part of the fabric; and in the absence of a "recorded reason for this, we may perhaps attribute it to the "D. P. W. mortar of the day. It was never filled and never "came into use for its original purpose, and stood for many years "as a ruined monument of a generous but impracticable impulse, "till time erased it from existing things. Kent is the only county "in England where grain is stored to any extent, and there the "granaries are lined with wood, and every precaution has to be "taken against weevil from within and vermin from without. "In this country with far less efficient management, the evils "to be contended with would be a hundredfold."

The difficulty is not exaggerated, but our contemporary seems not to be aware of the improvements that have been made of late years in the construction of European granaries. As a matter of fact, moreover, grain ever *has* been stored in large quantities in India, and what the people and the Native Governments of the country have done before us, we can do now. We are not so sanguine as to imagine that a State granary could be established at Agra, and at half a dozen other great centres of the country, without the expenditure of much thought and labour and expense in their formation. We count fully upon such an expenditure. Much thought, great labour, and heavy expense will have to be spent upon the work, but who that keeps the end steadily in view, will regret these? The work, moreover, is not one to be pressed through to completion in a year or two, or three, or four. Our proposal is that in districts where the ryots are found so hopelessly indebted as in Oudh, the State should take payment of the land revenue for a while in kind, and simply store the grain in the first instance in the neighbourhood instead of selling it. As to the formation of these granaries affecting prices, we have had abundant proof that the stimulus of high prices fails to command sufficient supplies of food in this country during the famine. Capital is too scarce and communications are too imperfect for us to trust to private enterprise for the importation of food into territories so afflicted. But the *Pioneer* does not surely suppose that we mean the State to establish granaries upon a scale to feed the *people* at such times. Our meaning simply is, that wherever a well-defined famine tract exists in the country as at Agra, the State should aim in years of plenty at the establishment of State granaries for feeding the labouring classes whom we are compelled at such period to employ in masses upon public works. Not a maund of grain need be sold at all. Nine times out of ten in India, it is a famine of *work* that overtakes the people. It is not that there is a positive want of food, but that the drought throws the labouring class out of work at the very moment when from the increasing price of food they most need to be fully employed. In these circumstances, the State has to find them employment, and instead of paying them in money as now, to enrich the dealer who is hoarding the grain of the country, we would have the State able to feed them itself from the public granaries. Recalling the last famine (1861) in the North-West, we think it is impossible to doubt that the sufferings of the Dooab and the surrounding districts would have been greatly lessened, had the State been possessed of considerable reserves of food along the Ganges. We propose to the State neither to *buy* grain nor to *sell* it, but considering the miserably indebted state of the cultivator that it should take payment for a few years of the land revenue in kind, and store the grain against the recurrence of famine. In the nature of things the experiment could only be begun in a small and tentative way, but we are sanguine that it would succeed. We find it impossible to reconcile ourselves to idly contemplating matters as they are. We are bound to find a remedy for the miserable condition of the people. The word *Government*, means, in their case, rescuing them from their misery. Let the Court of Wards in Oudh be empowered to make the experiment we recommend. The characteristic of our age is *paralytic* radicalism—the full, and frank and compassionate acknowledgment of existing misery, and then coldly taking leave of it, with philosophic talk about time and general laws. *Government* of the people means grappling with their misery and overcoming it, and making it give place to a state of well-being.

2 Nov.

DECIMALIZATION OF THE COINAGE.

RUPEES AND DOKADAS.

It may quicken the interest which seems to be taken by the Supreme Government in the question of decimalizing our currency, and serve as a sort of counterblast to the demonstration of the Madras Chamber against the proposal, if we say that the people in this part of India ignore the denominations of the existing currency altogether. To this day, accounts are kept in Bombay by Natives and Europeans, in rupees, quarters, and reas. Thirty or forty years ago, the official accounts of the Bombay Presidency were kept in the same way:—

100 Reas = 1 quarter (4 annas).
4 quarters = 400 Reas = 1 Rupee.

We have here a decimal system already existing amongst us dating from the time of the Portuguese, so superior to the modern device of rupees, annas, and pies, that it is the money of accounts with merchants and traders to this hour. To talk therefore of *introducing* a decimal system of currency into India, in so far as Bombay is concerned is an error. The people already have it. They reject the clumsy currency we have so long tried to force upon them, and stand by the old and better way. The result is, that we have two descriptions of money in use in Western India, the actual mint coinage current in the bazaar, and the money of accounts differing from it altogether. Our local readers are of course familiar with the fact; but it may be new to readers at a distance. It is *not* generally known, however, even in Bombay, that in some parts of the presidency, as in Guzerat, accounts are kept in a currency still more purely decimal, and greatly superior to the Portuguese system of which the integer is the quarter of 100 reas. We have ourselves been aware of this fact for some years, and a correspondent brings it prominently to our notice as follows:—

"Whatever the value, and whatever the denominations of the currency, the natives of Guzerat make all their calculations of interest, discount, and exchange by a decimal process.

One hundred Dokadas (વીસ્સી) = one Rupee.

"When rupees, quarters, and reas were the authorized standard, and now when rupees, annas, and pies, have taken their place, the real calculating standard was and still is Rupees and Dokadas. You will perceive that the value of the Dokada is exactly one mille of a Pound.

£1 = 10 Rs. = 1000 Dokadas.

"An intermediate denomination equal to one-tenth of a Rupee, or to 10 Dokadas is all that would be required for a perfect decimal coinage. And nothing could be better than the names proposed in "Extracts from the Proceedings of the Government, &c.," Page 2, No. 4. They would in Gujarati read એક પાંડુ, એક દશમી = એક રૂપીયો, એક-શતમી and એક હજારી = એક દોકડો. The coining of smaller coins than a Dokada, any of a half Dokada, nearly equal to one pie, or of coins equal to two or three Dokadas in copper, and of coins of higher values in silver, would be a matter of mere convenience, and can be easily settled. You may perhaps have noticed the rapidity with which natives will often calculate interest and exchange. The secret simply is that they are masters of the decimal system in use. They first get the answer in *Dokadas*, and then by a sort of practice table, read off the equivalent in rupees, annas, and pies. I have frequently found natives who could tell almost instantly in Dokadas, the answer to any given sum, but they have stumbled over the equivalents in rupees, annas, and pies.

"I laid the subject of your papers before some intelligent Banias here. They did not relish the idea of a new currency. I tried to explain to them what was the nature of the proposed currency. They still shook their heads. But I said, suppose the Dokada is coined? They at once exclaimed, *that* would be just the thing. "What we should have then to write in our books would exactly represent the process of our minds. We should be saved the perpetual annoyance of calculating on one system, and making equivalents, and be saved also the loss arising from the discrepancy between the coins of the currency and the Dokada of our calculations." If I am not mistaken, the term Dokada is derived from the Sanscrit Dashakah दशकः, and simply means Decimal. The use of the Dokada as a standard for calculation is universal in Gujarat. One can easily conjecture, how this standard came into use. Something of the sort was necessary for extended business in a country in which formerly every little Rajah had his separate currency. I do not think the Government need fear any inconvenience to the people from the introduction of the decimal system. Merchants who still keep their accounts in rupees, quarters, and pies, would find the decimal currency more convenient than the present. Native merchants throughout the country would find their theoretical system in harmony with the authorized currency, and there would be a great saving of time and trouble in all offices, both public and private. There may be some difficulty and fear of sacrifice with reference to the two-anna pieces, and the copper coin in circulation; but this case does not seem to be anything so serious as that which was met and overcome, when the present system was introduced, to the abolition of some half dozen different currencies in various parts of India. Our facilities are surely now much greater than the means available some 30 or 33 years ago. A gradual calling in of the old and a steady paying out of the new, would soon effect all that could be desired. At least, so it seems to an outsider like me.

"A decimal system for weights and measures would be very desirable and may be gradually introduced. *Any general system* would be a relief from the endless variety and confusion arising therefrom, which at present exists. A decimal system has of course special recommendations. I understand that the practice of calculating by Dokadas is used also in the Dekkan. If so to any extent, the probability is that it may be known beyond and perhaps over a large extent of the country. If this is the case, the question of difficulty to the natives is reduced to a very small matter.

HOME CHARGES.

THE POSTAL SERVICE.

"THE mistake of those who believe that fraud, force, *injustice*, whatsoever untrue thing, howsoever cloaked or decorated, was ever, or can ever be, the principle of man's relations to man—is great and the greatest. It is the error of the infidel, in whom the truth as yet is *not* * *. Any given thing, either *is* unjust or else just, however obscure the arguings and strugglings on it be the thing in itself, there as it lies, infallibly enough *is* the one or the other. To which let us add only this, the first, last article of faith, the Alpha and Omega of all faith among men, that nothing which is unjust can hope to continue in this world. Is it not from of old indubitable that untruth, injustice, which is but acted untruth, has no power to continue in this true universe of ours? Known and laid to heart, it must everywhere be before peace can pretend to come. All true men, high and low, each in his sphere, are consciously or unconsciously bringing it to pass; all false and half true men are fruitlessly spending themselves to hinder it from coming to pass * *. Force itself, the hopelessness of resistance, has doubtless a composing effect;—against inanimate and much other infliction of the like sort, we have found it suffice to produce complete composure. Yet one would say, a permanent injustice, even from an Infinite Power, would prove unendurable by men."

And yet they are dreaming in the India Office that the injustice with which the finite Power we call England, regulates all her financial arrangements with this dependency which we call "our Indian Empire" will contrive somehow to maintain itself in the universe of the all just Maker and Governor of men. Separated from the events of 1857, by less than fifteen years, the nation has not yet learned that "the unjust thing has no friend in the Earth or in the Heaven, that at bottom it has all men and the universe itself arrayed against it."

"We have the honour to acknowledge the receipt of your Grace's Public Despatch, No. 17, dated 9th March 1871, from which we regret to learn that the Lords Commissioners of Her Majesty's Treasury finally decline to concede certain claims which we have made for the relief of the tax-payers of British India.

"We have urged, in previous despatches, that it is unjust to saddle this country with a charge of £12,209 in respect of the postal services between Galle and Calcutta, explaining that our postal interest in this branch of the lines served by the Peninsular and Oriental Steam Navigation Company is so insignificant, that we could readily even dispense with it altogether.

"We continue to consider this claim indisputably fair and equitable, and we cannot accept as in any respect a satisfactory and sufficient answer to it, the allegation that it would be inconvenient to "unsettle the whole arrangements, in order to determine how the relief," to which this country is justly entitled, is "to be made good by the various other contributors."

"Again, we have remonstrated against the injustice of the absorption by the British Post Office of the whole of the excess postage collected as well in British India as in Great Britian upon the mails despatched by the French packets, and have emphatically claimed, for the revenue of British India, the portion of that excess collected in India.

"The only answer afforded to this claim is, that the Lords of the Treasury, having given it their consideration, are not prepared to alter or disturb the present arrangement."

So writes the Government of India to the Secretary of State. My Lords of the Treasury having no faith in the Universe or its Maker, contrive to persuade themselves that a little *profitable* pilfering is possible in the case, and do not dream that they are but guiding their country to the abyss. "The Throne of Iniquity decreeing injustice by a law" because it is not prepared to alter or disturb arrangements unjust to the discernment of all men from the first, and solemnly protested against, but now not to be disturbed, having become venerable and prescriptive by five years' duration. "There is a payment," says the prophet, "which Nature rigorously exacts of men, and also of nations, and this when her wrath is sternest in the shape of dooming them to possess money. Nature, when her scorn of a slave is divinest, and blazes like the blinding lightning against his slavehood, often enough flings him a bag of money, silently saying: 'That! away; thy doom is that!'

Is there no room for fearing that this doom is falling upon us as a people: to possess money, and lose the nation's soul? Here is our latest shame:—

Resolution of the Government of India.

The average actual payment received by the Indian Post Office for carrying letters addressed to Great Britain, does not, after deducting the discount paid on the sale of the postage labels, exceed three pies for a letter weighing half an ounce, and that in respect to letters addressed to other foreign countries *viâ* Great Britain, there is a positive loss. The charge for a letter weighing the equivalent of half an ounce carried from one place to another in India (deducting the average discount) is 22¼ pie. Moreover, the Indian Post Office makes specially costly arrangements for expediting the mails received from and addressed to the United Kingdom. So that it has, on the whole, at present, to bear an annual loss on this account of about three lakhs of rupees (£30,000). The Government of India has made earnest and repeated endeavours to induce the Imperial Government to consent to a distribution of the postal revenue derived from these letters more equitable to British India. These endeavours have been unsuccessful; and it is evident that no relief can be expected in this way. On the contrary, the reduction of the fixed rate of exchange for adjusting transaction between the Imperial and Indian Governments from 2*s.* to 1*s.* 11*d.* the rupee, has deprived the Indian revenues of an important compensation.

Eleven pence (the amount payable to the British Post Office on each half-ounce letter) cost at 2*s.* the rupee, 7 annas 4 pie; at 1*s.* 11*d.* the rupee, it costs more than 7 annas 7 pie: so that the alteration of the fixed rate of exchange, however just in itself, has deprived the revenues of India of rather more than 3 pie on each half-ounce letter for the postage on which it has to account to the British Post Office. It would be quite unjustifiable for the Government of India to continue to carry the correspondence of this country with the rest of the world at a heavy

charge to the general revenues. The Right Hon. the Governor-General in-Council, therefore, reluctantly resolves that the Director General of the Post Office shall be instructed to arrange for the levy, from the earliest convenient date, on behalf of the Indian revenues, of additional postage at the rate of 1*d.* or 8 pie on each half-ounce letter which passes to or from India through Great Britain, and in respect to which accounts have to be rendered to the British Post Office. The Director General must further report whether the use of labels of specified denominations may not be rendered compulsory for the payment of the postage on letters despatched by the contract mail steamers to places out of British India and, if so, whether the charge for discount on the sales of these labels may not be either stopped altogether or greatly reduced.

All honour to Lord Mayo for his loyalty to the people whom he governs. He will have the gratitude of all Englishmen too, who are jealous for their country's honour and concerned for its future.

WELL ASSESSMENT.

BOMBAY SURVEY SETTLEMENT.

A VERY important question in connection with the re-settlement of the land in this Presidency, now that the 30 years' leases are beginning to fall in, is the question of well assessment. The matter is so important, that it is impossible for it to be disposed of by a few casual words in a Government Resolution. It is one of those questions that should be discussed in all its aspects, and a final decision arrived at in the open face of day. It is a question that the Local Government has no right to dispose of upon its own responsibility. The issue should be distinctly and fully raised, and submitted to the judgment of the Supreme Government. The public which has a deep interest in it, should be invited to take part in its determination; and to promote this, we shall now state how the matter stands. The question arose, as it was inevitable it should, in the re-settlement of the first district in which the Settlement Officers were called upon to declare the terms upon which the new leases of the land would be granted to the people; and was stated by Colonel Francis in the following terms:—

"Great care will be required of the revising officer in respect to the treatment of improvements made with the cultivator's capital. The Survey Rules preclude the levy of any extra assessment during the currency of a settlement lease on account of the enhanced value of land resulting from such improvements. And the same ruling has been embodied in that part of the Survey Act relating to revision operations, the following being the provision inserted in the concluding part of Section 30:—"Such revised assessment shall be fixed, not with reference to improvements made by the owners or occupants from private capital and resources during the currency of any settlement under this Act, but with reference to general considerations of the value of land whether as to soil or situation, prices of produce or facilities of communication." There may, perhaps, be some difficulty in determining precisely the kind of improvement which is to be exempted from assessment at the revision. There are some improvements which obviously come under the rule: the construction of a new well, and the conversion thereby of dry-crop into garden land, and, in the same way, the repair of an old one during the currency of the settlement. These are both cases to which the rule is clearly applicable. The planting of trees, which in some districts would give an increased value to land, is another proper exemption from enhanced assessment. And, except in cases where rules have been made specially providing for the re-survey of rice lands at the expiration of the lease, or where rice land is held under special conditions, I should consider that new rice land—made out of jerayet or dry-crop cultivation at the ryots' expense—is not assessable otherwise than at jerayet rates, provided the land was so assessed under the original settlement. These are clear and obvious cases, I think, in which the enhancement of assessment, on account of improvement, is specially barred."

Upon submitting this Report to Sir George Wingate in England (1866), that gentleman took exception to the views expressed by Colonel Francis, in the following terms:—

"The question of exempting improvements made with the cultivator's capital, considered in the 135th and following paragraphs, is an important one, but demands very careful consideration in its practical application. The Survey Act limits the discretion of the revising officer more than is perhaps desirable by the enactment in the concluding part of Section 30, that "such revised assessment shall be fixed, not with reference to improvements made by the owners or occupants from private capital or resources during the currency of any settlement under this Act, but with reference to general considerations of the value of land, whether as to soil or situation, prices of produce or facilities of communication." Colonel Francis considers that this provision clearly exempts land brought under irrigation by the construction of a new well, or the repair of an old one from the imposition of additional assessment on that account. I am not satisfied of the correctness of this view, and although a decision may not be of much importance *in the case of Indapoor*, it may be, and probably would be so in other districts where well irrigation is extensively carried on and admits of great development. The application of the cultivator's capital to the construction of a new well, or the repair of an old one, does not *create* water for irrigation, but simply provides means for raising the water, stored in the subsoil, to the surface, and applying it to the land. The well is the production of the cultivator's capital, but the water is not. The operation is exactly analogous to the opening of a new mine, until which time the subterranean mineral lies useless to man, and yields nothing to the proprietor of the land in which it exists. But when once capital has supplied the means of bringing the mineral to the surface in a form suitable to man's wants, it immediately acquires value, and yields a rent or royalty to the proprietor of the land from which it is extracted. Water, like minerals, is a subterranean product, of great value in tropical climates, and therefore capable of legitimately yielding a rent to the lord of the soil, who is the Government in the present case. Colonel Francis estimates the average cost of the new wells, constructed in Indapoor, at 400 Rupees each, 5 per cent. on this capital, *i.e.*: 20 Rupees, with an addition for the replacement of the capital in 50 years, which may be considered as the duration of an ordinary well, together with an allowance for annual repairs, say 10 Rupees, thus making 30 Rupees in all, would be an adequate return to the cultivator for the expenditure of his capital; and if the additional value conferred upon the net returns from the land irrigated from the well over and above those obtained from it when cultivated as dry-crop should exceed 30 Rupees, then this surplus forms the value of the water which was previously an undeveloped capability of the land, and may most legitimately be made the subject of additional assessment. I am unable therefore to agree with Colonel Francis in considering the conversion of dry crop into garden land, by the construction of a new well, or the repair of an old one, to be in all cases excluded from increase of assessment by Section 30 of the Survey Act. I would not, however, propose to apply to such land any higher rate of assessment than the maximum dry-crop rate which Colonel Francis has recommended, though I think it might be desirable to record all land irrigated from wells separately from the ordinary dry-crop, with the view of presenting accurate statistics of the settlement, and of facilitating the imposition of special rates of assessment on garden land at a future settlement, should that course be then deemed desirable. It may be further mentioned in support of this suggestion, that should the district ever be brought under irrigation by means of a Canal from the Moota or other river, which is referred to in the 189th paragraph of the Report, the saturation of the soil by this means would probably give a great extension to well irrigation, so that the question of an additional assessment for that description of cultivation might rise into importance."

Reviewing this judgment of Sir George Wingate, in March 1868, the Bombay Government expressed itself as follows:—

"There is a great deal of force in what Sir George Wingate urges in his 6th to 9th paragraphs about the taxation of improvements. But Government cannot fully coincide in all his conclusions. In regard to special taxation of wells, it is said with truth that water is, like mineral wealth, fairly taxable by the landlord when used by the tenant. His Excellency in Council, however, considers that the first principle of its taxation should be that which governs our taxation of the land itself, that is, the capability of being used rather than the use itself. If water of good quality be easily available near the surface, it is more reasonable to tax such land by a light additional rate, whether the water be used or not, than to lay an oppressively heavy tax on those who expend capital and labour in bringing the water into use. There is, however, a point at which this principle must be modified, for when the land is such that when water is not brought to it, it will bear nothing, and when water is used it will yield a fine crop, than even a light tax in the former case is impossible. Of this class are the sandy tracts in the Konkan, which under the influence of water become cocoanut gardens. It must be held that the right of Government to levy a rate by virtue of the water below the surface is in abeyance, or dormant, till the water is produced, but it is doubted greatly even in this extreme case, whether it is politic, though it may be asserted to be just, to levy more than would be leviable from first-class rice ground, which enjoys also the benefits of water, not created it is true by the tenant, but utilized by means of his preparation of the ground."

The same question has since been raised in the re-settlement of the Madeh talooka and is supposed to have been determined in the same way. During the currency of the old lease, 861 new wells were sunk by the cultivators and 98 old ones repaired, and in re-settling the land thus converted into garden land, the Indapoor plan of assessing them only at the highest dry crop (jerayet) rates of the village was recommended by the Settlement Officer. The Survey Commissioner, Colonel Francis, approved the recommendation, and in submitting it to Government, expressed himself thereon as follows:—

I am sure it is a wise policy to forego the taxation of wells in a district subject as this is to periodical droughts. Every encouragement should be given to the construction of wells, and if the plan of granting loans for agricultural improvements is ever brought out, I should like to see the funds largely devoted to the above purpose. In his famine report, Colonel Baird Smith records it as his opinion, that at least one-third of the culturable area of a district should be supplied with the means of irrigation to enable the people to withstand the effects of a season of drought. Now, if we take the case of this district, we find the

irrigable land (10,968 acres), which is almost entirely under wells, bears the small proportion of 3·22 per cent. to the total culturable area. I think so large a proportion as a third is not necessary in this case, and that if we can bring above a tenth part of it under irrigation, provided it is pretty generally distributed over the district, we need fear no disastrous results from an occasional failure of the ordinary dry crops. The encouragement given to the expenditure of capital on such works by the remission of all special taxation will lead, I hope, to a considerable extension of the irrigable area in the course of a few years.

The importance of bagayet cultivation to this district was fully recognized by the Survey Officers at the first settlement. Referring to the subject, Lieutenant Wingate observes:—"It is to the extension of bagayet cultivation that we have to look for the most considerable addition to the resources and value of these districts; and as affording the best provision against the recurrence of those dearths and famines which have so frequently ravaged this part of the country, the policy of imposing an extra tax at all under such circumstances may well be doubted; but as Government might have difficulty in finding a less objectionable substitute for the loss of revenue its remission would entail, I do not venture to recommend this step." This reason for the imposition of a special tax on well garden lands no longer exists; on the contrary, the increase of 77 per cent. enables us easily to forego the revenue that would be realized by such a tax.

The Government supposed itself to be taking the same view and in the Resolution confirming the new leases, says:—

"The principle of placing no extra cess on lands irrigated by wells has the entire approval of Government. It is presumed that the highest jerayet rate has only been imposed on such lands as were formerly subjected to extra well assessment, and not on lands irrigated from wells constructed during the period of the settlement just expired. It is of the utmost importance to give every encouragement to the sinking of wells in a district where the rainfall is so light and uncertain; and any application that may be made for advances for this purpose will meet with favourable consideration."

Now a difficulty arises here: for if we understand this passage aright, Government repudiates 'the highest jerayet rate' in any case where the well was built during the currency of the old lease, and lays down the principle that *no extra assessment* whatever is to be placed on land for improvements effected by such means. And in doing so it disallows if we mistake not, the practice which it supposes it is approving. For if we read Colonel Francis aright, the rule adopted by him in Indapoor was to levy "the highest jerayet rate" on *all* lands whatever that he found improved by wells, new or old. Paras. 177 and 178 of his Indapoor Report seem to us to establish this conclusively. They run as follows:—

"The cultivators seem to have been impressed with the belief that the guarantee given in the joint report rules exempting new wells from assessment would extend only to the end of the present lease. Considering, therefore, the large number of new wells which have been constructed—as shown in a preceding paragraph—under such a conditional arrangement, I think the time has come for us to declare that henceforth no extra assessment will be placed on well-garden cultivation. It needs only such an assurance to bring forth a large fresh expenditure of capital in the construction of this class of permanent and useful works. It is almost impossible to over-rate the importance of well cultivation in a drought-stricken district like Indapoor. When the country is parched and unproductive from the want of the monsoon rainfall, we see little spots of bright cultivation, dotted here and there about the low lying lands of the village. This cultivation, which is the product of the small supply of water stored in the wells, is often the sole support of the village in such seasons. There may be financial difficulties in disposing of the existing assessment on well-garden cultivation in some districts, and I would not, therefore, ask for any general ruling applicable to all cases. But as there is no such difficulty in Indapoor, and as Government have recently expressed their wish to have present practice in assessing well cultivation modified, I feel no hesitation in proposing the entire abolition of the special cess in that case. The course adopted is to put the first class jerayet rate upon all lands capable of being irrigated from existing wells, irrespective of the value assigned to it by the jerayet classification. But when the land has been classed at the full jerayet rate, no addition has been made in consideration of its being irrigated by a well. Government wish a general addition to be made to the jerayet rates for all lands possessing a water-bearing stratum; but it is almost impossible, I think, to work out this plan in the ever-varying soil of the Deccan. I have, therefore, taken existing wells as the guide, and considered only the land under them as having a water-stratum.

If we understand these paragraphs aright, and we think we do, Colonel Francis in the re-settlement of Indapoor abolished altogether the old practice of levying a special cess upon land irrigated by private wells, and simply levied the highest dry-crop rate on all lands that he found so improved, *whether the wells were old or new*. Sir George Wingate plainly understands that he has done so, with ourselves; while the local Government seems to be under the impression that no increased assessment whatever has been imposed upon lands *newly* improved, but that the "highest jerayet rate," has been imposed only upon land that under the old leases paid a special cess on account of the wells formerly sunk therein. What Government *wished*, we are told in para. 178 was "a general addition to the jerayet rates upon all lands possessing "a water-bearing stratum in lieu of the special cess upon wells." Colonel Francis declares this to be 'impossible' for he could not identify such land. Instead of attempting, therefore, this general addition, he took "existing wells" (new as well as old) as his guide, and wherever he found them, imposed the highest jerayet rates upon such soil. We thus seem to be terribly at cross purposes. Colonel Francis is doing one thing and Sir George Wingate approving it, while the Government supposes him to be doing something else, and is approving *that*. The Government formerly wished an additional rate levied upon all lands possessing a water-bearing stratum as a stimulus to the people to avail themselves of the water. Sir George Wingate claims this also, but accepts the compromise of Colonel Francis, who says, that he assesses all land at the highest jerayet rate wherever he finds wells actually existing upon it. The Government seems to know nothing of this compromise, and to interdict the very course which Colonel Francis is adopting. If we understand these papers, Colonel Francis has abolished under the new leases in Indapoor, the special cess that was formerly levied upon lands irrigated by wells. He would have been glad to carry out the Government wishes, and make a general addition to the dry-crop rates on all soil possessing a water-bearing stratum. But he could not *identify* this soil, and has therefore levied the highest dry-crop rate on all lands which are *proved* to have a water-bearing stratum by the wells thereon, whether new or old. And we think he is right. The act is one of pure *grace* in both cases; and why should the builder of a well in 1860 be favoured more than he who built in 1830? But the further question arises as to the wisdom of these exemptions at all, and we shall now introduce to our readers a thoughtful paper upon this subject which has been addressed to us by a native servant of the Government, which we recommend to their careful study.

"For the last several years," says our correspondent, "the occurrence of famines in various parts of India has directed the attention of philanthropists, Governments, and financiers to the modes of averting these visitations; and obviously the plan of artificially supplying crops with water, temporarily denied by nature, has struck them as the first and cheapest remedy to be applied. But, like almost everything else with us, the idea is fast becoming a hobby, and threatens to be run to death, unless checked in its course in due time. One of the modes adopted of running it, in the Western Presidency, is the total abolition of well assessment in some of the districts recently settled under the guidance of Sir Bartle Frere. In renewing the revenue leases in the Madeh talooka, the Local Government, in sanctioning them, express their entire approval of the principle of placing no extra cess on lands irrigated by wells. We think that this approval is founded on ignorance of the conditions of successful well irrigation, and indeed of all irrigation. Plentiful watering of crops is of use in moistening the earth, and preparing the ingredients of the plants' food for easy absorption by the roots. But the easier they are absorbed, the quicker is the exhaustion of the soil, and the greater is the necessity of replenishing it with nourishment, to fit it for a condition of continual production. The process of supplying moisture to the plant artificially, is also immensely more laborious and costly than dry-crop cultivation. In other words, irrigation is only possible under a system of free manuring and high cultivation, and both these, in their turn, are mainly dependent on a thick population to admit of the sufficient creation of manure, and an increased amount of labour in agricultural operations. High cultivation pre-supposes, moreover, a certain spirit of adventure in the agricultural classes, a fair amount of attainment in the mechanical arts, and the existence of considerable capital in the community. Unless these conditions are fulfilled, irrigation cannot answer; and indeed even with these it will not do so, if the population does not tread fast on the heels of dry-crop cultivation, for jerayet is always cheaper than bagayet. If these principles are undoubted, and we believe they will be admitted by all who have much acquaintance with agriculture, we fail to

see how the mere exemption of wells from assessment can materially assist in extending irrigation; and if it does not, the exemption is a waste of means, and the creation of inconvenient prescriptive rights, which may, at some future period, hamper the exercise by the general community, of its control of what is common property —the water in the soil.

"Madeh is a talook containing, for our purpose, 77 villages and 2,051 wells, or say 27 wells in each village. The culturable area of the district is 269,600 acres. Nearly 11,000 of these, that is less than 6 acres a well, are irrigated from wells. The increase of population since the last lease has been 26 per cent. and of cultivation 24. The increase in the number of wells has been nearly 90 per cent., and the capital invested in them is somewhat less than four lakhs of rupees. We now ask our readers to study the significance of these figures. During the currency of the last lease, an assessment was levied on well irrigation, and yet the increase in the number of wells was 90 per cent.! It is plain therefore that the assessment in no way hindered an increase in wells, nay, it would seem to have encouraged it to the fullest extent, for 27 wells to a village represent more water than can ordinarily be used. Where then is the necessity of foregoing this assessment? We have stated above that an increase in irrigation pre-supposes an increase in population. Now this increase has only been 26 per cent. in 30 years. Such a rate of increase can evidently not support a more rapid increase of irrigation than has taken place The total extent of cultivable land in the talook has only been just taken up, and is not necessarily cultivated, for we suspect the low rates of assessment have induced persons to occupy land which they do not mean to cultivate at present. The Settlement Officer himself has remarked, that this is the cause of the slovenly cultivation of the talooka, and we have no doubt it must be so although Colonel Francis would account for it on other grounds. We thus see that neither on grounds of the necessity of supporting an increased population, nor on those of the increase of manuring resources of the district, is there cause to suppose that the abnormal encouragement to the digging of new wells, which the Government seeks to offer is justified; and therefore we contend that any amount spent in an abnormal increase of wells is unwisely spent. The Settlement Department however appears to be ignorant of the full conditions of bagayet extension. Thus the Settlement Officer regrets, that in a village named Malliacha Koorool 'only' nine new wells were added during the currency of the last lease. This village is called Malliacha "from its pre-eminence as a garden village in former days," when it contained 39 wells. Now we have no means of knowing the number of homesteads in the village, nor its population, nor its acreage, nor the average extent of the holdings of the cultivators, but unless the village is remarkably large, almost every homestead must have a well of its own, and some several. We do not see what the villagers can do with more wells, nor whence they are to obtain the manure necessary to make irrigation profitable. We therefore think them wise in spending their spare capital on something else. The rate of increase indicated by 'only' nine wells is fully explained by the fact that the village already contained a large number of wells, and was already *pre-eminently* a garden village. There was no room for a further extension of irrigation, and the amount of well assessment given up in this village is absolutely a present without consideration to the villagers, instead of its being, as the Settlement Department erroneously think an inducement held out on the part of Government for extending irrigation. We have already seen that during the last lease, an increase of 90 per cent. took place in the number of wells in the Madeh talook, but only a small portion of these is used for irrigation; for under the 2,052 wells, there were but 10,970 acres irrigated, at the rate of hardly 5½ acres a well. The Government itself would seem not to be better advised than the Settlement Department. In its solicitude for the increase of these wells, it presumes "that the highest jerayet rate has only "been imposed on such lands as were formerly subject to extra "well assessment, and not on lands irrigated from wells construct-"ed during the period of settlement just expired." There is no room for fear that the Settlement Officer has been over-exacting in his demands on bagayet land, for as a rule, wells are dug only in the best soils. The Settlement Officer has therefore, we presume, not levied any appreciable amount of extra assessment on bagayet lands, in assessing them at the highest jerayet rate of the village only, as Colonel Francis tells us. Had the department given us figures to shew on what extent of land the highest rate was imposed, or what is the amount thus levied on account of wells, we should have been able more fully to clear the point. In the absence of such an information we are strongly inclined to think that inquiry will show that the additional levy has been little. The Report ought also to have shown the amount of revenue given up for thus encouraging well irrigation. Its statistics on such points are incomplete in many respects. For instance, the Report tells us that the number of wells in the talook is 2,051. This may be information enough for experts, but to the general public it is inadequate, for a well may be of any capacity, and also in its relation to the soil which it irrigates.

"We do not assert that the revenue thus given up is all lost, but we believe and contend that the gain will be very small in proportion to the loss; and that the effect of the present arrangement will practically be to increase the inequality in the incidence of the land-tax, and therefore produce great and unjust inequality in the condition of the classes affected; and that the ordinary assessment rule by which a cultivator is exempt from assessment during the currency of the lease, and our light assessment of land revenue, were amply sufficient to encourage irrigation to a profitable extent, and that the assessment on garden lands, now given up, might have been far more usefully invested, for the mere existence of wells is not the only precaution against famine.

"It is intended by exempting wells from assessment to promote the extension of irrigation, and thus provide against a scanty rainfall. But to do this, it is not necessary to sacrifice a legitimate source of revenue, and which cannot under ordinary motives of human conduct be supposed to promote the object aimed at. Under the leases that have expired, wells were understood to be subject to taxation at the end of those leases, and their exemption is a free gift to agricultural capitalists, which they had never looked for. They were constructed under the inducement of light taxation, at a period of abnormal prosperity before the leases had expired, and their exemption now is no necessary encouragement to wells to be built; since the exemption is not officially declared to be a permanent alienation, but may last only for an arbitrary period. Government has put forth no proclamation that wells will never be assessed. They only cease from assessing those now existing. This is evidently not a sufficient guarantee for ryots to look upon their wells as property permanently exempted from the public demand. If the exemption is really intended to be permanent, it appears to me to be a mistake of the same nature as the proposed permanent settlement of the land revenue. Water in the land is as much public property as the earth on which the crops grow, and its value increases with the growth of population and other circumstances. Just as inferior lands are brought under tillage as population finds itself unable to live on the existing area of cultivation, and are then a source of income to the landlords, so is water a valuable agent fully liable to assessment as soon as it becomes productive under the ordinary conditions of production. To exempt such a natural agent from assessment altogether, is a neglect of a just source of public income, and a fault against posterity. But we would prefer to see Government take a decisive action either way. For should it go on as at present, its action will, in the end, be construed and pleaded by the ryots, like the Nurwadurs, as a promise of permanent exemption, and will be productive of administrative inconvenience. We think a better plan would be to follow the Oudh system, and exempt orchards from assessment altogether, and to plant patches of inferior land with timber and fuel trees in the vicinity of the road and railway which pass through the Madeh and Indapoor talooks, and near towns. These means, in all probability, would increase the rainfall of these districts."

NEW SETTLEMENT RETURNS.

It is now four years since we were promised by the Settlement Commissioner of the Deccan, amended statistical returns of the

Indapoor talooka. We want to know, in Sir George Wingate's words, what proportion of the population is dependent upon agriculture, and what upon trades and manufactures; what is the average size of the holdings of the cultivators, and what their modes of husbandry; what proportion of the land is untilled, for *grazing* cattle; what are the rents paid by sub-occupants of the land; how and to whom the ryot disposes of the produce, whether he sells it in the local or sends it to distant markets, or hands it over to the village banker. Colonel Francis told us in 1867, that this information existed already, for the most part, in his archives, and that it had been omitted from his Report, because it was already so voluminous. He promised at the same time to let us have it in the shape of a supplement to the Report. Our Settlement Officers are not in the habit of promising what they cannot perform, and we have little doubt that this supplement was long since prepared, for no man understands better than Colonel Francis himself exactly what we want. In his letter to Government *(No. 828 of 7th October 1867)* commenting upon Sir George Wingate's suggestion that a common form of return should be prepared for each district brought under re-settlement, he wrote :—

"It would be most desirable to have a uniform system of return for all the several Survey Departments, as here proposed. At present each Superintendent, as a rule, adopts his own particular way of showing the statistics of a district, and as a consequence there is considerable dissimilarity both as regards details as well as in the manner of exhibiting them. The compilation therefore of a uniform return for all the districts of the Presidency, which is a most desirable measure, is impracticable. Acting therefore on the hint thrown out by Sir George, I would suggest that the Survey Commissioners, after conferring with the several Superintendents of Survey, should prepare a form of statistical return for general adoption throughout the Survey Departments. As these returns are received, they should be compiled by districts in the Survey Commissioner's Office, which might then be made the regular statistical office of the Presidency. No expense will (at first at any rate) be incurred by the introduction of this plan, for the work could be done by the present office establishment. The form that may be agreed upon by the Survey Commissioners might be sent to Government through the Revenue Commissioners, who would thus have an opportunity of recording their opinion upon it."

The Government formally approved these suggestions in its resolution of 27th March 1868 "with the modification that the Survey Commissioners should consult the Revenue Commissioners before finally submitting the forms for the approval of Government," while in its resolution of 9th June last upon the re-settlement of the Madeh talook, we were told that the Survey Commissioners were desired, as far back as October 1870, to submit to Government, detailed proposals as to the form in which these reports should be submitted, and the statistics that should accompany them. The resolution proceeded thus :—

"Government desire that these proposals be submitted without fail during the course of the approaching rainy season. The officers who made the first settlements obtained and recorded a mass of valuable information, similar information ought invariably to be collected at the time of revision, and the facts ascertained at the two periods should be carefully examined and collated before the work of revision is commenced."

As a rule, official men in this country work with so much ardour—the Settlement Departments conspicuously so—that if we express some impatience for the publication of these forms, we trust it will not be construed into a reflection upon the Commissioners. Official men in India, as a body, know no leisure, and work far harder than the same classes at home. We do trust, however, that the orders of the Government in this matter have at last been executed, and that Colonel Francis and his colleagues managed during the Poona season just ended, to agree upon the forms to be submitted. We assume that they *did* so manage, and we would now ask the Bombay Government before deciding upon their adoption, to submit the forms to public criticism. The most gratifying proof has been afforded in the last few months, of the interest which the country is beginning to take in the Settlement proceedings in course of progress; and if these new forms have at last been agreed upon by the Commissioners, we would respectfully urge Government to publish them in the *Official Gazette* for the information of the public. We presume Colonel Francis has held back his 'amended returns' of the Indapoor talook, that he might present them in the new forms, and as Indapoor is the first of the re-settlements undertaken, he is no doubt wise in doing so.

Why does not the Bombay Government, and for that matter every local Government in the country, establish a special Statistical department of its own? It is most unaccountable that reforms of the utmost simplicity, involving neither trouble nor appreciable expense, have to be urged over and over again, for years together, upon the State without effect. All that is necessary in this case, is to find out a man with a 'taste for figures' and to make him an Assistant Secretary in one of the departments with three or four clerks under him. If he does not himself know the exact lines upon which to proceed, along or around which his figures must group or arrange themselves, he will soon learn it from the public. The hope of attaining what we want by one great central office of Statistics in Calcutta, is surely chimerical. Each Government should do for itself the work lying at its own door, and the Imperial office at Calcutta, should confine itself to condensing and summarizing the returns for Imperial purposes. It would be desirable to have *common* forms of Returns for all the Provinces, but the *best* common form will be attained only by and bye, out of these local varieties.

THE NATIONAL BANK OF INDIA.

THE affairs of this Bank continue to attract some attention, and time does but justify the strictures made by us a month or two ago, on the conduct of the Calcutta Shareholders therein. It will be remembered that we blamed them severely for their attempt to place the Bank in liquidation, and that we attributed it to the resentment felt by them at the removal of Mr. Anderson from the Calcutta Agency. The charge was somewhat loftily denied, but the statement of the London Board dated 10th ultimo, which reached us a few days ago, leaves little doubt that we rightly divined the facts. The Calcutta Shareholders would have forgiven the losses of 1870, but could not, it seems, brook the dismissal of the popular Mr. Anderson. It is impossible to suppose that they knew the real extent of his fault, or they would hardly have ventured to depute him as their representative to London in the teeth of the remonstrance of the Board that they could not receive him on that footing. In addition to numerous and repeated instances of disregard of their orders, the Board now feel it incumbent on them to inform the shareholders of the following special offences in his conduct of the Agency :—

"In one case an account which the Board had ordered to be closed, and which for several months previous to Mr Anderson's dismissal they had believed to be closed, has been found to have been carried on. The method pursued was to give uncovered overdrafts during the month, but on the last day of the month, when returns of overdrawn accounts had to be made to the London Office, the Account was nominally squared up to be re-opened on the next day. In one authenticated instance, cheques were taken on the last day of the month and held in cash, and as cash, in order to effect the above object; the account going again to debit on the following day.

"In another case Mr. Anderson transgressed a positive order of the Board forbidding any officer becoming indebted to the Bank, without the sanction of the Board first being obtained. It is right to add that the amount has been repaid by Mr. Anderson since his dismissal, but the character of the act is in no way altered by that fact."

As Mr. Anderson may have explanations to offer concerning these charges, we shall not comment upon them further than to say that unless satisfactory explanations are given, he has only himself to thank for his removal. But the Bank has made losses in the last 18 months, and the London Board, say these Calcutta gentlemen, has been the occasion of them. What then have these losses really been? Let the Board reply :—

First.—There were the losses which occurred at Calcutta during Mr. Anderson's tenure of office, the most serious of which were upon the advances made against securities of the Government of India, partly bearing forged endorsements, and partly notes, the property of rebels which had been confiscated by Government.

Second.—There were the losses at Bombay, during the year 1870, which occurred through unfortunate exchange operations, and also on bills of exchange purchased. It will be in the recollection of shareholders that the year 1870 was for Bombay a peculiarly trying one, and the Board deem it right to say, in justice to the manager of that branch, that previous to the year 1870 he had contributed his full quota to the profits of the Bank, and had kept his branch entirely free from loss.

Lastly.—In regard to the China loss, the Directors have already explained that the late manager at Hongkong acted in direct contra-

vention of his instructions; and further, that the Board, in selecting him for the appointment, were fully justified by his character and antecedents. The transactions on which the losses have occurred were entered upon and had culminated in disaster, before the Board were aware of their having been entered upon; and the following extract from the late manager's letter, in reference to those transactions, will show what opinion he entertained of his own conduct, and of the views held in London:—"I know all this will meet with your displea-"sure, and I cannot but condemn myself for not adhering to strict "banking rules, and not advancing a penny without ample security. "I am ashamed of those accounts, and for having been drawn into "allowing them."

The Board proceed to shew further that on about three and a half millions sterling of bills purchased by the London office since the Board was established there, the gross deficiency has amounted to no more than to £182, and the loss to £128, no other loss whatever having been incurred by the London Office. The error of the Calcutta Shareholders, must, we should think by this time, be clear to these gentlemen themselves. As to liquidating the Bank with a view to the removal of its head-quarters to Calcutta, the proposition is insane. If the Bank is to remain an Exchange Bank at all, and not to change its whole character, the experience of the last 25 years proves that the management must be in London. The local banks that India requires are banks of deposit and discount, not banks of exchange. Upon the whole, this Calcutta movement has been as ill-advised and unfortunate as it well could be. It will not ruin the bank, but it has given a check to its credit and career that may well mortify the shareholders in this and other cities deeply. Its losses have been so dwelt upon and magnified, that the final announcement that they amount in all to the sum of £66,000 seems almost incredible. Against this amount, moreover, there are reserved and current profits to the amount of £30,985 available, leaving the paid-up-capital of the Bank (£464,000) all but intact. In the present depressed condition of this country, and the great want there is of banking enterprise therein, the attempt to wind up the National, upon the ground of this trifling loss, is most reprehensible. The Board have made a dignified and spirited appeal to the general body of the shareholders to support them against this most irritating movement. They say, justly, that "the Provisional Committee have shown themselves "singularly unacquainted with the history of banking, if they "think that the experiences of the National Bank of India during "1870 are either exceptional or peculiar. There are few living "institutions which have not gone through, at one period of their "existence, similar experiences, and are to-day strong and flourish-"ing. If the vicious principle adopted by the Provisional "Committee, of attempting to liquidate, on the first blush of "misfortune, were to become general, there would be an end to "joint-stock enterprise and its benefits. The Board boldly affirm "that they have done nothing to forfeit the confidence of the "shareholders. They have not been to blame for the losses which "have overtaken the Bank, as the records of the Bank (to which "they confidently appeal) will show. They call, therefore, upon "the shareholders to support them against an attempted surprise "to destroy the Bank, headed by a justly discharged servant of the "Bank."

We cannot but hope that the Calcutta Shareholders will themselves see that they have been betrayed into hasty and ill-considered measures. There is a fine future before the Bank, and to sacrifice its organization, connexions, and hold upon the public favour by liquidation, were surely insane.

THE OFFICIAL PRICE LISTS OF INDIA.

One of our earliest steps upon the establishment of this journal, was the attempt to present the public with a monthly price list of the staple articles of food in the several provinces of the country. We have now all but given it up in despair. Madras will insist upon quoting prices in the *garce*, instead of the seer; Bombay declines to quote grain at all, and chooses to give us the price of *atta*; Sindh never sends any quotations; while Bengal persists in presenting them in an elaborate and peculiar method of its own, that defies reduction to a common order. Oh! for a whip of small scourges to lay upon the backs of the unruly lot. Of all weights in the country however, the Madras *garce* is the most incomprehensible, and that the Madras Government should persist in retaining it, is very unpardonable. Thus we have recently discovered that while the official quotations are all given in the garce, the garce of rice is one thing, the garce of cholum another, cumboo another, veragoo another, and salt still another. Not an inkling meanwhile do the price lists give of the fact. For the last two years and a half, have we been dealing with these quotations in the belief, that it was a uniform official garce at all events, that was presented to us. We now learn that while the *garce* in all cases consists of 3,200 Madras measures, as they are called, these measures themselves vary as follows:—

	Tolas.
The measure of Rice and gram is	120
" Paddy	88
" Cholum, wheat, and ragi	111
" Cumboo	102
" Veragoo	116
" Oolloondoo	115

or thereabouts!

The garce of salt again is supposed, we are told, to contain 3,392 Madras measures (424 mercals) instead of 3,200 like the garce of *grain*, while to complete the horrible confusion, the *measure* of salt differs from every other measure being *about* 120 tolas. Is it not discreditable that after a century and a quarter of our rule in Madras, such a state of matters as this should exist? An effort we believe has been made to persuade the Madras Government to publish the official price list in terms of a pucka seer as every other Government in the country does. Three of these, we are told, are the exact equivalent of two Madras measures "as com-"monly used. The garce proper is supposed to be 4,800 pucka "seers or 3,200 Madras measures of grain." As the *measure* itself however differs so materially for the various kinds of grain, we are puzzled to make out what measure can possibly be meant. The conclusion forced upon us is, that the Madras official price lists are not worth the paper they are printed upon. Why does the local Government not issue a simple order that the quotations shall be made in the Indian seer? The difficulty of converting the special local measures into the *garce* must be as troublesome and intricate as transmuting them into the seer, while the quotations are purely irritating and delusive in their present shape.

We do not know whether the matter falls within the province of the new department, but if it does, Mr. Hume should insist upon a common form being adopted for these quotations throughout the Empire.** For ourselves, we have nearly, we say, given the matter up in despair. We find the Bombay and Madras returns incapable of reduction to any common form whatever. The Bengal returns are better, but most difficult to tabulate from the kaleidoscope shifting of places therein every week. The returns of the North-West Provinces, Oudh, and the Central Provinces offer, we think, the best form for general adoption; those of the Punjab are mixed up with meteorological matters foreign to them and out of place therein.

GOVERNMENT PRINTING.

THE OFFICIAL GAZETTES.

The Bombay Government is about to adopt the plan of centralizing the printing work of its departments under one roof, but the head of the office should be, we think, instead of an Assistant, Secretary, simply a competent printer upon Rs. 400 or Rs. 500 a month; a man who knows the exact resources of his office and its power upon emergency, and who can work the establishment economically. A Secretary would be out of place, it seems to us, at the head of such an establishment, as all the work should go to the printer already edited, a division of labour in this case being imperative, unless you happen to light upon a man who has at once the education of a printer, a genius for editorial work, and the leisure to attend to it.

The work of editing the *Official Gazettes* is a very special one and a good deal of tact and considerable statistical skill will be required to make the *Government Gazettes of India* what they ought to be. We observe that a correspondent of one of the

Bombay papers treats the proposal to appoint an editor for this purpose as a joke. There is *nothing*, he tells us, to edit. "Notifi- "cations from the several Government offices are received and "registered at the printing office, and when they are in type, they "are ultimately put by a printer mechanically into page form." And the result of this faulty conception is the present miserable publication in Bombay.

There is no Official Gazette published in India at present, that can be regarded as altogether satisfactory; but the *Government Gazette* of the Bombay Presidency reflects discredit upon everyone connected with it. Printed on rag, and in the coarsest and most slovenly manner, it has hitherto appeared in a shape that has made it almost impossible to cumber one's shelves with it, and led to its being thrown into the waste paper basket where it ought to have been preserved for record. The cost of its publication has at the same time, we believe, been enormous. Upon enquiry some 12 or 15 months ago, we were told that the mere cost of printing the *Gazette* during the first six months of the past year (1869) had been nearly Rs. 26,000.

January	1869	Rs 3,782
February	,,	3,709
March	,,	4,971
April	,,	5,803
May	,,	5,741
June	,,	3,591
		25,603

This was the amount paid, we believe, under contract rates. The printing alone of the paper was thus costing Government £4,000 to £5,000 a year. Now this extravagant outlay is mainly the result of there being no *Editorship* of the publication. Masses of crude undigested matter that ought to be carefully summarized and condensed before being sent to press, and masses of other matter that ought never to appear in the *Gazette* at all, are put into type week after week, upon no one knows whose authority, with the effect of running up these enormous bills, and of destroying the character of the publication altogether. Trade returns, railway statistics, mortuary bills, price lists, insolvency schedules, mofussil municipal accounts, local funds reports, vernacular translations, commissariate notices, legislative proceedings, currency accounts, and masses of other matter are pitch-forked together, without the least effort to reduce the confusion. We are satisfied that the *Gazette* might be printed upon good paper, and made as attractive as it is now repulsive, for an outlay far below the amount now spent upon the publication. To effect this, it would be necessary to appoint a responsible editor, in whom should be vested the entire control of the printing. A mass of matter that now appears ought to be excluded altogether, and it would be the editor's business to effect this exclusion by communicating with the heads of departments ordering the publication. Much other matter requires to be recast and condensed, and it would be the business of the editor in this case to prepare the new forms for use. Much of the matter which now appears, the *law* requires to be published; but even here the editor might do much by a little skill to condense and arrange and classify what now appears in the most elementary and bulky form. Postal and commissariate notices ought not to appear at all in the *Gazettes*, the daily newspapers being the only effective channels for advertising such matters. The editorship of the *London Gazette* is a sinecure appointment in the gift of the Premier, and is usually conferred, we believe, upon literary men for public services. The last appointment was that of Mr. Walker, editor for some years of the *Daily News*, and was made by Mr. Gladstone. The appointment is said to be worth about £800 a year. To bring the Bombay Government *Gazette* into satisfactory form, would require some technical skill at starting, but would not entail much work upon the editor, after the first few months.

THE "CALCUTTA REVIEW" ON THE LAND QUESTION.

THE October number of the *Review* is, we think, exceptionally good. The fifth article is devoted to a refutation of the doctrines of the *Indian Economist* upon the subject of the land, but is so discursive and theoretical as to be of almost no practical value. The writer professes to discuss therein the three following propositions:—

1. Is there a fundamental distinction between land and other property?
2. To what extent can the State in India be said to have reserved its rights?
3. Are the rights so reserved adequately enforced by the 'State's' servants?

The answer given to the first of these questions is that there is no fundamental distinction between land and other property; that the economists are in error in supposing that there is; and that Mr. Mill in practicular would, the writer believes, "on further consideration," be himself in doubt, if there is any. It is of course impossible for us to say what effect the perusal of the article under notice might have upon Mr. Mill, but we may be permitted to doubt whether in the consideration which he has *already* bestowed upon the subject, reflections so obvious, as the *Reviewer* insists upon, escaped his notice.

In the answer which the writer professes to furnish to the second proposition, "the trumpet gives an uncertain sound." There is a vehement repudiation of the doctrine that "the State is the sole landlord of the soil," which according to the *Reviewer* would seem to be very prevalent, though it has not been our fortune to encounter it in the course of our reading; and an apparent adoption of the paradox that the State has *no* rights whatever therein. We do not think we are misrepresenting the writer, for what else can we make of the statement that the peculiar impost which we call Land revenue differs in no respect whatever from ordinary taxes. The apostle, whoever he is, of the doctrine that 'the State is sole landlord of the soil' is plainly at one end of the scale, and the *Reviewer* who holds that the State has no rights therein whatever, at the other. "*We* base our demand" says the *Reviewer*, "on very different grounds" from you who hold that "the State has an ancient prescriptive right to a share of the produce." "*We* propose to take the money because it is really wanted, and we know of no way by which an equal sum could be raised with so little annoyance." In other words, the Land revenue we are taking from the soil is simply a tax, and "must be defended "not by 'tall talk' about the property of the Commonwealth, "the 'reserved' "share of our 'common inheritance,' but by those "principles on which alone any tax is defensible." (page 285). It would have been more satisfactory if the *Reviewer* instead of leaving us to gather his conclusion from statements of this kind, had boldly avowed his belief, for such it seems to be, that the Land Revenue of the country is simply a tax upon agriculture. It is always pleasant to get the position of one's adversary stated with precision, and the *Reviewer*, we think, should have spared us the trouble of digging out his answer to the proposition so categorically raised by him. But if he hesitate to adopt his own conclusion in the naked form to which we have reduced it, we must take exception to his version of *our* doctrine upon the same subject, which he simply travesties as follows:—

> Our opponents demand the money (Land Revenue) because (1) The amount of the tax has been the subject of divine revelation; (2) It has been reserved by the Commonwealth; (3). The State is the sole land-lord.—*page* 287.

To shew the grounds on which we are held to affirm that the amount of the Indian land revenue has been fixed by divine revelation, we must introduce a somewhat longer passage:—

"The *Indian Economist* would have us believe that the proportion "of one-fifth of the gross produce has almost "been fixed by Divine "wisdom." We are told, "at all events our conviction is profound, "that the revolution by the young and inspired Hebrew minister, "was suggested to him by divine wisdom, and with these views "its study becomes to us a subject of deep and peculiar interest. "The *minister availed himself of the desperate condition of the "people to obtain a State proprietorship of the soil.* The modera- "tion with which the claim was asserted is seen in the giving "back of the land to the people, burdened simply with the con- "dition, that a fifth part of the produce should belong to the "State." Now "we were under the impression that Joseph was "represented as re-arranging an old tax on a more liberal basis, not

"as taking advantage of the necessities of the people to extort from "them an entirely new tax, to be squandered on the pleasures of "a corrupt court. In the former case he would deserve our ap- "plause, in the latter we should say, that Empson and Dudley were "in comparison just and liberal ministers. Is it true that the "population of Egypt consisted originally of independent free- "holders, and that *taking advantage of their desperate condition*, "an inspired Hebrew minister effected 'a great fiscal reform?' "We confess that we never heard a more ingenious euphemism; "we should have said (if the *Economist's* statement of the fact "is correct) that this taking advantage of the desperate con- "dition of the people, would disgrace a rapacious bunniah or "a clever but unscrupulous Jewish attorney."

It is not our fault that the *Reviewer's* "impression" of the sacred story is an effort of his imagination, for in this passage he travesties both the scripture narrative and our comment thereon, without seeming to be conscious that he is doing so. Where have we asserted that the inspired Hebrew minister took "advantage of the necessities of the people to extort from them an entirely new tax *to be squandered on the pleasures of the court?*" The narrative tells us that to prepare food against the impending famine, Joseph took up a fifth part of the produce of the land of Egypt, and this divinely suggested measure, the *Reviewer* revolving the matter in the depths of his own consciousness, discovers to have been an 'old tax' amongst the Egyptians. We cannot say that it was *not* an 'old tax,' but we say positively that everything in the narrative tends to discountenance the belief that it was. The narrative makes the exaction an exceptional act, an act called for by a great emergency, while the *Reviewer* has discovered that it was a normal proceeding, indeed simply an 'old tax' of the country. Bunsen says "Joseph converted the Egyptians into hereditary "farmers, in consideration of their paying a fifth part of the "produce." Where have we suggested that Joseph took advantage of the condition of the people to extort from them a permanent tax of the same weight *to be squandered on the pleasures of the court?* Money was as much required, we presume, in Egypt then for purposes of administration, as in India now? Well, the Scripture narrative suggests that Joseph took advantage of the condition of the people to force upon them a new fiscal system, a fiscal system which the statesmen and economists of modern times almost with one voice declare to be the wisest a nation can adopt. Joseph, we say, either stumbled upon, or was divinely led to, the adoption of a system of taxation, which almost all economists and statesmen in modern times declare to be the best a nation can possess; but because he *forced* it upon the people in their extremity, his conduct it seems "would disgrace a rapacious bunniah, or a clever but unscrupulous Jewish attorney." In the next place, where have we contended that the State is the *sole* landlord of the soil. Speaking popularly, the State is the *great* landlord of the soil of India, its rights however being everywhere more or less qualified by subordinate private rights and ancient usages and customs which it is bound to respect. One would imagine from the *Reviewer's* statements, that we represent a school which holds that the State is landlord of the soil of India in the same extensive meaning which the word has in England. Such misrepresentations are mere trifling with a great subject, and we pass on. The only really practical part of the article is the discussion in its last few pages of the third proposition:—

Do the State's servants adequately enforce the reserved rights of the State in the soil?

The *Reviewer's* answer is that they do; and that all criticism of the work of the settlement officers of the country if not mischievous is superfluous. We are not misrepresenting what he says in the least. He does not qualify his adherence to the Settlement Reports which have passed under review in the last year or two, by a single word of doubt or hesitancy. If we are to trust this gentleman, mistakes are never made in settlement proceedings, and the criticisms to which they have been subjected by ourselves and others are worthless, because it is only *the settlement officer* himself who can decide whether his assessment is rightly pitched or not. The *Indian Economist* is "honest no doubt" but erroneously "be- "lieves the settlement officers to be deluded by a vicious philanthropy "into abandoning what they know to be the just rights of the "State." We (Reviewers) believe them to be officials who, though very able, have sufficient common sense to know "the difference between assessments which are possible on paper, and those which are possible in reality, and who, if they have abstained from binding further burdens on the people have done so not from a false sentimentality, but because they know the burden too grievous to be borne." The *Reviewer* had better take private counsel of some of these gentlemen, before he writes his next article upon this subject, for nowhere is there a more loyal acknowledgment of the general healthfulness of the criticisms that have been made upon their work, than amongst these gentlemen themselves. The most emphatic testimony has been addressed to us from the department itself, of the *need* there was of the criticisms we have been led to make upon its work, and we close our notice of the *Reviewer's* impressions with the following extract from one of these communications:—

"I am very glad to see you are to review some of the North-West Provinces' Settlements. Though you will not find in them the same neglect of the proper share of the produce due to Government, as you have exposed in the Central Provinces, yet you will find that, looking to the changes that are taking place in the country from the introduction of railways and canals, the assessments on the whole are far too low. It was a great mistake to lower the rate in these Provinces from 66 per cent. to 50. This was done, I think, in Mr. Edmonstone's time by a stroke of the pen. Mr. Drummond raised it to 55 per cent., so as to include cesses for roads, dak, and municipal purposes. Similarly the present Lieut.-Governor might bring it back to 66 per cent. But the landlords would cry out of course. They have been told about the 50 per cent. rate, and every thing taken beyond that they now look upon as robbery. When the facts are plain they never deny their real assets. In———where I was sent to revise settlements in connection with the canal, the first thing that struck me was the large number of estates which did not pay 50 per cent. of net assets, and I have myself drawn up lists of some 400 estates in which the Government demand was not 40 per cent. of the acknowledged assets. To show the feeling of the landlords, I may mention that they would have agreed to an increase of 10 per cent. all round, rather than have had a new investigation. Now this would have given 1¼ lakhs, while the very same district was harassed for a year to obtain Rs. 20,000 from the income-tax, against which the loudest complaints came from the wealthiest proprietors. Call it revenue, and they will pay it: call it "*takkas*," and they will not."

What has the *Reviewer* to say to this?

MUNICIPAL FINANCE.

BOMBAY A BEACON.

In our last issue we demonstrated, we believe, that the so-called house-tax of Bombay which the Law makes the backbone of its Municipal Finance, is simply an income-tax in disguise upon one class of the people, and as such, in Mr. Mill's words, "a very easy form of plunder." Now, if we are going to commit ourselves to an attempt to raise the revenues of the island by a Municipal Income and Property-tax, well and good; only let it be understood that income and property of *all* kinds must be assessed in common. To determine otherwise, and to confine, as we are now doing, our income-tax to real property only, is, in the emphatic words of Mr. Mill once more, "plunder." As a matter of fact, the victims of our injustice would be better off under a special income-tax, than they are under what we call the house-rate. For under an income-tax, they would be exempt from payment in circumstances in which we now fleece them without remorse. Take the case of a man who has an income of Rs. 5,000 a year from house-property in the island, but has had to mortgage it to the extent of 30,000 or 40,000 Rupees at the prevailing rate of interest, and derives, in consequence, no more than a net income of 1,000 Rupees therefrom. Now under an income-tax, the assessment would be calculated upon his net income, and he would consequently have to pay 6 per cent. on 1,000 Rupees only, or 60 Rupees a year. But under this house-tax as we call it, he is required to pay upon the whole amount of the rental that passes through his hands, although four-fifths of it go to the mortgagee, who pays nothing. The miserable owner is mulcted by us 6 per cent. upon the gross rental, or 300 Rupees a year out of his small income of 1,000 Rupees, equivalent to an income-tax of 30 per cent. or 6s. in the pound; while the sowkar mortgagee takes the whole amount of his interest (Rs. 4,000) without being assessed one farthing. We say again, that a more oppressive system was never set up anywhere in the civilized world. You may number the house-owners of Bombay by thou-

sands who are in the position we have described; for the class of professional landlords hardly exists amongst us. The Bombay landlords in the main, are men in some kind of business or other, who in common with all traders have suffered such severe losses since 1864, that their property is commonly mortgaged up to the hilt at 12 to 18 per cent. In many cases they are living entirely upon their capital, the rental derived from their property being absorbed by the interest upon the mortgage. The sowkar mortgagee in these circumstances is the real landlord, but we leave *his* income untouched, and make the unfortunate owner pay. Now under a Municipal income-tax the mortgagee would pay—as equity and justice require that he should—while the house-owner, as equity and justice also require, would be exempted. Is not all this upon a level with the capacity of a child? Is it possible to hold two honest opinions upon such a state of matters? And what are we to say of those who refuse to be enlightened concerning what is so manifestly wrong?

From the day we began this agitation in 1868, we have stated our willingness to accept a *general* Municipal income-tax in the room of the so-called house-rate. But we have done so, not that we regard such a mode of raising revenue as economically sound in our circumstances, but simply as fair in principle, and to remove from us the stigma of injustice. The attempt to raise the revenues required in modern days for Municipal improvements by an income-tax has failed, we are told, where ever it has been tried; and looking at the nature of our population, their habits, the objections that lie against all direct taxes in India, the geographical position of the city as the *gate* of India, and the large revenue which is required for improvements that are indispensable, we have no more doubt than of our existence that the right course for the island to adopt is a system of *indirect* taxation throughout.

Now instead of this reform, the only reform that can give relief to the people, the notion seems to be nursed that the way to remove their sufferings, is to fasten *everything* upon the owners of house-property. The late Commissioner recommended that all the rates (house, police, lighting, water, and halalcore) should be consolidated into one gigantic rate of 17 or 18 per cent. upon the rental, and levied upon the owner, who should be empowered, however to recover the police, lighting, water, and halalcore rates from his tenants. The proposition is warmly seconded by the Controller, while we say advisedly that a more oppressive proposal was never submitted to a community of civilized men. Look at the following figures:—

The number of Householders is		15,400	owning	21,654	properties.	
The Police Rate is levied upon		25,097	persons	(including the 15,400 owners)		
The Lighting Rate	,,	25,000	,,	(the same persons who pay the Police Rate)		
The Halalcore Cess	,,	16,007	,,	,,	,,	,,
The Water Rate	,,	10,451	,,	,,	,,	,,

The house-rate upon owners is levied *half-yearly in advance*, and if the other rates are to be consolidated with it, and levied in the same way, we shall have a delightfully simple system certainly, but as atrocious a one as ever entered the mind of man. The taxes instead of falling as now upon 25,000 to 30,000 persons will be concentrated upon the 15,400 house-owners, to each of whom will be presented twice a year a bill of the average amount of about 70 Rs. But 11,905 of these so-called owners or landlords are in the receipt of a gross rental of but £1 to £5 a year, and 14,400 of the total 15,400 are receiving a rental of but £1 a year up to £50. Thus under the precious *reform* recommended by the Executive Staff and approved by the great body of the Justices, the whole burden of the rates (£240,000 a year) would fall upon about 1,000 men, whose rental, according to the Commissioner's last report, is as follows:—

832	Landlords with a rent income of			£ 50 to 100
83	,,	,,	,,	100 to 200
19	,,	,,	,,	200 to 300
8	,,	,,	,,	300 to 400
3	,,	,,	,,	400 to 500
9	,,	,,	,,	500 and upwards.

Behold the "brute mass of capitalized selfishness" that ought to pay the whole £240,000 rates and taxes of the island. The advocates of this course positively seem demented. They cannot be made to see that landlords as a class have no existence in Bombay at all. Do you call any man a landlord in the economic sense of the word, whose rents do not exceed £5 to £10 a year. The man is called a *landlord* here when he owns the single house he lives in, while the class of professional landlords may be told off upon the fingers of your two hands. What the Commissioner proposes is that we shall henceforward intensify the wrong we have been doing tenfold, and fasten the whole £240,000 of the rates upon the wretched 1,000 men whom we have scheduled. They are to pay £240 a year each that the town may pay nothing.

For as to giving them power to *recover* some of the rates from their tenants, does anyone suppose that that will be easier for them to do than it was for the Commissioner? If this preposterous recommendation be adopted, not 500 bills a year will be paid without the issue of a distress warrant, and if the Government wants the populace that now marches to the Town Hall with drums beating and flags flying, to break into open rebellion, let them take the Commissioner's advice and restrict the levy of the rates to the so-called house-owners of the island. As it is, these men are already being driven to the verge of rebellion by the oppressions we are practising upon them, and the Commissioner has largely fallen victim to his own want of insight into the real causes of the sufferings of the people. They have been taught to blame *him* for them, when it is the Law that is in fault, and the Commissioner himself seems to have been no more able to discern the fact, than the Justices and the Government.

THE LATE MUNICIPAL COMMISSIONER, BOMBAY.

"He who propagates a delusion, and he who connives at it when already existing, both alike tamper with truth. We must neither *lead* nor *leave* men to mistake falsehood for truth. Not to undeceive, is to deceive."—*Bacon's Essays.*

It can hardly have escaped the observation of the dullest person in Bombay, that the opposition which the late Commissioner had to encounter from a section of the Bench, derived almost all its strength from the fact that a part of the community is suffering very severely under the fiscal system set up in the island by Act II. of 1865. The excited and angry crowds which attended the meetings of the Justices in July were fully inspired with the belief, that the real occasion of their suffering was an extravagant and unprincipled Executive. The leaders of the movement contrived to fill the minds of the people with the notion that the distress warrants, which were being executed by thousands in the island, were the work of the late Commissioner. The disingenuousness of the direction thus given to the popular resentment has been very scandalous. The leaders of the agitation know well that it is not the Municipal Executive but the Law, which has occasioned the sufferings of the people, and that though the Government had renewed the Executive a dozen times over, there would not have been one distress warrant the less issued in the island, while the fiscal law was unchanged. The disingenuousness of the agitation, has been, we say, extreme. Its leaders had but one object, to destroy an Executive which had made itself personally obnoxious to them; and to compass this, they disingenuously professed to find the occasion of the people's sufferings in its extravagance. Had they had any real compassion for the people, they would have directed popular indignation, not against the man whom they were so anxious the Government should remove, but against the system of fiscal fraud which the Law compelled him to administer. The Commissioner is no more to us than the Commissioner of Customs, or the Accountant-General, but we have a keen sense of the obligations under which the city lies to him as an administrator, and a strong resentment of the hostility which for years has sought his overthrow, regardless of the disgrace which the step would entail upon the community.

And at last these gentlemen obtained a case against him, that they did not even venture to hope for. The Committee which the Government appointed a few weeks ago to investigate the affairs of the Municipality, has reported a series of irregularities in the Commissioner's 'financing,' one of which certainly

deserves severe reprehension. We refer of course to the use of the Sinking Fund for general Municipal purposes. A single fact, however, in connection with this matter goes very far to lessen the fault. From the very first then, we ourselves *forced* the late Commissioner upon irregular modes of financing, by requiring him to meet urgent and enormous liabilities with an empty treasury. Thus it is complained that he 'accepted' bills for Municipal liabilities. We demand whose fault that was,—the fault of the Commissioner who was required to incur the liability, but provided with no cash to meet it, or ours? From the day he entered office in 1865, we improperly cast upon him, in addition to his legitimate and overwhelming work, anxieties and responsibilities that were not his, but ours. Instead of a cash balance of Rs. 10,00,000 to relieve him of pecuniary anxiety, we required him to face an enormous mass of old liabilities at the very threshold of his office, and from that day until he left Bombay, we constantly required him to make bricks without straw. We gave him no money to meet the liabilities we ordered him to incur, and when importuned by Municipal creditors for acceptances *which they had a right to demand*, we ought to dismiss him it seems for having granted them. The Committee of investigation reports that when we professed to place him straight in 1868, we still left him £60,000 to the bad, while the Commissioner shews conclusively that it was nearer £90,000. Men accustomed to business will understand what that means. Immense, emergent, daily accruing liabilities to meet, with not a six pence in the Bank, and £90,000 to the bad. What could we expect in such circumstances but what the Committee has reported? A system of scratch finance, and a good many irregularities. Is it fair, is it honest, is it just to judge of these irregularities in any light but that of the wrong we ourselves inflicted upon the Commissioner from the first? Was it part of our bargain with him, part of the responsibility we had a right to throw upon him, that he should struggle with *our* liabilities, and then be fiercely assailed as we have seen him assailed for the devices to which he was driven to meet them? Upon an impartial review of the circumstances under which this gentleman administered his office, the blame of his irregularities seems to us to belong far more to ourselves, than to him. The most harassing part of his work from the first, was this work of financing, the meeting of liabilities without a cash balance to draw upon. The assemblies of the Bench meanwhile were characterized by all the paltry littleness of the parish vestries of our own land. Instead of inviting the confidence of the Commissioner, the Justices met five times out of six to badger and irritate him. It is time that the Government took measures to recast the constitution of the Municipality, and in doing so we venture to hope that it will contrive to secure the *next* incumbent in the thankless office from having responsibilities put upon him that are not his, and from being harried to death in the execution of his work, by persecution of the kind, we have noted with angry impatience for the last four years. The Bench, we are persuaded, knows well, that no possible change of the constitution, or of the Executive, can relieve the sufferings of the people, who have been taught to attribute them thereto; but almost any change is desirable that will prevent the recurrence of such scenes as we have witnessed in this city in the last few years. A Commissioner who deserved nothing but well of the community, traduced and opposed at every step, and dishonestly held forth to the populace as the occasion of sufferings which were simply the result of an inequitable Law.

The indecent terms in which he is now spoken of, are based upon complete forgetfulness of the fact that he was improperly thrust by us into the position of trustee for half a dozen different Funds, which he was bound to keep intact, while encumbered with a mass of liabilities which he had no means of paying. The Bench had the most perfect knowledge of his position, and that the funds which he was supposed to hold in trust, were constantly being used for general Municipal purposes, in consequence of the pressure under which we ever left him. And when he is at last shewn to have overstepped the margin of discretion which we were compelled to connive at, and has used the Sinking Fund to defray the cost of *our* Markets, we are asked to pass judgment upon the act, as though it were a positive embezzlement of the fund. There is dishonour in the spirit which calls for such a judgment. Distressed as the Commissioner was by the casting upon him of responsibilities that were not his but ours, regarded by us and treated by us as a sort of general Treasurer, whose business it was to *make* funds when we did not find them, we refuse to invest the use even of the sinking Fund, with the aspect which his enemies would make it wear. Had he embezzled the Fund instead of using it to pay for the markets, the spirit in which the act has been commented upon could not have been more hostile. Looked at from a more generous platform than the one upon which his enemies stand, what he has really done is this,—he has improperly and illegally taken the money in question from the shape in which the Law directs it to be held, and invested it in another security altogether. But are we to forget that the money is still there? Apostrophising his enemies we would say:—"What, he has done is illegal and reprehensible in the highest degree, but he has been guilty of an offence against the State more than against *you*. He has misappropriated the money beyond doubt: but it is into *your* pockets that he has put it. For the markets are not his, but yours. You know well that those markets are bringing in at this moment a net revenue of nearly a Lakh a year, and that within ten or twelve years, the returns you are deriving from them will make them your unencumbered property, yielding you for all time a clear revenue of £20,000 a year, or more. You contrive to keep your eyes wide open to his irregularities, but are stone-blind to the profits you are deriving from his administration. Avow, as honest men, whether upon the whole, you are not so well satisfied with this market investment—in spite of the irregularities and extravagancies of the Commissioner in connection with it—that you are glad to stand by it! And what does this mean, but that while ready to reap the *profit* of his acts, you are mean enough to grasp at a pretext for ignoring that to *him* you owe that profit. And you flatter yourselves, that 20 years hence, it will be no disgrace to you for it to be told, that the man who built the markets and endowed the Municipality with £20,000 a year thereby, was dismissed by you—not because he had applied any of your money to his own use—but because he paid for them out of funds that, according to law, he ought not to have touched. Do not mistake us. We are not defending what the Commissioner has done. No one can defend it: but it is not against *you* that he has sinned. From your hands he deserved nothing but generous treatment. If he has offended against the Law, he has not sinned against *you*; and that you should rise up in such haste to condemn and overthrow him, disgraces not him, but *you*. No one can have watched the proceedings of the Bench for the last four years, and be in any honest doubt as to the spirit which animates you. It is not the public interests that you have had at heart, but the gratification of your resentment.

"The various funds which were placed in trust in the hands of the Commissioner from time to time, ought *never* to have been placed there at all. No where but in India would such an arrangement have been dreamed of, as the placing half a dozen Trust Funds, in this loose way, in the hands of an officer borne down and overwhelmed with liabilities against which he has had one constant struggle. For ourselves, we absolutely refuse to judge the Commissioner's act as you do. In our eyes your judgment is cowardly, ungenerous, and unjust. Let Government blame him as severely as it will, it were more decent for *you* to keep silence. He has not wronged *you* at all events, while it was the putting of your responsibilities upon him that directly betrayed him into his fault. The generation which shall come after you, will set up a memorial in honour of the man against whom you are exciting popular fury, for in spite of his faults, he has laid you under

a debt which you cannot pay, and your sons will build a statue to the man whom *you* are urging the populace to stone. The "irregularities" and "extravagancies," of which you accuse him, have given you Institutions hardly to be seen in any other city of the world, while he has made them the means of endowing you with an income of Rs. 200,000 a year for all time. Pointed at by all Europe in 1865 for your foul loathsomeness as the Pest-House of Asia, your city, within the short space of six years, has been made by this man's "extravagancies" and "irregularities" one of the healthiest in the world, and had you allowed him, he would have made it one of the most beautiful too. The men who have been your leaders would have had neither the insight nor the courage to attempt a tithe of what the late Commissioner has *done*, while the poor common-place creatures, who would have gone on in the way of make-shift until now, persuade themselves and you, that you have been wronged by his administration. "For Empires or for individuals, there is "but one class of men to be trembled at: and that is the "Stupid Class; the class that cannot see, who alas are they "mainly that will not see." "

THE GOVERNMENT CENSURE.

SINCE the preceding articles were in type, the Government of Bombay has attempted, by an act of politic injustice, which will not be improbably be successful, to allay the popular ferment in the town. Embarrassed on the one hand by the fanaticism of the people, and on the other by the conviction that the late Commissioner deserved well and not ill at their hands, the drafting of a Resolution upon the subject was a task of so much difficulty that we are not going to magnify the blame which we still think attaches to it. The Resolution is able and dignified, and well-calculated to effect its object, but the final verdict upon it undoubtedly will be that it is unjust. The Commissioner is sacrificed for the sake of peace, and of a reconciliation between the Government and the Bench. The Governor-in-Council "expresses his surprise "and displeasure at the state of affairs which has been brought "to light and at the grave irregularities and other acts of a wholly "indefensible character which have been confessedly admitted. His "Excellency cannot shut his eyes to the extreme improvidence "and recklessness of many of the Commissioner's proceedings and the "culpable disregard exhibited by him to the restraints incidental "to his position as the custodian of public property of great value "and the dispenser of large public revenues."

All very severe, and very exactly calculated to gratify the popular will, but all unjust, and therefore fated as everything unjust in this world sooner or later to oblivion. Let us hope that it will not be frustrate even of the temporary success it is so well calculated to obtain. We make full allowance for the difficult position in which the Government is placed. That it entertains, as fully as ourselves, the conviction that Mr. Crawford deserves well of the community, we are sure, while the popular excitement had become so intense that it seemed almost necessary to sacrifice him to pacify it. Happily for ourselves, we have no such difficulty to embarass us in the expression of our conviction upon the merits of the quarrel, and if Government is compelled to dissemble in presence of popular fanaticism, it would be inexcusable in us to do so. It is now nearly 14 years since certain of the leaders of this most disingenuous agitation, were themselves the objects of the furious hostility of our own countrymen in Bombay, who were told by the popular leaders of that day, that the "public hangman ought to tear the tongue of these traitors from their caitiff jaws." Now, if we stood unflinchingly by *them* then, exchanging no honeyed courtesies with the men who were unjustly hounding them, do any of these local patriots suppose that we shall flinch to-day from the side of our own countryman, whom they are treating with the same scandalous injustice, with which they themselves were assailed in 1858? Rather our right hand wither, than minister to a movement of this kind.

We shall now make an attempt to review the grounds upon which the Commissioner is charged by the Government in terms of such heavy and measureless rebuke as the Resolution employs.

The length to which our comments upon these purely local affairs have already reached, makes it impossible for us however to review as closely as we should like the Committee's Report and the Commissioner's remarks thereon. The praise which the former has received is not deserved. It is one of the most narrow and ungenerous documents we have ever read. For the most part true, there is still hardly a paragraph in it that does not leave a false impression upon the mind. Anxious to form a Committee which should command the confidence of the people, the Government committed the initial injustice of appointing one of the Commissioner's most bitter personal enemies, Mr. Sorabjee Shapoorjee, thereto. We say this without intending the least disrespect to Mr. Sorabjee, who deservedly enjoys the confidence and esteem of his fellow-townsmen. But it was to expect Mr. Sorabjee, to be more than human to suppose that *he* could act with impartiality in an investigation of this nature, while it is well-known that although Mr. Hope drafted the instrument, the report in substance was the work of Mr. Sorabjee. The voice is Jacob's voice, but the hands are the hands of Esau. At once the most able and the most bitter of the Commissioner's enemies, it was, we say, a grave injustice to put Mr. Sorabjee upon the Committee at all. The result is a report that in suggestion and spirit is as narrow, injurious, and unjust as it could possibly be. We are quite aware that in speaking thus we are running counter to popular opinion: but no consideration of this kind shall hold us back from the statement of our conviction as to the real merits of the document. Our judgment is clear that it is a most narrow, ungenerous, and unworthy paper throughout. Grave as was the injustice of placing an investigation of this kind under the direction of a personal enemy of the Commissioner, still more serious was the wrong of allowing the report to be circulated broad-cast amongst the people, while the Commissioner's reply was withheld. For the report from beginning to end is one long indictment of his conduct, and Government knowing how calculated the document was to intensify popular passion, threw it amongst the people, without giving him even time to send in a reply. Sir Seymour Fitzgerald has been guilty of no equal act of injustice since he came amongst us. We have read the Report in the most careful manner several times over, and we say that with the exception of the charge it makes concerning the use of the Sinking Fund, there is not a single count in the indictment that is not completely disproved by the Commissioner, or too paltry to be worth notice.

Reducing the report to the several indictments of which it consists, the string runs thus:—

I.—Vehar is improperly treated in the Commissioner's annual accounts as a Municipal asset, to mislead people.

II.—The Controller's book-keeping is bad, as is evidenced by the following facts:—

(*a*) The Municipal liability under the Rs. 15,00,000 loan of 1868 is under-stated by him to the extent of Rs. 70,000.

(*b*) The drainage fund has been improperly charged by him with interest on funds that have been diverted to other uses.

III.—The Commissioner has improperly accepted bills for Municipal liabilities, and subjected the community to indefinite "loss thereby, in the shape of extravagant interest.

IV.—The Commissioner untruthfully alleges that the loan in 1868 was insufficient by nearly 8 lakhs to meet the deficit then existing, the real amount being 5½ lakhs only.

V.—The Commissioner has incurred, and the Controller connived at, unsanctioned expenditure to the tune of Rs. 31,84,495.

Lastly between them they have used the Sinking Fund to pay for the markets in breach of the law.

Anyone who will be at the pains to summarize the report with care, will find that it consists of these six indictments, and the spirit in which they are drawn as evidenced by what is suppressed and what is unwarrantably suggested is most discreditable. We shall now take the charges *seriatim*. First then, as to Vehar and the Markets: Are the Vehar works and the Markets a Municipal Asset or not? Let us see what each party says:—

The Report.

We consider that this property cannot practically be taken into account, or be of any avail in an inquiry of the present nature, which deals with the Municipality in the light of a working body in full operation, and to be kept so, rather than that of a ruined concern, to be freed, as far as possible, from liability by the sale, for what it will fetch, of every thing it possesses. The retention of such items in the annual accounts of past years has only tended to obscure them by showing an excess of income over expenditure which was altogether imaginary.

The Reply.

The possession of markets, scarcely even of water works, is *not* necessary for any working Municipality in full operation (many Municipalities do not possess either), and in estimating the financial position of this Municipality, the value of the real property which has been acquired by the loans shown on the liability side, *must* be incorporated in the assets side. Such real property, moreover, yields an income equal to one-fifth of the total Municipal revenue:—

Income from Vehar Water Works, say	Rs. 4,00,000
From Markets, &c.	„ 2,00,000
	Rs. 6,00,000

Comment is needless upon a position so absurd as the Committee take up: and yet it is made a *charge* against the Commissioner's mode of presenting his accounts. He is deluding the people by making out his Balance Sheet in the *only* way in which it can be correctly made out, the way in which every Municipality in the world presents its accounts. The next count is of just the same order, and has reference to the Controller's book-keeping, which it is *suggested* is very unenlightened and bad, as shown by the following criticisms :—

The Report.	*The Reply.*
"The indebtedness to Government on account of the 15 lacs loan has been understated in the accounts by Rs. 70,000, owing to an obviously faulty mode of calculation, and to neglect of comparison with the Bank book."	This is a point of minor importance and one of account only, inasmuch as whichever way the account is kept, the loan will be cleared at the end of the term of ten years (*see* the remark of the Committee to this effect at page 4.)

We have looked carefully into this question, and we affirm that these hypercritical gentlemen are wrong, and the Controller right in his book-keeping. The Committee have matured a deferred liability, and then blame the Controller for not having done so too. The matter is too troublesome to review at length, but the preferring of a *charge* against the Controller on such a ground, was simply scandalous. The other exception to his book-keeping is stated thus :

The Report.	*The Reply*
The Drainage Fund has been debited with the interest and Sinking Fund charge of the whole Drainage Loan of seven lakhs of rupee raised in 1868. But as Rs. 4,21,364 out of this Drainage Loan have been expended by the Commissioner on Markets, it is obvious that this Fund must be relieved, *pro tanto*, of the charge for interest and Sinking Fund, the burden being transferred to the general Municipal Funds, to which the Market revenue is credited. The adjustment on this account, with interest, amounts to Rs. 1,33,220-6-2, which, together with a further unexpended balance of Rs. 1,33,167-9-1, diverted to current Municipal expenditure, makes a total liability of Rs. 2,66,387-15-3.	I submit that the Controller was quite right in this course. Until a formal transfer had been made by the Bench of the balance of the House Rate Loan to the Market Loan, the Controller was bound to keep his books in accordance with the original resolutions of the Bench and to debit Interest and Sinking Fund accordingly On applying for the formal transfer I should, as a matter of course, have included an adjustment of the items overcharged to Interest and Sinking Fund of the House Rate Loan.

Now though the Committee were even right in these criticisms, what do they amount to? And yet they are the sum of the indictment they have to bring against the accounts of the department, while the facts incidentally disclosed in the course of their investigation, as to the general character of the book-keeping, are most startling. Not one generous word of praise has the Committee to give to an office, the accounts of which, while intricate beyond belief, are kept with such regularity and order, that the Controller positively handed in his Balance Sheet of income and expenditure up to 31st August *duly audited by the 8th September!* Instead of a hearty and generous recognition of the fact that the accounts are kept in the most singularly efficient manner, two points of theoretic book-keeping are picked out to throw an air of general dubiety over the whole of the Controller's work. Most handsome certainly: most conducive to a spirit of devotion in the public service. But we pass on to charge No. IV. as to the amount of the deficit in 1868.

The Report.	*The Reply.*
The Commissioner, in contending that he received 7¼ lakhs less than his requirements, has excluded Rs. 2,33,325 or arrears of rates and taxes due on December 31st 1868, but since recovered. It is somewhat extraordinary that the Commissioner and Controller should not have brought to notice this inadequacy of the arrangements of 1868-69 until the publication of the Report for 1870 last month. It is thus clear that of the deficit of Rs. 21,92,860 shown in paragraph 9 (3) *g*, only Rs. 5,40,039 are attributable to the arrangements of 1869, and arose before that period, while the remainder, viz., Rs. 16,52, 821, is fresh net excess, which has been incurred in the years 1869, 1870, and 1871, including the last four months of the latter as estimated for.	How, I ask, can the normal outstanding balance of the Rates and Taxes, varying between 2 and 3 lacs, be taken into account as an immediately available cash asset, available towards the payment of urgent *cash* liabilities? It clearly is not so, because there is no magical process by which the outstandings can be at once recovered and made available. This being so, I ask, was I not right in excluding the item of Rs. 2,33,325 from account when estimating the actual deficit left by the 15 lacs loan? And to prove I was right, I point to the fact that Mr. Hope's Committee *under precisely similar circumstances*, in estimating the cash required to meet immediate cash demands only (page 9 (3) *f*.) have themselves excluded the present normal outstandings estimated at 3 lacs of rupees!

Here we have a plain, palpable blunder on the part, not of the Commissioner, but of the Committee. The deficit was *not* Rs. 540,000 only, as this bland Report says, but plainly the full amount which the Commissioner makes it. The Committee must be conscious, we should think, of some shame when they remember how this report has been used by the enemies of the man whose administration they have so ungenerously reviewed. We next come to the subject of the acceptances concerning which the Report contrives to hint so much that is damaging to the Commissioner.

The Report.	*The Reply.*
The system of accepting bills for liabilities which there are no present means of meeting, still continues in force, and we learn from the Commissioner's private register, that Rs. 3,91,264 are thus due to six persons, as shown in Appendix D The process is this. The Gas Company, for instance, who are now five months in arrears, draw a bill at three months for say Rs 20,000, on which interest at 12 per cent. runs against the Municipality under the new contract. The bill is accepted by the Commissioner, and is then discounted at the current market rate by the Company, who perhaps, make a considerable profit by the transaction At the end of the period the bill is presented, and if payment be still inconvenient, it is renewed, perhaps with a considerable addition on account of increased liability on the same account in the interval.	There is some serious misunderstanding here, *for such a thing has never happened*, and in the case of the Gas Company especially, who by the contract sanctioned by the Bench can claim 12 per cent. interest on the balance of their account. The result of an acceptance being given, for say Rs 20,000, is that the said Rs. 20,000 becomes a cash payment to the Company, and it is the *Municipality, not* the Gas Company, which benefits by the difference between the current market rate and the contract rate of interest. It has thus been a positive saving to the Municipality to grant an acceptance to the Gas Company. I have addressed the Gas Company on the subject, and append their reply in confirmation of my statement. *See* appendix D. In the case of other acceptances, interest has never yet been paid or agreed upon, the whole amount of the acceptance going against the account of the *party* to whom it has been given.
We have found it impossible to ascertain the precise amount of interest now due on all these transactions, which are not very completely recorded by the Commissioner, are not communicated to the Controller or Accountant at all.	No such transaction was ever entered into by me without previous communication with the Controller and Accountant; who, whenever they desired, had access to the diary or record, which, as a matter of convenience, I retained in my own custody.
Besides these acceptances, it is probable that interest will have to be paid on several of the current accounts long outstanding, though in most cases it has not yet been claimed, but such payment as also the rate, will be subjects of negotiation when the occasion arises. On the other hand, the well-known determent of payment must undoubtedly lead to higher original charges, and it is probable that, were the Municipality placed in funds, a handsome discount for prompt payment might be obtained on many of the bills. On account of these difficulties in estimating the interest on all acceptances, accounts, &c., we cannot be responsible for the accuracy of any precise figure At the same time we are assured by the Controller that the item will *probably* not exceed Rs. 61,000, which we have entered accordingly.	Here again there must be some serious misconception, for the Controller's replies to questions on this point were as follows':— 1. Are the above amounts entered in your statement of liabilities already submitted to the Committee? Yes. These acceptances form part of "liabilities payable" shown in statement No 2, amounting to Rs. 10,90,027-0-11, and charges included in list No. 5, as will appear from the annexed statement. 2 Have the acceptances been submitted for your countersignature and examination prior to being incorporated in the accounts? They have not been submitted for my countersignature, but before accepting them the Commissioner inquires from my office whether such payments can safely be made on account. *These acceptances are not incorporated in the accounts until the payments are made, when they are debited to the respective drawers.*

When we look carefully at the wording of the charge made against the Commissioner, the little barbed word here and there interjected to suggest that this acceptance business has '*probably*' been a very bad one, very costly to the community, and by no means yet sifted to the bottom, and mark the total, the scandalous explosion of the charge, our indignation, we confess, gets somewhat hot against this Committee. Does the Government *now* see the wrong and the injustice of placing Mr. Sorabjee upon it? And what excuse has this gentleman to offer for directly perverting the facts, as to the economic effect of the acceptances? Who can look at this precious paragraph, and remember the comments it has called forth, and not feel some honest rage against the men who have ministered so willingly to popular fanaticism. There are but two other charges to deal with. The use of the Sinking Fund to pay for the markets, has been commented upon by us at length above. The Commissioner admits the grave error which he made, and bitterly has he had to atone for it. To get rid of this miserable subject for good, we briefly notice the remaining charge (V): "That during his incumbency, he had spent without sanction Rs. 31,84,495." Our generous Committee took good care to forget that this 'unsanctioned expenditure' had all been incurred under circumstances, where sanction over and over again has been admitted to have been impossible. The Committee knew well, that the Commissioner had even been thanked for having incurred it, and yet they once more bring it to the front to *suggest* (for *that* is the offence of the Report throughout) how

deserving he is of censure. That the most earnest and loyal effort has been made since 1868 by both the Commissioner and Controller to keep within the Budget Grants is kept in the background altogether, while the expenditure of 1865, 66, and 67 is brought into account with later years, to invest the *whole* with an aspect of reckless irregularity. *Proh pudor.* May you, Gentlemen of the Committee, have somewhat different measure dealt to you, should your official course some day come under the review of another such body as your own.

Government did the late Commissioner a grievous wrong in the constitution of the Committee, and a still graver injustice by allowing so unjust a report to see the light without reply. It is the cruel pre-possession of the public mind by years of twaddling, spiteful journalism which constitutes the real strength of the case against the late Commissioner; not the articles of impeachment brought against him which are easily crumbled into dust, but the bias of the court, the state of the atmosphere, the vibration all around which echoes the bold and perpetual assertion of his dishonesty, the pre-possession against him which takes it for granted that when his statements are unanswerable, there is something kept out of sight, hidden in his sleeve, that plausible but cruel conclusion that when much is alleged much *must* be true, and that it is more likely that one should be blamed than that many should be mistaken in blaming him. *These* are the real foes which the Commissioner has had to fight, the auxiliaries upon which his enemies have relied. The Commissioner and the Controller have been good servants of the public, and the ignoring of their real merits, and this bitter fastening upon and magnifying of matters that ought to be judged in the light of their general services, we declare to be a disgrace to the community. Each man has been made to lead the life of a dog by the conduct of the Bench towards them, and we can but express our hope that their successors may be very differently dealt with. At all events we have delivered our own souls.

EDITORIAL NOTES.

In the *Agricultural Gazette* which accompanies our present issue, a very important communication will be found from Captain Login, concerning the prosecution of his experiments in growing Indian cotton upon the Egyptian system. It will be seen from the letter that Captain Login had already, by the 24th October, picked at the rate of 185 lbs. of clean cotton to the acre, and that he was expecting to get 500 lbs. by the end of the season. He now writes to us under date of 8th instant:—

"I have, since writing last, received a return of the yield of my cotton field near Delhi, up to the 31st ultimo, so please substitute 31st October 1871 for 24th October 1871, and 241 lbs. per acre for 185 lbs."

These experiments are really very startling. We shall wait with interest Captain Login's Official Report to Government.

The *Spectator* of a few weeks back tells us, concerning the direct rate system as it works at home, that "the objections to it are innumerable;" and that if "an octroi were not too much discredited" a town duty on "alcohol and on one or two other articles of general consumption or luxury" would be the best means of raising their municipal revenues. In India, we are to understand that it is so easy for us to collect direct rates, that we have so admirable a machinery for the work, and that the people so readily discern the superiority of the system, that it is—'barbarous' and "iniquitous' and 'oppressive' to resort to town duties at all. We are not travestying what is said, but reproducing the *ipsissima verba* of the political doctors who assail us for getting the town duties upon alcohol and two or three articles of general consumption and luxury introduced into Bombay in 1868. What are you to do with such stolid unwisdom, but perpetually expose it to the public view, till its exponents themselves begin to see its real nature.

A native local paper which we forbear to name, because upon the whole it is very ably edited, says that the principle which Mr. Knight distinctly announces "for re-settling the assessment upon the land is that at every period of re-settlement, the "year of the highest prices should be chosen, either during the "year of settlement, or, if that was not favourable enough, any "year long previous to the settlement which favoured best, and "the assessment raised according to the difference of prices be-"tween this high rate and the average rate which obtained at the "settlement."

The same writer affirms that we advocate a general increase of assessments to three times their present weight. We know well how difficult it is, in the heat of controversy, to state with candour and impartiality the views of one's opponents; but we are fairly astonished at the statements made in the Indian press as to our views upon this subject. We are ready, in our haste, to exclaim with David "all men are liars." In Bombay we are represented as wishing to "grind the faces of the poor" because we insist upon substituting a just system of taxation for the false and oppressive system which was ignorantly adopted in 1865, and which fills the island with suffering. In the Empire, we are represented as wishing to rack-rent the ryot, because we would rescue him from the hands of the middleman, and the visits of the income-tax assessor. "For individuals as for Empires," says Carlyle, "the class to be everywhere *trembled at* is the stupid class."

According to the *Bombay Gazette*, "the proper mode of assess-"ing the land is to calculate what will probably be the *lowest rental* "of any year in the term for which a lease is to be granted, and "then take the smallest proportion of that rental which is required "by the exigencies of the State"!

The farming capital of the Indapoor talook, which is declared to be one of the poorest in Western India would seem, according to the Settlement Report of 1867, to consist of the following stock:—

21,500	Buffaloes (for Agriculture)	.. @ Rs.
24,000	Milch kine and calves	@ ,,
17,300	Sheep and goats	@ ,,
1,402	Horses, camels, &c	.. @ ,,
1,820	Ploughs	@ ,,
1,165	Carts	@ ,,
560	Tiled houses	
4,351	Flat-roofed do.	
1,375	Thatched houses	

The holdings appear to average about 35 acres each, for if we assume that 40,000 of the people, out of the total 53,000, are cultivators, this number would represent about 8,000 families occupying the 284,000 acres of cultivable land.

$$184{,}000 \div 8{,}000 = 35\tfrac{1}{2} \text{ acres}$$

We should like to have seen some estimate of the approximate value of the stock. The right of occupancy was selling at the time of the re-settlement (1865-66) in some cases at upwards of 60 years' purchase of the assessment, the average rate being 17. The *Madras Athenæum* remarked justly, some months ago, that "the selling price of the proprietary right—let the right be as undefined as it may—is the sure test of the weight of our assessments. If *that* is large, the assessment must be small, while, if there is a selling price at all, it is impossible that the assessment should be oppressive." If the Government would ascertain the comparative weight of the assessment in the older provinces of the country, with a view of its equalization as far as possible upon all, let it make exact enquiry into the selling price of land. The Law Courts will furnish unimpeachable information upon the point, sure data as to the real weight of the assessment.

A correspondent writes to us:—

Will you kindly supplement the information on farming, given in the correspondence columns of your last number, on the following points:—

1. The capital required in England to start with, is laid down as £15 or £20 per acre, the first amount being the minimum. You have only allowed £7 per acre. Is it a fact that farming in India is cheaper than in England?
2. Deducting the overseer's wages, you allow Rupees 500 for labour for 100 acres for six months, or not quite one Rupee per acre—surely, when we remember that the whole farm must be placed under crop in six months, this is an under-estimate.
3. Presuming that, after six months, all stock are fed on the produce of the farm alone, what course of cropping would you suggest?

Our correspondent is in error in supposing that the capital employed by British farmers is anything like £15 or £20 per acre. Over great part of the British Isles, the capital of the agriculturist does not exceed £10 per acre. There can be no doubt that the man with £15 will get on more pleasantly, and if he understands his business, make a larger income than he who only has £10 per acre, still there are thousands of farmers who have not half this amount of capital, and who nevertheless are thriving farmers.

2. Our replies were given to the queries of a Madras correspondent, and had special reference to the plains in that Presidency. The figures we gave are trust-worthy, and are founded on actual experience; of course there would be no difficulty in spending twice as much on labour, since there is no item in farm expenditure so elastic as labour-charge. But, on such a farm as we referred to, one conducted on sound commercial principles, one on which there will be no expenditure in keeping up ornamental roads, fences, and the many details which on a public farm, tend so greatly to swell the labour bill; on which there will be no expenditure of labour in conducting elaborate experiments on animals, crops, or machines; but on which all labour (under intelligent and careful supervision) will be confined to work likely to be immediately remunerative, our estimate will, we think, stand.

3. Our correspondent will find in Vol. 3, No. 1, of the *Agricultural Gazette*, at page 19, a rotation for such a farm as we have referred to, in these answers.

In reviewing the Irrigation Returns of the North-West Provinces for 1869, the *Pioneer* points out that of the 10,89,673 total acres irrigated, 1,04,610 acres were under sugar-cane, 708,857 acres cereal grains, and 130,895 acres under indigo. The increase in the more valuable crops had been very great, as the following figures show:—

	Sugar.	*Rice.*	*Indigo.*	*Cotton.*
1867-68 ...	87,050	97,867	77,976	8,285
1869-70	101,596	117,508	130,248	55,883

Can our contemporary give us no approximate estimate of the value of these crops?

Our own estimates, concerning the North-West harvests, are declared to be so extravagant, that we should be glad to know from the province itself, the average value of the produce of an acre of sugar, rice, indigo, and cotton. No mention is made, we observe, of opium.

The *Pioneer* calls attention to an article in the London *Daily News* of 7th October, according to which, the Secretary of State, on his own responsibility, has renewed the £17,100,000 of 5 per cent. Indian Stock which fell due last year at the same rate of interest for another ten years:—

"We are not quite certain, says our contemporary, who is responsible for this; but we presume it is the Financial Secretary of the India Office, who has thus saddled India with an additional ten years' payment of an extravagant rate of interest, which might easily have been reduced by the exercise of a little financial skill. Surely a four-and-a-half or even four-per-cent. loan might have been floated in London (which would have made a sensible reduction in the yearly interest) without taking too much advantage of the public creditor, as the *Daily News* says the Indian Government seems afraid of doing. But in this case Mr. Seccombe, we presume, represented the Indian Government, and we remember the light and airy way in which that gentleman, in giving his evidence before the Indian Committee of Inquiry, spoke of the manner in which, as it suited him, he quietly put more or less paper into the market. We are without full information on this subject, but it does seem as if India had been considered as quite an uninterested party in the transaction."

We were not aware that the stock in question fell due last year, the Official Returns annually issued of the Indian Debt, making no mention of the fact. The East India Association should cause 'interpellations' upon the subject to be made in the House of Commons next Sessions.

We have hitherto failed completely to make the *Pioneer* understand what we mean by the absence of all banking accommodation in India. Our contemporary says "the *Indian Economist* has "an idea that one of the proper functions of banks in India is "advancing money on acceptances, or in other words, discounting "accommodation bills." We assure our contemporary that we have no such 'idea' whatever. The only bills discounted by the State Banks, under the present system, are accommodation bills. The subject of our complaint is that 'payment by acceptance' is unknown in India, and as a consequence, the legitimate business of discounting such acceptances. If the *Pioneer* wants to buy 1,000 reams of printing paper in Calcutta, it will have to pay cash for them, whereas in England it would simply give an acceptance at 3 or 4 months for the amount, the Bank discounting such acceptances for the convenience of the paper-maker, out of the deposits lying in its hands. Now this process is simply unknown in India, to the indefinite loss of the country. Look at the vast sums of money which Mess agents have outstanding in India. Were payment by acceptance made the rule, we cannot help thinking, that the stimulus given to industry would be very great. Debts would cease to be stagnant in the trader's books, while payments would be far more regular than they now are.

In reply to the expression of our regret, a month or two ago, that an attempt was not made to convert part of the 5-per-cent. loan now maturing into terminable annuities, instead of 4½ per cent. stock, a correspondent reminds us that we have before us the option, at certain recurring periods, of buying up the guaranteed railways and of paying the purchase money, if we please, in such annuities, at a price to be fixed on scientific principles. We are glad to be reminded of this, for we regard this option as of great importance, since we have before us therein the means of relieving the country almost imperceptibly, but surely, of something like £100,000,000 of debt. We are glad to know also that this object is steadily kept in view by the Supreme Government, and will be grasped the moment it is attainable. We must have no more repetition however of the folly committed by the Secretary of State last year who, under pressure we suppose from the great railway interest at home, imprudently gave up this option in the case of several of the railways for 25 years to come. He offered, we believe, the surrender to *all*, the consideration being the abandonment on their part of the right to share the excess profits over 5 per cent., when the State claim for interest advances is paid off. Fortunately for this country, the great E. I. Railway was unwise enough to refuse. The consideration is really not worth a straw, and the offer will not, we may be sure, be repeated.

A late judgment of Mr. Justice Melvill's, in the High Court of Bombay, affecting a mortgagee's power of sale in the mofussil, contains the following passage:—

"I am strongly disposed to agree with the Calcutta Judges as to the impolicy of allowing sales by mortgages in the mofussil. The mass of mortgages consists of mortgages of ancestral fields, made by ignorant cultivators to greedy and unscrupulous money-lenders. The great object of the money-lender is to get the land into his own hands, and when he has succeeded, he is the worst possible landlord, spending nothing on the improvement of his estate, and rack-renting the unfortunate ryot, whose proprietary rights have passed from him, but who is willing to slave for the usurer rather than abandon the field of his fathers. When we stand between two classes such as these, it is the borrower, and not the lender, whom we should protect. Any measure which tends to the general transfer of proprietary rights in land from the cultivating to the money-lending classes should, in my opinion, be viewed with the greatest jealousy."

We should like to reproduce the judgment entire, if our space permitted. That it should be a settled object of our policy to prevent any general transfer of proprietary rights in land from the cultivating to the money-lending classes of the country, we cannot doubt, and for the reason which Mr. Justice Melvill states in such emphatic terms:—"The money-lender is the worst possible land-"lord, spending nothing on the improvement of his estate, and "rack-renting the unfortunate ryots." This experience is not confined to Bombay; it is the common experience of the whole country, and the prevention of this transfer is one of the great purposes which we have ever kept in view in this journal.

It is worth while, we think, trying if we cannot arrive at some common understanding concerning the income-tax. The *Bombay*

Gazette, under its present editor, has been a consistent supporter of the tax from its original imposition by the late Mr. Wilson until now; and if it would but support it upon grounds that are tenable, and with modifications that are indispensable, we should join with it in resisting its abolition. Thus we approve with our contemporary of the tax "for the purpose of reaching the purses of the rich," but then the rich agriculturists are surely as justly liable thereto as the rich trader, while our contemporary would confine it to the latter. The man who has been made rich by the moderation of the State demand upon his fields, is surely as obnoxious to taxation as the man who has grown rich by his own exertions in trade. The zemindar's fortune has grown "while men slept;" the native merchant's, by toil and frugality. We undoubtedly want a special tax upon "the rich," agricultural and trading alike, as a counterpoise to the salt-tax upon the poor. It is the perception of this that prevents our joining the ranks of those who would abolish the income-tax at all hazards and under any circumstances. What the tax might yield seems to us subordinate to those considerations of justice and right which prompt us to levy it. The objection to a *general* income-tax is the extortion and oppression inseparable therefrom; but no such objection lies against a special income-tax upon the really wealthy. They are in no danger of being oppressed, being protected by their wealth, position, and intelligence, from the oppressions which a horde of tax-collectors will ever practice upon the people when made the instruments of taxing them. Let us make a compromise. None of us doubt that direct taxes upon the masses mean extortion and oppression: but that has no application to the well-to-do. Keep the tax then, but confine it to the rich.

THE *Indian Observer*, in its issue of 28th ultimo, gives us some information concerning the Customs Preventive Line of the North-West Provinces, lately under the charge of Mr. Hume, of considerable interest. The line, we are told, is "generally a fence, with passages guarded by toll gates at every half mile," watched by a vast body of patrols. Each patrol has charge of a beat extending 30 or 40 miles along the line. A bungalow is provided for the patrol at the head quarters of his beat, and there are rest houses at intervals of 12 miles. The lowest grade of patrol receives 125 Rupees a month; the highest Rs. 400. The duty of these officers would seem to consist of watching the line to prevent the smuggling of salt and sugar across it, into British territories, and the burden of the *Observer's* article is that Mr. Hume pitched the daily *mileage* exacted of them at too high a rate. They are allowed, it seems, neither tentage nor travelling allowance, and yet in these circumstances, are expected to do 8 to 8½ miles a day, anything below that being regarded as unsatisfactory. The fact seems hardly to justify, we think, the complaints made about it. For the duty, the *sole* duty, it would seem, of the men, is to be constantly patrolling the line. They have nothing else to do, and are paid for that, and that only. At all events we gather so from the article. Now what sort of *patrol* can he be who finds 9 miles a day, which he can ride if he choose to afford himself a tat, an exhausting and impossible exertion. The mass of people in business in Bombay have to travel 8 or 9 miles every day in addition to the duties of their regular calling. For ourselves, if we had nothing whatever to do, but walk or ride 8 or 9 miles a day, we think we should feel we were somewhat cumbering the ground. The *Observer* appears to us to forget that these men are paid for this very work. We take out of them so many miles a day, and pay them for *that*. But what a flood of light does this Customs line of 1,800 miles, with its fences and watches, and guarded passages 'every half mile', let in upon the barbarous fiscal devices we are resorting to for revenue, and how with trumpet-tongue does it warn us against abandoning the land revenue of the country in favour of such devices.

THE prices realized at the Opium sale held on the 2nd instant were:—

Opium.	Chests.	Highest.	Lowest.	Average.	Proceeds.
Behar	2,665	1,590	1,580	1,582-8-5	42,17,100
Benares	1,665	1,555	1,545	1,549-0-9	25,77,500

The budget estimate, it will be remembered, was Rs. 1,075.

WE congratulate the finance Minister upon his good fortune; and we venture to counsel him to seize the opportunity which the next budget will present of relieving *the people* of the income-tax altogether. We are still of the conviction we have long held, that if the tax is retained at all, it should be confined to the wealthy. And by the wealthy we *mean* the wealthy. And we would have a graduated tax even then, increasing the weight of the tax as the income rises. A special tax upon the rich is wanted as a counterpoise against the salt-tax upon the poor. The mistake of the present income-tax is that it descends too low. You must exempt every man in the country whose income is so low that he is *likely* to be at the mercy of the machinery by which it is levied. The North-West Government is absolutely right when it declares that the tax cannot be collected without great oppression: but that is simply because it descends too low. We would not, because of that, however, abolish the tax: we would simply exempt the masses altogether. It is a tax inapplicable to the masses, and every attempt so to levy it in India will produce an amount of disaffection out of all proportion to the sum realized. On the other hand, almost every man acquainted with the country feels, as if by instinct, that the well-to-do classes are not taxed as they ought to be. Well make *them* pay the income-tax, and graduate it to the scale of their incomes. There is no fear of *their* being bullied and oppressed by the assessors, while the objection, that by confining the tax to these it will cease to be productive, has very little force. It is a sentiment of justice that has to be met in this case, rather than a hole in the Treasury. If there *is* a hole there, you will not stop it by an income-tax. What we are concerned to do just now, and what we can manifestly do by the income-tax—is to shew all men the equity of our fiscal system by levying this special tax upon the rich, as an equivalent for the salt-tax upon the poor.

WE are pained to see that scarcity, if not absolute famine, has overtaken Khandeish and some of the Deccan districts. The failure of the rains was almost total in parts of these territories, but within the last few days rain, it is said, has reached certain parts of them. Western India has never experienced, within the memory of man, a season so capricious; rain falling in torrents at places where it seldom falls at all, and no rain whatever reaching other districts that depend thereon for everything. The task of administration in India is grievously complicated by these adversities.

THE *Bombay Guardian* has given needless pain, we understand, to old Mr. Cowasjee Jehangeir Readymoney, to whom, in memorial of his singularly catholic charities, a statue is about to be erected in Bombay. The objections which the *Guardian* raises to such movements during the life time of their subject, however just in general, should hardly we think have found expression on this occasion. The heavy personal sufferings which Mr. Cowasjee has borne for so many years with resignation, the cheerful interest he has continued to take in public affairs although cut off from all share in their conduct, the extent of his charities, and their strangely *catholic* character, have made a large portion of the community anxious to shew honour in his life time to one of whom they think both gratefully and compassionately. Under the special circumstances of the case, the objection taken to the movement, on abstract grounds, sounds hard and unsympathizing, and we think might have been spared. Is there not a great lesson of sympathy taught for all time, in the words "The poor ye have always with you, but *me* ye have not always?" Any movement that would gratify Mr. Cowasjee, and temporarily lighten the weight of his sufferings should hardly be scanned in the cold light which a severe taste may throw upon it.

COTTON CROP—BOMBAY DISTRICTS.

Guzerat.—The following report, up to the 14th instant, has been submitted by Mr. E. M. Carroll, for Acting District Inspector, Guzerat:—

"The weather experienced in the Surat district during the past few days has been most unusual for the season, and was as follows:—

"8th and 9th—Light clouds, slight dews at night.

"10th and 11th—Variable winds, cloudy weather, light passing showers at night, but of no consequence.

"12th from 3 p.m. up to 5 a.m. 13th—Heavy wind, and rain squalls; quantity of rain gauged during that time 1 inch 61 cents. During latter part of the day heavy clouds were passing, but there was no rain.

"14th—Thick misty weather.

"That portion of the cotton crop raised from early sowings, and now in an advanced state, has somewhat suffered from the effects of the wind and rain of the 12th and 13th instant; which caused both flowers and young pods to fall to the ground. The portion of the crop raised from later sowings will no doubt benefit by the rain. Much of the joarree crop is still standing. Winter crops, viz., late

sown joarree, wheat, grain, &c., have derived great benefit from the late rain, and are thriving remarkably well.

"The market rate of ginned cotton per candy Rs. 220, and for churka Rs. 210.

"Broach, Unklesur, and Hansote. On the 10th and 11th the weather was cloudy, light showers fell at night from 3 p.m. of the 12th up to the morning of the 13th. Fall of rain gauged in Unklesur was 1 inch and 50 cents. Cultivators say that the wind and rain will somewhat injure the early sown cotton fields—late sown fields will profit by the rain. Winter crops are thriving well.

Dhollera and Dundooka.—"Up to 9th instant, early sown cotton fields were thriving well. Pods are fast forming on the plants. Late sown fields are also doing well, and are now in flower. Winter crops are in good condition.

"1,076 bales of cotton were exported from the Dhollera, and 42 from Gogo bunders.

Ahmedabad.—"A slight shower of rain fell at Ahmedabad and the surrounding villages during the night of the 11th instant. Dews fall at night; weather is much cooler, cotton crops are looking healthy and are well-favoured—grain crops have been collected."

Veerumgaum.—Up to 11th instant, weather was much cooler. Cotton crops are looking better. Cultivators are engaged collecting grain crops and sowing cold-weather crops."

Mr. A. Stormont, Superintendent of Cotton Experiments, Broach, reports up to the 14th instant, as follows:—

"Rain has come at last, and although it had been long looked for, still it was to a certain extent unexpected. People have been so repeatedly disappointed on that score this year, that very little notice was taken of the accumulation of dark clouds which appeared to the south-west on Saturday evening. Much kurub (fodder) had been stacked in the fields as usual, and the light shower (2 cents) which then fell was just sufficient to induce people to put all perishable material of this kind under cover.

"The heavy rain came on about 4 p.m. on Sunday, accompanied by thunder and lightning, the first hour's fall measured 70 cents, and since then we have had 1·10 inches more, making a total of 1 inch and 80 cents, or nearly 2 inches. From the appearance of the sky this morning, it is quite likely we shall have 2 inches more. I am not quite prepared to say *what* crops will be injured and *what* benefited by this unusual aberrance of the monsoon weather; so far is certain that many of the flowers of very early cotton will drop, the plants will start into fresh growth, and mature their produce very far on in the season. The late cotton will likewise go on growing, so that the general effect on this crop will be to throw its harvest say three weeks later than it otherwise would have been, and thus bring the picking season in about the same time as last year.

"The late joar will derive much benefit from this unexpected supply of moisture, while the early crop (being as above stated mostly cut and stacked) will not be much injured by it, all the late sown green crops will now improve rapidly."

Khandeish.—Mr. C. Wilkinson, Cotton Inspector in Khandeish, &c., has forwarded the following report up to 13th instant:—

"During the past week the weather has been closed with clouds gathering up from the south-west. Showers fell on the 10th and 11th in the night, very light in this neighbourhood, but heavier in a south and south-west direction. A little rain fell at Chalisgaum on the night of the 11th. The sky still continues cloudy, but the signs of rain are too slight to place much hope upon. These few showers have, however, cooled the air, which is now far less dry and evaporating. Cotton picking is going on in a few localities, and the quality of the produce is as I have already described it.

"This year much irrigated bagayet land has been planted with rubbee to the exclusion of ordinary garden produce.

"Owing to the arrival of large supplies from the north, viâ Jubbulpore, gram is more easily obtainable. But the price remains much the same as before reported, *viz.*, 7 to 8 seers (of 3¾ lbs.) per rupee. This is Rs. 24 to Rs. 27 or mass—in 1868-69 the price rose to Rs. 36.

"Greater distress prevails now than at first sight would be accounted for by the present price of grain. Unfortunately, this season succeeds a very indifferent one, in which the khurreef crops were not good, and the cotton crop was also scanty and the price unremunerative.

"The rate for cotton at Julgaum is Rs. 57 per pulla for old cotton, and Rs. 58 for new cotton, to arrive.

"*Sholapore.*—The Sub-Inspector reports cloudy weather since the 9th, with slight showers. Rate for cotton Rs. 48 to Rs. 49 per bojha. Operations suspended until close of Dewalee. Export of full-pressed bales in week ending 10th November, 189 bales; cotton coming in from the districts.

"In the Deccan Collectorates the area under cotton is stated to amount to 22,076 acres, as opposed to 105,404 acres last year. Of the above amount 17,456 acres are in the Sattara collectorate. 4,182 acres in Sholapore, 198 in Poona, and 240 in Nuggur (exclusive of Shegaum)."

The subjoined reports, up to 13th instant, has been submitted by Mr. J. Milne, Superintendent of Experiments, Khandeish:—

"The weather has been very cloudy here for several days during the week under report, and on Saturday it looked very much like rain; however, only a few drops fell in the evening about 8 p.m. Sunday was likewise cloudy all day, and about 5 p.m. several peals of thunder were heard, and just as it was beginning to get dark, a nice refreshing shower commenced to fall, which lasted only a short time, the quantity of rain gauged at Durrungaum was 25 cents, but probably more than that may have fallen in other localities. The rain will have a beneficial effect on many of the late sown cotton fields—the plants will be refreshed, and the bolls that are already formed will swell out to a large size.

"Several more showers are urgently required. I am hopeful, now that the weather has become a little cooler, from the appearance of the plants in several fields, that they will produce more cotton than I expected they would some time ago.

"Had we got another fall of rain earlier in the season, the experimental fields (where the land is good and sown with selected seed) would undoubtedly have produced a very fine crop.

"The bajree is now mostly harvested; some joaree is still standing in this district. Some fields of the latter are pretty good, while others have produced no grain at all, and such will only serve as kurbee for animals.

"Rubbee crops sown on land here, without the means of irrigation, are making but very little progress—the shower that fell last night will assist the plants a little. However, the rain seems to have passed off again, as the sky is clearer to-day than it had been for the past few days.

"The price of gram in Errundole and Dhurrungaum bazaars have been slightly reduced during the past week, owing to an opportune supply of grain from the north.

"Water is now getting very low in the tanks, and in many of the wells."

Southern Mahratta Country.—Mr. Walton, Cotton Inspector, S. M. Country, has forwarded the following report up to the 12th instant:—

"Prospects are still good in this division, and the cotton crop promises to be good; on the 6th and 7th we had very trying stormy easterly winds, these continued until the evening of the 8th; on that day I sent you a (the fortnightly) telegram, saying that rain appeared near; in the evening it came down very heavily for a short time, too heavy to do much good beyond filling up the tanks again. We had very light showers the following day, and on the evening of the 10th quite steady rain; yesterday was cloudy with occasional showers, to-day is bright and clear; the rain all came from an easterly direction, and must consequently have extended over a considerable area of the black soil cotton country. Wherever the ryots have been industrious enough to clean their fields, this rain must do great good, the downfall for the week, as registered at the Dharwar Civil Hospital, is 92 cents, making a total, for the season, of 30 inches and 5 cents, compared with 32·54 to the same period of 1870.

"The cotton trade has been very brisk during the week, and large quantities of the staple have been carted to the coast. For the next two or three days trade will be almost entirely suspended on account of the Dewallee holidays, afterwards there should be nothing of importance to cause interruption, (unless unforeseen changes in prices take place), until the whole of the balance of last season's crop has been carted away. This is always, excepting the refuse cotton and rubbish that some of the dealers will persist in keeping back for passing off in their new cotton, and which gives this department constant trouble at the commencement of ginning the new crop.

"From the Dharwar talookas (including the Savanoor State) excepting part of the north-eastern district, *all* reports are good. In those parts, whence unfavourable reports reached me, the heavy "surface" rain that fell early last month had "baked" the cotton fields, which were very dirty, and the natural results ensued: the ryots, however, have been industriously weeding and harrowing, and in all places where this had been done, the plants are recovering rapidly.

"In the cotton talookas of Belgaum, principally Uthnee, Chickodee, Sumpgaum, Parusgud, and Gokak, rain has been much wanted for bringing on the plants. These late showers will therefore be most acceptable in those districts.

"In the Kulladghee districts, accounts are good from the Hoondgoond and Bagewadee talookas, but rain was wanted. In the Beejapoor, Bagulkote, and Moodebehal talookas, more rain for bringing on cotton and other late crops is much required. I have not heard if the late showers have reached so far, but as they appeared to come from that direction, I trust that the required rain has fallen.

"The cutting of the early rice crop above the ghauts has commenced; the joaree harvest will also soon begin. Of the former, we will have a generally fair-crop, of the latter a very good one."

Sind. Mr. E. Pearson writes up to 9th instant:—

"Reports from the districts are mostly favourable.

"Picking is general and in some talookas finished."

The following report up to 8th instant has been furnished by Mr. W. Strachan, Superintendent of Experiments, Sind:—

"Some of the plants on land which has not been watered for some weeks are now rather thirsty looking, compared with those on the banks of the main canals; here, there is as yet nothing wrong for want of water, but the heavy dew at night and the high temperature during the day seems to have done a little damage in most fields. Boll worm has not increased much, and the pods are opening much more kindly than they did at the first or even second picking. The crop will still be a fair one, probably above the general average of returns for Sind.

"Grain is almost all harvested; that is, it is lying in heaps in the fields, or being trodden out by the bullocks; the kirbee or straw is still uncut.

"Prices of cotton and bajree are the same as last week, joaree is now 22 seers per rupee.

"Plants on the Cotton Farm are generally healthy, a few plots which were late in being sown on the Sangra Canal, are suffering for lack of water. Exotics are all healthy in leaf and wood, but the bolls are opening badly.

Tobacco is healthy, but late; sorgo seed has come up all right, but is not making rapid progress; the end of February or beginning of March would be the best time to sow it; seed has been kept for that purpose.

"Yesterday and to-day the wind is from the north; in the temperature there is still little difference since last week."

The following report has just been received from the Superintendent of Cotton Experiments, Dharwar:—

"During the week under report, the weather has been favourable for cotton and grain crops; passing showers have been frequent during the week over this part of the district. The only rain registered here was that which fell on the 10th—57 cents. The winds have continued during the week mostly in a north-east direction, till just before the rain fell on the night of the 10th, when it changed to north-west, but has again changed to the north-east. The cotton has improved considerably during the week, both early and late sown American, and the indigenous. The American that had suffered from the October rains has all but recovered, the under-foliage is mostly off, and fresh foliage made. The cotton crop is having more attention paid to it now that the grain, wheat, and the late joaree is now sown. Cleaning the field is rather difficult in places where they have got overgrown with grass, and in many places it has killed the cotton. Surface weeds do not seem to do the crop so much harm as the hurrohalla grass that is so rife in the fields in this part of the district. The most forward fields of American cotton here are now flowering freely, but the flowers that had set during the week have all or nearly fallen of owing to the rain. Cultivators consider two showers sufficient for the cotton after sowing, if the average rainfall falls before sowing. Towards the Nowlgoond side the cotton is not so forward, but the weather is reported to be all that is required for it just now, and a great change may soon be apparent in it if the weather holds as it has done during the week. The experimental fields have improved during the week. The plants are now free of green fly: but the stems of many of the plants seems cankered, and all foliage above is dying off; this is mostly where the plants suffered from over moisture at the roots."

PEARL FISHERIES.

From the Collector of Tinnevelly; to the Acting Secretary to the Board of Revenue, dated Mangalakurichi, 20th May 1871, No. 211.

I HAVE the honour to forward a copy of Captain Phipps's report on his recent inspection of pearl banks. I have just returned from a trip to Paumben, and have made such further inspection of the banks as the state of the weather permitted. No oysters of any age were found, and until they are five years old, there is no certainty of their remaining on the banks two years successively. The diver brought up the shells of dead oysters and stones to which the cable or ligament that holds the oyster to the rocks was attached. Barnacles and Soram and Kilakoi, two varieties of muscles, were found in abundance, and it is believed that this and other enemies suck the oysters out of their shells. There are no grounds whatever for thinking that the banks are poached by the fishermen, as there are no oysters of age sufficient to produce pearls, and the Jadi Talawan, the head of the fishermen caste, has such a direct interest in a Government fishery, that it is improbable that he could connive at a system of poaching which must be conducted wholesale to affect the banks materially. It must be remembered, too, that precisely the same state of affairs exists off the coast of Ceylon. In both cases the banks are covered with young oysters one year, and the next there are none at all. They then return only to disappear again, and there is no reckoning with any certainty on there getting a firm hold of the ground. We can only wait and watch the banks carefully in the hope of the oysters maturing.

The *Margaret Northcote* is a very serviceable vessel, exactly suited for the work; but I think it a mistake to examine the banks as often as been done of late, as constantly heaving the lead and letting down divers stones must tend to disturb the banks and keep the oysters from settling. Frequent examination till oysters are found is, I think, very desirable; but when once found they should be let alone for a year before they are again disturbed.

From Captain G. A. Phipps, Superintendent of Pearl Banks; to the Collector of Tinnevelly, dated Tuticorin, 27th April 1871, No. 13.

I have the honour to inform you that my examination of the pearl banks commenced at Paumben on the 22nd ultimo. Previous to this day I was engaged in attendance upon Mr. Robertson, the Harbour Engineer, and Colonel Farewell, &c. I am happy to say that since that time there has been a long continuance of favourable weather, and I was on the afternoon of the 21st enabled to nearly complete the work. Captain Richardson's report of the 20th February will have already prepared Government for the failure of those pearl banks which were thought so favourably of last year, and I regret that my late examination has proved the correctness of his surmises, and that at present there is not the slightest prospect of a pearl fishery taking place on the coast of Tinnevelly of Madura for some years. On arriving at Paumben on the 22nd of March, I at once proceeded to two of the banks off that place. I devoted to these all the forenoon, but found no oysters. The banks were covered with weed and some Kilakoi. It being late in the day when I finished, I decided to pass by the rocky ledge off Mannauli Tivu, which had been examined previously, and proceed to the westward, and the next morning examined the large bank off Keelacarry. On this the divers found a very few oysters—now and then one only, never more at a dive. A patch of rocky ground off Valinookum point was next examined, upon which three pearl oysters were found. From this we proceeded to another bank off Nalla Tanni Tivu; this proved to be quite bare. Having duties at my office which required attention, I went on to Tuticorin.

The banks off Tuticorin and Vypar as follows were next examined successively:—

Cruxian Par.—On this a very few oysters were found. *Kooda Par.*—Some oysters. *Koorichanthondoo Par.*—Some oysters. *Vantheroo Aroopagum Par.*—Blank. *Alankan Par.*—Blank. *Vairpar Kariar Par, Davee Par, Fernandoo Par, and Padootha Marican Par.*—When these last four banks, were examined by me in the early part of 1869, a large quantity of young oysters of about a year old were found. These seem to have remained over the succeeding year, but have now nearly disappeared. I remained here for some hours; but, although oysters to a limited extent were brought up, still the quantity was so very small that these banks may be considered to have completely failed; the buoys were anchored in different parts, so that no place escaped inspection. There were a large quantity of dead pearl shells of about two-and-a-half years of age, and the stones brought up showed the remains of the byssus of those oysters that have died. *St. Patrick's Bank off Mookoor.*—I arrived on this bank at 7-30 A.M., and having placed a buoy in its northern edge, worked across it until I came to the south and then to the west. It is a long rocky patch, extends from east to west; the canoes in company, and in signal communication; a few oysters were now and then reported, in no place did we get more than three at a dive, and oftener none. Those found were about three years old. Soram and Barnacles were found intermixed, the latter almost always adhering to any oysters that were brought up; in fact, this bank may be considered also to have failed; it corresponds to one known to us as the Vypar Periar Par, but by reason of its distance from shore it is seldom that it can be found by the native marks. After leaving this bank, I came upon two small patches of rocky ground a short distance to the west. On these some oysters were found similar in age to those on the larger bank. *Veerathee Coodamathu Par, Rajavookoo Chippi Sothichi Par, Sakithoo Coodamathu Par, Nadookoodaamthee Par, and Poodoo Par.*—These five banks are situated off Pinnacoil and are all joined together, the names by which they are known being merely to distinguish them from others off that place. When examined in 1869, a considerable quantity of young oysters were found, and I was then induced to be hopeful regarding them. The banks have since been inspected by Captain Richardson, who has reported adversely, and my examination has proved the same. A few oysters (about twenty) were found, not sufficient to be of any value to Government, and that after spending two and-a-half hours on it. On that part called Nadookoodamathe Par and Poodoo Par the divers brought up a good many of one year old, but intermixed with Soram.

Kanava Par and Kadian Par.—On these also were a few oysters mixed with Soram and Kilakoi.

Chowdee Par.—This bank was first found by me in 1869. Upon referring to my daily diary of that period I find the following remark:—"This is a large bank; the Parmandady calls it a new one. On this found a good many oysters of 1, 2, and 3 years of age. The divers brought up six and ten at a dive." This bank seems to have been thought more favourably of by Captain Richardson and Mr. Longley than by myself, as the fact of its having oysters of three different ages on it at one time would be sufficient to dissipate any hopes of it ever being valuable that I might otherwise have had. I certainly never expected it to yield even a small fishery, and am not surprised at the oysters having now almost entirely disappeared. I have devoted a good deal of time to its examination, and returned to it again to try it with the dredge. This brought up no oysters at all, but it was nearly covered with old shells, stones, weed, &c. Had there been oysters in even a moderate quantity, it would assuredly have brought up some. Regarding the position of the bank there is no doubt of this, as my former compass bearings were again found correct. At the examination the divers now and then brought up a few oysters of three years of age, and a number of pinna shells with the pearl oysters byssus still adhering, and to which Barnacles were also attached. Almost all the dead shells had Barnacles adhering. *Karia Carooval Par.*—On this bank only a very few pearl oysters. *Velangoo Carooval Par.*—We drifted to and fro over this bank with a canoe ahead and astern, keeping the driver working, but no oysters were brought up. *Coodamathee Par and Selthan Par* were both bare. *The large Manapad bank.*—The position

of this bank is, as I have previously stated in my reports, unfavourable for the pearl oysters, although, like all other rocky beds on the coast, a small number will always be found on it. I have now again passed several hours, sending the divers down in different places. A very few oysters covered with Barnacles were brought up. A buoy was placed in the centre, and the two canoes and myself worked first over the western end then to the eastward, the divers going down every one hundred yards or so. In some parts the quantity of large Barnacles seem almost to cover the whole bottom, some alive and others dead. *Manapaudoo Par.*—This is only a patch of rocky ground with sandy parts running in and out. A good deal of Soram was found. *Sandiamarun Pooditha Par.*—Some Soram and dead shells. *Sandama Covil Pooditha Par.*—One oyster found. *Poodoo Par.*—Blank. *Poondotta Par.*—This is a very extensive bank. I spent some time on it, but found no oysters. *Koothadiar Par.*—Three oysters found with Soram and Kilakoi.

Tholayiram Par.—A very large bank. The divers brought one oyster of nearly five years (in which was one small pearl) and four others of different ages, and a quantity of Soram. This was after spending three and-a-half hours on it. *Athambothoo Par.*—Two oysters found. *Pathari Par.*—Blank. *Passee Par.*—Three oysters found. *Keelathu Par.*—Blank. Thus completed the examination of all the principal banks and of all the patches of hard ground that we have found by the lead, which in some cases have proved only coarse gravel: the result is very unsatisfactory. There seems to be an absence of even the presence of spat, some of which was generally observed in different places in former examinations. As far as I can judge the prospects of a pearl fishery are as bad now as they have been at any time during the past eight years. The fact of a fishery having been fully expected in the ensuing year leads me to think that Captain Richardson was perhaps oversanguine, having had little experience with pearl oysters. The finding of a few made him think more favourably of the banks than he would have had, had he gone through my repeated disappointments, having been over the ground and satisfied myself that the divers have stated the truth by using the dredge on such banks which Captain Richardson seemed to be doubtful about. I am confident that oysters do not now exist except in very small quantities, perfectly insufficient to be of any value. There are many things to be considered before recommending a pearl fishery, first of which is the quantity of oysters. A bank to pay for fishing must contain so many oysters that at least five hundred divers can go down as often as possible and detach not less than from fifty to one hundred at each dive. This must be kept up from daylight until 2 P.M., andt hen for several days in succession. It will thus be seen that to permit this a bank must be thickly and completely covered. I learn from the divers that on no bank examined last year did they get more than ten or fifteen at a dive, and very seldom that number. The S. S. *Margaret Northcote* is in good order, both in hull and machinery. The Engineer at present engaged is a good, steady, willing man. The Guard Boats *Pearl* and *Edith* are now in dock, and will be re-coppered during the south-west monsoon. The aquarias are also in good order. The oysters placed in them during the cold weather are now all dead. A re-arrangement of the light must be made before they can be again used, the room, as it is, being far too dark to permit the growth of vegetation required for the existence of animal life. At present there is no vegetation on the glasses, although some of the tanks have been full of water for months. The Board of Revenue, in a late Proceedings, seem to think that there is good reason to doubt the truth of the statement of the divers, &c., on the coast. I am quite at a loss to know what object could be gained by their giving us false intelligence, and cannot think that such is the case. I am quite sure that the Jadi Talawan would not lend himself to any such deception. Regarding the employment of a European diver, this I might be desirous of should there be a reasonable prospect of a pearl fishery at an early date. I am fully convinced that at present the work can be done well and truthfully with the natives. This opinion I formed long ago, after having had some years' experience with European divers. The Ceylon Government have now discontinued them. In a pearl fishery it is dillierent; then a European diver is useful, and he can be employed profitably. The diving apparatus, so far as the helmet and pump, are in good order; but the air-tubing and dress being of Indian rubber, are unserviceable. The strong south winds which have now set in prevent further work being done. Should it be possible, I shall try and look at those banks that were left; but, as they have already been examined by Captain Richardson this season and found bare, it is unlikely that I shall be able to report anything more favourable.

From the Collector of Tinnevelly; to the Acting Secretary to the Board of Revenue, dated 5th June 1871, No. 231.

In reply to the Board's Proceedings, No. 2075, dated 19th May 1871, I have the honour to inform you that oysters must be five years old to be fished, and we have none more than three years old; there cannot therefore be a fishery in 1872. The subject will be reported at length with reference to another Proceedings now under reply.

The Board regret to learn that on further examination of the pearl banks on the coast of Madura and Tinnevelly by Captain Phipps, and of the banks about Paumben by the Collector, there appears to be not the least hope of a successful pearl fishery for some years to come. In his second letter above recorded, the Collector states the reason for there being no probability of success this year. It will be remembered that in the latter part of 1869 and beginning of 1870, Captain Richardson, then Acting Superintendent, carefully examined the pearl banks south and westward of Tuticorin nearly as far as Cape Comorin, and reported* favourably on banks at Vypar, some ten miles from Tuticorin, on some large banks off Manapad, formerly reported blank by Captain Phipps, but where large numbers of oysters were found by Captain Richardson and of hopes of a fishery on the banks of Trichendur in 1872. In continuation of this report, Captain Richardson† submitted the result of further examination of the banks north-east from Paumben to Tuticorin. Off Paumben, in the direction of Manaar, oysters were found, but not in quantities likely to yield a good fishery. Off Moosel Island, and in another spot four miles to the south-west, promising patches in sufficiently deep water were discovered, which it was hoped might extend and be ready in three or four years; and due south of "Uppu Tanni Tivu" what was described as the richest and best bank on the whole coast, on which were found oysters 3½ years old, some with well-formed pearls in them, in 8½ fathoms of water, was named St. Patrick's bank, and a confident hope was expressed that these four or five extensive patches would yield a lucrative fishery for four consecutive years, from 1872 or 1873. The result of Captain Phipps's examination in March and April last is as follows:—From the banks off Vypar and Tuticorin nothing can be expected. At St. Patrick's Bank a few oysters, but not more than two or three at a dive were found, and this also is considered a failure. The unfavourable opinion of the banks off Pinnacoil, entertained by Captain Phipps in 1869 and endorsed by Captain Richardson, is again confirmed by the former.

The position of Mannapad is thought unsuited to pearl oysters, though a few may always be found there. From the "Chowdee Par" bank, reported well of by Captain Richardson and Mr. Longley, Captain Phipps never expected even a small fishery, and has no hopes of its being ever valuable. Captain Phipps concludes that Captain Richardson was over-sanguine, owing to his want of experience of the difficulties and disappointments attendant on the pearl fishery, and that the prospects of success are as unpromising as they have ever been for the past eight years. The Collector states that there are no grounds whatever for supposing that systematic poaching on a large scale is carried on by the fishermen, as there are no oysters of sufficient age to produce pearls; and concurs with Captain Phipps in thinking that there is no cause to doubt the statements of the divers and others who have nothing to gain by giving false intelligence, or to suppose that the Jadi Talawan, who has a direct interest in the Government fishery, would connive at any wholesale poaching. A further report is promised by the Collector with reference to another Proceedings of the Board.* It is presumed that this refers to their Proceedings of the 5th May last, No. 1,890, to which no reply has as yet been received, and in which the Board, before submitting their Proceedings to Government, requested the Collector's opinion as to sufficiency of Captain Phipps's explanation regarding the large quantities of shells discovered on "Nalla Tanni Tivu." The Board are glad to learn that the vessel *Margaret Northcote* is found so well-suited for the purposes for which it is used. With reference to the Order of Government of the 12th May 1871, No. 834, an application for employment as a diver has been made by a European who is recommended by the Master Attendant, and the Board are in communication with the Collector on the subject.

INDIAN FISHERIES.

ON "PISCICULTURE"—AND OTHER "CULTURES."

WHEN I commenced a perusal of that minute, announcing the birth of an infant department, I fully expected to find a batch of new nurses for the euphonious stranger, and which, in blunt phraseology, I do call a *lusus naturæ*, or "monster"—to whose first existence, even the senile guardians of Paphian hygiene have been summoned—with many, many more of fine "professors," and "poor performers," whose spoilt charges have only brought them "ill-fame!"

But to my fishes: and in spite of the Anglo-Indian fashion "not to care a brass farthing" for Nature, only for rupees, I exactly reversed the motto, and made it *my* code (I am proud to say), and to my peculiar mind I even preferred a tree, a flower, or a fish, to a billiard ball, a racquet bat, and have passed most of my youth in the wild society of Indian fauna and flora; and, in fulfilment too of the above-named Anglo-Indian fashion have grown grey in my pur-

* 2nd February 1870. G. O., 28th June 1870, No. 957, Revenue Department.

† Report of 4th May 1870, in G. O., 15th July 1870, No. 1086, Revenue Department.

suits, without one offer to carry them out in the interest of the State. I never played game-keeper to Capuam grandees, or presented folios of forest sketches to their queens! I always love my fishes, my flowers, and my beasts and birds, very much more than "tuft hunting." The solitary task set to poor Dr. Day on the Malabar shores, *malgre* all his zeal and qualifications will only result in a drop or two of practical knowledge in the interests of piscatory improvement, and even if he live to a patriarchal age and die in harness then, of what general use to the whole vast Empire will be the names and breeding places of the "Malabar Fishes?"—all long ago fully known and understood by the subtle and sable fishermen of that ilk. Had even the learned doctor, all the horns, hands, and eyes of a Hindoo divinity, he would never in mortal life-time accomplish the whole Bay of Bengal, of which the Coromandel shores are but a fringe; and again, unless this piscatory *employé* of Government knows the dialects of the races of Bengal, and something too of the fishes they consume, their names and habits, how large will be the fruits of "dabbling in the water!" Not only is Lower Bengal fertile in choice and abundant scaly species, but the great rivers and tributaries of Upper Bengal (Assam and the N. E. Frontier) teem with little-known myriads of "watery inhabitants." The upper Burrumpooter, and its sister tributaries, and contless back-waters of unknown sources, all abound in the beautiful forms of Indo-Chinese type, mostly elegant in shape and colour. A portion of them so delicious that, as old Dr. Hamilton says in his well-known travels on that frontier (speaking of the *sentooree* fish), that wherever it was required to form a sanitarium, the first thing would be to introduce this species as an attraction to visitors and settlers. I can fully vouch for its super excellence—it will rank with British turbot; as to its abundance, I have seen the entire rocky or pebbly flooring of a great rapid for hundreds of yards paved with them, 2 or 3 deep, as my canoe shot like an arrow over their backs. The scanty fishery consists of an occasional fling of his rude casting net, by some wandering savage. The net is made of wild rhea fibres, weighted with pebbles: such on a larger and better finished scale is the great casting net of the Assamese boatmen, who sometimes venture into those upper waters to catch this highly-valued delicacy, for barter in grain and salt with the villagers of the low country. I said "venture," for without fire arms these canoe men are liable to be killed or kidnapped by the man-stealers and man-destroyers of the surrounding tribes. Night being the only time of fishing, torches are used to attract the *sentooree*, and I have seen from 10 to 20 of various weights come up in the pockets of the net, after such a fling into a black pool at the tai of the rapid, while our canoe danced in the eddies, and drifted into smooth water as we slowly removed the spoils from the meshes.

What grand shoals, too, in those remote rivers of the lively and carnivorous Indo-Chinese barbel, growing to 25 pounds weight, and supplying cartloads of good "for a common man." And what glorious giants of the *Macrocephalus* and *Megalepis Cyprius* occasionally much larger than man, and all fine eating; and what hosts of smaller fishes, herbivorous, and evidently grazing on the weed o'ergrown rocks and boulders of the depths! By the time good Dr. Day has travelled in the footprints of Hamilton, Griffiths, and Wilcox, our black fellow-subjects will, at the present enlightening pace if wisdom, have learned to prefer the concentrated forces—sealed up in those tiny porcelain pots from Australian laboratories—to all the fishes of India; the bulls, and the goats, and the fowls of this over-populous part of the world will have "gone the way of all fishes," in spite of the new Agricultural Department:—*Correspondent Times of India.*

SILK.

SERICULTURE.—I wonder if one, or any or many of the new-born departments know *Saturnia Atlas* (an old friend of mine; indeed one of the oldest). The family resides in Bengal, and in the Central Provinces, and some of its members have settled elsewhere. Under "high patronage" (as a young human acquaintance worded it, after a successful *debut* during the silly season at Capua), I have always wondered that British skill and machinery (the *interloping* article I mean, not the *official*) were not turned to a product, which frequently commands more than two shillings a yard on the spot from the rude native loom, I mean, of course, *tussur* silk. On the dark rainy nights, if you dwell among green groves, as I do, you have only to leave a lamp in front of an open window, and you will attract some of the beautiful spinster *Saturnias* in search of males; and I have a peculiar lure which, when I walk into the verandah, entices these gorgeous images to settle on my hands and feet, and I catch the most desirable to become mothers of *tussur*—*i. e.*, to lay as many eggs as possible. I have *zizyphus zujuba* tree just now covered with eggs, and I gathered many fine cocoons therefrom early in the season. I have seen these cocoons hatched in London spontaneously after several months' immurement at sea by a sailing ship; and it will be doubtless possible to introduce the worm into other countries. The moth is a glorious insect, especially the female with transparent membranaceous windows in her wings; and so has the male, but he is smaller and not so inconspicuous. The Gonds of the Central Provinces wander about the jungles to collect the cocoons, and sell them at the frontier markets to the silk spinners. I have some twilled fabric of this kind, purchased at Bhagulpoor, which cost me 2*s.* 3*d.* per yard—surely a rate to tempt English enterprise. The worms of Assam, *Eria* and *Moonya*, are of larger proportions—magnificent lepidoptera we may call them; for the moths are like gaudy birds! This quality of silk is greatly prized and very limited in manufacture, being chiefly confined to the families of opulent landholders who pass on these fine silkcloths from generation to generation; the fabric is very thick and strong, and the more it is washed the more glossy and supple does it become. These cloths are rarely to be purchased, but may be sometimes obtained in barter among the backwoods of Upper Assam.

OSTREOCULTURE.—Very long ago it struck me forcibly that within a few days' steam of Calcutta or Bombay, we could make such a marine paradise—with villas, and saline baths, and boating, and ponds stocked with, and Crustacean and bivalve delicacies, and crystal aquaria, with all manner of algæ and other vegetation floating, as would attract invalids and idlers. Newest in my mind's eye is the Chilka Lake, a spot where at some future day there will be a noble harbour of refuge—the only point in all the Bay of Bengal where such a work could be established. There the oyster of civilized man breeds and multiplies; also at a few other small coast stations. This oyster is not the giant creature of the Andamans, which lives in a pair of soup plates, but the real soft and slippery conchoid. Off Tranquebar I met with the real living representative of his European prototype, and from that greasy mudshore obtained such a pleasing surprise as I never dreamed of, and what could be easier than to transplant him to a quiet and salubrious bank at Chilka, where artificial food might be tried to increase his bulk and render him a useful addition to the natural invigorations of a marine sojourn?

PUBLIC WORKS.—RAILWAY.

NEEMUCH RAILWAY—SURVEYS FROM INDORE TO AJMERE.

RESOLUTION BY THE GOVERNMENT OF INDIA.

Simla, 3rd November 1871.

SINCE the orders of the Government of India were given for the preliminary surveys for a railway between Indore and Neemuch, a contract has been entered into for the construction of a railway from Agra to the Sambhur Salt Lake, with a view to extension to Ajmere and Nusseerabad, and the project for a railway from Khundwa to Indore, after careful preparation, extending over two seasons, has been so far matured as to permit of advertisements being issued, inviting tenders for the execution of the works which include a large bridge over the Nerbudda River, and the ascent of the Vindhya range to the plateau of Central India. The country between Indore and Neemuch has been also examined in a thorough manner, and each of the six alternative routes, which have been surveyed, possesses some characteristic advantages. The Government of India have ascertained that no unusual physical difficulty will be encountered on any of the suggested lines, and have now to decide which route will best meet the local wants of the Native States which will be traversed. This may absorb some little time, as the interests of several Native Chiefs are affected according as one or other of the several lines examined may be adopted, but there appears to be no room for doubt that the line should pass southward, from Neemuch to Mundesore and Jowra, whatever location be preferred south of the last-named place, and that the present season should be taken advantage of to locate the line finally between Neemuch and Indore, so that the designs and estimates may be got out during the recess of 1872, to admit of the commencement of work in the cold season of 1872-73.

The three survey parties which have been engaged on the country between Indore and Neemuch are ready to commence operations, and the Governor General-in-Council, therefore, determines that one party shall proceed at once to locate the line between Neemuch and Indore. It may be expected that by the time the party has done this as far as Jowra, the general direction of the line between that place and Indore will have been settled. The only instruction that it is necessary to give is that a ruling gradient of 1 in 150 should be adopted. If this should make it expedient to abandon the existing road which, in the preliminary survey, it has been found possible to follow by using a gradient of 1 in 100, a separate alignment should be adopted, but every endeavour should be made to carry the line in the vicinity of all important places. His Excellency in Council is desirous that the road should not be abandoned without full and sufficient reasons.

The other survey parties should continue the investigation from Neemuch to Nusseerabad, in order to ascertain the best line on which through communication may be made. The general direction of the examination will be due north from Neemuch, and the existing road though Chittoregurh and Sanganeer probably indicates the line which will be best suited for a railway, but the country should be examined in a searching manner, and, if deviations from the direct line are thought to be desirable, they should be reported on. As to the precise direction of the line north of Neemuch, the Governor-General-in Council will be glad to receive a full expression of the

opinions of the Agents in Central India and Rajaputana, and requests that they will also make known their views to the Superintending Engineer. His Excellency in Council further desires that the needful communications may be made to the Chiefs of the Native States likely to be affected by the proposed railway, so that any representation they may wish to offer as to the direction of the line may be duly heard, and every assistance may be extended to Mr. Miller and his staff in the prosecution of the surveys. The Agent for Central India should, without delay, make known to the Chiefs concerned, the instructions now issued for the final marking out of the line between Neemuch and Jowra.

Certain merchants of Nyanuggur have solicited that the railway may be diverted through that small but thriving town, which is believed to be situated too far to the west, and in too difficult a country to be readily accessible by railway from the neighbourhood which it is now proposed to examine. The Superintending Engineer will, however, visit Nyanuggur, and will report on the feasibility of complying with the request of the inhabitants.

The Governor-General-in-Council believes that there is less doubt concerning the towns to be accommodated between Neemuch and Nusscerabad, than there was on the line between Indore and Neemuch. The result of the preliminary investigation should be prepared and submitted at an early date, to enable the Government to pass orders, and His Excellency-in-Council trust that the centre line of the whole railway from Indore to Nusscerabad may be permanently staked out during the working season of 1871 72, so that the estimate may be taken out on the final line during the recess of 1872. The Superintending Engineer will be guided by the same general instructions in the prosecution of the further surveys as were issued to him for the section between Indore and Neemuch.

The section between Ajmere and Nusscerabad will be adopted to the Agra district, or the Rajaputana Railway, and Mr. Furnivall will submit the estimates for this section as soon as ready, but as a distinct sub-division of the Sambbur and Ajmere division.

The Governor-General-in-Council is much satisfied with the results of the short season's work between Indore and Neemuch; a great length of trial line has been run in a very short space of time and the results obtained reflect great credit on Mr. Miller and the officers* named by him, and afford evidence of much intelligence combined with rapidity of execution.

* 1st Division.... { Lieutenant Firebrace, R. E., Exec. Engr.
Mr. H. B. Addis, Asst. Engr.
2nd ,, ... { Lieutenant J. Dundas, R. E., Exec. Engr.
,, A. G. Begbie, R. E., Asst. Engr.
3rd ,, ... Mr. J. M. Span, Exec. Engr.

PUBLIC WORKS.—IRRIGATION.

NORTON'S TUBE WELLS.

From the Collector of Nellore; to the Acting Secretary to the Board of Revenue, dated 8th February 1871, No. 256.

ADVERTING to Proceedings of Board, dated 3rd May 1870, No. 2931, I have the honour to subjoin a report on the working of Norton's Tube Wells by Mr. Williams, late of the Department Public Works, and now Manager of the Municipal Office at Nellore.

From W. C. WILLIAMS, Esq., Manager, Municipal Office; to the Collector of Nellore, dated 6th February 1871, No. 86.

In continuation of my No. 55, dated 11th October 1870, on the subject of Norton's Tube Wells, and being since supplied with the gutta-percha required therein, I now beg to submit the report called for by the Board of Revenue in their Proceedings dated 10th November 1870, No. 6594. In the month of July last I received three of Norton's 2-inch Tube Wells, with a set of driving apparatus from Mr. Master, the then Officiating Collector of the district, and put them down in different localities where water for drinking purposes was most required.

The first was put down at Nabobpett, a 10-feet well, on sandy soil, with 5 feet water in the tube, the second at Fattekhanpett, a 16-feet well, on sand and laterite soil, with 9 feet water in the tube, and the third at Subadarpett, a 26-feet well, on sand, laterite, and mud soil, with 12 feet water in the tube. The wells in the two first localities worked very favourably for a few days, and produced a good supply of drinking water, when suddenly the pumps refused to work; on examining them I found that the valves were not air-tight, owing to the gutta-percha strips attached to them being destroyed, substituted tanned hide, but failed to produce the desired effect; the third well I could not work at all, owing to the same defect in the pump. Since being supplied with fresh gutta-purcha and the valves of the pumps made air-tight, I got the two first in working order, but failed with the third, owing to, I think, either from the great depth or the extreme density of the clay which prevents free percolation. I intend drawing this up and giving it another trial in another locality. The driving apparatus supplies every requisite, but the driving down of the tubes is most laborious (particularly on compact soils); it requires three able men at each rope's end attached to the monkey, who ought to be relieved every now and again; thus working, with the assistance of a smith, it occupied me two hours in driving in and fitting up each of the small wells, and three hours the large. Independent of the defects in the pumps I found that the screws of the tubes are not turned out with sufficient exactness, and the threads more or less of the whole of them injured, thereby making the coupling portion of the work most difficult and imperfect. In no case did I succeed in getting the screws (male and female) to butt. Each of the two wells, now in working order, produce with easy pumping 132 gallons of clear water per hour of a metallic taste. The Board's Proceedings No. 6594, forwarded with docket No. 3163, is herewith returned.

From the Acting Sub-Collector, to the Collector of Cuddapah, dated Gurrumcondah, 17th November 1870. No. 413.

In reply to your docket No. 253 of July 28th, 1870, requesting me to report, after trial of Norton's Tube Wells, I have the honour to state that I concur generally with the opinion expressed by Mr. Boyle in his report of July 19th, 1870. The tubes were put down in only two places. The first was in the bed of the stream running to the east of the village of Madanapally, near which water is ordinarily found at the depth of about 20 feet. The tubes were easily driven for about 15 feet, after which they apparently met a bed of clay, and driving became difficult. They were, however, finally put down to a depth of 22 feet, but no result could be obtained. My own impression is that the clay had so completely stopped up the holes of the lower tube, that the water could not percolate. No force pump was sent with the wells, and it was in consequence impossible to clear them. Water was poured down the tubes, and pumped out again and again, but no result followed. During this pumping, the top of the pump broke clean away from the body. The iron where it broke is excessively thin, and is quite unable to stand any ordinarily rough usage. A new pump was obtained from Cuddapah, and the well tubes taken up and put down in the bed of another stream to the north of Madanapally. Here water was obtained at about a depth of 10 feet and flowed freely from the pump. The general depth of the wells near Madanapally is from 25 to 35 feet, so that the well tubes would not be of much use in the town itself. I did not find the same difficulty experienced by Messrs. Boyle and Arundel in screwing the pipes home. Before using them I had the screws thoroughly cleaned out with the apparatus sent with the pump, and easily screwed them home with the help of a little oil. The tubes were taken up by putting on the clamp, and then lifting it up by levers. No difficulty was experienced in withdrawing them. I consider that ordinarily the services of a skilled mechanic would be necessary for driving and fixing the pumps. It is not without a reason that a suggestion is made at the end of the prospectus, that when a well cannot be successfully made, a guinea a day, with man's expenses and railway fare, should generally meet the case. Had it not been that Mr. Assistant Engineer Brickwell was at Madanapally at the time the experiments were made, and gave his advice and manual assistance, I do not think we should have succeeded in setting up the pumps at all. I should have made more experiments with the wells had I seen any prospect of their being of any practical use in this part of the country. The small depth from which they draw water (without the aid of a bucket and valves) renders them far less useful than they might otherwise be. The pump handles are far too short, and the pumps generally seem too weak to last long. The wells and apparatus have been returned to Cuddapah. I enclose a memorandum of the charges incurred by me, and request that the amount may be remitted.

Submitted for the information of the Board of Revenue, in continuation of Mr. VansAgnew's letter and enclosure recorded in Board's Proceedings dated 26th September last, No. 5862.

From the Collector of Kurnool, to the Acting Secretary to the Board of Revenue, dated 6th May 1871, No. 150.

With reference to the Board's official memorandum No. 703, dated 18th July 1870, I have the honour to inform you that I have experimented on the Norton Tube Wells within the town of Kurnool with the following result:—These tubes are so small that they are only fit for supplying water for drinking purposes, and that in small quantities. For irrigation purposes they are useless. In this district water is not generally found near the surface, and during the hot season it has to be sought for at great depths, and as the water sinks gradually, the tubes have to be driven occasionally deeper. These tubes were driven into the dry bed of the Tungabudra with success at the time the town supply from the Irrigation Canal had ceased. But the constant use of them has damaged them, and as attempts have been made to steal them, I have been obliged to have them removed. In any case they would have to be removed, as the freshes come down the river. It would be useless to keep them without the driving apparatus, and at best they can be only looked upon as temporary contrivances, but valueless when a large and plentiful supply of water is required. I have had applications to sell them. If the Board would fix a price, and let me dispose of as many as

I can, and allow me to return the remainder with the driving apparatus to Madras, I think that would be the best course to adopt. I regret the delay that has occurred in replying to the Board's call; it is owing to my having sent a pump with driving apparatus to Cumbum, where many changes of Head Assistant Collectors have been made. A pump was sent to Mr. McCarthy before he tried to put it down; Mr. Gribble was put into the appointment, and was not at Cumbum for more than a few days. Then Mr. Turner succeeded, and his attempt to drive the tube down to water was unsuccessful. The driving apparatus was all that time in Cumbum, and I had to wait till I had it returned to me lately by Mr. Turner.

From the Acting Collector of Chingleput; to the Acting Secretary to the Board of Revenue, dated Sydapet, 12th June 1871, *No. 252.*

With reference to Board's Proceedings, dated 3rd May 1870, No. 2931, four Norton's Tube Wells, with two sets of driving apparatus, were supplied from the Public Works Stores and Work-shops. Mr. Crole having expressed a desire to exhibit these wells in each of the talooks of the sub-division, three, together with a set of driving apparatus, were forwarded to him, only one being retained for experiment by the late Acting Collector. Although several trials appear to have been given last year to the one well retained by the Collector, the result of the experiments was not recorded by Mr. Blair. I am informed, however, that the tubes were sunk in four places; first, in this Cutcherry compound, where no water was reached after driving nearly 30 feet. The well was next taken to the Home's Garden's Cutcherry, and, after one unsuccessful trial, water was reached at 27 feet, but the supply was both scanty and muddy, and ceased after some days' pumping. The tubes were again removed at the end of last year to the race course, where, I am informed, the attempts were again unsuccessful, boring being stopped by rock. Reporting second-hand is not satisfactory; but from all I can gather, the failure of these experiments arose from sinking in unsuitable places. Mr. Barter particularly mentions in his pamphlet that the wells can only raise water when there is water, and if the soil admits of boring, and cannot perform impossibilities or pierce rocks. I found this last to be true to my cost at Chingleput, when I tried last year to sink a tube well of my own for several successive days, and at twenty different places in my compound. I always came on rock at about 15 or 20 feet according to the undulation of the ground. At Home's Gardens, when Mr. Blair reached water, had the well been sunk a few feet *deeper* when the supply ran short, the result might have been different. When there is water, and the strata admit of sinking the tubes, there can be no question that the wells are a success, as shown by the one sunk by Mr. Crole at Chingleput, and which I have often tested myself. I am going to try the one well still lying here at the Police huts at the Vallur Salt-pans; when there a fortnight ago, the men complained bitterly to me of the straits they are put to for sweet drinking water in the hot weather; the soil will, I think, allow of the tubes being sunk. I enclose copy of Mr. Crole's report; at paragraph 11 of it, he correctly estimates, I think, the chief value of these wells as being for raising drinking water in crowded localities. The Sub-Collector, after experiments in different parts of his division, has left the three wells supplied to him in the Government garden at Chingleput, and the local fund topes at Mamundur and Manamai; at the first place for public inspection, and at the topes with a view to watering the young trees. Mr. Crole is not satisfied with these pumps, which he considers very inferior both as regards fittings and workmanship; I think, however, unskilful handling may have had something to do with the breakages. He wishes to be supplied with another pump (pump only, not tubes) for use at Mamundur, the one sent having broken as described by him; I beg that his request be complied with. The cost of the experiments in the sub-division has amounted to Rs. 9-7-6, and I now request that this sum may be sanctioned from the "Land Revenue Contingencies." I have directed the despatch of one driving apparatus to the Superintendent of Public Works and Stores Workshops, as required by the Board in their official memorandum, No 703 of the 18th July last; the other will be returned as soon as the experiment alluded to at paragraph 5 of this letter has been tried at the Police huts, Vallur Salt-pans.

From the Acting Sub-Collector; to the Acting Collector of Chingleput, dated Mamundur, 31st March 1871, *No.* 202.

With reference to Proceedings of the Board of Revenue, dated 10th November 1870, and numbered 6594, I have the honour to give you the results of my experiments with Norton's Tube Wells. As you are aware three were sent to me. The first one I sank at the second attempt (after bending the tubes) through a bed of quartz, flint, and chalk, 20 feet thick, into a bed of coarse sand. This was in the Government Garden at Chingleput. The percolation being free, it works as well as can be expected of a small tube. I must add, however, that besides the bending of the tube, it suffered many other mishaps. In spite of the greatest care, parts of the head split off, as if composed of crockery ware instead of English iron work. I next tried another in gravel with a 9·15 bed of decaying rock below. After going down 25 feet, we were stopped by harder rock, and withdrew the tubes which were bent. I afterwards sank this same tube through sand and a bed of very stiff clay, 19 feet thick, into fine sand which was reached at a depth of 26 feet. This brought us a little below the bed of the neighbouring river. This was in the Local Fund tope at Mamundur. After an extreme amount of labour in withdrawing, testing, re-fitting, and re-driving the tubes, and pumping for several days on and off, with no result, the water suddenly sprung up the tube, and is now standing 19 feet deep in it, that is 14 feet from the sucker. The head of this pump also behaved in the same way as the last, and is now, though patched, a complete wreck. I should be much obliged for another, as this pump will be very useful in watering the young trees to be kept in stock in the above garden for the other topes and avenues on that side of the Madurantakam talook. I had intended the third well for Conjeveram, and drove it in the compound of the Talook Cutcherry during a visit paid to the place in December last, leaving instructions to pump on till water came. It had been driven 28 feet through sand and clay. On my re-visiting the place in February, I found that the result was only the smallest quantity of very dirty water. I tried in another part of the compound with like results. The failure in this case is attributable to the springs at that end of Conjeveram being very slow and weak. I subsequently attempted to sink the same well in the Local Fund tope at Guduvancheri on the trunk Road. It was found impossible to drive it beyond 14 feet, owing to its meeting with a sort of whitish, reddish rock. It was then sent down to the sea coast to the Local Fund tope at Manami, on the bank of the East Coast Canal, and, on the 16th instant, was sunk in sand, and an abundant supply of water, slightly brackish, was found at a depth of 18 feet. Having determined to allow it to remain there for the present, in order to water the young trees, I directed the despatch of the driving apparatus to you *via* the Canal on the 21st instant, in obedience to the request contained in your Nos. 534 and 761, dated respectively 28th July 1870 and 25th October 1870. In all cases it was found necessary to use the sand filter. Without that, the pump invariably became choked up, and the little water that was obtained prior to its ceasing to draw was muddy and gritty to a degree, entailing of course great wear and tear to the sucker. The workmanship of these wells is so very inferior as to preclude any prospect of the successful introduction of the present kind. They would not last any time in ordinary use by Natives. There, is also a patent defect in the length of stroke and of the handle. The screws are ill-fitted, which very considerably weakens the tube in driving through stiff soil. None broke with me however. On the other hand, the driving apparatus with the exception of the smaller keys, is well made. The supply of water, where the springs are free, would be enough for household consumption, and if a stronger and more useful well could be supplied for, say, Rs. 40, its introduction would be a great boon in many localities where unhealthiness is, with reason, traceable to the contamination of the sources of water supply by surface drainage. Little Conjeveram is such a place, and the Municipality might do worse than try some in suitable localities in the streets as public wells. For irrigation purposes, they are mere toys and will never be of the slightest use. I have to apologize for the delay which has taken place in submitting this report. It has resulted solely from my desiring not to give any opinion until I had convinced myself by personal inspection of the probable value of these wells in their suitability, or otherwise to this part of the country. In conclusion, I beg to inform you that an expense of Rs. 9-7-6 has been incurred in driving, repairing, and carrying about the tube wells, and to request that you will obtain the sanction of the Board for the disbursement of the amount.

From the Collector of South Arcot; to the Acting Secretary to the Board of Revenue, dated Porto Novo, 28th February 1871, *No.* 60.

With reference to Board's Proceedings, No. 2931, dated 3rd May 1870, I have the honour to forward copy of a letter from my Sub-Collector, reporting the result of the experiment made at Virdachellum with Norton's Tube Wells. The well had previously been tried in the vicinity of my own office at Munjacoopum. Water is readily procurable all over the place and at no great depth, but it is difficult to get it free from saline matter, and it might have to be put down fifty times within a fixed area before good water would be secured.

From the Acting Sub-Collector; to the Collector of South Arcot, dated Virdachellum, 8th February 1871, *No.* 65.

With reference to your official memorandum, No. 1,158, of 23rd November 1870, forwarding a Norton's Tube Well for experiment in this place. I have the honour to report the result of several experiments made by Mr. Roberts, as recorded by him. "The Norton's Tube Well was first sunk in my compound, the "level of which may be 30 or 40 feet above the river bed. The "well was driven to a depth of 20 or 21 feet, but for the last few "feet the ground was so hard that the driving was very slow, no

"water was obtained. It seemed as if after the red soil was passed, "the tube had entered a hard clay and sand formation. It is "called Namakatti. It looks like stone, but is easily broken by "flinging one piece on another. The tube was next sunk in the "Cutcherry compound, but at 6 or 8 feet struck rock. A third "experiment was made on the north bank of the river Manimuk- "tanadi, but though there was plenty of water it could not be "raised. This was due, I believe, to the choking up of the ori- "fices in the tube, as the ground there is regur or black soil, "with very hard red soil or stone beneath. The tube was sunk "about 20 feet, the last portion with great difficulty. A fourth "experiment was made in the river bed and a copious supply of "water was obtained this morning, 16th December 1870. The "tube was sunk to a depth of about 10 or 11 feet. But the water "had a bad odour. The soil was all sand. I also tried it near "a pond in my garden, but it struck rock at about 2 feet depth."

"On the road to Cuddalore, about two miles out, there is a well "19 or 20 yards deep. The top of the water is 18 yards from that "of the ground. At this depth the well will not work. But in "the red soil of the talook water is generally found only at this or "greater depths, so that I think the tube well is not suited to this "talook, for it cannot work in the black soil which also prevails "here." As desired in paragraph 2 of your memorandum, the driving and other apparatus and the well, &c., are returned in charge of a peon.

From the Acting Collector of Trichinopoly; to the Acting Secretary to the Board of Revenue, dated 19th May 1871, *No.* 142.

With reference to the Proceedings of the Board, under date the 10th November 1870, requesting me to report on the result of the experiments made with Norton's Tubular Wells, I have the honour to state that I had two experiments made in grounds reclaimed from the old Fort ditch at this station. In these experiments, the tubes were driven of course with ease, but in the first the pointed end of the pipe chanced to strike on a stone, at a depth of about 18 feet and had to be withdrawn. On the other occasion, the pipes were driven to a depth of 22 feet. When water was obtained, it was, however, of a very muddy and dirty description, and the quantity raised though with much exertion, owing to the shortness of the stroke, was ludicrously small. On two other occasions, when the wells were attempted to be driven on the dry beds of paddy-fields, the clay proved so tenacious and stiff that the pipes could only be driven above 6 feet, and in both instances had to be withdrawn.

I was present also when two other experiments were made with wells belonging to the Municipality, both of which were also failures; one owing to the stiffness of the clay, and the other to the tube having chanced to hit on a boulder beneath the surface. I am, therefore, of opinion, that these wells are not adapted to this district, although in sandy and more porous soils they may doubtless prove useful.

From the Collector of Madura; to the Acting Secretary to the Board of Revenue, dated 1st February 1871, *No.* 30.

With reference to the Proceedings of the Board of Revenue, No. 307, dated 21st January 1871, I have the honour to state that the Norton's Tube Well was tried close to the bank of the Vigai river, but the experiment was a failure, and the tube had to be extracted by digging it out of the ground.

From the Collector of Malabar; to the Acting Secretary to the Board of Revenue, dated Vytry, 1st December 1870, *No.* 306.

With reference to the Proceedings of the Board of Revenue, dated 10th November 1870, No. 6594, I have the honour to inform you that the large Norton Tube Well was tried near the beach at Calicut, but that with the exception of bringing up at first a few buckets full of water it proved an utter failure, owing apparently to defect in the pumping apparatus. In this case water was reached at less 10 feet. Another trial has been made with one of the small wells which has been placed in an open well at the new market place, the well being boarded over. The object of this is to ascertain whether the pump will stand regular use, and it has not yet been long enough in use to admit of a decision being arrived at. One great objection is, that it is necessary first to pour water down before the pump will work, a process which destroys the advantage that would otherwise arise from the certainty of the water brought up being certain to be uncontaminated. It is proposed to try some of the tubes in Wynaad, and Major Kennedy has undertaken to do this as soon as the effect of the monsoon has so far ended as to admit of the value of the tubes in searching for water being fairly tested. On the whole the wells do not seem to be adapted for any useful purpose in this district.

From the General Superintendent of Public Works Stores and Workshops; to the Acting Secretary to the Board of Revenue, dated Chepauk, 14th November 1870, *No.* 924.

With reference to the Proceedings of the Board of Revenue, dated 26th September 1870, No 5802, requesting my opinion as to the general character of the workmanship of Norton's Tube Wells, I have the honour to state that, having examined the pumps in store, I have not found anything defective either in material or workmanship. There is no doubt that lightness of material was one of the objects aimed at by the Patentee in the construction of these wells for the sake of easy and ready transport, and if care is taken to select proper ground for putting down these wells, avoiding rocky soils whenever practicable, there will be little danger of damage or breakage to them. In fitting the tubes they were taken promiscuously, and I found that they screwed on easily and without any difficulty. In my several experiments with these wells, I found no difficulty in bringing up the water after a few strokes of the pump, and although the water obtained was at first muddy, it became clear after a few gallons had been discharged. It is immaterial if the screws do not butt closely when fourteen out of nineteen threads are screwed on, the tubes are well put together and a little white or red lead puttey should be used at the joints in order to make them *air-tight*. The failure of Mr. Arundel to raise water during his experiments is possibly owing to the puttey not having properly been applied to the joints, and thus allowing air to leak into the tubes. It is rather surprizing that so many as six men should be required to raise a monkey 89 lbs. in weight, with the additional aid of two pulleys attached to the lifting gear; a little stretching and greasing of the ropes and oiling of the boss of the pulley would have overcome any resistance offered by both. These points I have noted are very often overlooked, but if attention is paid to these matters, the wells would be found to work very satisfactorily.

In May 1870, the Board requested the Superintendent of Public Works Stores and Workshops to despatch to the Collectors* several of Norton's Tube Wells for experiment. The letters above recorded contain the replies of several Collectors to whom the wells were supplied.

MALABAR.—The Collector of Malabar reports that the large well was tried on the beach near Calicut, but proved an utter failure, apparently owing to a defect in the pumping apparatus: water was reached at a depth of less than 10 feet. A small well was placed in an open well in the market place. The only objection to this experiment is said to be that water must be first pumped down the tube which neutralizes the advantage the tube well would otherwise possess of ensuring the water pumped up being free from surrounding contamination. Major Kennedy is to make further experiments in the Wynaad, but the Collector thinks that on the whole these wells are not adapted to any useful purpose in the Malabar district.

CUDDAPAH.—In the Cuddapah district a thorough trial was given by the Sub-Collector, the Head Assistant, and Assistant Collectors. Complaints are made by all these officers of the faulty construction and material of the pumps. The screws are reported to be not accurately fitted, the valves not air-tight, and the interior of the tubes are found to get choked up with clay and grit. In almost every case the failure was due to the pump coming in contact with tenacious clay or rock: and Mr. Boyle reports that after repeated and prolonged efforts nothing but a muddy dribble of water was obtainable. The Head Assistant reports that when water was obtained it had, though clear, a nasty metallic taste. Mr. Boyle stated, moreover, that the labour of driving in the tubes is most severe, three men at least being required to each of the two ropes.

NELLORE.—The experiments made by Mr. Williams, late of Department Public Works in the Nellore district, gave much the same result. Two wells put down in 10 feet wells in sandy and laterite soils worked freely and well for some days, but failed then owing to the valves not being air-tight. They lifted 132 gallons of clear water per hour, but it had a metallic taste. The third experiment was a failure owing to the tube being sunk in clay.

KURNOOL.—The Collector of Kurnool reports that the wells are too small to be of any use for agricultural purposes: and, as water is obtainable generally only at great depth in his district, these pumps are not likely to be generally used with success. A good supply of water was, however, obtained by sinking a well in the Toongabuddra river after the town supply from the Irrigation Canal had ceased. Permission is required to sell as many of the wells as are wanted—some having been already applied for—the rest to be returned to Madras with the driving apparatus, and the Board approve of these proposals. They find from a letter of the Collector of Malabar, recorded in their Proceedings of the 6th July 1868, that the then selling price was as follows:—

10 feet well and pump fixed	£ 6
15 ...	7
20 ...	8
25 ...	9
30 ...	12

plus about 30 per cent. as delivered at Madras. The Board resolve to request Government to authorize the Collector to dispose

* Malabar, Cuddapah, Godavery district, South Arcot, Madura, Madras (Collector), Do. (Sub-Collector), Trichinopoly, Coimbatore, Nellore.

of the wells now at Kurnool at not less than half the cost thus estimated.

CHINGLEPUT.—The Collector of the Chingleput district states that success did not attend three attempts made, one in the Collector's Cutcherry compound, where water was not obtainable at a depth of 30 feet, nor in Home's Gardens, where at a depth of 27 feet water was raised, but scanty in quantity and muddy, and the supply ceased after a few days; an experiment made on the race-course failed in consequence of the tube coming in contact with rock. Mr. Barlow, however, asserts from personal experience that where the soil admits of these wells being driven, and where there is water, they are a complete success. The Sub-Collector complains of defects in the fittings and workmanship, and though his experiments were not altogether successful, request that another may be sent, as it will be very useful for watering the trees in the Mamaundur tope and in other nurseries, and thinks that the tube wells will answer well where springs are free and the soil not rock or clay. He thinks that larger sized wells would prove effective in crowded localities where the object is to get water free from the impurities inherent in the surface soil, but that they are useless for irrigation purposes. The cost incurred in the sub-division, viz., Rs. 9-7-6, is sanctioned, and will be debited to Land Revenue Contingencies.

SOUTH ARCOT.—The Collector says there is no difficulty in getting water anywhere at no great depth from the surface, the only difficulty is to get it free from saline matter. The Sub-Collector says, water cannot be raised where the ground is hard and rocky, and that the wells are not suited to the sub-division as water is not generally found at a less depth than 18 feet in red soil, and the wells will not work at all in the regur or black soil. He found that on the banks of the river, where there was plenty of water, a well would not work, owing to the choking of the orifices of the tube with black soil and stones.

TRICHINOPOLY.—Two trials were made in the old Fort ditch at Trichinopoly. In the first, rock was struck at a depth of 18 feet: in the second at a depth of 22 feet water was arrived at, but it is said to have been "ludicrously small in quantity and very muddy and dirty.

COIMBATORE.—The Collector of Coimbatore reports very favourably on the wells sent to him. One was found to answer very well in a spot above the water spread of the large tank on the Pothanoor road. The Collector says the pump is easily worked by boys, and does not consider the workmanship defective: he thinks that a greater length of stroke is required, but suggests that the failure reported by Mr. Boyle in the Cuddapah district may have been due to the tube having been strained and wrenched in putting down, and to have been not due to faulty workmanship nor material. Three large pumps have been sent to the Collector since this report was received. The result is not known to the Board.

MADURA.—The only trial which seems to have been made in the Madura district is said to have been a complete failure, and the tube had to be dug out. The cause is not stated. The Superintendent of Public Works Stores, to whom a reference was made in consequence of the unfavourable comments on the machinery of the wells, states that these latter are not defective in workmanship or material: the lightness was no doubt one of the chief objects aimed at in their construction; and therefore they cannot be expected to have the same strength as greater weight would give; but he reports that no difficulty was found with the screws; taken at haphazard they fitted sufficiently, accurately and can be made airtight by the use of a little red or white puttey at the joints, and that it is immaterial if the screws do not butt closely, provided 14 out of 19 threads are screwed in. Further that by greasing and stretching the ropes, and oiling the boss of the pulley, resistance will be overcome, and that it is not intelligible that with such precautions and with proper management six men should be required to raise a monkey only 80 lbs. in weight with pulleys and lifting gear attached. The Board do not attach much importance to the very unfavourable reports received from districts where the tubes have been forcibly driven into rocky ground and thick tenacious clays: here they naturally failed, for, as before remarked in the correspondence on this subject, the wells cannot be expected to perform impossibilities, but the result of these trials is to confirm the Board in their opinion, that under favourable circumstances, the wells are a success; if they are used only in soft soils containing water at a moderate depth they achieve all that is expected, but in rocky or tenacious clay soils they are of no use. Sunk in ordinary pot wells and worked by a crank and wheel attached to the head of the pump, instead of the lift handle with which they are sent out, they raise water free from impurities of the drainage surface in quantities sufficient for domestic or farm yard purposes, but not for irrigation. They would also be of great use in districts like Kurnool, or the Guntoor portion of the Kistna district, in a time of drought, if used in the sandy beds of rivers, water-courses, and other suitable places.

IRRIGATION REVENUE REPORTS OF THE NORTH-WESTERN PROVINCES FOR 1869-70.

WE have before us a series of these reports for former years, and are glad to find so great an improvement both in the form and substance of the present one. The old reports always contained a good deal of valuable information, but it was thrown together without order or arrangement. Even the want of a title-page, though not a great thing to complain of was indicative of carelessness as to the appearance of the reports; while the want of a table of contents, and the jumbling up of tabular statements with the text, were material defects. These have now been remedied. There is a full and clear table of contents; the text can be read continuously, and is properly divided into chapters and sections; and the tabular statements have been put together into an appendix. But it is in the Chief Engineer's review of the proceedings of the year that the greatest improvement has taken place. Formerly, this was a very short and evidently hurriedly written document. And yet it is to this review, written by the chief responsible officer and head of the department having full command of materials, that we look for a complete review of the operations of the year, and a detail of the more salient and important points in the working. It is here we naturally look for a statement of the financial condition of the whole system of works —for a comparison of the working of the various canals—for a mention of the chief administrative charges. This information was not given in the former reviews, but is supplied us in the present one. This review is very clear, full, and complete, and so arranged as not only to ensure this completeness now, but to secure it in future provided the same admirable form be adhered to.

The operations of the Irrigation Departments now extend through every portion of these Provinces lying north of Allahabad. Taking first the main portion, the Doab of the Ganges and Jumna, we find the uppermost portion of it—the valley of the Dhoon—watered by small canals. There the eastern Jumna Canal and the great Ganges Canal, taken off from the two rivers at the points where they debouch from the hills, water the greater part of the land lying between them as far down as Cawnpur; the new Lower Ganges Canal, starting from the river not far from Anoop-Shuhr, will complete the irrigation of the whole Doab down to the very junction of the rivers at Allahabad. The Agra Canal, leaving the Jumna near Delhi, will water the tract lying between the right bank of the river and foreign territory to a little below Agra. Further down in the same direction expensive surveys have been made for canals in Bundelkund, where a system of irrigation from reservoirs already exists. A complete system of new irrigation work has been designed for the whole of the great sub-Himalayan tract of Rohilkund. One large canal will be taken off from the river Ganges at one extremity, another from the river Sardah at the other extremity; while there will be some seven or eight smaller canals between the two When complete, the canal system of these Provinces will be by far the finest in the world. Even now there is hardly any, if any other system that can compare with it in extent or magnitude. It includes the largest and finest canal in the world—the great Ganges Canal. The following figures will enable an idea to be formed of its "extent and magnitude."

The Naviglio Grande, the great canal of Northern Italy, has a length of 32 miles, and carries 1,800 cubic feet of water per second. The Muzza, the largest canal in Italy, is 24 miles long, and carries 2,652 cubic feet of water per second. The ordinary summer discharge of the Thames at Staines is 750 cubic feet per second; of the Severn below Gloucester, 550 cubic feet per second. The length of the Ganges Canal (main canal and branches) is 654 miles: it has 3,000 miles of minor channels for the distribution of the water, and discharges about 6,000 cubic feet of water per second. The Eastern Jumna Canal has a length of 130 miles, with 600 miles of distribution channels, and a discharge of 1,600 cubic feet per second. Turning to the report, we find that the capital sunk in the whole system of works, up to the end of the year under review, 1869-70, was in round numbers £2,866,200. For the greater part of this, £2,407,600, was on the Ganges Canal. On the new Agra Canal £101,860 have been spent. The Eastern Jumna Canal has cost only £194,570, but it was constructed under specially favourable circumstances.

The character of the seasons during the year 1869-70, was not a favourable one for the canals. "The two crops, autumnal and spring, are usually dependent to a great extent on the same rains, but the year under review was abnormal in this respect. The rains were long delayed and fitful. The people fresh from the experience of a year of drought, were apprehensive and eager for water. The consequence was an area under *autumnal* irrigation greater by 18,008 acres than the unprecedented area in the preceeding years of drought. But eventually, at the very close of the monsoon, the long-deferred rain came down in copious showers, extending even into the month of October, and the sowings thus propitiously made were brought to a maturity by seasonable showers in the spring. Artificial irrigation was surperseded, and a plentiful spring harvest secured by the natural rain of heaven. The result was that the area under canal irrigation for the spring crop was less by 370,000 acres than the area in the similar season of 1868-69."

The area irrigated during the year was 1,089,673 acres, less by 352,245 acres than the area irrigated in the year of drought 1868-69, but greater by 106,283 acres than the area irrigated in any other year. "The revenue results, considering the season, are satisfactory. The gross receipts, though 5¼ lakhs less than in the preceding year of drought, were nearly 4 lakhs greater than in any other year." The gross income for the year was Rs. 25,69,792. The nett profits for the year were Rs. 13,67,035. This gives a return of a little over 5 per cent. on the capital sunk. This is direct income. If an allowance for enhancement of land revenue be made, the profits rise to 8 2 per cent. Besides "the capital sum includes the expenditure on surveys for new works, and the construction of the Agra Canal from which no return is at present derived or derivable." Inasmuch as the above return has passed the 7 per cent limit, which the Government has fixed as that for reproductive works, it is satisfactory. But there is no doubt that the returns will greatly exceed the above. The Eastern Jumna Canal, which having been long established has got over the troubles which always attend the infancy of a canal, and has got its system of distribution thoroughly completed (always necessarily a slow process), now returns 23 per cent on its capital. There is no reason why the Ganges Canal, from which the main bulk of the irrigation revenue is derived, should not gradually come up to the Eastern Jumna Canal standard. It may perhaps never attain quite to it, for the cost of construction was relatively so much greater—Rs. 4,000 per cubic foot of discharge, while on the Eastern Jumna it was only Rs. 1,200 per cubic foot. And with its greater volume the cost of maintenance must always be greater; the repairs on such a canal cannot be trifled

with ; but that greater volume will also give it greater relative irrigating power. Every cubic foot of water on the Eastern Jumna Canal gave this year a revenue of Rs. 600, while on the Ganges Canal it was only Rs. 400. Thus then there is a proved capacity in the water to give 50 per cent more of revenue. The present charges of maintenance are large because the cost of repairs is heavy, it being wisely determined to put the works into a state of thorough efficiency, to place them beyond all risk of damage. But this item of cost will diminish. The working charges on the Eastern Jumna Canal fall at the rate of 27 per cent. on the gross revenue, those on the Ganges Canal at 49 per cent. Supposing the working expenses on the Ganges Canal to be 30 per cent on the gross revenue, and the revenue to increase by 50 per cent as we have shewn it can, the present gross income being Rs. 18,01,300, we should have an income of, say, Rs. 27,00,300, with an expenditure of Rs. 8,00,000 leaving a net surplus of Rs. 19,00,000. This would be a return of about 8 per cent on the capital. We think this even below the mark. Taking the above return for the Ganges Canal, the profit on all the works on the whole capital sunk would be 8·5 per cent. We fully expect that these works will pay ten per cent, and more. As noted before, the gross income of the year is Rs. 25,69,792, while the net income is Rs. 13,67,035, or only a little over 50 per cent of the gross income. This is very low. The remarks we have made above partly account for this. But the charges for direction and establishment seem very high. Doubtless it would not do to under-man the running canals. But on the Rohilkund Canals we find there is a deficit of Rs. 44,333 on this very amount; the figures indeed are rather startling—income Rs. 25,269, maintenance charges Rs 13,645, establishment Rs. 69,602. This is stated to be due "to the large establishment employed in carrying out extensive surveys for new works." But surely these charges should be placed primarily against the capital of those new works; at all events placed to capital and not charged against current revenue. This deficit on the Rohilkund Canals is also attributable to water-rate not being charged now on the irrigation from natural streams. The loss is about Rs. 50,000 a year. A legislative enactment is needed for this charge, or better still, the substitution of the newly-designed canal irrigation for the stream irrigation, which does not pay the Government and kills the people. It is to be hoped the Supreme Government will expedite the passing of the new Canal Bill, and make haste to sanction the new canals in Rohilkund.

The great bulk of the revenue is derived from the irrigation of land. On the Ganges Canal 93 per cent., on the Eastern Jumna Canal, 95·5 per cent on the Rohilkund Canals 94 per cent of the revenue comes under the head "Irrigation." The water-power, which is enormous, being on the Ganges Canal a lone equivalent to 30,000 horse-power, seems to be but little utilized, and gives a poor return. On the Ganges Canal it brought in only Rs. 20,637, or 1·09 per cent of the whole revenue; on the Eastern Jumna Canal Rs. 6,905, or 1·14 per cent. On the Dhoon Canals, however, the mill rent forms 36 per cent of the whole revenue. The navigation returns are also very small. On the Ganges Canal they form only 1·78 per cent of the whole. The figures under this head are worth giving. The gross Navigation Returns were Rs. 33,795, but the net only Rs. 3,125. As noted in the report, "a gross revenue of Rs. 34,000 from 350 miles of navigable chanel, passing through the most fertile tracts of the Doab, and running into a navigable river, is very inadequate." It is true that there are some drawbacks to navigation in this canal, owing to the lowness of the bridges on the lower branch. And during the year under review, the long closure was detrimental to the interests of navigation; but then such closures must always take place on irrigation canals, and must always be detrimental to the navigation of them. But to us the struggle with which navigation is conducted on this great canal, seems only to prove that as the conditions of efficiency and the conditions of construction on a navigation and irrigation canal are opposed to one another theoretically, so practically their combination can never be found favourable. If to make an irrigation canal navigable also throws at all a heavy burthen on the returns, we say leave the navigation out. The drawbacks that are so much talked about do not affect the Ganges Canal much for that finest portion of its length, the 180 miles from Roorki to Allygurh. It runs through the heart of a fertile country and by great towns. What would be the traffic on a similar length of channel—the breadth is about 150 feet, and the depth 7 or 8 feet—in Europe or America? What is the traffic on it here? Can it be that there is not much to carry? The space at our command will only permit us to touch on one or two points more. The prompt and full collection of the canal revenue is a most important matter. Considering that each field irrigated has to be measured up at the end of each harvest, and the demand on it made out, and the collection made from each individual cultivator (more than a million and half in all probably), this is a matter of no small difficulty. It has been satisfactorily performed. We read that "out of a demand of Rs. 23,11,000 only Rs. 4,300 needed to be remitted, and only Rs. 3,400 remained uncollected."

Of the 1,089,673 acres irrigated, 104,610 acres were in sugar-cane, 708,857 acres in cereal grains, and 130,895 acres in dyes, *i. e.*, indigo chiefly. The increase in the valuable crops has been very great, as the following figures show :—

	Sugar.		*Rice.*		*Indigo.*		*Cotton*
1867-68	87,050	...	97,807	..	77,976	..	8,245
1869-70..	104,596	...	117,508	...	130,243	.	55,883

This points to a great increase in the wealth of the agricultural classes. Going through the well-arranged appendix of tables and returns, we find many a fact worthy of note or discussion.

We can only note that we see that in Zillah Mozuffurnuggur, the whole area is 1,054,065 acres, the cultivated area 703,549 acres, and the irrigated area 146,523 acres. We cannot see how the irrigation of this small proportion of the whole area can effect the health of the whole population.

At the end of his "Resolution" on this Report, Sir William Muir offers to the head of the Department, Colonel Greathed, "as well as to the whole irrigation staff," "his best thanks for the able administration and zealous working of the Department in a year which, though not marked to the same extent by the care and anxieties of the one preceding, was yet full of busy work and laborious undertakings." This seems to us to be praise well-deserved.

Advertisements.

THE INDIAN ANTIQUARY.

A MONTHLY JOURNAL

of Research on Indian Archæology, History, Literature, Folklore, &c., &c.

ON Friday, the 5th January 1872, will be published in Bombay, the first number of a Monthly Journal of 32 pages, demy 4to, to be called THE INDIAN ANTIQUARY.

THE INDIAN ANTIQUARY is intended as a medium of communication between Oriental Scholars in India, Europe, and America, and a repertory for information on the Antiquities, History, Geography, Literature, Religion, Mythology, Natural History, Ethnography and Folklore of India and adjoining countries, and will thus embrace a similar variety of subjects to the English "Notes and Queries"—the plan of which "The Indian Antiquary" will to some extent follow.

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All Contributions intended to appear in the Journal and Books for Review to be addressed to the Editor, Mr. BURGESS, M.R.A.S., F.R.G.S.

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Madras, April 1870.

TO STOCK BREEDERS.

CATTLE FOOD PHOSPHATES.

As the remarkable degeneration in the Bone, Muscle, and Strength of the Indian horse (no matter how well bred), commences *in Utero* and is entirely due to the grass, hay, and corn given to the Dam, being most detrimentally deficient in the Phosphates of *Soda, Potash, Lime, Magnesia,* and *Iron,* PRIVATE BREEDERS are advised to add them to the food. A Mare in Foal will require one ounce daily for ten months, and the same quantity till her Foal is weaned.

The Yearling will require one quarter of an ounce per diem, and the two and three year old COLT and FILLY, half an ounce daily, throughout each year.

The Cattle Food Phosphates will cost twelve annas per pound for Horses, and eight annas for Cows—ready for use.

For further information, address LIEUTENANT J. F. POGSON, SIMLA.

Agents wanted for Bombay and Madras.

NOTICE is hereby given, that the Annual Auction Sales of Mysore Sandalwood will be held at the various Kothis on the dates below specified :—

Shimoga	Kothi..	13th November 1871.
Saugur	,, ..	27th do
Cowlidroog	,, ...	12th December
Seringapatam	,, ..	4th do
Hoonsoor	,, ..	18th do

The quantity exposed for Sale will be 2,000 candies (500 tons) more or less.

2. Copies of revised rules for Sandalwood Auction Sales can be obtained free by application to the undersigned.

G. J. VAN SOMEREN, Captain,
Conservator of Forests, Mysore and Coorg.

Bangalore, 6th October 1871.

GREAT INDIAN PENINSULA RAILWAY.

TEAK TIMBER.

TENDERS are invited for the supply of such quantities as the Company may require for one year of well seasoned MOULMEIN or RANGOON TEAK TIMBER, in Square Logs, sound and straight, not less than 12 inches square and 20 feet in length, to be delivered at the Company's Stores Depôt, Byculla, at the rate of not less than between 250 and 300 tons per month, commencing from the 1st day of January 1872.

Specification and form of Tender may be obtained on application at the Storekeeper's Office, Byculla, Bombay.

Sealed Tenders endorsed, "TENDER FOR TEAK TIMBER," and which must specify whether of Moulmein or Rangoon, and the rate per ton of 50 cubic feet, delivered at the Stores Depôt, Byculla, will be received by the Agent at the Company's Offices, Elphinstone Circle, Bombay, up to noon on THURSDAY, the 30th November next.

The person whose Tender shall be accepted will be required to enter into a Contract, and, for the due fulfilment of the same, to find security amounting to 10 per cent. on the estimated value of the contract.

The Agent does not bind himself to accept the lowest or any Tender.

Signed) W. WARDEN MORICE,
Storekeeper.

Stores Office, Byculla, 11th October 1871.

NOTICE

IS hereby given, that Timber Sales will take place at the Ghaut Depots of the Canara Zillah in the month of December next.

2. The sale at the Hullial Depot, in the Soopa Talooka, will commence on *Monday*, the 11th December, and will continue there till the whole is disposed of.

3. The sale at Yellapoor Depot, in the Yellapoor Talooka, will commence as soon as possible after the Hullial Depot is finished (about the 3rd January 1872), and will be continued at the neighbouring Branch Depots till the whole is sold.

4. The sale at the Katoor Depot, in the Sircy Talooka, will likewise commence as soon as possible after the Yellapoor Talooka sales are finished, and will be continued at the neighbouring Branch Depots till the whole is sold.

5. The probable quantity of Timber put up for Sale will be as follows :—

	Teak.		Black-wood.		Jungle-wood.		Teak Poles.	
	Logs.	Candies.	Logs.	Candies.	Logs.	Candies.	Logs.	Candies.
Soopa Talooka, Hullial Depot.	8,062	6,050	200	175	1,300	1,090	1,800	474
Yellapoor Talooka, Yellapoor Depot	1,700	1,400	45	40	700	600	..	..
Sircy Talooka, Katoor Depot	50	41	15	11	850	949	..	..
Total....	9,812	7,491	260	226	2,850	2,629	1,800	474

6. For any further information that may be required apply to H. BARRETT, Esquire, Deputy Conservator of Forests, Canara.

W. PEYTON, Major,
Conservator of Forests, Southern Division.

Conservator's Office S. D., Camp Poona, 28th September 1871.

TIMBER SALE IN NORTH CANARA.

NOTICE is hereby given, that the undermentioned quantity of Timber, the property of Government, will be sold by Public Auction in November 1871, at the Ports of GUNGAWULLY, CARWAR and SEDASHEGUR :—

	Teak best Southern.		Blackwood.		Jungle-wood.		Firewood.	Date of Sale.
	Logs.	Candies.	Logs.	Candies.	Logs.	Candies.	Tons'	
Gungawully ..	210	243	33	29	5	5	..	15th Nov.
Carwar	2,408	4,843	13	10	378	859	158	20th ditto.
Sedashegur	..	..	...	...	1	9	..	ditto.
Total..	2,618	5,086	46	39	384	873	158	

The whole will be arranged in convenient lots.

Terms :—

On the day of sale the buyer to deposit 15 per cent. of the purchase-money.

The balance of sale price is due on or before the 1st March 1872.

All the lots to be removed from the Depot before the 1st April 1872.

Further particulars of Sale and Rules may be obtained at the Office of the Superintendent of Timber Depot, Carwar.

(Signed) W. PEYTON, Major,
Conservator of Forests, S. D.

Conservator's Office, Dharwar, 20th September 1871.

(True copy.)
GEO. C. PARKER, Lieut., I. N.,
Superintendent Timber Depot.

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NEW FRENCH LOAN.—The sixteen Monthly Instalments fall due on the First of each month, commencing from the 1st August 1871.

The amount due on each Instalment per 5 Francs Rente is Rs. 1-14-1 92-100.

The Coupons are payable on 16th August, 16th November, 16th February, 16th May.

During the payment of Instalment, namely, up to 21st October 1872, the Interest will be paid on the 1st August, November, February, and May, in order that the Coupons due may be received in part-payment of Instalments.

Interest is payable on presentation of Stock Receipts, pending the arrival of the Stock from Paris.

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20	31	9	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
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50	61	4	69	10	65	7	74	5
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Fire Premiums	£ 836,816	Capital	£ 391,752
Life Premiums	,, 250,039	Life Reserve	,, 1,873,020
Interest.....	,, 162,680	Reserve Fund	,, 971,410
		Undivided Profit	,, 64,823
	£1,240,535		£3,301,005

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		435,668 5 11
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THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, THURSDAY, 21ST DECEMBER 1871. [No. 5.

TRAVELS IN INDIA.

VOL. I.

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Translation of the chief passages, and of the contents, is given in English. The Book is dedicated to H. R. H. The Duke of Edinburgh, with the portrait of the Prince, by the new process of printing photographs by the Woodbery process.

The Indian Economist.

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LETTERS TO THE EDITOR.

THE SIND FORESTS.

(To the Editor of the Indian Economist.)

DEAR SIR,—THERE is one very important subject in the administration of the Sind Forests, that I should be glad if you could find spare time to look into and give the outer world your sound practical views on the question partially discussed in the Annual Sind Forests' Report of 1869-70.

The report referred to has been laid on the Editors' table. I believe, and may perhaps, be in your own office. There was a review of the said report in the ———, but the articles failed to hit the nail on the head, and besides were wanting in good taste and proper tone: for this reason I should be glad to see the *Indian Economist* discuss the matter on broad and equitable principles.

The question is one that strikes at the very root of the existence of the alluvial forests of Sind, which undergo incessant changes, owing to erosion and increment. It is to the latter element that exception has been taken in this province, which I maintain is the basis of the whole forest system, for if ignored for a period of years, the forests must, of necessity, diminish sensibly in area, and in some cases be blotted out of the map altogether.

You probably know something of the character of the Indus and its peculiarities, as I know you journeyed on its waters some years ago. I must explain that, as regards what are termed *Cutchas*, that every forest has been in its term a Cutcha, and further, that antecedent to the Talpoor Dynasty, (some 70 years), no forests were found in Sind. In that reign the nuclei of the existing forests were what were called Shikargah, viz., enclosed mud-walled hunting grounds. After the British conquest these preserves were extended by the taking up of new lands, and by the application of the Alluvion and Diluvion rules, and on these principles it appears to me our system must stand or fall!—*Vide the Report.*

In a general way it may be argued that the Forest Department take up all land that reforms on its grants. This is true, but the system is not properly understood, and we are brought into collision with the Revenue Officers, no two of whom interpret the law alike. One will argue that the Forest Department may have lost 5,000 acres of its frontage by the river's encroachment, but the increment now in dispute has a narrow channel between it and the old forest, and until that channel has silted up, the forests cannot take possession of the land which should belong to the department. A fiscal and inflexible rule should, I think, be laid down that the sites of old forests, irrespective of the river changes, should be determined by the triangulated fixed points of our first Surveys, (topographical), otherwise with the conflicting decisions in regard to the true application of the alluvion law, we may find one or more of the forests displaced by other landholders.

The matter is, doubtless, practically a very difficult one, and requires to be thoroughly ventilated apart from all spirit of a dogmatic tendency. It has of late been proposed to work the Sind Forests on a rational system of Forestry, that is, on the principle of a given rotation or period of years, so that it is the more necessary the basis of the system, by which the area of ground is to be kept permanent, should be fully understood and not open to cavil and misconstruction by every new administration.

It may be said that in regard to forests of so changeable a character, that nature performs its own rotation; and to a certain extent this is true.

I must explain, however, that it is only within the reach of the fertilising waters of the Indus that vegetation holds its own: *a fortiori* high lands, beyond the reach of the highest flood, become parched, and for forest purposes of little or no value. Further, the said lands can only pay zemindars under wheel irrigation, all very well for cereal crops, but too expensive to admit of these low lands being fitted by artificial means for forest purposes.

It would, undoubtedly, be better if our forests were situated back some distance from the river, we should then get rid of that precarious tenure of existence, which always hangs over them, threatening like a storm cloud, but in this case we must secure lands favourably situated as regards level, that is that can be flooded by the ordinary inundations, and such localities it would be difficult to obtain.

I have before shown that the forests, so-called, were first formed under the rule of the Talpoors, who reigned some 60 or 70 years prior to British rule, so that the oldest forest would not probably now exceed 70 or 80 years of growth; the larger portion, however, of the existing forests have grown up within the memory of men now living. They have, as a matter of course, all been *Cutchas* in their time, but owing to a succession of deposits, some of these alluvial lands get raised now and again beyond the ordinary high inundation level. When this change takes place, trees situated on high ground, in the absence of artificial irrigation, die out owing to the small rainfall, and to the great intensity of the drought. It is therefore from the soil of the growing Cutcha lands that our natural reproduction of wood fuel must be derived.

From what has been said, you will judge that, to ensure the due perpetuation of our Sind alluvial forests, is a very difficult matter, and that not only must the alluvial law be taken advantage of to its fullest extent, but that in all cases, where practicable, other lands should be made over for forest purposes, so as to keep up the required area now less than one per cent. of the entire area of the province. In the absence of a system that shall secure a fixed area of ground, all attempt of management by regular rotation process, would be so much money and labour thrown away.

I must further explain that these valuable *Cutcha* lands, as will be seen from the figured statement of the Forest Report, bring in a very large revenue in the shape of grazing fees, and it must also be borne in mind, that the growth of these said lands is very rapid, ten or twelve years tamarisk (the self-sown and natural produce of such increments) being considered the best fuel of the Flotilla Steamers. The maxima and minima breadth of the forest taken from the rivers' edge may be roundly stated from a quarter to four miles, so that in cases of violent erosion, a large forest may be seriously diminished in size in one season.

I trust from what I have written, you will be able to understand the merits of the case, and work it out in a logical discussion in an early number of your *Economist*.

X. Y. Z.

THE MADRAS GARCE.

(To the Editor of the Indian Economist.)

SIR,—In your last issue (November) under the heading "Agricultural Price Lists of India" you take the Government of Madras to task, in rather a severe manner, for what you imagine to be, their want of intelligence in permitting the use of a different sized measure in selling or buying each particular variety of grain. Now, though the weights and measures of this Presidency are undoubtedly in a very unsatisfactory state, I really do not think that in this respect, we in Madras, are greater sinners than you in Bombay, or our friends in the rest of India. I have for some time purchased and sold large quantities of country grain; cumboo, cholum, ragi, &c., and never used any but the regular "Madras measure," which contains 104 cubic inches, and never before heard that different "measures" were used for different grains. I believe there is some sort of understanding that the average weight of a "measure" of cumboo is so many tolas less than the average weight of a "measure" of gram; but this has nothing to do with "price lists" which report "measure" only. You must be aware that the specific gravity of our

different grains varies greatly; and that a volume of one grain may probably weigh 20 per cent. heavier than the same volume of another grain. We, in England, sell our wheat at 63 pounds per bushel, our peas and beans probably at 66 pounds, our barley at 55 or 56, and our oats probably at 40 pounds, using of course in every instance the same bushel "measure" and so in Madras, we may sell a "measure" of grain weighing 120 tolas, or a "measure" of paddy, weighing 88 tolas. By all means, use your whip of small scourges, the measures and weights of this country, are in a most unsatisfactory state, but first try its effects on our neighbours in Bombay.—Yours very truly,

A MADRAS FARMER.

AN OUTSIDER ON THE LAND QUESTION.

(To the Editor of the Indian Observer.)

SIR,—It must be a matter of regret to the few outsiders who take an interest in the great land questions now under discussion, the most important and vital to the future of the country that have been mooted in Indian politics for many years, that the principles at issue should be so much obscured by the dust and heat of a personal and technical conflict between the Settlement Officers and the *Indian Economist*.

I trust you will lend your powerful aid to divest the controversy as much as possible of the details and technicalities which prevent the general public from understanding or following the arguments, and to assist in forming an intelligent opinion among those who, without being experts, would yet wish to be able to give a reason for the faith that is in them on so great a political question.

The fight between direct and indirect taxation has clearly to be preceded by a fight between Land Revenue and Taxation. Whatever else is dark, it is evident that if Mr. Knight is right, we might, in a few years, cease to trouble ourselves about income-taxes, or such trifling additions to our resources, when additional millions are waiting to tumble into the Exchequer for the asking. When this is fairly realised by the general public, everyone will range himself on one side or the other; let the choice be made, if possible, on instructed reasoning and not on the blind following of a cry.

May I venture to suggest that some of your talented contributors should give us, outsiders, a brief outline of the whole matter from the beginning. We want to be told clearly the principles on which assessments are now made, and the *modus operandi*. We want some of the elementary statistics of the subject, such, for instance, as the percentage of area in different districts cultivated by proprietors, by hereditary tenants, and by tenants-at-will. A host of questions suggest themselves to the general reader attempting to study the matter, which at present he could only get answered by cross-examining a settlement officer, or referring to settlement reports and revenue circulars, not accessible to the public.

If I mention some of these, I am conscious that I am exposing my own ignorance, but as I have given more time and attention to the subject than nine out of ten outsiders, it will be perhaps useful to shew how ignorant are the public of the questions forcing themselves upon us, and how necessary it is that the disputants should enlighten us.

In the first place, I gather that the old native assessments were based on the idea that the State should take a certain share of the *produce*, and I also gather that while this principle still holds in native States, our own assessments are supposed to be based on the *rent*. Now the rent of land varies with a great number of circumstances, while the produce from similar land will be tolerably constant. How did the idea of rent come in, and why was this change of principle introduced?

Next, I observe, that while the native States have usually taken as large a share as could be spared by the actual cultivator, after paying the expenses of cultivation and of supporting himself and his family, we relinquish a part of that surplus to pay for the keep of a landlord or under-landlord, a sort of copy-holder. Now, granting for the sake of argument, that a landlord is a useful article, and worth the money he costs us, I want to know what proportion of land is cultivated by the landlords themselves, and what by the tenants? I want to know why, in the case where the landlord is his own tenant, we should give him the landlord's share, as well as the tenants, or farming profit? Why should we, for the sake of having landlords to collect the rent for us in a small fraction of cases, relinquish the landlord's share of rents in the great majority? Further, does experience shew that the landlords we have already made, are so useful and valuable that we should go on making more? Ought we not, as much for the good of the cultivators themselves as for our own profit, *i.e.*, the good of the State, to encourage them to hold directly from Government, instead of from a middleman?

Then again, granting that prescriptive rights of occupancy tenants, prior to our *regime* ought to be respected, on what possible principle are we creating new rights under the twelve years' clause of Act X? To protect the cultivator from rack-renting? Then why is not the cultivator who holds from an occupancy tenant, as much entitled to such protection as he who holds from a zemindar? If twelve years' actual occupancy give a natural right to a cultivator to continue to hold at the same rent, why does the chance status of his next superior affect his right? Suppose the whole of a district gets into the hands of occupancy tenants, then they become virtually sub-landlords; gradually the usual causes will lead to a considerable proportion being taken up by tenants-at-will, who cannot, under the present law, when holding from an occupancy tenant, acquire occupancy rights. We shall then be in just the fix we were in before; the actual cultivators will be as much liable to rack-renting as ever, and will be saddled with an additional middleman between them and the Government to be supported out of the produce of the land. What shall we have gained by Act X. except these middlemen? A single landlord seems to me in India to be a doubtful sort of blessing, but even in countries where landlords are at present accepted as advantageous, middlemen are looked on as a curse. What is there peculiar in India, that should lead us to manufacture them wholesale by Act of Parliament? I suppose there must have been reasons for passing Act X. but to me it certainly seems the maddest and most illogical piece of legislation I remember. Then as to the general question of assessment, is it, or is it not, the fact that two and-a-half centuries ago, when money was worth two or three times what it is now, Akbar raised nearly or quite as much land revenue from a given area as we do at the present day, and yet that the people were tolerably happy and prosperous. How much has our artificial manufacture of non-productive consumers, in the shape of landlords and middlemen, to do with this result? How is it that with the immense rise of prices in the last few years—nearly all clear profit to the cultivator—the new assessments are so little, if at all, higher than the old ones? Even where the gross amount from increased area of the cultivation shews a rise, the rate per acre sometimes shews a fall. Take the Meerut district, settled more than thirty years ago, and lately re-settled, here are the old and the new rates per acre in three purgunnahs from Mr. Forbes' Memo. on the famous purgunnah Baghut:—

	Old rate.	*New rate.*
Chuprowlee ...	Rs. 3 5 2¼	Rs. 3 1 5½
Barote ...	,, 3 3 7¼	,, 2 11 5
Kotana ...	,, 3 1 1¼	,, 2 12 1

Now, if the assessment is meant to represent a certain fraction of the gross produce, as it admittedly did under the old native Governments, it is quite clear that if this share were commutable into 3¼ rupees, thirty years ago, it would be commutable into something like double as much now. On what possible grounds has it been actually reduced to less than one-half its former amount? Or, if it be said that our old assessment was a share of the rent, not of the produce, have rents in kind fallen to one-half what they were in 1837.

The only argument I have heard put forward to excuse the reduction of the share of produce taken is, that population has increased, and that more mouths have to be fed off the same land than in former years. But if the area cultivated remains the same, which is assumed in the argument, it is clear that whereas the former population was sufficient to cultivate the land, the increased population must be in excess of the labour required; and as by the hypothesis they are supported off the land, and not by other labour, they must spend much of their lives in idleness. That is the case in some districts, I know from personal observation. The inference is, I submit, that whereas by taking the same share of the produce that we did formerly, we should compel one part of the cultivators to work honestly for their living, and the excess to seek employment elsewhere; under our present system of keeping the money assessment down to nearly the same as it was thirty years ago, and thereby, from the fall in the value of money, reducing the State's share of the produce of the land to one-half what it has been for centuries, we are squandering the resources of the empire to maintain one part of its inhabitants in semi-idleness, while the other part is driven to desperation by blistering taxation to make up the deficiency.

I am, Sir, yours faithfully,

A CIVIL ENGINEER.

PRICES.

N. W. PROVINCES.

WE are glad to see that attention is at last being directed in earnest to the course of *prices* in India, as it is only upon a clear understanding of the revolution that has taken place of late years therein, that we can found an intelligent policy towards the land. It is now many years since our own investigations convinced us of the following general conclusions:—

1. That prices were gradually falling throughout India from the commencement of the century down to about the years 1847-53.

The cause of this fall, we believe, to have been partly universal in its nature, and partly local. India produces no precious metals but depends upon other lands for their supply. Now there seems to be a general agreement in the opinion that the industry of *all* lands was suffering throughout the first-half of the century from an insufficient supply of these metals which form the universal medium of exchange between civilized countries. No country was able to obtain the full supply which its industry needed, and the consequence was a downward tendency in prices for the first 50 years of the century in *all* lands. The discovery of the gold fields of California in 1847, followed by that of the Australia yield in 1850, arrested this downward movement in Europe almost immediately. As the *natural sink*, from her geographical position, into which the residue of the supply finds its way, after the wants of all other nations had been met, it was in India that the downward course of prices was most plainly seen. Suffering in common with

the rest of the world from the evils of a restricted currency, she suffered more severely than all from a cause which was nevertheless universal. But there was another cause in operation in her case which, unseen at the time, was intensifying the evil ten-fold. The substitution of foreign rule in the country for that of the Native governments, was marked by two circumstances, each of which directly aggravated her sufferings. The first of these was the change of administrative system, blindly made by us, in substituting *cash* assessments for the old practice of taking the revenue in kind. The other was the abstraction of capital from the country to pay for the foreign rule which had been set up therein. Now it is absolutely necessary to keep these considerations clearly in mind, whenever the discussion of this subject is entered upon. The evil seems to have culminated about the middle of the century, or from 1847 to 1853, just after the annexation of Sind and the Punjab, and the substitution therein of the system of cash assessments in lieu of payment in kind. Let the student but once get these facts clearly fixed in his mind, and everything becomes comparatively clear. Prices were, we say, falling throughout India down to 1847-53 from two causes now clearly discerned :—

a. The *universal* cause : An insufficient supply of the precious metals throughout the world.

b. The *local* cause : Substitution of foreign rule for native, resulting (1) in the substitution of cash payment of the revenue for payment in kind ; (2) the unavoidable abstraction of money from the country, for the conditions and exigencies of that rule.

Thus upon the evils of a currency already unduly restricted by a general failure of the supply of silver, there supervened a heavy abnormal demand upon the currency of India as the result of foreign rule. Suffering in common with the rest of the world from inability to obtain silver to replenish her currency, that currency was simultaneously subjected to unusual demands to meet the Home charges and private remittances of the strangers who ruled her ; while by an administrative blunder, they threw three times the work upon this currency that it had ever before performed, by insisting upon the revenues being paid in cash. The result was a general and in some places terrific fall in prices. The people simply could not find the money that we demanded of them. They had grain in abundance to offer, but we would not have it. We forced them to convert it into silver at any price they could get for it, and the result was that the agricultural produce of the country was at the command of the shroff and the bunia for almost anything they chose to offer. Those were terrible days for the cultivator, and had they lasted, the whole country would have been hopelessly pauperized under our rule. As it was, the people had to sell everything they possessed to retain a precarious hold upon the land, cultivated by their forefathers for a thousand years. It was not the theoretical demand, but the *practical* weight of the money assessment that destroyed the people, and everything was sacrificed to meet it. Every scrap of jewellery, and at last every metal pot was sold, in parts of the country, to meet our revenue demands, and the people were in despair. The writer well remembers the day when he first put his foot on the main land of India (1847), and was astonished by hearing a *fakeer* cursing him and his country by all the gods of the Hindoo Pantheon for *having carried away all the silver rupees from the country.* The poor creature was but expressing the fact, as the people ignorantly apprehended it. Our rule had made silver so scarce and dear, that the people believed we had carried it all away from the country. Now, unless we say there is a clear understanding of these facts, *i. e.*, of the position of the country about the period 1847 to 1853, there can be no clear insight into the course of affairs since, or the adoption of any intelligent financial *policy* in the country.

Our second general conclusion arrived at many years ago is :—

2. That from the year 1853 downwards, there has been a clear and very material rise in prices in *every* part of the country, and that the causes of this advance, being for the most part permanent, the rise is likely to be permanent also.

For the *first* and most important of these causes by far, is the immense development of the export trade of the country since 1853. The Crimean War in 1854 gave the first stimulus to our exports, indeed creating the export trade in oil, seeds, hemp, and jute. The growing demand in China for Indian opium, the American War (1861 to 1866) and the successful growth of tea in Northern India, and coffee in the South, have resulted in sending the exports of the country up from £18,000,000 a year in 1853 to their present level. A glance at the following figures will shew how vast an increase has taken place in the export trade of the country in the last 20 years :—

1853	£18,000,000
The Crimean War 1854-1856	
1858	28,978,474
1859	30,532,298
1860	28,889,210
1861	34,090,154
1862	37,000,397
1863	48,970,785
1864	66,895,884
1865	60,471,791
1866	67,058,475

We are unable at the moment to give the returns of the last four years.

Now, these exports have been in the main a clear addition to the produce of the land. For we doubt, whether upon the whole, there is a less breadth of soil under cultivation with food grains now than there was before. Cultivation has largely encroached in the last 20 years upon the waste lands of the country, and while cotton has no doubt displaced grain in some parts of it, we are persuaded that the *exports* upon the whole represent the produce of extended cultivation. In other words, the ryot has found that in addition to growing food for the markets near him, there is silver to be got from other lands for the oil seeds, cotton, sugar, jute, and indigo, which his fields produce. For this enlarged export trade means, amongst other things and first of all, power to import silver. And this growth of the exports of the country is not only permanent but likely, we say, to be progressive. We may reasonably believe that the country has entered upon a course of production of exports which, whatever temporary check it may sustain, will be steadily progressive. We have no reason whatever to suppose that the export-producing power of India is exhausted, or has reached its natural limits, but on the contrary have every reason to conclude that it is in its infancy, and that the export trade of the country admits of, and in the ordinary course of things, will receive immense and indefinite development. Improved communications, improved husbandry, and above all perhaps, increase of irrigation, promise to increase the export power of the country indefinitely. At all events there is no reasonable ground for supposing that the exports have reached their highest limits ; but on the contrary, strong ground for believing that the trade is still but in its infancy. Well, this growth of the export trade, be it remembered, is the chief cause of the great rise in prices in the country, and is *permanent* in its nature. Another cause has been the virtual suspension for many years of the annual drain upon the country for the so-called Home Charges of the Government, the capital which was subscribed in England for the construction of the guaranteed railways having been directed to this use by the India Office. In other words, the annual expenses of the India Office since 1853, instead of being drawn from the Indian taxes as they accrued, have to a very considerable extent, been met out of loans contracted in London by the Secretary of State in our name. About £100,000,000 sterling have in this way been added in the last 18 years to the debt of the country. The money paid into the India Office by the Railway Companies for the construction of their various lines in this country, has been used by the India Office for defraying the Home Charges. Instead of drawing Bills upon the Indian Treasury, or what is the same thing arresting in London the silver remittances on their way to India in payment of her exports, the Secretary of State has appropriated the railway capital paid into his office by the various guaranteed Companies for the prosecution of their works in India. The economic effect of this arrangement has been to suspend the annual drain for Home Charges upon India. The taxes, instead of leaving the country, have been spent within it, in the construction of earthworks, and embankments, and viaducts, and upon the thousand industrial arts which the construction of a railway creates or promotes. India has really built the railways *herself* : the assistance she has received from the Railway Companies is that every year they have paid the Home Charges of the India Office for her. In other words, to build her railways, she has allowed £100,000,000 of debt for Home Charges to accumulate, and now

finds those charges permanently swollen by £5,000,000 sterling a year for interest upon these arrears.

The railways being built, and the drafts for Home Charges being at last resumed, she now finds the annual drain to be ten or twelve millions a year, where before it was but five or six. Now she can only pay this drain in one of two ways; (1) by going still further into debt, or (2) by parting annually with so much of her exports to meet the amount. So that while the exports of the country have risen in amount since 1853 from £18,000,000 a year to £60,000,000 or £70,000,000, the Secretary of State's lien upon these exports has simultaneously risen from £5,000,000 to £10,000,000, the consideration for the increased lien being the railways we now possess.

It is the want, we believe, of a clear apprehension of these facts that has led a recent writer in the *Indian Observer* into the expression of a doubt whether the rise of prices in the North-West Provinces, in the last few years, is not after all rather attributable to a "variation in the seasons," than to any other cause. As the article to which we refer is of considerable interest, we reproduce it below, that we may notice it at length. We do so because the manifest intention of the writer, in accordance with the present policy of the journal, is to discredit our statement concerning the great rise which has everywhere taken place in prices of late years in the country, as the ground for demanding a substantial increase in the weight of the assessments. The *Observer* maintains that a rise or fall for years together of 40 per cent. in the average price of wheat, has been a matter of ordinary occurrence in the North-West Provinces, and in proof of this fact he adduces the following statistics, obtained he says "partly from returns lately collected by the Board of Revenue and partly from other sources":—

Average number of seers for a rupee.

Periods		Agra for Muttra	Bareilly	Ghazeeabad (Meerut)	Allahabad	Average for the N W P
1805 to 1815	12 years	34	36			34
1817 to 1827	11 years	24	24			24
1829 to 1835	8 years	32	34	14	30	27
1836 to 1842	7 years	24	24	24	22	23
1843 to 1858	16 years	34	35	35	30	33
1859 to 1870	12 years	21	20	22	18	20

This table shows that the history of prices in the North West, so far as we possess it, is the history of a series of *violent oscillations*. It is not merely that prices occasionally rose and fell largely. The oscillations recur regularly in periods of from eight to sixteen years. A cycle of bad years follows a cycle of good years with perfect regularity. Between the first and second periods given in the table, the prices of wheat rose 42 per cent.; in the third period it fell 25 per cent.; in the fourth it rose again 39 per cent.; then in the fifth it fell 42 per cent.; and finally in the sixth it made its last rise of 72 per cent. The price of the last twelve years has been very high, but it has been barely 20 per cent. higher than it was for a period of eleven years, fifty years ago, and only 15 per cent. higher than it was for a period of seven years, thirty years ago. It is true that each of those periods comprised a year of famine, but the last twelve years contained also two years of partial famine. The above figures show that a rise or fall of 40 per cent. in the average price of wheat, due solely to the fluctuations of seasons, has been a matter of ordinary occurrence.

We have not the advantage of access to the figures which the writer has manipulated in so arbitrary a manner, but we remark that he seems to have created his cycle theory first, and then grouped his figures to prove it. Why did he not give us the averages in equal periods of three or five years, or still better the quotations, year by year, for our own independent inspection and grouping. Moreover, he seems to have lost sight nearly altogether of the great political changes that have taken place in Upper India in the last 60 or 70 years, all of them calculated materially to affect prices. Take, for instance, the annexation of the Punjab and change of administrative system therein (1848-50) with its well known effect upon prices in the Province and, as we may presume, its neighbourhood. The annexation of Oude (1857) and the effects of settled rule therein upon its harvests, and consequently upon the markets of the North-West, and the opening up of the vast grain stores of the Central Provinces to the same markets, by the railway from Jubbulpore. We cannot but reasonably suspect, when observing that these considerations are overlooked, and that the plain intention of the article is to discredit belief in any special rise of prices in the last twelve years, that the writer came to his subject with his mind full of a foregone conclusion. He *wanted* to disprove a substantial rise in prices, and hence this peculiar grouping in what he calls "cycles" and the theory of oscillation between periods of good and "bad years." In absence of the statistics with which he has dealt, we will do the best we can with those at our own command, viz., the official statement of prices from 1853-54 to 1870-71 in fourteen districts of the Punjab, comprising, however, the North-West territories of Delhi, Hissar, and Umballa. We shall not attempt to give any arbitrary grouping to these figures, but place them at once frankly at the reader's use. The staple food grain of the well-to-do in all this part of India is wheat, as quoted by the *Observer*, and we shall accordingly quote it too. The tables begin, it will be observed, with the year 1853-54, the period which we have fixed upon from independent enquiry, as that of lowest depression in the country generally:—

Year.		Delhi.	Hissar.	Umballa.	Loodiana.	Jullundur.	Lurtisur.	Scalkote.	Lahore.	Mooltan	Jhelum	Rawulpindee.	Peshawur.	D. I. Khan.	D. G. Khan.
		Wheat.	Wheat.	Wheat.	Wheat.	Wheat	Wheat	Wheat.	Wheat.	Wheat.	Wheat.	Wheat	Wheat.	Wheat.	Wheat.
		Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.
1853-54		24	15	35	0	46	13	37	4	37	15	31	11	31	11
1854-55		37	0	41	0	53	13	49	11	24	0	34	7	24	7
1855-56		14	8	50	0	36	10	26	9	26	8	26	6	26	6
1856-57		23	12	44	0	32	7	32	6	32	8	32	6	32	6
1857-58		26	21	41	0	23	0	41	12	27	8	27	6	27	6
1858-59		21	24	37	14	49	7	42	6	34	8	34	6	34	6
1859-60		18	0	37	8	24	0	42	0	24	0	24	0	24	0
1860-61 (Famine)		30	0	19	4	21	8	32	0	21	0	21	0	21	0
1861-62	"	20	2	15	8	21	6	25	0	21	0	21	0	21	0
1862-63		24	14	26	8	31	6	32	0	21	0	21	0	21	0
1863-64		26	9	25	8	31	6	32	0	21	0	21	0	21	0
1864-65		21	0	25	8	31	6	32	0	21	0	21	0	21	0
1865-66		18	0	19	8	31	6	32	0	21	0	21	0	21	0
1866-67		30	0	15	8	31	6	32	0	21	0	21	0	21	0
1867-68		24	0	20	8	31	6	32	0	21	0	21	0	21	0
1868-69		24	0	26	8	31	6	32	0	21	0	21	0	21	0
1869-70 (Famine)		12	0	18	8	31	6	32	0	21	0	21	0	21	0
1870-71		16	0	18	8	31	6	32	0	21	0	21	0	21	0

Now, this period of 18 years was marked by two years of famine (1861 and 1869), the effects of which upon the quotations are sufficiently manifest. What is *not* seen however therein, and cannot

be shewn, is the fact that all Northern India was in profound repose throughout its duration, the disturbance to agriculture occasioned by the mutiny being hardly appreciable. What is certain is that a very large extension of cultivation has taken place in the period throughout Northern India, partly by the new works of irrigation therein, while the important granaries of Oude on the one side, and of Central India on the other, have been thrown open to the people of the North-West. And yet in the face of these events, directly tending to *lower* prices, the rise has been absolute, steady, and unprecedented. How is it possible then to resist the teachings of such figures as this table presents, and to attribute the rise to the "violent oscillations" occasioned by fluctuation of the seasons? There is a foregone opinion, we say, to be established here, or such a conclusion were impossible. We should be glad, however, if the *Indian Observer* would return to the subject, and in doing so favour us with a statement of the prices year by year during the period he has reviewed, that we may group them for ourselves. At all events let him at least give us regular averages of three or five years. We do not believe in his doctrine of 'a series of violent oscillations.' An abundant harvest or succession of harvests will now and again make food abnormally cheap, as a period of drought will make it abnormally dear, and it is of course necessary, when attempting to find out the general *tendency* of prices, to take such disturbances into the account. But the general fact stands, we think, very clearly revealed in the North-West, that prices have greatly risen in the teeth of conditions that ought to have materially *lowered* them, namely the spread of cultivation, peace, and the opening of new sources of supply. If prices have risen steadily in the face of these conditions, there must be some potential cause for the rise, and we have no doubt ourselves what that cause is, viz., a change in the value of money.

We have had a growing conviction for many years past that it is quite within the power of the Indian Government, by simple and sound currency *arrangements* to reduce the drain upon the exports of the country very materially. In spite of all that has been written upon currency in the last 70 years, the subject is still in the infancy of its discussion; and in full view of all the "orthodox" objections to the course, we avow our conviction that one of the wisest steps the Government of this country could take would be the gradual issue of an *inconvertible* paper-currency to the extent of the railway debt of the country. The issue might be extended over 30 years at the rate of £3,000,000 or £4,000,000 a year, or about ⅓rd the amount of the Home Charges. The notes should be legal tender everywhere, and receivable in payment of customs duties, land revenue, and all taxes whatever. We are perfectly familiar with the objections raised to the issue of such money by economic writers, but should be untrue to our own insight and convictions, if we deferred thereto. The currency arrangements of the most advanced nations of the world, our own for instance, are to this hour marked by a want of wisdom and economy which will be the marvel of coming times. The annual issue by the State in India of three or four millions of inconvertible currency legal tender, would have precisely the same effect upon prices and upon the economic condition of the country, as the importation of the same amount of silver to be coined by the Mints into rupees. In this way, might the State directly *neutralize* so far the effect of this annual drain upon the country, with nothing but advantage to all interested therein. We need hardly say that we are aware of the hopelessness of any such suggestion being acted upon, but *magna est veritas*. The suggestion, we are persuaded, and have been for many years, is sound, and we hazard little when we say that the present century will not close upon us, ere the possibility of any people being allowed to suffer as this and other countries have done from a *restricted* currency, will have long passed away. Had the Indian Government possessed from the first a true insight into the effects of our administrative system upon the condition of the people, it might have counteracted the evil by currency arrangements of the simplest order, but impossible because half a century in advance of the times in which we live.

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3 DEC.

BULSAR,—BOMBAY.

ORIGINAL SETTLEMENT OF THE TALOOKA FOR 30 YEARS.

It is now 36 years since the new Survey and Settlement system of Bombay was first introduced into the Presidency, and so protracted has been the work that the earliest of the leases granted thereunder have been falling in for some years past, while the original settlement itself is still not completed in some of the districts in the Northern Division. The work is at last, however, approaching an end, and the Settlement Reports of the last of the talookas in Guzerat are appearing simultaneously with the *re-settlement* reports of the Indapoor and Madeh talookas in the Deccan. The new settlement was in full course of extension in the Presidency for nearly 30 years, before its provisions were finally embodied in an Act of the Legislature (Bombay Act 1. of 1865), and it is impossible to acquit the Local Government, we think, of the charge of extreme apathy in regard to this most vital work. Six and thirty years of active settlement, and the work not yet finished! One of the latest of these original settlement reports that has reached our hands is that of the Bulsar talooka, along the line of the Baroda Railway, 100 miles north of Bombay, and adjoining the talooka of Soopa, the settlement of which was sharply criticized by us a few months ago. We are sorry that the next of these reports which falls under notice should again happen to be the work of Mr. Beyts, as it is impossible for us to approve his work, while we have a true respect for the enthusiasm and abilities which he brings to the service of the State, and if we can let Mr. Beyts off, we shall. The first remark then that we have to make upon his work, and it ought equally to have been made in the case of Soopa, is the expression of our surprise at the perfunctory manner in which the reviewing authorities have treated it. It would be difficult to match, in the whole body of records that have been amassed in such proceedings, a document less satisfactory in every respect than the letter of the Collector of Surat, forwarding the report, for final sanction, to the Revenue Commissioner of the division. The report, as we shall presently show, teems with disclosures of great moment, demanding close attention and earnest and exhaustive discussion, while the Collector of the district to whom it is submitted for review, who, above all others, is answerable for the well-being of the people and the determination of every problem affecting it, is as a man who has no eyes. A report marked by the gravest and most patent defects and by great want of insight on the one side, and on the other by much ability and honesty, and earnestness, and suggestiveness, commands no attention, excites no interest whatever in the Collector, the officer who, we say of all others, was bound to show deep, active sympathy therein. The abilities of Mr. Hope are so well known, that his indifference to this matter completely puzzles us. The most important work by far that he had to supervise in Surat surely was the settlement of these very districts, while, judging from the papers that have been published, they have been regarded by him simply as a bore. Thus, this Bulsar report, which demanded the closest attention is handed on to the Revenue Commissioner in a despatch of about 40 lines, which nevertheless profess to embody his opinions as the reviewing authority upon the Report for the guidance of the Government. The Revenue Commissioner (Mr. Rogers) does *his* part of the work with more conscience, devoting some attention to the disclosures and suggestions of Mr. Beyts, but we should be insincere were we to speak more favourably even of the Commissioner's Review, while that of the Collector is a simple mockery. Last of all, we have the Government Resolution upon the Report, (4th July 1870), shewing some real work of revision; but upon the whole unsatisfactory and wanting in thoroughness. We are truly sorry to have to speak thus, and, were the work itself not so important as it is, would rather say nothing. Labour is not joyous but grievous, and we have a good deal of it to do among us here. To lift willingly with our whole strength at the general burden—*that* as we understand it is the proper work of us all, Settlement Officers, Collector, Commissioner, Government, and the Fourth Estate—too. We are all too apt to shirk our part of the labour, and instead of faithfully lifting, think only of *seeming* to lift while we are cunningly carried along.

The Report professes to describe the circumstances and economic condition of some 70,000 people, making suggestions concerning the terms on which they are to be *settled* upon the land for a generation of years to come, with a view to their own well-being and that of the empire at large. The total population of the talooka (page 24) appears to be 72,355 divided into agricultural and urban classes (para. 38) as follows :—

Agricultural....	Bhatella Brahmins.... ..	2,480	(Landlord class)
	Koombees and Koolees .	19,178	
	Rajpoots	817	
	Dooblas, Doondas, &c .	17,790	(Aborigines)
	Shepherds	962	(Cattle owners)
		41,216	
Non-Agricultural.	Weavers, dhers, &c.	5,141	(Partly cultivators)
	Village artisans	3,089	do
	Parsees	221	(Toddy farmers)
	Mahomedans	94	(Weavers)
	Fishermen and Sailors .. .	9,721	(A few cultivators.)
	Bunnias, priests, mendicants	2,818	
	Town of Bulsar	7,926	
		72,355	

According to this table, we may perhaps assume that about 45,000 of the people are cultivators, and the remaining 27,000 dependent upon other kinds of industry. There seems to be a slight excess of males over females in the talook as in so many other districts of India, the proportions being 3·39 and 3·04, respectively. Comparing the resources of the talook with those of the very wealthy district of Soopa immediately adjoining, the figures stand thus :—

	Bulsar.	*Soopa.*	
Population . .	312	302	per square mile.
Houses	78	78	,,
Cattle	252	235	,,
Carts	20	22	,,
Ploughs	41	26	,,

The district would thus seem to be as wealthy as Soopa itself, and apart altogether from agriculture, employment is afforded, we are told (para. 44), in almost every village to a great number of people employed in manufacturing cloth, blankets, date-matting, sugar-presses, agricultural implements, and metal ware, while

The Koombars carry on an extensive and profitable trade in brickwork and tile-making, and pottery is exported to Bombay by sea. The latter kind is also sent to the Dangs in great quantities. The Machee and Kharwas, who live along the sea coast and on the banks of tidal creeks and rivers, gain their livelihood by fishing, and catch large quantities of bumbaloes and other fish for consumption and inland export. Sailors from this district are very much engaged in the native craft of Bombay. The demand for sand since 1864 for reclamations has opened a new field, which balances the injury done to the interests of this class by the opening of the railway. The owners of carts and cattle, after the crops have been harvested, profitably spend their time in conveying timber from the Dang jungles.

We may reasonably therefore conclude that nearly one-half, certainly 2-5ths, of the people are independent of agriculture altogether, and are simply consumers of the surplus produce raised by the cultivators around them. The latter have thus a market at their very door for the grain, sugar, ghee, grass, cattle, and garden stuff, which the 27,000 to 30,000 of the non-agricultural classes consume, while the district, not merely communicates with the great markets of Bombay and Surat by sea, but has direct railway communication therewith, and with all Western India. The importance of these facts is incidentally shewn by the remark at page 9 that "the grass of the district is as valuable a product as many of "the better kinds of dry crop cultivation." The whole cultivated area of the talook consists of 82,073 acres, which are classified (para. 20) as follows :—

Garden land .....Acres	2,700	Cane, vegetable, &c.
Rice land ..... ,,	12,251	Rice and cane.
Dry crop land ... . ,,	24,889	Joaree, wheat, &c.
Grass land ..... ,,	43,227	(As valuable as dry crops).
	82,073	

These figures are surely very striking and suggestive, and yet they are passed over by the reviewing authorities without a single remark. Out of 82,073 acres of land, 43,227 are grass, neither needing nor receiving cultivation of any kind, and yet yielding as valuable a harvest as though they were under cultivation "with the better kinds of dry crops" *(page 9)*. Not a word, we say, is there of remark upon this most striking fact, nor an attempt to account for the value of these grass lands, and yet Mr. Beyts distinctly, although incidentally only, had called attention to the phenomenon. For, remarking in para 86 upon the slow extension of cultivation in the talook, he says :—

The people who have had the option of reaping the profits of a grass crop, quite as valuable as most descriptions of dry crops, on lands charged with little or no rent, were of course naturally averse to regular cultivation, for which they would have had to pay a higher rate. It is a well-known fact—illustrated on all sides out here—that, with an apathetic people, prone to be content on very little, light assessments do more harm than good. It encourages idleness and a careless system of farming, and no one is more aware of the fact than the natives themselves—although their appreciation of it unfortunately manifests itself in extreme measures—as in the case of all assessments imposed by native Governments, and even under our own rule when there is no check upon the exactions practised by superior holders on their tenants.

It does not seem to have occurred to Mr. Beyts, however, that the obvious cause of the value of these grass lands is the proximity of the markets of Bombay and Surat, with their immense demand for grass and cattle—a cause precisely of the same nature as that which is fast converting a large part of the United Kingdom into pasture land. The further fact, that this demand for grass contracting the acreage under grain, must indefinitely have increased the value of jerayet land under dry crop cultivation seems also to have entirely escaped observation, and a district positively teeming with potential elements of wealth is passed by as though it were of no interest whatever. Half the land under grass, growing spontaneously and yielding a return as valuable as that of ordinary arable land under cultivation; 15,000 acres of the remaining 40,000 under rice and sugar-cane; and 24,000 under grain, with a vast urban population at the door to consume it; a sea-board skirting the whole talook; a first-class railway through it; and a dozen navigable rivers running across it at intervals of every 3 or 4 miles. What could nature or man do more for any district? As a matter of fact the report shews that the district is full of wealth, although the facts are recorded in so imperfect a manner, that it is impossible to do more than use them very generally. Thus at page 46, Mr. Beyts gives us a statement of the Exports and Imports of the *port* of Bulsar, for the years 1865-66 and 1866-67, according to which their value was as follows :—

	Imports,	Exports.
1865-66	Rs. 8,07,137	18,89,952
1866-67	,, 6,86,659 ..	14,77,918

Now these figures are worthless except as indicating generally that the district makes large exports and imports. For what we want to know is the value of the exports and imports respectively of the *district*, not of the mere *port* of Bulsar. Does not a railway go right through it to Bombay in the one direction, and Surat in the other? What we want to know, what it is vital to know—is the total value of the talook's *exports*. We could do *without* the imports, since we know they must at least equal the exports, minus only the revenues drawn from the district. Let the reader look at the following table as presented by Mr. Beyts :—

Names of Articles.	1865-66.		1866-67.	
	Import.	Export.	Import.	Export.
	Value	Value.	Value.	Value.
	Rs.	Rs.	Rs.	Rs.
Tortoise-shell	2,318	..	..	..
Cotton and silk cloths	1,01,145	1,456	72,415	1,233
Coppra	4,242	..	32,468	..
Date and dry date	16,731	394	14,092	218
Sugarcandy	7,136	..	7,006	..
Sugar	90,351	105	75,795	..
Gum	..	955	..	1,534
Ghee	3,000	12,917	5,870	2,640
Tea	513	..	57	..
Oil	1,142	1,73,184	...	97,046
Tobacco	1,36,048	12,111	88,478	423
Metals	63,805	1,331	35,192	1,839
Coins	1,100	8,500	4,603	..
Sundry	1,00,777	10,04,479	1,27,275	7,84,414
Alum	498	389	997	...
Almond	2,271	..	1,872	..
Cutlery	3,505	..	2,682	50
Earthen pots	..	30,662	..	15,505
Spices	31,152	9,348	13,640	938
Salt	..	..	..	10,819
Cotton	38,832	31,483	..	..
Gold and silver	6,248	..	..	..
Building wood	12,162	3,16,404	1,437	3,91,248
Wool	...	3,214	358	144
Firewood	15,596	29,582	13,070	15,574
Materials for Ships	5,521	570	5,204	..
Betel-nut	9,134	30	15,077	..
Cocoanuts	3,397	1,500	4,635	3,288
Yarn	13,490	..	16,205	2,476
Ivory	6,600	..	..	..
Medicines	8,875	2,102	6,775	217
Grain	1,17,052	1,59,645	1,41,795	1,48,372

We sometimes wonder how such tables can be prepared without their deficiencies and discrepancies at once striking the compiler. Thus, according to this table, Bulsar makes the rest of the world a present of eight or ten lakhs a year of exports without payment for them, not one word of explanation being given, or called for, as to the cause of the discrepancy. Again although half the district as we have seen is under *grass*, and the immediate markets of Bombay and Surat are immediately adjacent, the district would seem by this table to export neither fodder nor cattle. Did it not occur to Mr. Beyts to apply to the Baroda Railway Company for statistics of the produce and merchandize, borne *into* and *out* of the talook by their line? The imports and exports of Bulsar itself—the mere port—guide us to nothing. In many respects we are compelled to acknowledge that the Settlement Reports of other Provinces, as those of the Central Provinces, compare most favourably with those of Bombay. Not a report of this kind ought ever to appear without a painstaking attempt to ascertain the exports and imports of the whole talook. All that we can gather in the present case is that the district makes very large exports of produce every year, and proportionally large imports.

So as to the harvest, Mr. Beyts does not make the faintest attempt to estimate the worth of the annual harvest, while should *we* essay to do so, we may expect to be loftily rebuked for our ignorance and presumption. We are told literally nothing concerning the agriculture of the talook, nothing the modes of husbandry, nothing of the produce of the land, nothing as to the size of the holdings, nothing as to the value of the land. That there is a landlord class in the talook (the Bhatella Brahmins) crops up two or three times, but not one word upon the subject of rents. Here is the whole account which the report gives of the agriculture of the district:—

"This district has a very considerable area of natural bagayet land, which enables it to export more coarse sugar than Soopa. The yield per beeghe varies from 50 to 80 maunds in Bulsar, and from 25 to 50 maunds in Parneira. Rice of the better kind is also brought to market, and is grown on fields quite as productive as those in Soopa and Chickloo. In garyet soils, teel, castor-oil seed, kodra, toor, and joar are the principal crops; cotton is scarcely known in this district. Tobacco is sometimes planted in small quantities with sugarcane, a mode of culture quit singular. It is impossible to account for the whims displayed in different places; for instance, in Nariad and Anund nothing but tobacco engages the ryots' attention, and sugarcane cultivation is entirely neglected. In Dholka it is all sugarcane, and no tobacco. In Bulsar it is sugarcane, with tobacco sparingly intermixed. Now it is well known, that in the districts mentioned, both can be raised to perfection. A Chowrasee patel petitioned several times to have an essentially wheat tract drained for joar and cotton, although wheat is an imported article, and a crop of it on that soil would consequently pay him better than either cotton or joar. But who ever heard of wheat fields in Chowrasee, rice and tobacco fields in Dhundooka, or cotton fields in Bulsar?"

This is all interesting enough, but of what earthly use to men who are anxious to form an intelligent opinion as to the weight of the Government assessment upon the land, the proportion it bears to the rental paid by the sub-occupants of the soil, and the sale value of the right of occupancy under the leases. The vital question of *prices* again is left all but wholly untouched. At para. 31 we are told indeed the range of prices from 1857 down to 1867, but what we wanted, and what is essential, is the range of prices for at least the last 30 years and the ten preceding. For how can we possibly decide intelligently as to the weight of the assessments now proposed without such information? Upon the face of the report, the talook, we do not hesitate to say, has been grossly *under*-assessed. And we go simply upon a general fact or two. Thus, at page 48, the assessments of the 20 years immediately preceding this new settlement, are recorded to have been as follows:—

Year.	Acres in cultivation of Government land.	Collections on Government land. Rs a p.
1847-48	71,215·15	2,07,164 13 4
1848-49	71,882· 5	1,93,367 5 3
1849-50	71,733·39	2,09,033 0 10
1850-51	71,623·31	2,10,041 7 4
1851-52	71,230 17	2,09,121 13 2
1852-53	71,255· 0	2,09,911 2 1
1853-54	69,682· 2	2,01,401 1 3
1854-55	69,752·22	2,07,051 13 1
1855-56	69,721· 1	2,07,035 2 1
1856-57	69,670·36	2,08,140 1 0
1857-58	70,115· 3	2,09,203 7 7
1858-59	71,775·13	2,11,260 7 2
1859-60	72,420·32	2,11,247 15 3
1860-61	73,815·37	2,13,889 1 5
1861-62	74,020·17	2,14,372 12 1
1862-63	74,147·28	2,14,793 0 6
1863-64	74,024·34	2,16,372 5 9
1864-65	74,407·18	2,18,820 9 5
1865-66	74,440· 4	2,18,659 4 3
1866-67	74,685·22	2,19,611 8 10
Total ..	14,41,667·16	42,10,221 2 8
Average of the last 20 years	72,083·15	2,10,511 0 11
Totals of the last 10 years	7,33,891· 8	21,47,260 8 3
Average of the last 10 years	73,389· 5	2,14,726 0 10

Thus the average actual collections of the land revenue from the talook in 1847, upon 71,000 acres of land were about Rupees 2,00,000, two lakhs of Rupees, and in spite of the vast revolution that has taken place in prices since then, this new assessment for 30 years to come upon 74,000 acres is to be no more than Rupees 2,50,000. In other words, while prices have risen three-fold in the talook, and the State has gone to enormous cost in sending a railway through this district, the assessment virtually is to be the same or nearly so for 30 years to come, that it was 30 years ago. The position is monstrous. We do not care to go into the several processes by which Mr. Beyts justifies the fact to himself. We say that upon the face of it, the former assessment was iniquitous or the present one is ridiculous. Mr. Beyts will not allow us to take up with the former supposition (*para.* 61), and we are shut up to the latter. The simplicity of this gentleman, which amazed us so much in his Soopa Report, is not wanting here. Thus he concludes his Bulsar Report as follows:—

"Although it would be utterly impossible to succeed in pleasing everyone by measures professedly undertaken to improve the land revenues of the district since the last general revision, and after a long interval of peace, high prices, and improved railway communication, Government will be pleased to learn that the settlement has given very general satisfaction. I received very few petitions, and could therefore attend to every complaint patiently."

The simple fact is that, he has been allowed to make an absurd settlement, a settlement that mocks the necessities of modern Government in India, and forces us upon such devices as the income-tax to retrieve the error. If Bulsar could pay Rupees 2,00,000 as land revenue in 1847 upon 71,000 acres of land when grain was about one-third its present price without oppression, it could very well pay twice that amount to-day upon 74,000, and were the report but supplemented by reliable statistics of the produce and capabilities of the soil, the fact would, we are persuaded, lie patent to the world.

A feature in this Bulsar Report, which we hope will be preserved in all future ones, is the statements (para. 121) of the total amount of taxes levied locally within the talook itself. They are declared to be as follows:—

The Land and Sayer revenue of the talook for 1868-69 amounted in all to the sum detailed below:—

	Rs. a p.
1. Land revenue under all heads	2,56,781 0 1
2. Abkaree	78,119 1 8
3. Local cess	16,096 15 0
4 Certificate tax	1,324 1 8
5. Income tax	353 15 0
6. Stamp paper	38,367 10 3
7. Magisterial fines, &c.	1,662 6 11
8. Registration fees	984 9 0
9. Revenue fines, &c	407 3 5
Total.	3,94,096 14 0

To ascertain the total weight of taxation upon the talook, it would be necessary simply to add the excise upon salt, and the import duties levied at the Customs Houses of the country. The abkaree question and the prevalence of drunkenness amongst the people have deservedly much prominence given them in the report. Mr. Beyts draws attention to the following comparison between the yield of the abkaree in Bulsar and Soopa respectively:—

	People	*Abkaree.*
Soopa	55,412	Rs. 9,057
Bulsar	72,355	,, 78,119

"If," he adds, "the sum of Rs. 69,062 represents the mere difference in the value of *licenses* granted, what an enormous extra consumption of liquor there must be in Bulsar. A rupee's worth of toddy suffices to intoxicate 20 men." What is Government doing in this momentous question?

RE-SETTLEMENT OF MADEH.—I.

A TALOOK OF THE SHOLAPOOR COLLECTORATE,—BOMBAY.

We have purposely delayed noticing the re-settlement of this district, that we might observe the comments the Bombay Press would make upon it. This Madeh talook is the *second* district in which the 30 years' leases have expired, and in renewing the tenure for another 30 years, or what is called re-settling the talook, the Settlement Officer has given somewhat courageous proof of his belief in the doctrines advocated by the *Indian Economist* by raising the assessment nearly 80 per cent. with the approval of the Collector

of the district, of the Survey and Settlement Commissioner, and of the Government. That the district is still greatly under-assessed we shall shew conclusively in the course of this article; while the reasonable, just and necessary enhancement that has been made has elicited a perfect storm of remonstrance from the local Press, European and Native. It is difficult to maintain a courteous tone towards writers, who, while declining all serious effort to master the real conditions of the case, or dispassionately to view it in the light of the vast interests bound up therewith, arraign the Government before the people in language of the most incendiary character. The raising of the assessment in this talook has *not* been the act of injustice and extortion it is mischievously declared to be, but a just and necessary assertion of State rights, rights that cannot be waived, and the hesitancy to assert which in late years has been the direct cause of all the financial embarrassments we are suffering, and the parent of the ruinous devices to which the State has been driven to supplement its resources, alienating the people from our rule and filling the country with disaffection and the seeds of rebellion. The writers who declaim against the maintenance in its integrity of the Land Revenue of the country, earn a cheap popularity by inveighing against all attempt to enhance it, while they are either too blind or too prejudiced to see that we are in the dilemma of having to choose between the ancient fiscal system of the country, to which the people willingly submit, and an attempt to meet the growing expenditure of the State by modes of taxation foreign to and hated by the people. Not an attempt is made to show us *how* we are to raise the increased revenue required to meet the vast outlay which the State has incurred for the improvement of the land, and to which it is committed, at the instance and requirement of a public opinion too strong to be resisted, while the opportunity offered us in the renewal of these long leases—an opportunity which once neglected is lost for a generation of years—is to be forfeited at the bidding of men who really seem to think that public virtue consists in carping and declaiming against every act of State whatever. If Government enhances the land revenue, it is oppressing the cultivator; if it levies customs duties, it is strangling trade; if an income-tax, it is demoralizing the people and alienating them from our rule; if it fails to spend money upon education, it is behind the age; while if it levy a cess for the purpose, it is breaking faith with the people. If it do not construct railways, and make canals and build bridges, and give the cultivator roads—away with such a Government from the Earth, while if it take the money required for the purpose from the only source open to it, it is playing the part of an extortioner. We have yet to learn that this is healthy journalism, or conducive to anything but anarchy. We say that the government *must* do all these things, every one of them, and that it *must* have the money to do them with: and we say lastly that that money *must* come, in the main, from the land, and that to trust to any other source for it will end in the abyss, as every fact in the circumstances and economic condition of the people tells to the opened ear with sound of trumpet. The time may come, but is a full century distant, when such devices as the income-tax or customs duties may be trusted to for the Imperial expenditure of the country. Seeing these things clearly, the Settlement Officer in Madeh, with the authorities above him up to His Excellency-in-Council himself—"considering the rise in the price of grain "therein, the increase of the district in material wealth, and the "improvement in communications which has taken place since "the first settlement was introduced therein" have agreed to raise the assessment 77 per cent. Whereupon, the enlightened and patriotic and public-spirited men who constitute the fourth estate of this part of India, set up a prolonged and intelligent howl. Let us now try to see with how much reason. An increase of 80 per cent., no doubt, calls for justification, and we proceed to shew how ample that justification is. First of all then, the State during the currency of the leases that have just expired has lavished—for there is no other word for it—has lavished its resources upon the district. Let the reader reflect carefully upon the meaning of the following statement:—

"With regard to the works affecting communications carried out during the lease, there was not a mile of made road in the district at the time the settlement was introduced, but it has now been opened out to traffic in every direction. The G. I. P. Railway Line from Poona to Sholapoor skirts the northern part of it. The great trunk road running between the above stations passes through the centre, and the southern corner is crossed by a part of the road from Sholapoor to Pundhurpoor. In addition to these, there is, as mentioned by Mr. Grant, "a cross road from Barsee to the Barsee Road Station (situated in the district), which is continued to Tembournee. In fact the district is so thoroughly accessible in every part, that in point of communication nearly all the villages are equally favourably situated."

This is a very satisfactory account of the present state of the means of communication possessed by the district, and nothing more may be said to be needed. The construction of one or two branch roads leading from the Sholapoor and Poona road to the Railway stations, would be an improvement, and the Local Funds may be looked to for eventually supplying the means for carrying out such small works. The State has done all that is required of it, indeed few districts have been so fortunate as this in having a first-class metalled road and a railway run through them during the last twenty years.

Now this railway has cost the people of India generally £25,000 for every mile of it. All India has been taxed to pay interest on this outlay for the last 20 years, and will be so taxed for an indefinite time to come. To bring this Madeh and other districts into railway communication with Poona and Bombay in the one direction, and with Sholapore and the Nizam's country in the other, we have constructed some 200 miles of railway at the cost of about five millions sterling during the currency of the leases that have just expired; while we have made a first-class metalled road through the very heart of Madeh itself and so many cross roads as feeders thereto, that upon the whole "the district is so thoroughly accessible in every part," that the State literally can do no more for it than it has done. Now, who *ought* to pay for all this, if the cultivators are to be exempt? We remark next that the former leases were granted upon abnormal terms altogether, being issued in abnormal times. They were issued at a period of deep agricultural depression. From causes that were not clearly discerned at the time, but which are now well known and which we have once more described at length in a previous article, the people had been greatly impoverished under our rule. It was necessary, therefore, to pitch their assessment unusually low. "Whatever," says the Settlement Officer (Mr. Grant) "may have been the real cause of the depression which "existed, the only remedy which lay in the hands of the Revenue "Officers was to reduce the assessment which was accordingly done, "and *the very low rates* then fixed have continued in force until now." (*para* 11). We have now got *two* facts of importance to the question; (1) that the State has done all it can possibly do for the district; and (2) that the old leases were issued at abnormally low rates because of the depressed condition of agriculture at the time of their issue. Now the next and *third* fact is that this depression gave place during the early currency of these old leases to a condition of prosperity. Very shortly after their issue, so profitable did agriculture become, and so enduring was the improvement, that every acre of ground in the talook was brought under cultivation, till the assessment at last became a mere bagatelle to the cultivator. Is it not amazing that men can be found to sneer at statistics, with such a record before them as the following price list, which the Settlement Officer produces?

Statement showing the average yearly price of grain at Mohol and Mareh for 30 years:—In seers.

	Mohol.		Mareh		Remarks.
	Joaree	Bajree.	Joaree	Bajree.	
1839-40	78	72	91	70	
1840-41	84	78	84	63	
1841-42	108	96	102	68	Average 10 years price of Joaree is 3½ per cent. lower at Mareh than Mohol.
1842-43	72	60	70	63	
1843-44	54	47	56	49	
1844-45	15	14	21	17	Bajree 2 per cent. higher at Mareh than Mohol.
1845-46	47	36	49	35	
1846-47	30	24	31	26	
1847-48	36	30	35	28	
1848-49	47	36	49	35	
Average.	57	49	59	48	
1849-50	47	42	49	42	
1850-51	54	36	56	35	
1851-52	47	36	50	42	
1852-53	42	36	42	35	Average 10 years price of Joaree 6 per cent. lower at Mareh than Mohol.
1853-54	36	24	35	36	
1854-55	16	15	17	16	Bajree 3½ per cent. lower at Mareh than Mohol.
1855-56	23	16	24	17	
1856-57	31	27	35	28	
1857-58	27	17	26	19	
1858-59	17	21	19	24	
Average.	34	27	36	28	
1859-60	46	38	45	38	
1860-61	30	36	30	26	
1861-62	24	21	26	28	
1862-63	22	18	23	19	Average 10 years price of Joaree 0·7 per cent. lower at Mareh than Mohol.
1863-64	15	12	16	14	
1864-65	18	14	19	16	
1865-66	24	19	26	21	Bajree 2 1/3 per cent. lower at Mareh than Mohol.
1866-67	23	19	24	21	
1867-68	24	21	24	21	
1868-69	31	28	26	28	
Average.	25·7	21½	25·9	22	

If the reader will look carefully into this table and remember that according to our theory, it is the Crimean war (1854) that separates the period of low from that of high prices in India, he will find the table more instructive and suggestive, perhaps, than in the shape presented by Mr. Grant. We should divide the lease into two distinct periods of 15 years each, the 15 years preceding the Crimean war, the commencement of the *modern* export trade of India, and the fifteen years since, thus :—

	Joaree.		*Bajree.*
1839-1854	63 seers.	.....	44½ seers.
1854-1869	24½ „	.....	21½ „

We make this readjustment of the averages because too much, we are persuaded, is being made of the effect of the *American* war upon prices in Western India. It was the *Crimean* war, not the *American* war, that revolutionized prices in the Presidency, as the following averages in periods of 5 years seem to shew conclusively :—

	Joaree.		*Bajree.*
1839-44	79 seers.	.....	71 seers.
1844-49	35 „	.....	29 „
1849-54	45 „	.....	35 „
1854-59	28 „	.....	19 „
1859-64	28 „	.....	25 „
1864-69	24 „	.....	20 „

Now, in face of these figures, one of the patriotic gentlemen, who have objected so passionately to the increase of the assessment in the present case, tells us that : –

"When a district is re assessed, the whole range of prices for thirty years should be added up to det rmine the average for the next 30 years. Fanciful extensions to times beyond memory, or fanciful exclusions should not be allowed. It is a fair inference to suppose that the thirty years to come will be as good or bad years as those which have gone away."

According to this theory, the new assessment at the highest should have been based upon the average of the whole 30 years, although for the last fifteen years the contractor had been engrossing the whole benefit of a rise in prices to three times the rates upon which his lease was framed.

We throw the average into this shape for the purpose of correcting what we are persuaded is the undue prominence given by the Survey Commissioner and the Local Government to the effect exercised upon prices by the American War. Thus the former, Colonel Francis complains that the estimates of the *Indian Economist* of the value of the produce "in the case of Indapoor were based entirely on the high prices of the American War period." The Local Government, dealing with the same question in the present case (Madeh), says :—

"There can be no doubt that the extraordinary rise in prices which took place throughout the Presidency during the years from 1862-63 to 1866-67, was owing to the American war, and the consequent increase in the value of cotton. It is equally certain that a reaction has now set in; the importation of bullion has for the present ceased, and prices have fallen considerably, and are likely to go still lower. The average to be deduced from the prices of the five years from 1856-57 to 1860-61 is perhaps the fairest criterion that can be adopted for the determination of the average standard of prices which is likely to be maintained in future. This gives the price of joaree at 31 seers per rupee."

If these gentlemen will look carefully at the re-adjusted averages given by us above, they will perhaps modify their conclusions as to the effect of the American war upon prices. What is clear, at all events, in the case of Madeh, is the fact that throughout the last 15 years of the old leases, the average price of grain was more than *double* the average prices of the first 15 years. But *that* after all is a wrong comparison altogether, the error made therein being manifest : for the terms of the original leases were settled upon a consideration of the average prices of the years *preceding* their issue, just as the new assessment has to be determined in the light of the averages of the years we have been reviewing. The only effective comparison, therefore, that can be made is, between the prices on which Lieut. Wingate based *his* assessments in 1836, and those on which Mr. Grant bases *his* in 1868. Now this comparison stands thus :—

Average prices in periods of 15 years.

	Joaree.	
Wingate's basis,—15 years preceding old leases ...	63	seers per rupee.
New basis,—1851-69	24½	„

These plainly are the figures that constitute the effective averages in the case, and we may judge fairly enough in their light, if we are candid, as to the propriety of now enhancing the assessment by about 77 per cent., when there has been a plain palpable rule in prices of more than twice that amount. If Wingate's assessment of 100 were moderate when the average price of Joaree was 63 seers per rupee, what must the new one of 177 be when the price of grain for the last fifteen years has been 24½? But as a matter of fact, Wingate based his assessment upon lower prices still than 63, viz., upon the average of the 5 years immediately preceding his settlement, when they were as low as 70. The truth is, that look at this new assessment in whatever light we may, it is as clear as the sun at noon-day to those who do not wilfully shut their eyes, that it is extremely moderate. There is not a shadow of pretence for declaring it to be oppressive, and when we bear in mind what has been done for the district at the expense of the State, we say that it would have been a grave offence against the Commonwealth had the assessment been fixed at a materially lower rate.

For, it seems to be forgotten on all sides, that these lucky cultivators have confessedly been holding for the past 30 years upon a rental infinitely lighter than was *intended* to be imposed, and that during the last fifteen years of their tenure, the rent they were paying was the merest quit-rent. Now, however prices may range in the future – there is the plain fact that for the last 15 years, the cultivator has been paying almost nothing. There is more than mere dullness at the bottom of the refusal to see these facts, and the carpings at the enhancement. There is dogged determination not to open the mind to conviction, clear unwillingness to look the question in the face as it really stands. The district has been very mildly dealt with indeed, and the exact enquiry we are persuaded, would shew that the sale price of the leases, under the new assessment, has not been affected one whit by the present enhancement. There is still an immense margin of State rights conceded to the ryot under them, a margin such as was never for a moment contemplated when the Bombay Settlement was first introduced. The truth is, we have got into a morbid state of mind upon this subject everywhere. Thus we speak in this Presidency, of Wingate and Goldsmid, and Professor Green as the men whom we look up to, and believe in, as the apostles of moderate assessments, while they would have stood aghast at the sacrifice of State rights made in these days, without the least perception as to where it is leading us. Thus Wingate and Goldsmid alike declare in their famous joint Report, that for the Commonwealth to take "no more than from 50 to 80 per cent. of the *true rent* of the land, is to deal liberally with the cultivator." Now, where are we taking this proposition of the true rental in any part of this Presidency? If we take Professor Green again as our authority, and we all profess to regard him as such, listen to what he says :—

"At the threshold of such an undertaking as a revenue settlement, the question which presents itself is, what is to be the nature of the revenue raised from the land? Is it to be a tax on raw produce, intended ultimately to fall on the consumer, a tax therefore on the necessaries of life—the most objectionable of all taxes? Or is it to be a (political economist's) rent, the least objectionable of any tax, and which, in a certain sense, may be said to fall upon nobody; but the economical effect of which is to maintain a remote approximation to equality among the cultivators, by taxing each man according to the advantages he starts with, and so to prevent or retard the growth of a landed proprietory living merely on their rents? The Indian Governments, very much, no doubt, from the necessity of the case,—but whether from that or from any other cause, with great propriety, as it seems to us, have decided upon the latter—the least profitable lands in cultivation are taxed at a rate little more than nominal, (from three pence to six pence per acre), and all others are supposed to pay the assessment on them from the surplus profit, which, from superior fertility, proximity to markets, convenience of carriage, &c., they would otherwise yield to the labour and capital of the cultivator. Many of our native friends, and some of our European ones also, seem to labour under a strange confusion of ideas on this subject. They perceive that a remission

of the Government land revenue would raise the holders of the best lands, the lands which pay the highest rates, to the rank of well-to-do landed proprietors; that it might even enable the more fortunate of them to live, if they chose, in idleness, supported by the rent which their less fortunate brethren would then be willing to pay to obtain the superiority of fertility, situation, &c., of these better holdings. But they do not perceive that this could only be done by taxing themselves and the rest of the community to the full amount of all which these new landed proprietors would thus be enabled to appropriate;—that their scheme is, at bottom, merely a proposition to levy taxes on the community generally, for no governmental purpose, either local or general, but to present, in pure gift, to a portion of the kunbi population, in order to make independent gentlemen of them."

So wrote Professor Green in the *Bombay Gazette* in 1852. But we have grown wiser since the days of these gentlemen. We have discovered a new political economy altogether, and they, who like ourselves, strive earnestly to correct the aberration of the public mind, are represented as public enemies. The Bombay Government has acted wisely in refusing to defer to the popular clamour of the hour, and the new leases being issued will give full expression, we trust, to the reasonable and enlightened convictions of the Statesmen who gave the Bombay Settlement System to the country.

(To be Continued.)

WELL ASSESSMENTS IN BOMBAY.—II.

We called attention in our last issue to the fact that the Bombay Government seems to be at cross purposes with the Settlement Officers of the Deccan upon the subject of well assessments, without knowing that it is so. Thus, if we understand Colonel Francis aright, the rule he is acting upon in re-settling the Deccan talooks is to impose the "highest jerayet rate" upon dry crop lands wherever he finds a well, new or old, sunk therein. Now the Government *appears* to approve of the imposition of this rate only in cases where the well was sunk at a period antecedent to the grant of the old leases, and to disapprove the imposition of any higher rate whatever upon land so improved during the currency of the leases. It seems to us at once formally to sanction, and expressly to disallow, the very same thing, without knowing that it is doing so. The Settlement Officer of Madeh says, (para 35) :—

No extra assessment has been placed upon well garden lands, the maximum rates for which is the same as for first-class dry crop lands.

This is not very clear, but we take it to mean that the uniform rate upon well garden lands is the highest dry crop rate. Colonel Francis, in noticing the para, says, (*page* 10) :—

"I am glad to find that the Acting Superintendent has not imposed any extra cess on well garden land, but adopted *the Indapoor plan* of assessing them only at the highest jerayet rate of the village.

The Government approves of this plan and says :—

The principle of placing no extra cess on lands irrigated by wells, has the entire approval of Government. *It is presumed that the highest jerayet rate has only been imposed on such lands as were formerly subjected to extra well-assessment, and not on lands irrigated from wells constructed during the period of the settlement just expired.* It is of the utmost importance to give every encouragement to the sinking of wells in a district where the rainfall is so light and uncertain; and any applications that may be made for advances for this purpose will meet with favourable consideration.

Mark the words we have italicized. The Government presumes that 'the highest jerayet rate' has been imposed only on such lands as were formerly subjected to extra well-assessment. But that is *not* the Indapoor plan, as we understand it. The Indapoor plan is "to put the first class jerayet rates upon *all* lands capable of "being irrigated from existing wells." Colonel Francis says explicitly :—

The course adopted is to put the first class jerayet rate upon all lands capable of being irrigated from existing wells, irrespective of the value assigned to it by the jerayet classification. But when the land has been classed at the full jerayet rate, no addition has been made in consideration of its being irrigated by a well. Government wish a general addition to be made to the jerayet rates for all lands possessing a water bearing stratum; but it is almost impossible, I think, to work out this plan in the ever-varying soil of the Deccan. I have, therefore, taken existing wells as the guide, and considered only the land under them as having a water-stratum.

Sir George Wingate understands this to mean that all lands in Indapoor upon which wells, whether new or old, were found existing at the time of re-settlement, were assessed at the highest dry crop rate. He says :—

I am unable, therefore, to agree with Colonel Francis in considering the conversion of dry crop into garden land, by the construction of a new well or the repair of an old one, to be in all cases excluded from increase of assessment by Section 30 of the Survey Act. I would not, however, propose to apply to such land any higher rate of assessment than the maximum dry crop rate which Colonel Francis has recommended, though I think it might be desirable to record all land irrigated from wells separately from the ordinary dry crop, with the view of presenting accurate statistics of the settlement, and of facilitating the imposition of special rates of assessment on garden land at a future settlement, should that course be then deemed desirable.

Now the Government *presumes* that lands so improved by wells sunk during the currency of the old leases have suffered no enhancement whatever, while, if we understand the reports aright, the assessment has been raised to the highest jerayet rate. The matter at all events ought to be cleared up.

The *general* question is an exceedingly difficult one, and one that does not perhaps admit of a common solution in districts, the physical characteristics of which differ so widely as the Deccan and Guzerat. It is popularly supposed that under the Bombay settlement, the ryot is liable to no extra taxation whatever on account of improvements made by himself, and stated generally, the fact is so. The principle is thus laid down in Section XXX of the Survey Act (1 of 1865) :—

"It shall be lawful for the Governor-in-Council to direct, at any time, a fresh survey or classification or all or any of these combined, but the assessment so revised shall not take effect till the expiration of the period of previous guarantee given, as provided in Section XXVIII. Such revised settlement shall be fixed, not with reference to improvements made by the owners or occupants from private capital and resources during the currency of any settlement under this Act, but with references to general considerations of the value of land, whether as to soil or situation, prices of produce, or facilities of communication."

But Government has never, we believe, in any *original* settlement hitherto, foregone its previous right to levy assessment in some form or other upon wells already in existence, unless they happened to be of very recent construction, or to be protected by some special agreement; but on the re-settlement of the Indapoor talook, this special cess was altogether abandoned, and instead thereof, "the highest dry crop rate" imposed upon *all* lands indiscriminately wherever wells were found, without regard to their being new or old. And, we think this is equitable. From a resolution however quoted by us above, sanctioning the *re-settlement* of the Madeh talook, Government explicitly condemns the imposition of this rate on dry lands except such as were formerly subjected to the extra well-assessment, and requires all lands *newly* so improved, that is, by wells built during the currency of the leases now expired, to be assessed as though they had no water-producing qualities whatever. We think this is impolitic and inequitable; while its embodiment, in an express resolution of the Government, makes it necessary to direct attention prominently to the matter. In point of fact, the Government by this resolution, has refused so far to sanction the Madeh settlement, and the whole question is therefore re-opened for discussion. We feel somewhat curious as to whether Colonel Francis has detected this. It is not likely, we should think, to have escaped his notice, but if it has, it should be at once made the subject of communication with the Government. The general question was well stated three or four years ago by one of our correspondents, in the *Times of India*, as follows :—

"The capability of land to yield water, by sinking wells, at a greater or less depth, is as much a natural advantage, as is its superiority of soil or situation, or any other quality that gives value to one piece of land over another, and constitutes its natural rent. Take the common case of a piece of land commanded by a running stream, which only requires the construction of a simple bund, at the trifling cost of a few stones and a puddling of mud, to turn its water on to the land. Would you hold that land so irrigated should pay no higher rent, because its possessor (subject to land-tax) has invested a morning's work, or a few rupees of "capital" in realizing his advantage? So with the water-bearing stratum below the surface. In some places a "kutcha" well of 12 or 15 feet depth, such as is made in every field in many parts of the N. W. Provinces, and costing but 30 or 40 rupees even when made by hired labour, suffices to irrigate the land with a small expenditure of man and bullock power in raising the water. In other parts the water is deeper below the surface, the soil is not so firm as to stand without masonry lining, and severe labour is necessary in raising it. Surely these different conditions point to an essential difference in the value of the two plots, such a difference in fact as constitutes a rent value in favour of the former.

For ourselves we should like to see this question of well-assessment re-argued from its foundation. We are but just beginning to re-issue the new leases in the Bombay Presidency, and the matter might well, we think, make the subject of close investigation and special legislation. The *policy* of abandoning for ever all increase of revenue from this source, or even generally commuting the State claim thereto upon "the Indapoor plan" of levying the highest jerayet rate, seems to us very doubtful. The question was argued in our last issue very ably by one of the native officers of the Settlement Department, and we shall probably recur to the subject in our next issue. In the meanwhile the question raised by the Government Resolution in the case of Madeh should receive, we think, immediate attention.

EDITORIAL NOTES.

A CORRESPONDENT sends us the following memorandum on the Russian Trade with Khiva and Bokhara :—

"The merchants who trade regularly with Bokhara and Khiva, supply the following information. They shew that the transport of ordinary, not particularly valuable, goods was effected within the following number of days :—

From Moscow to Orenburg, in summer	20 to 30 days
" " in winter	35 to 45 "
" Orenburg to Kazala, even by the long route through Orsk	27 to 0 "
" Kazala to Bokhara	16 to 20 "
Total from Moscow to Bokhara, in summer	63 to 77 "
" " " in winter	78 to 93 "
" Orenburg to Tashkend on camels	50 to 60 "
Total from Moscow, in summer	70 to 90 "
" " in winter	85 to105 "
" Orenburg to Khiva	30 to 40 "
Total from Moscow to Khiva, in summer	50 to 70 "
" " " in winter	65 to 85 "
Light and valuable goods are, however, delivered at Bokhara and Khiva much quicker, viz., in	20 to 25 "
Total from Bokhara and Khiva to Moscow, in summer	40 to 55 "
" " " " in winter	55 to 70 "

"As regards the cost of carriage, the same merchants have supplied me with the following figures taken from their books, and for an average of six years. The cost of carriage from Moscow to Orenburg in summer is 70 to 80 coperles* per pood, in winter 1 R. to 1 R. 15 C. or an average of about 90 C. per pood. From Orenburg to Bokhara 1 R. 10 C., consequently total cost from Moscow to Bokhara about 2 R. per pood, not 3 R. to 5 R. The cost of carrying private goods to Tashkend is 1 R. to 1 R. 30 C., and it is only within the present year, that the cost rose to 1 R. 70 C., while Government stores have been delivered at Kazala, at the rate of 38¼ C. per pood. In the opinion of a merchant, who is constantly engaged in the transport of heavy goods in the steppe, it will be possible to engage camels (as soon as the new regulations shall have been confirmed) for 12 R. to 13 R. from Orenburg to Bokhara, and as the camels of the Caravans to Bokhara generally carry 14 to 16 poods, it may be confidently asserted that 90 C. per pood will be a high price. The same merchant thinks that the hire of a camel carrying 18 poods will not exceed 10 R. between Orenburg and Khiva. The cost of carriage will thus be about 50 C. per pood. Merchants state that the cost of carriage this year to Khiva has been as high as 94 C. and 1 R. per pood. It is stated that all the above considerations, *i. e.*, the high rate of carriage, the length of the route, and the absence of insurance and such facilities, fall heavily on the value of our goods, without speaking even of the inconveniences to which products brought from Tashkend, and chiefly cotton, are subjected. Owing to the daily falling of the cotton and the absence of shelter, it is liable to damage and loss, which frequently take up to 40 per cent. of its value. The percentage of loss is, however, in reality never very considerable. Merchants state, that it is generally 2½ to 5 per cent., were it to reach 20 per cent. (not above 40) the same merchants consider it would be impossible to do any business in cotton."

AMONG the strange events of the day, opening out new fields of peaceful industry and linking remote nations, none is more marvellous than that connected with the success of the Suez Canal. Its success as *un fait accompli* burst suddenly on disbelieving England who is now slowly beginning to see the effect it will have on the course of her trade, and that the continental trade with the East will be to a great degree *direct* instead of through London or Liverpool. The effects of this will be felt on the banks of the Neva as well as of the Thames. Ice-bound Petersburg will lose a certain amount of her influence by the opening of the Suez Canal, which, while Odessa and the Ports of the Black Sea are *en rapport* with Moscow and the manufacturing districts of Russia by several lines of rail, will connect the distant East by the Canal with Russia. Bombay and Calcutta, Petersburg and Moscow will be brought into commercial relations. A Russian steamer sailed from Hongkong and Shangai last spring with a cargo of tea for the fair of Negra Neogorod in August, and there will thus be a revolution in the tea trade of Russia, which instead of taking, as hitherto, the long and expensive route across the desert of Gobie, the wilds of Tartary, and recesses of Siberia, a 14 months' journey will now proceed from China to Russia in eight weeks at a less cost, though whether the high priced tea *sea* borne will have the same flavour as the land borne, is still a question. Eight years ago, the duty on tea imported into Russia was reduced, and large supplies of China tea were forwarded from London to Petersburg, but it is probable, that much of this will pass through the Canal, except what may be necessary for Petersburg itself.

Indian tea may be able to compete with China tea in the Russian market, but it will require, as it did in England, some time to form a taste for it. We have little doubt, however, that the highly-flavoured teas of Assam and Kangra will suit the Russian taste, and the Russians are the greatest tea-drinkers in the world. The merchant in his office cannot conclude a bargain without the fragrant leaf, nor the peasant enjoy himself in town without his *tea-shop*.

Notwithstanding all the delay and disadvantages of the Cape route, Russia has hitherto imported 20,000 tons of Indian Cotton, chiefly Surat, annually, and the demand for it is increasing. The Russian factories have their machinery adapted to the short Indian staple. In 1869, the price of East India Cotton at St. Petersburg was about 10*s.* per cwt., or nearly a shilling a pound, and in Moscow it was higher. The cost of carriage to Suez will be slightly greater than that *viâ* the Cape, Liverpool, and St. Petersburg, but the gain in time by the former route, will fully make up the greater cost of carriage. Nearly one-half the coffee consumed in Russia is imported from England. The duty is 14*s.* 8*d.* per cwt. The excellent quality of Ceylon Plantation Coffee is well known in Russia, and it will probably be imported in large quantities by the Suez route, the steamers touching at Colombo on their return from China. Spices, gums, drugs, must also come in for their share in the trade. Russia might send to the Indian market flour and biscuits, salt-beef, horses, candles, (these latter have for some years been in the Indian market), also caviare and cigarettes. Ice might be sent from the Sea of Azoff; Kerosine is made in the south of Russia. Salt might be exported to Calcutta from the shores of the Black Sea. *M. Skaffolsky* calculates, in his report, that Russia might export to India annually, in return for cotton and indigo, 8,000 tons weight of goods irrespective of coal. Russian travellers are likely to find their way to India in considerable numbers, as 26 days will take them by a very agreeable route to Bombay; while commerce and friendly intercourse are favourable to peace and the lessening of national prejudices.

IT will be remembered by some of our readers that North Canara was transferred some eight or nine years ago from the Madras Presidency to the administration of Bombay, mainly for the sake of 'developing' the port of Sedasheorgur or Carwar, as it is now called, as an outlet for the great cotton-growing district of the Southern Mahratta country. The Settlement Officers of Bombay have been for some time past surveying the district with a view to the introduction of the 30 years' lease system into it, but the people refuse to accept the system, and affirm that the State claim upon their lands was *permanently* settled for all time, by the late Sir Thomas Munro, in a notification dated so far back as 26th March 1800. The Local Government has obtained a rule nisi from the High Court of Bombay for the transfer of the first

* 36 lbs.

suit which has arisen under this claim from the Canara Courts to the High Court of Bombay as a Court of Extraordinary Original Jurisdiction. As the case is representative, and affects landed rights in the district *en masse*, it is impossible to exaggerate its importance. The rule will, in all probability, be made absolute, but Chief Justice Westropp has intimated, with great propriety, we think, that he will require Government to bear all costs arising from the transfer of the suit for the jurisdiction of the Lower Courts.

The case promises, we think, to be the most important tried for many years in India, and we shall await it with considerable impatience, as it will bring the whole question of these Land Settlements before the public mind in a most vivid and effective form. If these landholders in Canara establish their claim, to hold *permanently* at rates levied 70 years ago, half the Madras Presidency may be able to do so too, with the effect of necessitating the instant abandonment of all expenditure therein upon Public Works for improving the land. It is most marvellous that men are so slow to discern the vastness of the issues involved in this question. Thus, to this hour, the State is making an immense annual outlay upon such works in Bengal, while not one rupee of this outlay can be justified on any reasonable ground whatever, since the State is barred by the Permanent Settlement from all share in the improved value of the land, resulting from such expenditure.

REVIEW.

TRAVELS IN INDIA.

BY A. F. MOOS.

We extend a hearty welcome to this handsome volume, both as one of a class of publications which we wish to see multiplied in the vernacular languages of India, and also for its own merits. As one of a class, it is a praiseworthy attempt by Mr Ardeshir Framjee to acquaint the people of Western India with the social and material institutions of their countrymen and co-religionists, who are separated from them by thousands of miles. Within the last few years there has been a growing and healthy desire among our native fellow-subjects on this side for travel, the result of which is seen in the production of some very meritorious works, such as Mr. Dossabhoy Framjee's and Mr. Karsandas Moolji's Travels in Great Britain. These works, however, relate to travels performed beyond the *kala panee*, and we had absolutely no good work ere now from the pen of an educated native on India itself. The want is now supplied by Mr. Ardeshir, and supplied in a manner which cannot but be appreciated by the Goojrati reading public in the way it deserves to be. What constitutes the intrinsic merit of this book, is the excellence of its literary as well as mechanical style which claims for it a place in the foremost rank of native literature. The language used, both Goojrati and English, is in point of simplicity and vigour, quite a model for imitation by the juvenile portion of native aspirants to literary authorship, whose effusions are not unfrequently disfigured by extravagant and unmeaning verbiage, while the extent of his observation and the suitability of his comparisons and contrasts which intersperse his narrative, point to the author as no mean or indiscriminating observer of "men and manners."

The natural curiosities and the artistic skill of which India may be said to be one vast museum, its varied and interesting sceneries, its palatial edifices and beautiful mausoleums, its diverse manners and customs, together with a host of incidental points have all been observed and described by our author with considerable minuteness and impartiality. Nor is the exterior neglected. A splendid corner with an appropriate design in gold, a carefully executed map of the country, and the excellent chromo-lithographs of the places and scenes visited during the tour, complete all that is necessary to invest this work with a high degree of interest and attraction for those for whose benefit it is primarily intended, while an interesting English translation, occupying the first forty pages of some of the principal passages, is inserted with the view of imparting an idea, however faint, of the character of the contents to Government, whose support it may justly claim, and to the Duke of Edinburgh, to whom it is dedicated by permission.

As it is impossible for us, owing to the limited space at our command, to give more than two or three extracts, we select those which evidences the author's anxious desire to turn his travels, at every available opportunity, to some acceptable service, such as opening the eyes of the ignorant motussahites to the merits of the British Government in India, to the people's own rights and privileges in matters religious and political, as accorded them by the humanity of their rulers, &c. Take, for instance, the following:—

"Feeling hungry on our way back to the village of Manthal, whence "we had gone to look at the ruins of some old temples, we desired the "cultivators working in the sugar-cane fields by the way side to let us "have some pieces of sugar-cane, which they refused, because many "'Saheb loke' on feeling hungry or thirsty on the road in the Mofussil, "do not scruple to lay hold of anything they come across, without pay-"ing for it, as if they had a vested right so to do; and such is the im-"pression under which many a poor ignorant cultivator labours even "at the present day. *** Such unlawful exactions, however, being far "from our intention, we set the cultivators right on this point, and "explained to them that no one had a right to take anything from "anybody forcibly and without payment under the British *Raj*".

Though this description is somewhat exaggerated, inasmuch as we do not believe that *many* "Saheb loke" resort to such a rapacious practice, yet it is not altogether uncommon to hear such complaints in the Mofussil villages, where occasionally some one probably belonging to the loafing fraternity, or some silly fellows "out of mere fun", or, as is more frequently the case, the subordinates or servants of public officials *do make* their purchases without the knowledge or sanction on the part of the latter, without paying for them at all or without paying the full price asked for them. If ignorant shopkeepers in such cases forthwith trace the acts to Government itself, as done under its implied sanction or authority, it is not to be wondered at, and hence these travellers have, we think, done a good service in informing the ryots of what is due to them, and clearing the character of Government from the ignorant, but mischievous, imputations cast upon it. The next passage has the same object in view, but embraces a much wider scope:—

"We employed ourselves in conversing on various matters with the so-"called "fakeers" who had assembled there, (in a Masjid at Kalia-"nee), in the course of which we had the opportunity of correcting "some errors and misunderstanding into which they had fallen regard-"ing the policy of the British Government in religious matters. They "seemed strongly impressed with the belief that their rulers were now "intent on making the people of this country converts to Christianity "by all means in their power. Upon this we explained to them that "there was no other Government on earth which treated alien religions "with so much consideration, and granted such entire toleration to the "professions of each and all of them in their various practices in accord-"ance with the dictates of their individual faith. When the British people "had undergone so much persecution and made so many sacrifices "for the express purpose of obtaining absolute religious freedom, and "through the Divine favour, had their efforts finally crowned with "success, could it be believed that the same people would use "persecution against their own subjects? The Christian missionaries "who are engaged in the work of proselytizing natives are entirely "unconnected with Government. They come to this country of their "own accord to expound and propagate their religion without either "encouragement or prohibition from the Government." * * * * * *

And then again. "The fact is, certain designing and riotous men, find-"ing themselves unable otherwise to carry on their nefarious practices, "resort to inciting the bigotry of fanatical and short-sighted persons by "raving the Government in every possible way their mendacious pro-"pensities can invent, and driving them into rebellion, attempt to make "the best they can of the favourable opportunity thus created to carry out "their objects. The sensible portion of the people have, by this time, "clearly seen through this dodge. It was the incendiarism of these "unscrupulous malcontents which inflicted such terrible calamities on "Delhi, and brought about its sack. It resulted in extinguishing the "very name of its ruler, Bahadar Shah, and of his dynasty, he "became a prisoner of the British Government, was transported, and "died a convict and in exile! * * *. It subsequently became apparent "that the mutiny was purely the doing of rebellious people, who "drove the simple and credulous to the front, by using all kinds of "misrepresentations and deceptions ostensibly in the name of religion, "but really to gain their own private ends. These evil-doers, however, "did not escape the stroke of Divine retribution. Some of them "expiated their crimes on the gallows, others paid the penalty from "the muzzles of guns, and some put an end to their lives by their own "hands. This rebellion has had the effect of sweeping away the names "of some of the most illustrious families, of which not a vestige is "now to be seen any more than that they never existed on the face of "the earth." * * *

This eloquent harangue was far from being thrown away on the fakeers, who though they were so averse to becoming converts to Christianity, did become, it seems, converts to our author's views, but on this point too, we shall let the author speak for himself who is always pleasant to listen to.

They "admitted that instead of re-conquering Hindoostan, the mutineers "only perpetrated shocking atrocities, and having eventually been "worsted in fight, were blown away from guns. They (the fakeers) "now thought differently of us from what they did on our first arrival, "and began accordingly to treat us with courtesy. They even put "themselves to some trouble on our account, and fetched water for us "to wash our faces and hands with. Lastly, they became so obliging "as to say that they would not object to our proceeding so far into "the Musjid, with shoes on, if we liked."

This result must, indeed, be very satisfactory to the author and his friends, but we are not told how far the mighty rupee contributed towards the fakeer's speedy conversion and their services in fetching water for them. Such expositions, however, of the policy and intentions of Government, coming from independent and enlightened natives are calculated to produce a wholesome effect on the recipients, who will, in all probability, believe them more readily than if they emanated from the Europeans. In this view Mr. Ardeshir may be considered to have done an acceptable service, and ought to receive a willing and grateful recognition from all those who are interested in the maintenance of order and quiet in the land.

In the next passage Mr. Moos laments the absence, in Bombay, of two of the most important social institutions, and makes a feeling appeal to the benevolence of his countrymen to supply the want:—

"A charitable institution bearing the above name (Magdalene Asylum "of Madras) stands on the way to Kilpauk. It is established with the "noble and praiseworthy object of affording shelter and protection to "such females of the European and Indo-British communities as have "gone astray from the path of virtue, but are disposed to abandon

"their evil courses and return to the right way. The inmates are em"ployed in work, suited to their respective capacities, and the sale "proceeds of the articles are handed over to the inmates themselves, "after reserving a portion for contingent expenses. With this exception, "the Asylum is entirely supported from funds raised by public subscrip"tion. It is a pity that no institution of this kind has yet been opened "in a city like Bombay, remarkable for its wealth, and reputation for "establishing charitable institutions. * *

"With it, the foundation of at least one foundling hospital is also "urgently needed to save the lives of innocent children who are de"stroyed to conceal the shame and guilt of illicit intercourse. Some "persons are of opinion that the introduction of such an institution "would be tantamount to offering a premium on unchastity; but patient "consideration leads us to a different conclusion. As matters now "stand, a double crime is committed—unchastity is followed by the "murder of innocent infants so begotten; but if the suggested estab"lishment were effectual in suppressing the latter heinous offence, and "thereby in lessening the number of murders annually perpetrated, it "could not but be placed in the foremost rank of humane institu"tions." * * *

Besides these, there are in the work under review, many other subjects of moral and social interest to the people which would repay perusal, and which shows that the author is a man of reflective habits and earnest spirit. It will be seen that our quotations are confined to such points as refer only to one special and agreeable feature of the treatment adopted in the work, and not usually found in books of travels. For the description of places and scenes we must refer the reader to the fountain itself. We have, however, stated our opinion of the general character of "Travels in India," and nothing now remains for us to add but an expression of a hope that it may receive the support it deserves.

THE NEW TRANSFER LOAN.

The following notification is published by the Government of India:—

Financial Department, Calcutta, the 16th November 1871.

By notification, No. 3206, dated 16th September 1871, holders of the Five-per-cent. Loan of 1856-57 were allowed the option, to the 15th November inclusive, of transferring the amount of their holding to the extent of one hundred and thirty-five millions of rupees to the transfer loan of 1872.

The amount actually so transferred is as follows:—

In London, Rupees	1,10,02,300
In India Approximately, Rupees	10,06,97,700
Total Approximate, Rupees	13,26,00,000

In anticipation of the advertised date of discharge, the 16th January 1872, the Governor-General-in-Council is pleased to authorise the immediate encashment of any of the outstanding notes of the Five-per-cent. Loan of 1856-57 that may be presented, duly receipted, at either of the Presidency Banks of Bengal, Bombay, and Madras, together with interest to date of discharge, and in addition thereto, half the interest that would have accrued between that date and the 15th January 1872, inclusive, had such notes not been discharged before maturity.

By order of His Excellency the Right Hon'ble the Viceroy and Governor-General-in-Council.

(Signed) R. B. CHAPMAN,
Secretary to the Government of India.

PRICES OF PRODUCE IN THE NORTH-WEST PROVINCES.

THERE are few subjects more deserving of investigation at the present time than the law governing the prices of produce in this country. Since 1858 prices of produce have risen more or less, we believe, all over India. In the North-West Provinces, the rise has been, perhaps, more marked than anywhere else. The subject also is of special importance there on account of its connection with the settlements of land revenue now in progress. For fifteen years before 1858, wheat sold in the chief cities of the North-West at the average rate of 33 or 34 seers for a rupee. Since 1858 it has sold at the average rate of 20 or 21 seers. This is a rise in price of about 70 per cent. Now a rise in prices of produce means also a rise in rents. In several districts of the North-West Provinces rent is taken in kind, by actual division of the produce, and in such districts land-owners at once reap the benefit of a rise in prices by their share of the produce becoming so much more valuable than it was before. Elsewhere, where money rents are paid, the effect is slower, but ultimately there also rise in rents must ensue, although not necessarily to the same amount as the rise in prices. It is a most important question, therefore, at the present moment, whether the late rise in prices of produce is a permanent rise. If the whole rise or the greater part of it is permanent, a large rise in rent is to be anticipated, and may be taken into account in the settlement of the revenue. If the rise has been caused chiefly by temporary causes, that is, by a series of bad harvests, and only partially by permanent causes, it will be unsafe to count on any such rise in rents. Thus the amount of revenue to be obtained from any district, during the next thirty years, depends considerably upon the view which the assessing officer may take at the present time of the probable permanence of the rise in prices. As a fact, there is a good deal of divergence of opinion on the subject. It is generally agreed, indeed, that a certain permanent rise has taken place, but opinions differ largely as to the amount. Most officers, however, as it appears from the printed reports, take it to be over 35 per cent., and many take it to be over 50 per cent. But these estimates are in actual fact of very little value, for they are founded merely upon a comparison of the average of prices as they have stood in the past twelve years, with the average of some former period of equal length. Such comparisons are evidently insufficient. It is a mistake to suppose, as is so often done, that a period of 10 or 15 years is long enough to give an average unaffected by the fluctuation of seasons, and to argue that any rise shown by a comparison of the average of two such periods must be due solely to permanent causes. Mr. Tooke showed long ago, for European countries, that even so long a period as half-a-century may include an undue proportion of abundant or of deficient seasons. In a country like India, where produce depends so largely upon rainfall and seasons vary so much, the fluctuations of produce must be still greater.

It is evident, therefore, that the question cannot be answered satisfactorily without much more systematic enquiry than it has hitherto received. Local inquiry is not sufficient by itself. The North-West Provinces are only part of a vast continent, and until statistics are collected from all parts of India, and the history of prices in each part is compared, no safe conclusions can be drawn as to the future. It may be hoped that the collection of such statistics will form one of the first duties of the new Department of Agriculture.

But although the material does not yet exist for a final judgment in the matter, certain broad conclusions may, it seems to us, be drawn with tolerable safety from the information already in existence.

The chief causes which may effect a rise in prices of produce over the whole country are three, *viz.*, increase of population, increase of capital, and influx of the precious metals. Let us see how far these causes may have contributed to the rise in the North-West Provinces. First, as to increase of population. When population increases, there are more mouths to fill, more grain is required to fill them; this has to be produced at a greater cost, and prices of produce accordingly rise. But this is manifestly a slow process. Population does not increase suddenly, and the rise in prices occurs subsequently to the increase of population, not simultaneously with it.

In the twenty or thirty years preceding 1858, population no doubt increased, but no rise in prices was observable. The disturbances of 1857 and the famine of 1861 must, on the other hand, have checked the increase; yet it is in this period that the rise in prices has taken place. It may be concluded then, that increase of population is not one of the causes which has produced the rise.

Then, as to increase of capital. When capital increases wages rise; labourers then consume more or better food, and ultimately prices rise as before. There is no doubt as to the increase of capital since 1858. The works of Government alone—canals, roads, railways, and buildings of all kinds, have greatly increased the demand for labour. Wherever those works have been in progress, labour has been drawn off from the surrounding country, and the rate of wages has undoubtedly risen over large tracts. This has been particularly the case in the North-West Provinces, where so many great works have been constructed, but it does not follow that the rise in prices is due to this cause. The increased productiveness of the country must be taken into account on the other side. The spreading of canals has vastly increased the produce of thousands of acres of good land at no extra cost to the cultivator, and has brought under the plough whole tracts that were formerly worthless. And generally, the security of life and property, which our rule has given to India, must have tended to economize labour, and to increase the total productive power of the country. It does not seem probable that, in the twelve years that have elapsed since 1858, the expenditure of capital can have had any further effect upon prices of produce than to counteract the fall that would otherwise have followed on increased production. Its effect in raising prices must be still to come.

Then, as to the influx of silver, which, by rendering money cheap, raises the prices of all commodities. This cause has *undoubtedly contributed largely* to the rise in prices of produce, but it cannot be accepted as the sole cause until it can be shown that the prices of all commodities have risen equally with those of produce. Against accepting it as the sole cause is the consideration that its effect must have been progressive. Silver has been pouring into India year by year in increasing amounts. The effect of this influx upon prices would have been small at first and have gone on increasing. Now the rise in prices of produce in the North-West has not been gradual. Prices rose suddenly in 1859-60, and with a few fluctuations have since remained at the same amount. There has been nothing like a progressive rise.

There is a fourth cause of a local character, which has, no doubt, tended to raise the prices of produce in the North-West Provinces—namely, the construction of the great trunk lines of railway. Railways tend to equalise prices all over the country. Those parts where the produce is large in proportion to the population, export grain to those where it is small. The North-West Provinces belong to the former class, and it is natural, therefore, that there should be a rise in prices. But it has still to be shown that there has been a corresponding fall elsewhere. And here, again, the suddenness of the rise meets us as a difficulty. The great chains of railway communication were little more than sketched on the map when the rise took place, and since then there has been no corresponding progression.

Of the four causes above enumerated then, one may be held to have been as yet ineffective; the second has been effective, but has been counterbalanced by opposing causes; the third and fourth have been effective, but there are strong reasons for thinking that other causes must have been at work also. Now the only other cause that could have been at work is temporary deficiency of produce. It seems, at first sight, improbable that there could have been a succession of bad harvests during so long a period as twelve years; but we have quoted Mr. Tooke's opinion above; and it is to be remembered that in this term there has been twice a partial famine, *viz.*, in 1861 and in 1869,

and that in 1867 vast stores of grain were drawn away from the province by the famine in Orissa.

But, without examining the history of the harvests of the past twelve years, it seems to us that the best foundation for judging of the future is to be found in the records of the past. What has been the history of prices in past years? If it can be shown that in former times, when the variation of seasons was the only, or almost the only, disturbing cause, prices remained for periods of several years together at an abnormally high rate, and then fell again to their ordinary amount, it must be admitted that what has happened before may happen again, due allowance, of course, being made for the equalising effect of railways, and that a great part of the present high rates may turn out to be due only to temporary causes.

Now the following table gives some interesting information on this point. It shows the average price of wheat (*i.e.*, the number of *seers* sold for a rupee) in some of the chief markets of the North-Western Provinces for more than half a century. The figures have been obtained partly from Returns lately collected by the Board of Revenue and partly from other sources:—

Periods.	Average number of *seers* for a rupee				Average for the N W P.
	Agra and Mutra.	Bareilly.	Ghazeebad (Meerut).	Allahabad.	
1805 to 1815 (12 years)	33	36	.	.	34
1817 to 1827 (11 years)	24	23	.	.	24
1828 to 1835 (8 years)	32	34	13	20	25
1836 to 1842 (7 years)	24	24	24	22	23
1843 to 1858 (16 years)	34	35	35	30	33
1859 to 1870 (12 years)	21	20	22	18	20

This table shows that the history of prices in the North-West, so far as we possess it, is the history of a series of *violent oscillations*. It is not merely that prices occasionally rose and fell largely. The oscillations recur regularly in periods of from eight to sixteen years. A cycle of bad years follows a cycle of good years with perfect regularity. Between the first and second periods given in the table, the prices of wheat rose 42 per cent.; in the third period it fell 25 per cent.; in the fourth it rose again 39 per cent; then in the fifth it fell 42 per cent.; and finally in the sixth it made its last rise of 72 per cent. The price of the last twelve years has been very high, but it has been barely 20 per cent. higher than it was for a period of eleven years, fifty years ago, and only 15 per cent. higher than it was for a period of seven years, thirty years ago. It is true that each of those periods comprise a year of famine, but the last twelve years contained also two years of partial famine. The above figures show that a rise or fall of 40 per cent. in the average price of wheat, due solely to the fluctuations of seasons, has been a matter of ordinary occurrence.

The variations are not likely to be so violent in future, but it still seems possible that of the late rise in the price of wheat of 72 per cent., only one-half may be due to permanent causes, and the other half may be caused by bad seasons. If this is so, the price of wheat may be expected shortly to fall, and the average price for the next twelve or fifteen years, leaving out of the question the progressive effect of the permanent causes tending to produce a rise, will be about 27 seers for a rupee. We commend the subject to the consideration of the Secretary to the Department of Agriculture.—*Indian Observer.*

THE FIRST THIRTY YEARS OF BRITISH ADMINISTRATION IN BENGAL—JESSORE.

Extract from a Report on the District of Jessore, its Antiquities, its History, and its Commerce, by J. Westland Esq., C.S., late Magistrate and Collector of Jessore.

THE district of Jessore, before it passed out of Mahomedan into British hands, was divided chiefly among three or four great zemindaris, Raja Srikant Ray was the zemindar of all that part of the country which lay between the Bhairab and Pasar on the east, almost up to the Ichamati on the west. His northern limit, stated in the same general way, was the region through which the imperial road from Calcutta to Jessore and Dacca subsequently ran. This estate was called the Isafpur estate. The Saydpur zemindari was only a twelve annas share of the original zemindari, for four annas of it had been separated off and conferred upon a Mussulman zemindar. This separated part was composed principally of lands in the pergunnahs of Saydpur and Sahos, and the estate derived its name from Saydpur. Beyond the boundaries just specified, and to the north of them, was the estate of Muhammadshahi, which was at that time possessed by the Naldanga family. Its boundaries may be described as coincident with those which are now allotted on the map to pergunnah Muhammadshahi.

The next great zemindari was that of Bhusna, which was part of the territory of the Raja of Nattore. It included not only the present district of Furreedpore, but also the pergunnah Naldi, which is at present the north-eastern quarter of the district, and which, in its most extensive meaning, includes such pergunnahs as Sator and Mokimpur. Although Bhusna was only part of the domains of the Raja of Nattore, yet it was a separate zemindari, and was all along treated as such. Besides these great zemindaris there were a few others of less extent within the district. Pergunnahs Hogla and Belfulia formed the largest of these minor zemindaris, and belonged to one Krishna Singh Ray. Another minor zemindari which, along with the one just mentioned, and with Selimabad, filled up the south-eastern corner of the district, was pergunnah Sultanpur. Kasinath Datt was the zemindar of it, and he obtained the zemindari in a manner which is sufficient of itself to show how little the idea of proprietorship in the soil, which was at the foundation of the permanent settlement, originally entered into the conception of a zemindar's rights. In 1774, the Committee of Revenue reported to the President and Council that the then zemindars of Sultanpur were in arrears and would not pay up. They recommended that they should be turned out of possession, and stated that one Kasinath Datt was ready to pay up the arrears, and to engage for the payment of the future revenue accruing on the estate, if it were transferred to him. The Governor-General approved the proposal on 16th May 1774, and some days after, the committee again wrote, stating, that Kasinath Datt had paid up the arrears and had entered into engagements for the future revenue; in consequence of which he was put in possession of the estate, or rather of thirteen annas of it, for that was all that was affected by these proceedings.

In the history of the family of the Raja of Chanchra, several instances have been noted, where proprietorship of an estate was transferred by the ruling power from a defaulting zemindar to a stranger, merely on the latter's undertaking to pay up arrears, but the present is the only instance that has come across where the principle was adopted by the British Government. The old zemindars had sued to have it declared that Kasinath Datt was only a farmer for life, and not a zemindar in his own right. They claimed this, not by denying that Government had power to make such transfers as had been made in this case, but by alleging that this was the intention of the Government, because, when it accepted the committee's recommendation that Kasinath Datt should be admitted to engagements, it omitted to specifically declare that the old zemindars should be turned out of possession. What the decree in the suit was, it is not known, but Kasinath certainly retained the zemindari.

The zemindaris included almost the entire area of the district, but there were other smaller ones scattered over the country. The total number of zemindaris at the time of the permanent settlement, was just over 100; but the character of the large ones, and the position of the proprietors of them, were so different from that obtained in the case of the smaller ones, that one is almost led to infer that these smaller zemindaris were rather fragments of the large ones which had been separated off by purchase or grant of some sort, than estates which always had a separate existence. The owners of the larger zemindaris had a part in the administration of the country, to which these pettier zemindars were not admitted. This, with respect to the origin of Kasinath Datt's title, affords a strong argument to shew that the zemindars were rather in the position of contractors for land revenue, than of owners of landed estates paying revenue to Government. This view of their position is further supported by a fact which appears in the history of the "Chanchra family," namely, that Manohar Ray, one of the Chanchra line, not only engaged with the Nawab to pay the revenue of his own estates, but also to collect and pay over the revenue accruing on the smaller estates in his neighbourhood, with which previously he had had nothing to do. But the zemindars were contractors not only for land revenue, but for other revenues also: in fact, contractors for the general administration such as it then was. They paid, as it appears, a certain sum by way of excise revenue, and managed excise within their limits just as they pleased. They also handed over to Government a certain sum as duties on internal trade, and were allowed in turn to make almost any exactions they pleased on traders. The duties of police were in their hands, and they had to keep up police establishments. They were also held liable to reimburse anyone who had been despoiled by robbery within their limits; though it is doubtful whether, at the time at least when the British obtained possession, they were ever called on to fulfil this condition of their contract, or even whether the Mahomedan Government was strong enough to enforce it. It will be found also that the zemindars, or rather their subordinates, had a good deal to do with the adjudication of petty disputes, whether of a criminal or of a civil nature. The daroga, as he was called, appears to have been almost the only Government officer in the district who had anything to do with civil administration. It was his duty to receive from the zemindars, the dacoits, robbers, and murderers whom they had to apprehend, and to try them. He might also receive complaints direct from complainants. His authority was, however, very limited, for, except perhaps in petty cases, he had to submit his proceedings to the Government (the naib Nawab) in each case, and to receive from the Govern-

ment the order passed on each individual accused; and neither in theory nor in practice had he any supervisional authority over the zemindars. In such a system it may be said that the only object of the Government was revenue. Almost all the functions of administration were heaped upon the zemindars, and they might do pretty much as it pleased them, so long as they discharged their revenue. Supervision was a mere name, if it was even so much as that, and the consequences of such a state of things may be easily imagined. The best and most energetic men in the world would be sure to fail as administrators if they found themselves left, without control or supervision, to rule over people whose interests in almost every matter were opposed to their own. How much worse must it have been when the rulers were Bengali zemindars, a class notorious, at that time at least, for their habit of handing over all their duties to too often corrupt subordinates, and who even now, after nearly a century of enlightenment, are often apt to postpone the interests of justice to their own private ends!

The zemindars followed the example of Government and transferred the task of administration to subordinates selected by themselves, not with reference to their ability or uprightness, but solely with reference to their readiness to secure their masters' interests.

The people were oppressed that the zemindar might have his rent, and they were plundered in order that the zemindars' servants might become rich. The zemindars, who performed all their police duties on contract, kept up the most wretchedly inefficient establishments for the purpose; and dacoits and robbers piled their profession with vigour, finding little hinderance from the police, and often in league with them, and even with the zemindar himself, or his higher officers. Complaint against wrong was useless; the zemindar or his officer had it entirely in his own option whether he should listen to it or not, and the complainant had very little chance of relief, for the oppressor was often the zemindar's servant, and the plunderer, even if they took the trouble to trace him, would not find it difficult to make friends with his captors.

The collection of revenue was at this time, and for long after, a matter entirely distinct from the rest of the internal administration. The first district officer came to administer the Government and not to collect the revenue, and for several years the revenue of the districts which he administered was paid partly in Calcutta and partly in the Rajshahye district (Nattore). There had been a Collector of Jessore for a year or two, from 1772 to 1774, but that was an experiment which Warren Hastings tried in many districts of Bengal, and after a short time discontinued on the ground of expense. It was the first attempt at direct collection, but was made to give way to a system much less expensive, but much less efficient. Had the English Collectors been retained, and kept stationed at the many places in the interior where they were in 1772 to 1774, it is not unlikely that the British Government would sooner have had its eyes opened to the monstrous injustices of the Native Government through zemindars, and would long before 1781 have considered itself obliged to take a direct part in the internal administration of the country. The direct Government is usually dated from 1772, but what the British did before 1781 can hardly be dignified by the name of internal administration. The maintenance of half a dozen provincial civil courts in the whole of the wide territory of Bengal can hardly be said to constitute an active government. The collection of the revenue had been in the hands of the company for some years before they undertook the administration proper of the country; and when our history of the administration opens, the Mussulman system of collection had already given way to a more regular one. We can, however, see a little of its nature from the accounts that have already been given of the old zemindars. These zemindars were a turbulent lot, much too independent and not very punctual in the payment of their revenues. They might, however, fight among themselves and swallow up their smaller neighbours, much as they chose, so long as they paid their revenue; and to ensure their paying, the Nawabs kept a Military Governor with a small force in each of the districts. This officer, the Foujdar as he was called, retained, on the part of the Nawab, sufficient appearance of power to make it the interest of each zemindar to secure himself by continuing to pay his revenue, or as much of it as would satisfy the Nawab. Beyond that point, probably, the Foujdars did not care to go, as the system of the Nawabs was rather a military occupation of the country where the zemindars, their tribute bearers, were the potentates, than the administration of the country as their own.

When the British undertook the collection of the revenues, however, the Foujdars appear to have been charged with duties somewhat different to those they performed under the Mahomedan Government. The British idea of administration was not a military occupation, and the Foujdars became purely high officers of police. They formed part of a police system established by Warren Hastings, and had under them Thanadars, or officers in charge of smaller jurisdictions. As there had been under the Mahomedans two Foujdaris, one at Bhusna and one at Mirzanagar, so both of these appear to have been retained in the first police system of Jessore. Such, then, was the condition of the district prior to 1781, when English administration was first established.

(To be continued.)

THE GHAZEEPOOR DISTRICT DURING THE REIGN OF AKBER.

Extract from a memoir of the Ghazeepore district, by Wilton Oldham, B.C.S., L.L.D.

The principal authority for the state of the district during the reign of Akber, is the "Ayeen Akbery," or Institute of Akber, by Abul Fuzl. A marvellous work; containing "some things important, many things useful, and *everything* superfluous." It is a treatise which explains the Hindoo system of philosophy, and the Mahomedan system of cookery, from which we can learn the latitude and longitude of the Cape de Verde Islands and the current price of mango pickles, which is equally at home in the assaying of money and the management of an army. From it we learn that the Sirkar of Ghazeepoor comprized the following pergunnahs:—

1. Buhuriabad.
2. Sydpoor Numdee,
3. Ghazeepoor.
4. Puchotur.
5. Kurrendah.
6. Bulaitch.
7. Zuhoorabad.
8. Lucknesur.
9. Kopachit.
10. Mahomedabad Purbarbaree.
11. Kureat Palee.
12. Gurha,
13. Dehma.
14. Bulliah.
15. Zumaneah.
16. Chowsa.
17. Belhabans.

Of these pergunnahs the first fifteen are still included in the district; Chowsa has been transferred to Shahabad, and Belhabans belongs to Azimgurh. On the other hand, four pergunnahs, which in Akber's time were included in the Sircar of Jounpoor, now form part of the Ghazeepoor district. Three of them, *viz.*, Khanpoor, Shadeeabad, and Khurreed, form separate pergunnahs; the fourth, Bhitree, immediately after the introduction of our Government, was joined to Sydpoor: so they now form jointly a single pergunnah, Doabeh, which in Akber's time was a Tuppah, or sub-division, of the Beeheeah pergunnah of Shahabad, and which in 1838 was included in the Ghazeepoor district; and Muhaitch, which formerly belonged to the Chunar Sirkar, has long been included in the Ghazeepoor district. It is, perhaps, desirable to notice briefly the names of the pergunnahs of the district.

Buhuriabad, from a celebrated Saint, Mullik Buhree, whose tomb is in the chief village of the pergunnah. *Sydpoor*, formerly Sydpoor Numdee, from another holy man, Syud Shah Numud. *Shadeeabad*, originally Shadeeabad, called from Sadee, the faithful servant of Mullik Murdan, brother of Mullik Buhree, who first conquered the pergunnah. The tombs of Mullik Murdan, and of Sadee, in the chief village of the pergunnah, are much venerated. *Bhitree*, from Behtureem, wife of Mahomed Toghluk. *Doabeh*, from the two waters (*do-ab*), between which it is situated. *Zumaneah*, from Khan Zuman, Governor of Jounpoor, and founder of the town.

The Hindoos, unsupported by sense or sound, derive the name Bulliah from the Saint and Poet Balmeek; and they say that Kurreed is so called because it was bought by someone, as the word implies. The old name of Bulliah, *Toork Bulliah*, recalls the days when the Toorkee cavalry of Baber was quartered in the neighbourhood. Even as the name of the adjacent village of Hybutpoor reminds us of one of the greatest of the Affghan Chiefs of the time, Hybut Khan.

The old name of Zumaneah, *Muddum Benares*, is said to mean the intention of Benares; though Muddum, in Sanskrit, signifies desire, not intention. The tradition is that the founder of Benares first selected Zumaneah as the site; but finding it was not the precise centre of the earth, he moved on to the place ultimately chosen.

Khanpoor, it is stated, was formerly called *Khanpoor Chumkee*, and the account of the origin of the name is as follows:—The nobleman entrusted with the erection of the great bridge over the Goomtee at Jounpoor, had the title of "Khan Khanan," "Lord of Lords." After the completion of the bridge, Khan Khanan went on a hunting expedition to the verdant forest, which, in those days occupied the country on the left bank of the Goomtee, near its junction with the Ganges. He spent his days in hunting, and his nights in watching the graceful movements of the dancer, Chumkee, who accompained his camp; and in return for the entertainment she had afforded him, he bestowed upon her the country around his tents. In the appellation of his grant, he associated his own title with her name, and called it Khanpoor Chumkee.

The old pergunnah of Kureat Palee is now part of the pergunnah of Mahomedabad.

The talooka of Baraitch consisted of seventeen villages, and was formerly the property of Canoongo Ghulam Peer, whom, in 1869 Fusly or 1761 A.D., Fuzal Ali Khan, the last Mahomedan Governor, a ruthless tyrant, killed. On the death of the Canoongo the talooka was held by Fuzal Ali for a very short time, and after him by the Rajahs of Benares. At the permanent settlement, (A.D. 1780), as no owner was forthcoming, the talooka was leased to a farmer, Gunesh Singh, at Rs. 5,236 per annum. In 1802, a large part of it was included in the Cantonment of Ghazeepoor, and after the death of the

former, the different townships forming the talooka, were made separate estates, and settled in 1841-42 with the headmen of each of the villages.

In the fifteenth year of the reign of Akber (1570 or 1571 A. D.), Rajah Todur Mull and Moozuffer Khan were appointed Finance Ministers of the Empire. Subordinate Revenue Officers were appointed by them to procure accurate statements of the extent and outturn of all cultivated lands in the Empire, and of the revenue paid. On an average of the receipts for the nine preceding years, a settlement for ten years was concluded in the 24th year of the King's reign (1589 or 1590 A. D.).

In the Ghazeepoor district, the cultivated area was estimated at 2,88,770 beegahs 7 biswas, and the land revenue of the Crown was fixed at 1,34,31,300 dams, or Rs. 3,35,782. There were also assignments called "Sayurghal," for the support of learned men, of devotees, the poor, and the descendants of impoverished nobles, the amount of which was 1,31,825 dams, or Rs. 3,295. The total land revenue, including "Sayurghal," amounted to Rs. 3,39,077.

From a careful perusal of the "Ayeen Akbery," it certainly proved that Akber's revenue system was *ryotwaree*; and that the actual cultivators of the soil were the persons responsible for the annual payment of the fixed revenue. Zemindars are mentioned, but only as persons likely to rebel, not as tax-payers. Husbandmen are constantly mentioned as the direct payers of the land revenue, and from this it must be concluded that the settlement was made direct with them. Nevertheless, there were in the whole district only nineteen mehals; each of the pergunnahs forming a single mehal, except Ghazeepoor and Mahomedabad, each of which formed two. On the whole, it appears that owners of land were as such, ignored. But, for the fields actually cultivated by them, engagements were entered into with them, and similarly with non-proprietary cultivators. In accordance with the total ascertained proceeds of the land revenue for a pergunnah, an engagement perhaps in some instances was made with a single person, who might or might not be himself a landowner. In other cases, for purposes of account, a pergunnah, or part of a pergunnah, was *called* a mehal, though not actually one.

The revenue was fixed *at a third part of the money-value of the crop*, being twice as much as the amount to which, by the ancient Hindoo law, the monarch was entitled. It was prescribed that for all valuable crops, such as sugar, indigo, vegetable, spices, &c., a cash rent should be always fixed; which was, probably, much less than the third part of the value of the crops: for all the ordinary crops the cultivator was allowed the option of paying in kind or in money. Abul Fuzl justifies the high rate of land revenue demanded, on the ground that the King had remitted an immense number of oppressive vexatious taxes, of which he enumerates thirty-six.

A comparison of the present state of the district with its condition in the time of Akber, is likely to yield interesting and valuable results; but before it can be made, a number of questions, apparently simple, have to be answered, and the preliminary process of determining these points is not devoid of intricacy, and involves some dry and uninteresting calculations; so before we can make much progress in any comparison of the past with the present, we require to know what was a maund, what a beegah of Akbor's time, and what the intrinsic and relative value of a rupee. We must ascertain the area of what was then the district, and the revenue which is now collected from it. To the investigation of these problems we now turn:—

It appears that a maund of Akber's was equivalent to about twenty-seven of our seers. A maund contained 40 seers, each seer weighed 30 dams; a dam weighed 1 tolah, 8 mashas, 7 ruttees; there were 8 ruttees in a masha, and 12 mashas in a tolah; a seer consequently consisted of 52 tolahs 2 mashas, and 2 ruttees. A rupee of Akber's weighs 11¼ mashas, *or* 175 grains Troy. A tolah therefore weighs 180·6 grains Troy; and a seer must have weighed 9,742 grains Troy. A seer now weighs 14,400 grains Troy, *i. e.*, 80 tolahs of 180 grains each. A seer of Akber's time was, therefore, 676 of the present seer, or 54 tolahs 22 grains; and in the same proportion a maund must have been 27 *seers* and a little less than one chittack; and for practical purposes a maund of Akber's may be considered two-thirds of a maund of the present day.

A beegah was fixed by Akber to contain 3,600 *Illahee guz* Wilson states that an *Illahee guz* was, as nearly as can be ascertained, 33 inches long: a beegah, therefore, contained 3,025 square yards, and was ·625 of an English statute acre.

A rupee, according to Wilson, contained 175 grains of pure silver in Akber's time. At present it contains 165 grains of pure silver. Akber's rupee was therefore intrinsically worth 1 rupee 1 anna of the rupees now current. According to the prices current given in the *Ayeen Akbery*, a rupee in the days of Akber would purchase at the very lowest computation about four times the amount of agricultural produce that can now be bought for a rupee.

Wheat cost 12 dams a maund; in other words, ninety of our seers per rupee.

Barley was 8 dams per maund; or 175 of our seers per rupee.

Millet, of spring harvest, 6 dams per maund; or 180 of our seers per rupee.

Millet of the autumn harvest was the same as barley; 175 seers per rupee.

Milk, 25 dams per maund; or 43 of our seers per rupee.

Ghee, 105 dams per maund; or 10 of our seers per rupee.

Brown Sugar, 56 dams per maund; or 19 of our seers per rupee.

The area of the district in the days of Akber is found by deducting from the area of the present district the area of Bhitree and five other pergunnahs since added, and adding the area of Chowsa and Belhabans. The area of Bhitree cannot now be ascertained, but is about 55,000 acres; estimating it at this, the area of the Sirkar Ghazeepoor was 11,11,228 English statute acres.

The exact revenue to be deducted on account of Bhitree cannot be stated, as the pergunnah is now entirely amalgamated with Sydpoor; but, approximately, the present land revenue of the old Sirkar is about Rs. 11,50,000. In the reign of Akber the cultivated area amounted to only 1,80,481 acres, or less than one-sixth of the total area of the Sirkar. According to the census of 1865, the cultivated area of the district amounts to above five-sevenths of the whole. But the Census Returns in this particular are based on the returns of the survey and settlement operations of 1840-41; and since then so much more land has come under cultivation that the present cultivated area of the district is not less, and probably is more, than five-sixths of the whole area. The land revenue in proportion to the increase of cultivation, without regard to the decrease in intrinsic and relative value of the rupee, ought to be five times as great as it was in the days of Akber; but for the same area it is actually less than 3½ times what it was. Having regard to the change in the money-value of agricultural produce, as well as to the increase of cultivation, the revenue ought to be now nearly, if not quite, twenty times as great as it was in Akber's reign. The revenue assessment per acre in Akber's reign was, both in theory and in practice, about Rs. 2 per statute acre. Theoretically it was so, because for *average* wheat land the estimated out-turn was 12 maunds 38¼ seers, and the Government share 4 maunds 12¾ seers; which, at 12 dams per maund, would be worth 52 dams. There was a further demand of 10 seers of grain from every beegah for the supply of the royal granaries. The money-value of this would be for wheat 3 dams, making the total demand for revenue 55 dams per beegah, or 88 dams, equivalent to Rs. 2-3-4 of Akber's currency and Rs. 2-5-6 of our currency per acre. The amount due on land cultivated with inferior grains was something less: but, on an average, the demand was theoretically fully Rs. 2 per acre. *Practically*, the revenue to be paid in cash for 1,80,481 acres was Rs. 3,39,077; and there were further due to the Crown for the granaries 72,198 maunds of grain, worth at 10 dams, or four annas the maund, Rs. 18,040: so the total demand amounted to Rs. 3,67,126, or very nearly 2 rupees per acre of Akber's coinage, and to more than 2 per acre of the rupees now current.

According to the census, the present revenue rate on cultivation is Rs. 1-0-2 per acre; but the actual rate is somewhat less than this, as the cultivated area is greater than appears in the Census Statement. For practical purposes the rate may be taken at Rs. 1-8 per acre, or one-fourth less than it was in the reign of Akber. *In proportion to the change* in the value of agricultural produce, *it ought to be Rs. 8 per acre, or four times* as great as it was in the reign of Akber.

The causes of the low rate of the present assessment will be discussed hereafter, but some explanation of the disproportion between the former and the present assessment is necessary. The causes of the discrepancy are as follows:—

(1.) The present assessment is rigorously enforced. In Akber's time, according to Abul Fuzl, there was a wide difference between the settlement and the revenue paid. The directions to the revenue officers contained so many prohibitions of any harsh or oppressive measures in collecting the revenue, that the occurrence of arrears is not surprising. The Amils were indeed directed to collect the revenues in full in plentiful seasons, but in this is implied that, in seasons at all below the average, the full revenues were not expected. (2.) In Akber's time only the best lands were cultivated, and consequently the average out-turn per acre was greater than at the present day, when all land, not absolutely unfit for cultivation, is cultivated. (3.) The population is now so much increased, and the class of landowners—middlemen—between Government and the actual cultivators is so large, that the enforcement of so high a revenue as in Akber's reign would be impossible. (4.) There are now other sources of revenue, *viz.*, duty on spirits and intoxicating drugs, stamp duties, customs' duties, and income-tax. In Akber's reign the land revenue was almost the sole source of income for the State. (5.) The settlement of 1780 A.D., was first made for ten years, and subsequently declared perpetual; the revenue has not increased with the increasing value of agricultural produce or the depreciation in the value of money. (6.) The permanent settlement was made at a time when the country was in a very depressed and backward state. The proprietary right in immense tracts of waste land was made over to neighbouring cultivators and zemindars, in many cases without any provision for demanding revenue from them when the land should come under cultivation. (7.) By the agreement made with the Rajah of Benares in 1781 A. D., the Government was debarred from our receiving any revenue from the Benares Province beyond 40 lakhs of rupees per annum.

:fore, if the settlement of the province in 1780 A.D., had made higher than it was, the Rajah would have been entio the surplus; and consequently our Government had no mo- or fixing the assessment, either actually or prospectively higher was done. This agreement was set aside with the consent e Rajah *after* the settlement of 1780 was concluded, *viz.*, in

e influence of the permanent settlement in retarding the ıy growth of the revenue would have been much more marked t actually has been, but for the following causes:—
) The pergunnahs of Sydpoor, Bhitree, and Buhuriabad, jagheers, were not included in the permanent settlement: have since been assessed at an adequate land. (2.) Many s held rent-free on insufficient titles have been resumed and ed. (3.) At the permanent settlement nearly all estates of ı the owners had been ejected by the Rajah before 1775 were settled for life with farmers. These estates amounted ırly one-third of the province. The revenue of these estates nce been increased, and the proprietary right conferred no ators. (4.) The constant changes in the course of the have a tendency to increase the revenue, as remission for ut away is allowed at the inadequate rate actually paid, while formed lands are assessed according to their present value.
e military contingent of the Ghazeepoor Sirkar was fixed at undred and ninety horse, and sixteen thousand one hundred fty infantry. The largest infantry battalion (5,000 men) was hed by Zumaneah, and the largest troop of cavalry (200 ers) was supplied by Bulliah, unless indeed 200 be an error manuscripts for 20.
s worthy of mention that the State monopolies of saltpetre pium, which supplied the Emperor with one thousand chests ium and one lakh of maunds of saltpetre, were principally ed in the districts of Ghazeepoor, Allahabad, and Korah.

PROPOSED DECIMALISATION OF THE COINAGE.

BOMBAY CHAMBER OF COMMERCE, BOMBAY, 5th Dec.

Hon. E. W. RAVENSCROFT, Acting Chief Secretary to Government, Bombay.

,—Referring to my letter of 9th October, I have now the , by direction of the Committee of Management, to forward ith printed copies of minutes made by a few of the members e Chamber on the question of the proposed decimal subon of the rupee. The Committee regret that only a very number of the members have recorded their opinions, but ews expressed in the majority of the minutes represent very he views held by the majority of the members.
m further to state, for the information of the Government lia, that while amongst the merchants and bankers generally, is nearly unanimity of opinion in favour of the theory of the al system, a majority are strongly of opinion that the introon into this country at the present time of the decimal subon of the rupee, on the plan proposed in the papers submitthe Chamber, is neither necessary nor desirable. In the n of the Committee of Management, the advantages of the al system are greatly exaggerated, and the trifling conve- it might afford to merchants and bankers in their mode k-keeping, would be but a poor set-off against the possible r of arousing the distrust of the people, by upsetting their stablished habits in connection with a matter in which they ecially jealous of Government interference.
Committee consider the existing monetary system is as well ed to the wants of the people as a decimal system would be, its harmony with the English system, of which it is as as may be the equivalent, is a strong reason for its conıce.
re seems no prospect of any change being made in the h system, and in these circumstances, surely change in the ı system, for the mere sake of change, is a thing greatly to precated.
example of Ceylon is cited in favour of the proposed e, but the information before the Chamber on this point that the opinion of the mercantile community of that was by no means so favourable to the scheme as has been ented to the Government of India.
a meeting of the merchants of Colombo, held on 20th July resolution deprecating the course pursued by the Ceylon nment in the matter, was carried in the following terms:— the attention of the Chamber having been drawn to the which have been published by Government in continuaı the currency question, do not consider that the memorial community and the Chamber against any change in the cy has received that consideration at the hands of His ency to which it was entitled, in that His Excellency, in spatches, has slurred over that memorial, while a partial rial in favour of a change to decimals is carefully analysed ı Excellency, and construed into a general support of His ency's own scheme."

But even were the case otherwise, the Committee consider that the introduction of the decimal sub-division of the rupee into a small place like Ceylon would be no justification for the Government of India disturbing a system which works well, merely to introduce another scheme which no class or section of the people asks for, and whose only advocates appear to be a few able men more enamoured of the supposed perfection of the decimal system than apprehensive of the difficulties that would perplex and trouble Government, should it seek to put it in force.

The Committee are of opinion that no action should be taken in this matter by the Government of India without the fullest enquiry, and they believe that a thorough enquiry of the character suggested by Major Tennant, would be the means of collecting information that would be valuable alike to Government and the public, whatever might be its practical bearing on the question under consideration.

In several of the minutes of the members of this Chamber, attention is called to the necessity for a uniform system of weights and measures for India. This subject is one of pressing importance, for there is hardly any question affecting the country at large on which thorough reform is so desirable, but the Committee are not prepared to say, without further consideration, that change in this matter should assume the decimal form.

In conclusion, I am respectfully to request His Excellency-in-Council will do the Committee the favour to transmit this letter, with the accompanying minutes, to the Government of India with the least possible delay.—I have, &c.

JAMES TAYLOR, Secretary.

MINUTES BY MEMBERS OF THE BOMBAY CHAMBER OF COMMERCE.

MINUTE OF MR. W. G. HALL, OF MESSRS. W. NICOL & CO.

THEORETICALLY I think it is indisputable that a decimal system of coinage is superior to any other, and, if combined with a decimal system of weights and measures, it immensely facilitates calculations of all kinds in any branch of trade. Anyone who has seen the ease with which a Frenchman, either mentally or on paper, makes a calculation, will be convinced of this.

But, whilst admitting this, it has to be considered whether the advantages resulting from the introduction of a decimal coinage compensate for the very grave inconveniences which will arise whilst the currency is being changed. In England, the balance of opinion seems to be that the inconveniences are not compensated for by the advantages afforded by a decimal coinage. I say this because, after much discussion, no change has been made in England. And, if in a country where the people have attained the highest point of civilisation it seems not advisable to make any change, how much less is it desirable rashly to introduce a new currency amongst a semi-barbarous people! I should be very glad to be convinced that the change could be easily effected; but I deprecate any hasty measures, and think that an enquiry, as suggested by Colonel Tennant, is essential.

I do not quite agree with Mr. Graham as to native accounts being kept in quarters and cents. It used to be so formerly, but my information leads me to the conclusion that this system is gradually dying out. The accounts of the firm with which I am connected have been hitherto kept in quarters and cents, or reas, but of late, as the accounts which other people rendered to us have invariably been in annas and pies, the system was so inconvenient, that we now keep our accounts in annas and pies also.

I advocate very careful enquiry, particularly amongst all classes of the native community, before any change is made. Speaking for myself, and the convenience which it would be to every merchant, I cannot doubt the advantages of the decimal system; but the wants and convenience of the great mass of the people is what has mainly to be thought of.

W. G. HALL, (Messrs. W. Nicol & Co.),
Chairman of the Chamber.

October 1871.

MINUTE OF MR. ROBERT CAMPBELL, AGENT CHARTERED MERCANTILE BANK OF INDIA, LONDON, AND CHINA.

Government interference with the established monetary system of a country can only be justified by absolute necessity, which in the present case does not exist.

The sub-division of the rupee into annas and pies is a system so deeply rooted in the business, forms, and customs of the people of India, and so identified even with their habits of thought, that it could not be overturned without a violent shock to their prejudices, and without causing widespread confusion and complication. The effects of those would be all the more strongly felt in the case of a people so averse to change, so apt to misconstrue motives, and so jealous of unnecessary interference in their affairs.

But even if such a change were attended with fewer difficulties, there is no adequate reason for its adoption. It is, of course, easy to show by two columns of figures that a calculation is more quickly worked out by decimals than in any other way, and this is

ways the argument to which most weight is attached by the supporters of the decimal system. Practically, however, this is a matter of very little importance, as all merchants whose business is extensive have tables which save them the necessity of working out such elaborate calculations. And, besides, the question to be considered is not so much how to promote the convenience of large merchants, who form but a small fraction of the community, but whether the change would bring any adequate advantage to the great mass of the people who never put pen to paper at all. On this point the balance of authority is clearly in favour of the argument that the present system, which is exactly the equivalent of the English system of florin, shilling, six-penny and three-penny pieces, is better adapted than a decimal sub-division for the mental calculations necessary in the every-day small transactions of the poorer classes. In proof of this the extracts from Lord Overstone's draft report alluded to in Mr. Gay's minutes are well worthy of attention.

Even if Government were to resolve upon such a change in the currency, it would be impossible to compel people to conform to it, and the result would probably be, that for many years, the new system would only be adopted by Government officers, and the large merchants in the Presidency towns, while the great mass of the people would refuse to unlearn a system as familiar to them as a second nature, and would continue to keep their accounts and transact their business in the old way. Such a state of matters would be productive of inconveniences which would far outweigh any benefits to be derived from the introduction of the decimal system.

It certainly appears, from the papers forwarded by Government to the Chamber, that the people of Ceylon have been wonderfully unanimous in desiring a decimal sub-division of the rupee. But that there is also another side to the question is apparent from a document which came into my hand the other day, in the shape of a letter addressed to the Ceylon Banks, protesting against the change, expressing intentions of not conforming to it, and desiring the Banks to continue to keep their accounts in the old way, the Government proclamation notwithstanding. This letter has been signed by a very large number of planters, and by *every mercantile firm in Colombo except two.* I append a copy of it, in order that, if the Committee think fit, it may be circulated along with the other papers.

R. CAMPBELL,
Agent, Chart. Mer. Bk. of Ind., Lon., and China.
September 1871.

MINUTE OF MR. JAMES DOUGLAS, AGENT CHARTERED BANK OF INDIA, AUSTRALIA, AND CHINA.

It appears that it is the intention of the Indian Government to introduce the decimal coinage into India.

I fully concur with the promoters of this scheme, that a decimal coinage would be an advantage to any nation adopting it; but it appears that the intention of Government is to issue only a small quantity of copper tokens,—cents and half cents,—so that the scheme is tentative and incomplete; that is, that the present copper coinage would run along side by side of the new tokens until the former had disappeared. India would thus have a double copper currency. To estimate the difficulties, this scheme will have to contend with on being launched, it may be as well to turn to the Government returns to form an adequate idea of the existing copper coinage. Since 1835, 2,333,739,714 copper pieces have been coined in India. Estimating that half the number has been lost or destroyed, there still remains a formidable aggregate.

The copper coinage in India, as elsewhere, it is almost superfluous to add, is in active circulation; and though the observation is trite, it may be as well to remember that almost none of this coinage, like that of silver, is ever hoarded in the Government Treasuries or in native hands, or is either melted or exported, so that in proportion to the silver, the copper coinage is an interest of very much larger magnitude, affecting many more millions of a poorer and more ignorant and prejudiced class than that touched by the silver coinage. The handlers of the copper coinage in India may be safely estimated at one hundred and fifty millions, and their position in regard to education is represented by the very significant fact contained in the Government Returns that, averaging the number of letters that pass the Post Office, each native sends a single letter only once in two years!

The proposed coins are the cent and the half cent.

Present Copper Coins

¼ anna	dhubbu equal to	3·125	Cents.
⅓ „	dhirki „	1·562	
1-12 „	pie „	·520	

These smaller copper coins are almost exclusively paid as wages to be again passed from the workman in exchange for his daily food. They represent the exchangeable medium of the most numerous and the lowest retail transanctions current in India. The vexation would be in proportion to the number of times every unit in India would have occasion to measure the exchangeable value of the cent and half cent in his daily or hourly purchases. Let my man pass into a new country and see what are his difficulties before he learns the exchangeable value of another coinage than that to which he has been accustomed. How then will a cooly look when brought face to face with an array of decimals? Will it not be the case that the stronger will get the better of the weaker, and the more acute take advantage of the ignorant.

A great deal has been said about the facilities which India offers to decimalization. "You do not require to touch the silver coins; the natives have a natural aptitude for figures; they have no attachment to the existing copper tokens; they will receive the proposed coins; a knowledge of decimals will enhance their education; it will harmonize with the proposed decimal weights and measures, and none of the objections which apply to England can be urged in India." That India is 6,000 miles from the central authority; that her population is six times greater and more diversified in race and language, and that she is less civilized surely cannot be urged as advantages! There is no occult connection between the natives of India and decimals that we know of. Some of them keep their books in decimals, and it is a truism to say that decimal coins harmonise with decimal weights and measures. The change ought to begin in the latter; and new universal weights and measures be made imperative over the whole of India. The framers of this measure, we believe, are acting in a narrow and contracted spirit in dealing with such a great question as the copper coinage of India. Some slight changes they say will require to be made; a few tokens will require to be issued; as if such cheese-paring could have any other effect than producing vexation and petty annoyance to millions of unoffending people. It was otherwise that Lord Cornwallis dealt in 1790 to 1795 with the silver coinage of India, when he found himself amid 32 different kinds of rupees, the refuse of twenty different dynasties. He called them all in, and declared by law that none else than Sicca were recoverable. So it was when the copper coinage of England was called in and the bronze substituted, and if ever a change is accomplished in India it will be by some such scheme, broad and comprehensive, before it can be effective and complete.

The change is not wanted in India. It would, no doubt, gratify a few theorists and dilettanti in England and elsewhere; but we fear its introduction in its present form is grave enough to be liable to misconstruction by an ignorant population, and to be turned with cruel effect by fanatics against the English Government.

The natives of India for generations have thought in annas, and it has been wisely said "that what is settled by custom, though it be not good, yet at least it is fit; and those things which have long gone together are, as it were, confederate among themselves."

Let us beware how we touch them, and see that the necessity for doing so "be urgent and the utility evident."

The proposed change, according to my opinion, is at present neither desirable nor desired.

JAMES DOUGLAS,
Agent, Chartered Bank of India, Australia, and China.
September 1871.

MINUTE OF MR. F. T. ATKINS, MANAGER AGRA BANK, LIMITED.

The question of the decimal sub-division of the rupee is one affecting chiefly the masses of the people of India. Any innovation, the advantage of which is not on the face of it apparent, is almost certain to be regarded with suspicion, and to be strenuously opposed by the ignorant classes. If, then, men of education and ability hold such opposite views on the subject as are to be found in the foregoing papers, it cannot reasonably be expected that the poor and uneducated would look with anything but dissatisfaction upon a revolution in the subsidiary coinage to which they and their ancestors for generations past have been accustomed, and the object of which revolution they could not comprehend.

Even were the decimal system beyond doubt superior to the existing one, as a system for the people, it would, I think, be a question for serious consideration whether, in the face of the ignorance and prejudice of the lower orders, it would be desirable to introduce it.

With a decimal system of weights and measures, a decimal coinage might be of advantage; but with the present weights and measures, it appears to me that, for the petty every-day transactions of the shop and the bazaar, in which, as a rule, all calculations are made mentally, a decimal coinage is not so suitable as the existing one.

FRED. T. ATKINS,
Officiating Manager Agra Bank, Limited.
Bombay, October 1871.

MINUTE OF MR. JAMES N. GRAHAM, OF MESSRS. W. & A. GRAHAM AND CO.

Decimal calculation, at any rate, as far as the Bombay Presidency is concerned, is no novelty, but has long been the regular system in use among the native merchants who keep their books in rupees, quarters, and cents.

Of the four new coins proposed by Sir W. Mansfield, three already exist in name.

The Fuddœa or Suwahka about 4 pie or 1-50th of a rupee.
The Dokra or Dookanee about 2 pie or 1-100th of a rupee.
The Urdhee or pie about 1 pie or 1-200th of a rupee.

The Dokra is, in fact, the cent, and although now obsolete as a coin, at one time actually existed. The proposed change, therefore, instead of being an innovation, would merely assimilate the coinage to the already existing system of keeping accounts among the natives. Theoretically the decimal system is of all others universally admitted to be the least intricate, and for this reason commends itself as the best adapted for the coinage of such a country as India. Practically, the bases for the adoption of such a system already exist, and if the Government consider the change practicable and consistent with general economy, &c., &c., the mere mercantile classes, without perhaps being very enthusiastic on the subject, will, I think, look on the new order of things as a decided improvement.

JAMES N. GRAHAM,
Messrs. W. & A. Graham & Co.

October 1871.

MINUTE OF MR. W. F. PEEL, OF MESSRS. PEEL, CASSELS & CO.

Decimal coinage has been rejected in England, and I think that any radical change in the currency would be still more objectionable and more difficult to carry out in a country of such magnitude as India, with a population so ignorant and conservative as the masses are. But on the other hand, as Mr. Graham points out, the natives do already make use of decimals I believe (although the coins he mentions are not the exact decimal part of the rupee as stated by him.) The masses are chiefly concerned in the proposed change, and should be first considered, for to quote Lord Overstone, "the grand test of the value of the rival systems of coinage is the readiness with which they may be adapted to mental reckoning, especially to such short computations as occur on all retail purchases," and it appears to me that Government are in the best position, through their own officials, to ascertain whether the change would be acceptable to the people. I think, therefore, that the Chamber should urge upon Government the importance of making a close enquiry on this point before attempting the proposed scheme. Speaking as a merchant, the change, though it might eventually be convenient, would involve considerable inconvenience at first, and I do not think that merchants are at all anxious for it. In my opinion, universal decimal weights and measures are more essential, and I should be glad to see that change accomplished.

W. F. PEEL,
Messrs. Peel, Cassels & Co.

Bombay, October 1871.

MINUTE OF MR. H. D. DODS, OF MESSRS. HUTCHISON, DODS AND CO.

So long as the rupee unit retained, it seems to me that its subdivision is not a matter of very vital importance. At the same time, I think the change now proposed is impolitic and quite uncalled for.

The decimal system is excellent in theory, and possibly, after about twelve months of intense annoyance and trouble, merchants, bankers, and educated people generally would find it simple in practice, and an improvement upon the present system of annas and pies. The great mass of the people, on the other hand, who have been accustomed to calculate in the present currency, would find the change intolerable, and would, in all probability not adopt it during the next fifty years. The natives are so thoroughly accustomed to the ruling subsidiary currency, that they do not find it practically inconvenient, and the case with which uneducated men can calculate mentally in annas and pies must have struck all Europeans with astonishment.

It must be borne in mind that the vast majority of the people of this country have to trust exclusively to mental calculations, and if anyone who has not previously studied the subject, will try to realize mentally the advantages of the decimal system, he may then have some faint idea of the difficulty with which the ignorant class of natives will have to contend.

The examples printed in the papers submitted by the Government of India, show at a glance any advantage which there is in the decimal system; but to understand the working and realize the advantage mentally is a matter of considerable difficulty; and this is what must be expected of the uneducated portion of the people, who constitute the bulk of the population, and whose mental capacity is presumably the weakest.

The movers in the matter should let well alone; but if they must introduce some novelty, let them turn their attention to devising a uniform system of Indian weights and measures. Every one, high and low, understands the present coinage, and few object to it, while literally no one can fathom the weights and measures, and all are confused and annoyed by them.

HENRY D. DODS,
Messrs. Hutchison, Dods & Co.

Bombay, November 1871.

MINUTE OF MR. THOMAS WILSON, OF MESSRS. RENNIE, SCOVELL & CO.

I do not see much advantage to be gained by a decimal subdivision of the rupee unless it is accompanied by a decimal re-arrangement of weights and measures. The rupee of 16 annas divisible into halves, quarters and eights in unbroken annas, and the anna of 12 pies divisible into halves and quarters in unknown pies are both extremely convenient coins for shopkeeping and household purposes, *i. e.*, for all the purposes of at least 90 out of every 100 of the population. I attach little importance to the convenience which it is alleged would be felt in reckoning and in book-keeping. No doubt some fractions of time would be saved, but practically calculations are, to the man of any training, as easy by the present as they would be by the proposed system.

When the people are better educated, then the question of introducing uniform decimal standards of weights and measures may be discussed; and when such standards are adopted, a decimal coinage will be their natural compliment. Meantime, I am not sure that a change would not cause loss, as it certainly would inconvenience, to the poor and uneducated, and it is their interests which, should in my opinion, be most considered in the matter.

T. WILSON,
of Messrs. Rennie, Scovell & Co.

Bombay, November 1871.

MINUTE OF MR. B. BEYNON, OF MESSRS. BLASCHECK & CO.

I am in favour of the decimal sub-division of the rupee.

I consider that so far as native prejudices are concerned, the present is at least as favourable, perhaps, more so, than any past time for the introduction of change. It seems to me that too much is said about Hindu conservatism in several of the opinions given in the papers submitted to the members of the Chamber, both printed and written, and too little about the broader question "whether it would simplify the operations of trade from the office "of the great banker or merchant down to the humble shopkeeper "in the native bazaars." I do not believe that the imposition of a simpler metal currency would be condemned by native commercial judgment. The quite uneducated natives would, no doubt, be puzzled much at first, but even they would get used to the change in time, and that not a long time, once they found that Government had ordered the new coins.

Together with the decimal sub-division of the rupee, I desire to see its decimal multiplication in gold. All new coins would then, of course, be made legal tender to the exclusion of old currency (the rupee only excepted) which would be promptly withdrawn from circulation.

BRERETON BEYNON,
of Messrs. Blascheck & Co.

November 1871.

MINUTE OF MR. S. J. BEHREND, OF MESSRS. BEHREND BROTHERS.

I am decidedly against the introduction of the decimal coinage. The theoretical advantages to be derived from the proposed decimal system are completely outweighed by the enormous practical drawbacks fully set forth by Messrs. Campbell, Douglas, and other gentlemen. The official papers must fail to convince any practical man.

The Ceylon Director of P. W., in his Report to the Colonial Secretary, enumerates the only difficulties under two heads:—

1st.—The adjustment of stamps and tolls. *2nd.*—The circulation of coins of the two systems at the same time and the adjustment of small rates, and considers that *only the first requires serious consideration.* Colonel Strachey, in his Report, protests against interrogating ignorance, and only wants to consider "how ignorant people can be got to leave off habits—the result of ignorance."

Surely reasons like these cannot stand by the side of the broad practical ground so ably set forth in Lord Overstone's draft Report—and in my opinion the reasons therein adduced against the introduction of the decimal system in England apply even with far greater force to this country.

As a perhaps, interesting and not generally known illustration, how slowly a transition is effected, I may mention from personal experience that in the interior of the Cape Colony,—although now for generations under British rule, and the English coinage, the only circulating medium,—still trade is almost generally carried on by the old system of Rigsdalers (1s. 6d. sterling) which is the only standard of calculation of the Dutch Boers, and the books of a great many English shopkeepers are still kept in Rigsdalers and its sub-divisions (stivers and dents.)

To a merchant, the decimal system if feasible, could only be welcome, but to the millions it would be a source of endless confusion, suspicion and discontent.

S. J. BEHREND,
of Messrs. Behrend Brothers.

November, 1871.

THE FINANCES OF FRANCE.

(From the Standard's Correspondent.)

PARIS, *Oct.* 2.

THE financial problem which France has to solve just now reminds one of the Sphinx and its enigma—if the country fail to make out that terrible problem it is doomed to be devoured by a monster more fearful than the offspring of Typhon and Echidna—national bankruptcy. M. Michel Chevalier, in to-day's *Débats*, makes a praiseworthy attempt to clear up the mysterious tangle, which he observes, with some truth, all who have dealt with have hitherto failed resolutely to face. M. Chevalier thinks that what it is essential to find out is the burden of debt France will have to pay interest on, and to do so he begins at the beginning. When the first Empire was overthrown in 1814, the yearly interest on the consolidated debt (all in five per cents) amounted to 63 millions of francs. After the Hundred Days it rose to 165 millions and underwent no further increase until 1830. Louis Philippe's reign only added 12 millions to the annual charge, the Republic of 1848 increased it by 54 millions, and the second empire by 129. To put it more clearly, I will give you the amounts of the interest on the consolidated debt in a tabular form:—

1814	63,000,000 f.
1815-30	165,000,000 f.
1830-48	177,000,000 f.
1848-52	241,000,000 f.
1852-70	360,000,000 f.

According to M. de la Boullerie's report, it was supposed that the annual charge would be raised to 723 millions—a mistake, for the amount only reaches 719½ millions, but Mr Michel Chevalier, who has studied that report more diligently and with greater competency than ordinary readers, has discovered that this charge of 719 millions merely represents what the Treasury will have to disburse in this year of disgrace 1871, and that it does not include certain expenses which were not voted until after his report was drawn up, and it follows from M. Michel Chevalier's admirably clear and lucid explanation, that M. de la Boullerie was not called upon even to estimate the increased burden which the many loans contracted by France have permanently entailed on her resources. These 719 millions consist of the following sums:—

1.	Interest on debt in 1870	360,000,000 f.
2.	Interest on the loans issued 1st, by the Imperial Government, 2d, by M. Gambetta, one in 3, the other in 6 per cents	54,710,000 f.
3.	Interest on the loan of two milliards of 1871	1[illegible],820,000 f.
4.	Interest paid to the Germans (at 5 per cent.) on the three milliards still due to them ...	1[illegible],000,000 f.
5.	Interest on the sum due to the Eastern Railway Company for the portion of their lines taken by the Germans	16,270,000 f.
	Total	719,5[illegible],000 f.

To this total of 719 millions, (not 723 millions as M. Chevalier erroneously assumes it to be) there must be added, in the first place, the additional expense accruing from the vote of 500 millions as an indemnity to the departments that have suffered from invasion. That sum, he assumes rightly enough, can only be raised by a loan, and he calculates the annual charge for interest under that head at 34,700,000f. Another extraordinary outlay will, he estimates, have to be met by a loan, for the purpose of replacing all the *material* lost or destroyed in the course of the war such as guns, small arms, sabres, horses, waggons, tents, pontoon trains, fortifications, the repairs of roads and railways &c. This expenditure will be all the more considerable from the insane way in which bridges were destroyed on the approach of the enemy. The cost of reconstructing the public buildings destroyed by the Prussians or the Communists will also swell the amount which M. Chevalier, it appears to me, rather under-estimates, when he sets it down at 500 millions of francs. This sum will have to be borrowed, hence another annual charge of 34,700,000f. Moreover, within the next three years another three milliards will have to be paid to the Prussians. The sum must be borrowed, and M. Michel Chevalier holds that it would be courting deception to suppose that it can be raised on better terms than the two milliards raised in 1871, viz, a yearly interest of 258,235,000f., or 58,235,000f. more than the sum set down under that head (No. 4. of second table) by M. de la Boullerie for 1871. In addition, under "what people choose to call the Government of Tours and Bordeaux," exorbitant advances were extorted from the Bank of France, so that although its capital is but 182 millions of francs, the bank is a creditor to the State to the amount of more than seven times its capital, viz., 1,530 millions of francs. This, M. Michel Chevalier says, is a dangerous position for the bank, and to put an end to it the State must borrow 1,530 millions to reimburse the bank, and that loan, issued on the same terms as that for two milliards, will entail a further annual charge of 106,200,000f., thus bringing up the total annual payments of France for the consolidated debt to 953,418,000f. M. Michel Chevalier makes it 956,000,000f., but that arises simply from his addition being incorrect. This fearful amount, however, still falls short of the annual payments France will have to pay; there are pensions, civil and military, various kinds of annuities, the floating debt, and the guarantee of interest to railway companies which M. Chevalier sets down in the lump of 45 millions of francs. Thus setting forth the various amounts tabularly, we find —

Interest on funded debt in 1871, including interest to Prussia on the unpaid three milliards	719,583,000 f.
Interest on the war indemnity to invaded departments	34,700,000 f.
Interest on loan necessary to supply destroyed war material, &c.	34,700,000 f.
Surplus interest on loan on three milliards to pay the Prussians off	58,235,000 f.
Interest on loan to repay the Bank of France its advances	106,200,000 f.
Interest for pensions, floating debt, &c	45,000,000 f.
Total	998,418,000 f.

Thus, according to M. Michel Chevalier's calculations, the annual payments on account of the public debt alone must be taken at close on a milliard of francs, or nearly forty millions sterling. This is, as M. Michel Chevalier says, a fearful state of things; but it is doing the country an ill-service to conceal the truth from it. It may be further pointed out that nothing but strict economy and a productive system of taxation will enable the country to meet these exorbitant demands upon it, and that if the Government persist in keeping up an army of 450,000 men at present under arms, it will never be able to pave its way. The keep of soldiers (taken in the lump, of course) averages 1,000 f. per man per year. This gives, exclusive of the interest on debt, a further charge of 450 millions of francs, or 18 millions sterling which, added to the 998 millions due for debt, gives us a total of unremunerative expenditure of, in round numbers, £57,800,000 sterling; and to fill up that chasm, France has no one to look to but M. M. Thiers and Pouyer-Quertier.

IS IRRIGATION NECESSARY IN UPPER INDIA?

BY MAJOR CORBETT, B. S. C.

(Published by desire of H. E. the Viceroy.)

AT a time when extensive irrigational works are being carried out and more proposed, it may not be out of place to consider to what extent such works are required and what quantity of water is useful, or otherwise, to crops in general.

It may, in the first place, be as well to consider the general condition of land and the present system of cultivation of both irrigable and unirrigable lands. I shall here, where not otherwise mentioned, refer more particularly to the rubbee crops, and take wheat as an example, it being the most valuable of these crops, as a food for man. The soil of cultivated fields has, lying immediately below the cultivated surface soil, a hard layer or crust; this is not a natural, but an artifical formation, caused by the treading of men and cattle, and the pressure of the sole of the plough. This is called by farmers in England the *pan*, and is known to the natives by the word "tawa," which is almost identical in meaning. This pan is much denser in stiff than in sandy soils, and in some clays and stiff loams is almost impermeable to water: the roots of cereals can hardly force their way into this pan. As the irrigable land is prepared in this country for sowing by being ploughed and reploughed about three or four inches deep, the cereals are limited to a little more than this depth of soil in which to seek moisture and nourishment, and this too in a soil impoverished by yearly cropping. The moisture quickly evaporates from this loosened upper layer of soil above the pan, and irrigation becomes necessary to keep the plants alive.

I believe indiscriminate irrigation to be the bane of Indian farming, for as long as a cultivator can, by scratching the surface soil and swamping it with water, get a crop of four or five-fold, the amount of the seed sown, he lets things follow the old course and does not trouble himself to look about for a better system. Below this pan the soil is generally more free and open and contains moisture held there by capillary attraction; the amount of water is small, as most of the rain falling on the land or water supplied by irrigation is evaporated from surface or taken up by the crops before passing through the pan.

All porous soils have a greater or less power of capillary attraction; the smaller the particles composing the soil the less will be the power of capillary attraction possessed by it. Thus clay soils, which can be rubbed into an almost impalpable powder, have a much less power of capillary attraction than gritty sandy soils; but whilst clay or loamy soils have a less power of capillary attraction, they have a greater retentive power for moisture, that is, they will retain moisture longer when once it has penetrated into them, and will not so soon lose it by evaporation or filtration.

We have a familiar example of capillary attraction in a flower pot. If we fill a flower pot with dry loose earth and place it in a shallow pan of water, moisture will rise in the flower pot by capillary attraction to the surface of the soil, although much higher than the water was in the pan. If, however, instead of a flower pot we use tubs, we can ascertain what height the water will rise in different descriptions of soils.

Rain falling on the surface requires some time to penetrate the hard pan, and should hot sunshiny weather succeed the falls of rain, the greater part of the water is evaporated. In Upper India it requires a heavy fall of rain, or rather a continuance of wet weather, to produce what the natives call the "*Milwan*" or meeting of the surface water with the water held by capillary attraction in the lower strata of the soil, below or in the lower part of the pan.

As I said before, under the present system, irrigation is required to keep the plants alive. This irrigation tends to consolidate the soil, the smaller particles being washed into any fissures there may be in the pan, and the surface soil binds together. The roots of plants, however, require air as well as water, but the air can hardly penetrate the now almost hermetically-sealed surface soil. Weeds grow amongst the crop, and in hoeing these out, the soil is lessened. Here we see the use of weeds, in the absence of which the surface soil would not be stirred. When the crops are cut, there is a little grass, which is eaten off by cattle, after which the bare fields are left a smooth, hardened surface, almost impervious to air and moisture.

The more water has been supplied to the land by irrigation, the more parched the land becomes when the crops are removed and irrigation ceases. Solar heat is reflected from the hardened surface of the soil and heats the air, causing the hot winds; the direct rays of the sun having very little effect in raising the temperature of the air.

It is difficult to say what amount of water is applied to irrigated lands, but where the fields are irrigated from wells, I think we may calculate the amount of water to be about two inches for each irrigation; so by doubling the number of times the lands are irrigated, we get a fair approximation of the depth in inches of the water supplied to the land. As the land irrigated from wells is generally watered three or four times during the growth of the crop, we may consider it receives the depth of six or eight inches of water.

I believe where canal water is used, very much more water is applied to the land than where water has to be drawn from wells, and if I am correct in my reading of a tabular statement in a late Government of India *Gazette*, the amount of water supplied by the Ganges Canal during the month of February last was equal to a depth of six inches over the whole of the irrigated area.

There is a Report on Tank Irrigation in Ajmere and Mhairwarra, by Lieutenant Home, R. E., in No. 4, Vol. I., second series, "Selections from Records of Government, N. W. P.," and a letter from Major Stewart, R. E., forwarding the said Report, in which he says:—"The average required to irrigate one acre is shown by Lieutenant Home to be 177,261 cubic feet, whereas in our calculations we have allowed 200,000 to 300,000, and generally the latter." Now 177,261 cubic feet per acre is equal to a depth of 4·07 feet, and the 300,000 cubic feet is nearly 7 feet, say 80 inches. This seems excessive, as one inch depth of water over an acre of ground is upwards of 100 tons in weight; so every inch of rain that falls, or water that is applied to the land by irrigation, supplies upwards of 100 tons of water to the acre. By weighing the produce of a few square yards of churree, (joar), I calculated the weight per acre of the crop, when at its full growth and full of sap, to be about 100 tons. The amount of water in churree cut green for cattle is about 80 per cent. of the total weight of the crop; and an inch of water, being, say 100 tons, the crop only contains eight-tenths, i. e., four-fifths of an inch of water.

To obtain a deep moist soil, in the first place the land must be ploughed or stirred up deeply, so that the rain will sink into it to a depth from which it will not readily be evaporated. The rain-water will pass through the loosened soil by gravitation, leaving the soil moist, and as the upper surface soil is dried by evaporation caused by the heat of the sun, the water lost by evaporation will be replaced by water rising in the loosened soil by capillary attraction, exactly as oil rises in the wick of a lamp. The loss of water by evaporation would tend to dry the soil; but as solar heat would be absorbed by the loosened soil during the day, and radiated during the night, and the surface consequently cooled by the radiation, we should have a copious dew deposit from the vapour in the atmosphere caused by evaporation during the day. The advantage of allowing as much rain-water as possible to penetrate to the sub-soil before it has time to evaporate, will be sufficiently evident when I mention that from experiments carried out in the temperate climate of England, during a period of eight years, it was ascertained that of a mean yearly rain-fall of 26·49 inches, the quantity evaporated was 15·20 inches, and only 11·29 inches filtered into the sub-soil. It is shown in the same experiments that, whilst in the month of February from an average rain-fall of 1·971 inches only 0·424 inch was lost by evaporation, from a mean fall of 3·550 inches in June, July, August and September, the loss by evaporation was 9·080. What then must be the amount of loss by evaporation in India?

What the required depth may be, to which land should be stirred, will vary with the description of the soil: thus close-grained soils, having a greater retentive power for water, will not require to be stirred so deeply as loose sandy soils, which possesses that power in a less degree. In sandy soil we must make up for the want of retentive power by deeper stirring. The proper depths to ensure crops on the different soils can best be found out by direct experiments on the soils. I am, however, inclined to think, from experiments carried out with tubes filled with soil, and an experiment I am going to describe further on, that 15 to 18 inches would be sufficient for stiff soils of the "doomat" sort, and 1½ to 2 feet would be a safe depth to plough light sandy bhoor lands. The depths I here state are what I consider extreme depths, which would be sufficient for the very driest seasons. Every few inches deeper we plough unirrigable lands will tell in increased produce from them. Wherever the culturable soil is of two or more feet in depth, I believe there is no necessity for irrigation. Deep ploughing will be sufficient, provided the soil is brought to a fine tilth, *i. e.*, sufficiently broken up and pulverised. Where, however, kunkur, stone, or loose sand, which will not retain moisture, lies within less than two feet from the surface, irrigation *may* be necessary, but I am not certain that it *is*. The country plough, although abused by many persons, is perfectly efficient as long as shallow ploughing only is wanted. The whole of the mechanical operations we see brought into play in England in cultivating the soil, such as ploughing, sub-soil ploughing, the use of the cultivator or grubber, the clod-crusher, the harrow, and the furrow-pressers are, after all, only to make a suitable seed-bed for whatever we may wish to sow. Where shallow cultivation only is wanted, the land can be very efficiently prepared with a country plough and a "putela," which is merely a log of wood drawn over the surface and with a tube tied behind it, the country plough makes an efficient drill. Still this country plough will not do for deep cultivation, as any pressure on the stilt depresses the heel of the plough and raises the point. English ploughs and sub-soil ploughs are, from their price, beyond the reach of natives, even if they were inclined to try them. What is wanted is an alteration in the common plough of the country, to enable it to penetrate deeper into the soil, which alteration must be effected so cheaply as to make the improved plough not more expensive than the present one.

The old plough is made in three principal pieces—the *haras* or draught pole which rests on the yoke, the stilt or handle and the share in which an iron point is fixed. The angle at which the share is to the draught pole will not allow of its penetrating deep into the soil; true the share is fitted into a groove in the stilt and fixed there by wedges, by altering which a slight difference in the angle can be made, and a somewhat deeper ploughing effected; still pressure on the stilt depresses the heel and not the point of the plough, which is thus brought to the surface.

My altered plough is made in two pieces, the draught pole and the stilt which is continued, the lower end of it forming the share, which is like, in shape and action, one of the tines of the modern cultivator. Pressure on the stilt forces the point (which is covered with iron) into the ground. This is simpler than the country plough, being in two pieces, and less likely to get out of order, and it is also cheaper. It could be strengthened by having a piece of iron from the point of the share to the pole thus forming a coulter.

The natives have a prejudice against deep ploughing; they say it turns up bad soil. I believe this is merely an excuse for laziness, as although I have asked hundreds of natives whether they have tried it, I have not met one who told me he had. Thirty or forty years ago there was a strong objection on the part of farmers in many parts of England to breaking up the pan, but now it has been done, they acknowledge the advantages of deep cultivation. Cereal crops are always better here after cotton or indigo. This is, I believe, because these crops have, with their deeply penetrating roots, loosened the sub-soil, which enables the roots of cereals to penetrate deeper into it.

Another objection made by natives to deep ploughing is that their bullocks cannot draw the plough. If one pair of bullocks cannot draw the plough I have made, two pairs can do so easily. As, however, the deep ploughing would be effected, not by one ploughing, but by several, each going a few inches deeper than the former, there would not be much more power required with my plough than there is at present with the ordinary country plough.

Secondly, banks must be raised round the fields to prevent rain-water running off by surface drainage. Where the land is tolerably level, there will be no difficulty in this; the ordinary ridges will be sufficient when the land is deeply ploughed; but where the land is undulating, long narrow fields should be made with the length of the fields running across the direction of the slope; in fact, the fields will require to be terraced, as they are in the hills. By raising the ridges between the fields, any manure there may be on the surface, droppings of cattle, stubble of old crops, &c., is all retained on the land, and, when the land is also deeply cultivated, sinks into the soil, where it remains available for crops. Now, all this manuring matter is carried down by streams to the Ganges, and deposited on the low lands of Bengal, where it is the cause of malaria and disease on the subsidence of the floods which have carried it there in suspension. Not only is manure lying on the land lost by surface drainage, but the rain-water, which is required to moisten the sub-soil, and also contains valuable manurial ingredients, is lost to the land of these provinces, and carried down to Bengal, which does not require it. Bengal, with an ample rain-fall, is flooded and manured by the Ganges, as Egypt is by the Nile; only Egypt has next to no rain-fall and requires it, whereas it is injurious in every way to Bengal.

The water being arrested in the soil of the fields where it fell

would slowly filter through the sub-soil to the rivers, which would be kept at a more equal depth throughout the year; and Bengal would not suffer to the extent it now does from floods. Another advantage resulting from deep ploughing would be that solar heat, instead of being reflected and heating the air, would be absorbed and radiated by the loosened surface soil, and the intense heat of the hot weather would be moderated; as also would the steamy atmosphere of the rains, by the rain sinking into the lower soil before it had time to evaporate. The temperature being lowered, the evaporation would be lessened, consequently less rain would be sufficient, and possibly the climate might be so altered as to adapt it to many plants, such as tea, which cannot now be grown in the plains, and also to the culture of the silk-worm.

With modified hot winds there would be less difficulty in growing grasses and forage crops in the hot weather, and the crops that have now to be irrigated almost daily, to keep them alive, might possibly, after a few years, when the sub-soil was more moistened, hardly require irrigation. A reduced temperature would render the climate more adapted to Europeans and lessen the necessity for hill sanitaria for troops. To what extent the temperature might be reduced I have no means of judging, further than some balloon experiments of the British Association gave a decrease of 1 Fahrenheit for every 276 feet of altitude. If therefore we divide the difference of altitude in feet of hill stations and the plains by 276, we get the theoretical difference of temperature. Thus 5,520 feet, which is about the difference between the altitude of parts of the Upper Doab and Nynee Tal, should give a temperature in the Upper Doab only 20 higher than that of Nynee Tal. A loosened soil of 1½ or 2 feet in depth would be useful as a sanitary measure for the country generally, porous earth being a great absorbent of malaria and noxious vapours. Troops moved into camp on cholera breaking out in military stations soon improve in health, I believe chiefly from getting away from the sodden consolidated soil of cantonments to the vicinity of more cultivated land. Cantonment lands cannot well be cultivated, but if they were sub-soil drained, I believe we should have less sickness in the stations. I am here straying from my question. I have, however, brought the subject of sub-soil drainage of military stations to the notice of the Sanitary Commissioner with the Government of India.

So convinced was I of the benefits of deep ploughing, that last year, in the rains, I ploughed and re-ploughed a piece of ground, stated to be four *kucha* beeghas, as deeply as I could with the country plough. The land was hard "doomat," which had always been irrigated. I thought I had ploughed this field ten to twelve inches deep, but on testing it, it proved to have only been ploughed eight or nine inches deep. I sowed wheat in this field on the 4th November, 7½ seers Budaon weight per *kucha* beegah. The last fall of rain there had been on it, previous to sowing, was on the 9th October. Hardly a blade of this was touched by white-ants, and as the crop looked very healthy up to the 12th January, I determined not to irrigate it. I did not see it again from 12th January till I returned from camp on 1st March, when it seemed to be in want of water, and I was persuaded to irrigate a few beds (kiaras) (possibly one-twentieth part of the field) on one side of the field, which looked more dried up than the rest: the irrigated part at once became laid and the irrigation did more harm than good. The next field to mine (said to be three beeghas), farmed by a native in the usual way, was ploughed three or four inches deep, and also sown on the 4th November, the same day as mine; he sowed ten seers Budaon weight per *kucha* beegah; a great quantity, I should think, three-fourths of his plants were destroyed by white-ants when the crop was a few inches high; he irrigated his field three times from sowing to harvesting.

As the *kucha* beegah is rather a vague measurement, I had these fields measured, and found the area of mine was 3,213, and the native's field 1,944 square yards. The crop from my field was 9 maunds, 6 seers, 8 chittacks Budaon weight of 100 tolahs to the seer, and the native's crop was 2 maunds, 10 seers, according to his statement. Reducing this to bushels of 60 lbs, my crop was at the rate of nearly 23 bushels per acre, and his a little over 9 bushels. I must mention that I manured my land with a dressing of farm-yard manure; on one part of it I applied some broken bones and afterwards gave a dressing of brickkiln ashes over the whole.

It is impossible to say what amount of crop was due to manure and what to deep-ploughing.

Had I, after the manure was applied, ploughed my land like the native, three or four inches deep and watered, I do not think I should have as good a crop as I had. This is only conjecture. However, had I only ploughed three or four inches deep and not irrigated, I am certain I should have no crop at all. But, had my land been ploughed even five or six inches deeper than it was, I think I should have had nearly double the crop I had, as a great many of the ears of my crop were altogether empty, and a great quantity of the grain was shrivelled from want of moisture when the grain was forming, which would not have been the case had there been a greater depth of pulverized moist soil under the plants, and the roots been able to penetrate deeper. My land being ploughed to a depth of only eight or nine inches, the roots of the plants could not strike down sufficiently deep in the soil to be unaffected by draught and the heat of the sun, and the moisture was dried up out of the depth of soil they could reach, before the grain was perfected.

My field sloped down to one side, and perhaps half the rain which fell on it ran off by surface drainage, it not having been properly banked up: this makes me consider that half the average rainfall would be sufficient if it were retained in the land.

The cultivators about Budaon have been enquiring how it was I obtained a better crop without, than they did with irrigation. Some say they irrigated four and even five times, and only got about half the return I did, and from the same description of soil. I merely tell them to "manure well and plough deeply," and have shown them my new plough, which they seem to have taken a fancy to, and say they will adopt.

As it is, my crop does not compare badly with the average crops of European countries, as mine was nearly 23 bushels per acre In a late number of the *Farmer*, the average of wheat in bushels per acre in different countries is given as follows:—

Ireland, 26 bushels, high farming 30 to 40; England and Scotland, 28, high farming 41; Belgium, 21; France, 14; Russia, 17; Silesia, 10; Austria, 15 to 16 bushels.

The rainfall at Budaon, from the 10th October to within two or three days previous to the time I cut my crop, was 1·3 inches. I do not include rain falling just previous to cutting the crop, as it delayed my harvesting and did it more harm than good.

The natives sow a large quantity of seed per acre, as they expect a great quantity of the young plants will be destroyed by white-ants. White-ants, I believe, will not attack strong healthy plants. It is only when in the struggle for existence caused by the poverty of, and want of nourishment in the soil, the weaker plants begin to droop, that they become the prey of the white-ants.

(To be continued.)

PORT CHARGES IN INDIA.

MEMO. BY THE CHAIRMAN OF THE CHAMBER OF COMMERCE, RELATIVE TO PORT CHARGES IN BOMBAY.

BEFORE discussing the constitution of the proposed New Port Trust (whenever the parturition may be happily accomplished), it seems desirable that we should understand our position in Bombay as regards the charges on Ship and Cargo here as compared with other Ports. For this purpose I have prepared the accompanying statements. I am indebted to Captain Henry, of the P. and O. S. N. Co., for details regarding the Ports of Penang, Singapore, Hongkong, Shanghai, and Yokohama. The landing charges in Bombay I have taken on the scale charged by the P. and O., and British India Steam Navigation Companies. They are somewhat higher than certain muccadums offer to do business for here, but less than muccadums formerly charged, (although they had other means of making money from their employers) and considering the risk of damage, and the present rates of boat hire in Bombay, not by any means out of the way. It will startle many members of the Chamber to see that, excepting Penang and Yokohama, Bombay is the most expensive of the various ports enumerated, and this, notwithstanding the fact that in many of the other ports, pilotage and towage form very heavy items in charges. Bombay is something like twice as expensive as London and Liverpool. And it is only the tonnage and very high pilotage in Calcutta which makes that port dearer than Bombay. A glance at the figures will show that boat hire, hamallage, cranage, and wharfage fees, constitute the most prominent items of expense in Bombay, and the inference is unavoidable, that some means must be taken so to cheapen lighterage and wharfage fees that goods are less heavily burdened, or else to find means of doing away with lighterage altogether. In Calcutta, wharfage fees are considerably heavier than they are here, but the ship gets alongside of a jetty, and boat hire is avoided. But on the whole in Calcutta goods pay less than they do here. I do not pretend to enter here into the wide question of docks or piers, but when Government does unbosom itself as to the intentions regarding future harbour arrangements, it is quite plain, from the annexed figures, that means must be found to lighten, rather than to increase, the burdens on the trade of the port. I should explain that my figures of boat hire and wharfage fees in Bombay are arrived at from a cargo actually landed, and are confirmed by the P. & O. S. N. Co. Even the items of port dues and pilotage are sufficiently heavy in Bombay, considering the great natural facilities of the harbour, and any attempt to increase these, and to which I have heard allusion made, should be opposed. I should be very glad if any member could afford me information as to charges at any ports other than those enumerated.

Statement showing charges on Ship and Cargo inwards for a vessel of 1,000 tons register tonnage at various English and Eastern Ports. The cargo carried by the vessel inwards to the Eastern Ports is presumed to consist of 1,800 tons weight, and measurement (40 cubic feet) and to weigh 1,400 tons. At the

English Ports the cargo is presumed to be from India or China :—

BOMBAY—

Pilotage inwards ... ...Rs.	85	0	0
Port dues, 2 Annas per ton	125	0	0
Landing charges, including stevedore, boat hire, hamallage, and cranage, 1,400 tons at Rs. 2-2-0 per ton	2,975	0	0
Warfage fees, 7½ Annas per ton ...	656	4	0
Total Rs.	3,841	4	0

CALCUTTA—

Basses Rock light dues, 1 Anna per ton...Rs.	62	8	0
Pilotage on a draft of 19 to 20 feet Rs. 600 less ¼ for being towed ... 150	450	0	0
Tug hire	800	0	0
Transporting fee from Garden Reach ...	25	0	0
Hauling into moorings	16	0	0
Jetty charges for 6 days, at Rs. 20 per diem	120	0	0
Hoisting charges, say	80	0	0
Stevedore's bill for discharging 1,400 tons of cargo, at 4 Annas per ton	350	0	0
Port dues, 4 Annas per ton register .	250	0	0
Hospital dues, 9 Pies per ton register ...	46	14	0
Mooring hire, fair weather, Rs. 5 per day, say 30 days...	150	0	0
Landing charges at the jetties 1,600 tons at Rs 1-14 per ton	2,625	0	0
Total...Rs.	4,975	6	0

POINT DE GALLE—

Pilotage inwards, on all vessels over 600 tons ...	£ 3
Harbour dues on do. do	5
Wharfage, free.	
Cost of landing cargo, 1,400 tons, at 1s. 6d. per ton...	105
	£ 113
	or Rs. 1,130

There are three public wharves for landing and shipping cargo. Two are fitted with cranes, and one is covered, but no charge whatever is made for their use.

PENANG—*Pilotage.*

19 feet, at 75 cents per foot ... ...Rs.	30	0	0
Port dues	None.		
No wharfage fee			
Boat hire, godown rent, cooly hire, superintendence, and delivery, 10 cents per package, equal to $1½ per ton, or, say, Rs. 3-2 per ton, on 1,400 tons ...	4,375	0	0
Total...Rs.	4,405	0	0

Pilotage not compulsory on vessels entering by Northern Channel; compulsory for vessels by Southern Channel.

It is proposed to build a Pier, which, when completed, will reduce landing charges by one-third.

SINGAPORE—

Pilotage, $1 per foot draft = $19 ...Rs.	42	0	0
Port dues	None.		
Wharves are all private property. I have unfortunately no details of the charges levied, but cost of landing cargo is estimated at 30 cents per ton on 1,400 tons.	925	0	0
Total...Rs.	967	0	0

HONKONG—

Pilotage—pilot not usually taken.			
Port dues	None.		
Landing cargo costs 50 cents per ton on 1,400 tons ... ...Rs.	1,540	0	0

SHANGHAI—

Pilotage—Taels 4 per foot ... ...Rs.	228	0	0
Port charges, 45 Tael cents per register ton	1,350	0	0
Landing cargo costs 28 Tael cents per ton, or, say, 13 Annas 5 Pies per ton on 1,400 tons...	1,175	0	9
Total...Rs.	2,753	0	0

Port Dues at Shanghai are an Imperial Chinese tax, and, once paid, enable the vessel to enter, leave, or trade with any Chinese Port for a period of four months from the date "the Chop" is issued.

YOKOHAMA—

Pilotage, $3 per foot, say ... ...Rs.	120	0	0
Port charges, $15 in	31	0	0
Landing cargo costs $1½ per ton, say Rs. 3-2 per ton on 1,400 tons	4,375	0	0
Total...Rs.	4,526	0	0

A Pilot is not usually taken into Yokohama.

LONDON—

Reporting at Custom House	3	3	0
Tonnage duty ¾d. per ton, entry 5s. ...	3	7	6
Putting pilot on board	3	3	0
Pilotage, Dungeness to Gravesend, with steam, say 20 feet draft	14	13	3
Ditto Gravesend, to London, with steam	5	16	3
Waterman assisting with boats... ...	2	0	0
Trinity lights	14	13	6
Tonnage dues, 9d. per ton registered ...	37	10	0
Discharging cargo, 1s. per ton registered ...	50	0	0
Towage from Dungeness according to agreement	50	0	0
Fees paying off crew	3	5	0
Total...	£187	11	6

All ordinary cargoes from India or China pay 1s. per ton register for discharging, but for Cutch, Gambier, &c., any additional labour incurred is charged extra. Sugar in casks pay 1s. 3d.

LIVERPOOL—

Dock rates and harbour lights on an East Indiamen, 1,000 tons register 1s. 4½d. per ton for tonnage, and 1½d. for harbour lights (including floating lights) = 1s. 6d.	£ 75	0	0
Rate for discharging a China cargo, &c., 1s. per ton register in closed docks, or about 10d. in an open dock according to arrangement	50	0	0
Discharging cotton from U. S., 6d. to 8d. per ton register.			
Pilotage, 9s. per foot on draft of water, say 20 feet	9	0	0
Towage, according to agreement, say from skerries	15	0	0
Light dues	14	14	6
Discharging crew, £3-5; surveying hatches, 30s.	4	15	0
Stage dues, £1-15; anchorage 1s. 6d. ...	1	16	6
Weights taken and sundries, say ...	5	0	0
Total...	£175	6	0

Should a vessel discharge in the river, she would have to pay 1s. per ton lighting dues besides the other items already mentioned.

BRISTOL—

Dock dues, 1s. per ton	£ 50	0	0
Pilotage from Lundy to Kingwood ...	10	10	0
Do. Kingwood to Basin ...	2	5	0
Do. Assistant pilot, say ...	1	0	0
Seven men, at 3s. 9d. each, and Boat 5s. to assist	1	11	3
Harbour Master's fee	0	5	0
Steam Tug, Kingwood to Basin, 5d. per ton.	20	16	8
Anchorage	0	5	0
Mooring, 1d. per ton	4	3	4
Mayor's dues, 40s., and Warder's dues, 5s ...	2	5	0
Light dues	9	10	1
Surveying hatches	2	2	0
Discharging cargo 6d. per ton, say 1,400 tons	35	0	0
Total...	£139	13	4

HULL—

Dock dues, 1s. 4½d. per ton	£ 68	15	0
Anchorage, 2s. 6d.; Jettage, 7s... ...	0	9	6
Buoyage, 2s. 6d. for first 30 tons, and 6d. every additional 10 tons	2	11	0
River pilotage, 5s. per foot, on, say 20 feet...	5	0	0
Towage unnecessary and only small if availed of 6d. to 8d. per ton is about the rate charged for discharging, say, 1,400 tons, at 8d....	46	13	4
Trinity Lights	20	16	8
Total...	£144	5	6

GLASGOW—

Harbour dues on ship, 4d. per ton ...	£ 16	13	4
Tonnage dues on, say, 5,000 bales Bombay cotton, weighing each 400 lbs. = 892 tons weight, at 2s. *paid by consignee* ...	89	4	0
Lumpers discharging cotton, 6d. per ton ...	22	6	0
Northern Lights, 4½d. per ton; and 6d. per 50 tons	18	4	2
Clyde lights, 1d. per ton	4	3	4
Towing ship, 9d. per ton	37	10	0
Pilotage, 2s. per foot, 20 feet	2	0	0
Planks and stages for discharging ...	0	15	0
Total...	£ 190	15	10

The importer pays dues on cargo, not the ship. Ship pays Stevedore for discharging.

MINERAL RESOURCES.

REPORT ON COAL EXPLORATION IN THE CHANDA DISTRICT.

From Mr. Mark Fryar, Mining Engineer, to the Commissioner, Nagpoor Division,—No. 234, dated Warora Colliery, Chanda, Central Provinces, the 23rd July 1871.

1. BEG to acknowledge the receipt of your letter No. 2359, dated 28th June 1871, in which you say that the Chief Commissioner desires that a general report upon the coal explorations should be submitted, and that this report should give a brief summary of past operations from the beginning, showing the cost of the same and the results obtained. Accordingly, I have now the honour to submit to you the following brief summary of the work which has been done in the Chanda District, in the way of putting down bore-holes and pits to prove the existence and quality of coal-beds, and of the expenditure incurred on account of each work.

2. Earth borings for proving coal were commenced by me in the neighbourhood of the city of Chanda on the 22nd May 1869. Prior to this a boring had been made on the South-East side of the Chanda walls, near the dâk bungalow, by the Deputy Commissioner (Major Lucie Smith). This was put down to a depth of about 180 feet, and was said to have passed through about 20 feet of shaly rock containing coal stains or thin layers of coal.

3. For the sake of clearness and brevity, I have divided the places where borings have been made into the following, *viz.*, Chanda, Ballarpur, Gugus, Telwassa, Telwassa to Nandori, North from Warora, and Warora.

Commencing with Chanda and its neighbourhood we have the following records, viz.:—

CHANDA,—I.

Names of Bore-holes.	Dates. Commenced.	Dates. Finished.	Depth in feet.	Results.	Cost of boring.	Contingencies.	Office.	Total.
Chanda.	1869				Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Nos. 1 and 2 ...	May 22nd	June 5th ...	80 & 40	Sandstones and soft decomposed stones.	22 12 0	122 4 3	... ..	145 0 3
* No. 3 ...	June 6th.	... July 16th ...	242	At about 162 feet, 2 feet of coal, and at 206, 1 foot 6 inches of coal and shale...	219 14 0	817 7 4	... ..	1,067 5 1
„ 6 ...	Sept. 19th	Nov. 30th ...	238	Was stopped by the Superintendent, Geological Survey, when in coaly shale, had penetrated this for 11 feet	700 5 4	749 15 1	201 11 9	1,651 12 2
„ 6 A ..	...	...		Put down by steam borer, but lost by running together, there being no tubes at the time to prevent this	... ...	.....	.....	1,364 12 11
	1869			BALLARPUR.—II.				4,228 14 8
Ballarpur No. 1	July 21st	.. Aug. 14th ...	71	Surface soil and pebble beds. The river bank	120 8 0	199 15 1	68 1 6	338 8 7
† Ballarpur No. 2	Aug. 15th	...Sept. 18th ...	172	At 109 feet good coal... ...	ft. in. 0 9			
				Black shale ..	0 9			
	1870			Good coal	1 6			
‡ No. 3 ..	Jan. 9th	...Jan. 29th ...	118	At 40 feet coal	3 0	496 14 6	251 9 3	41 7 0 789 14 9
				„ 71 „ coal shaly... ..	2 0			
				„ 51 „ „ „ ...	1 0			
				Good coal .	2 0			
No. 4 ...	Jan. 30th	...March 7th ...	200	At 101 feet coal shaly,. ...	1 1	293 1 0	42 3 2	..... 333 4 2
				„ 182 „ good coal...	3 0	510 1 10	42 2 0	..... 552 3 10
				GUGUS.—III.				2,013 15 4
	1869	1870			ft. in.	ft. in.		
Gugus No. 3 ...	Nov. 5th	...Jan. 8th	143	At 15 0 Coal	1 0			
				51 10	3 6			
				60 8 „ ..	3 6			
				81 0 „ ...	9 0			
				100 10 „ .	21 8			
				122 8 „	13 0	328 12 2	23 10 9	..... 352 6 11
No. 4 ...	Dec. 16th	...Feb. 5th ...	206	At 124 6 „	3 0			
				129 6 „	3 0			
				138 6 „	4 0			
				151 6 „ . ..	7 0			
Gugus.				169 0 „	32 0	599 15 1	324 9 6	..... 924 8 7
§ Pit No. 1 ...	... .	.....	.	.....		152 0 0	55 14 6	..... 207 14 6
‖ No. 2. ..	The Mayo Pit.		..	At 80 0 Coal	8 0			
				Shale	11 6			
				Coal	13 0			
				Shale	11 6			
				Coal	8 6	.....	.....	..... 25,532 11 1
								27,017 9 1

* This seems to be below the good coal-bearing horizon of the field.

† In the same stratum apparently as the No. 8 boring at Chanda.

‡ Put down by Dr. Oldham. This seems to be in the same stratum as No.

§ Sunk to recover lost boring tools and rods.

‖ The first bore-hole at Gugus was put down where No. 3 pit (the Mayo pit) was afterwards put down to the coal: 470 tons of coal have been raised from this pit; part of this was conveyed to Railway and Bombay Gas Works to be experimented on, as well as Warora now mining for engine fuel,

TELWASSA.—IV.

Names of Bore-holes.	Dates. Commenced.	Finished.	Depth in feet.	Results.	Cost of boring. Rs. A. P.	Contingencies. Rs. A. P.	Office. Rs. A. P.	Total. Rs. A. P.
Bandak.	1869							
No. 1	Dec. 1st ...	Dec. 9th ..	23½	Passed through surface soil into the Talchir beds under the coal-bearing sandstones.	50 0 6	40 7 0	.....	90 7 6
Telwassa.	1869	1870		ft. in. ft. in.				
No. 1	Dec. 9th ...	Jan. 22nd ...	187	At 150 0 Coal .. 1 6 165 0 „ ... 0 8 Shale mixed with coal... 20 8	187 12 0	115 7 7	70 15 9	374 3 4
No. 2	Dec. 13th ...	Jan. 17th ...	140	At 68 ft. Coal ... 29 0 Shale .. 1 6 Coal ... 4 5 Shale ... 12 9 Coal ... 11 2	143 0 2	39 2 0	.. ...	182 2 4
								646 13 2
				TELWASSA TO NANDORI.—V.			Total for 1869 ...	33,947 4 3
Kunara.	1870							
No. 1	March 16th ...	April 5th ...	180	No coal; beds of sandstone and clay...	133 0 0	114 4 9	58 1 5	305 6 2
Majri.								
No. 1	March 14th...	March 21st...	86	No coal	147 5 2	69 12 0	.	217 1 2
„ 2	„ 22nd...	April 9th ...	127	At 75 ft. 3 in. coal 50 ft. 8 in. ...	269 14 3	109 8 0	.....	379 6 3
Nandori.								
* No. 1 .	April 16th ...	May 30th ...	214	No coal	489 4 0	119 2 0	.....	608 6 0
„ 2 ...	May 31st ...	June 13th	134	No coal	174 10 0	7 3 0	.....	181 13 0
								1,692 0 7
				NORTH FROM WARORA.—VI.				
Ekona.	1870							
No. 1	April 23rd.....	May 29th .	40	No coal hole in hard rock below the coal-bearing sandstone	245 2 0	136 8 0	131 13 11	513 7 11
† No. 2 ...	1870 Dec. 15th ...	1871 Jany. 7th ...	155	Sandstone, no coal	231 2 6	21 10 6	...	252 13 0
† „ 3 ...	1871 Jany. 7th ...	Feby. 6th .	177	Ditto ditto	214 15 0	36 15 0	...	251 14 0
† „ 4 ...	„ 16th ..	„ „	134	Ditto ditto	183 1 0	53 4 8	.....	236 5 8
Kundara.	1871		about					
No. 1	...	March	200	No coal	216 6 0	50 8 0	.....	266 14 0
Nagpur.								
No. 1	...	...		Not known	.. ...	1376 11 0	. ...	1,376 11 0
								2,898 1 7
				WARORA.—VII.				
Warora.	1870							
No. 1	May 30th ...	July 26th ..	220	No coal.	450 11 3	576 5 4	124 14 0	1,151 14 7
„ 2	Oct. 15th.....	Oct. 20th	56		44 15 3	1 0 0	.....	45 13 3
Akapur.				Put down through surface deposits to prove the sandstone.				
Mo. 1	July 27th.	July 30th .	37		29 14 0	10 7 0	.. .	40 5 0
„ 2.	Augt. 2nd ...	Augt. 6th ..	40		39 6 0	9 7 0	.....	48 13 0
„ 3	Augt. 8th ...	Sept. 14th ...	158	At 102 ft. Coal ft. 4 in. 6 Coal Shaly 1 0 Coal 7 6 Sandy shale 1 6 Coaly shale 3 0 Coal 17 0	262 6 6	48 7 9	.....	310 14 3
„ 4	Sept. 1st.....	Sept. 10th ...	103	To prove strata not down to coal horizon	74 13 8	3 4 0	.....	78 1 8
								1,675 15 9
„ 5	Sept. 12th ...	Oct. 3rd	120	Into thick clay beds.	135 11 4	14 1 0	.....	149 12 4
„ 6	„ 15th ...	„ „ ...	93	At 69 feet, coal 10 feet	109 6 6	2 15 0	.....	112 5 6
„ 7	Oct. 5th ...	„ 18th ...	133	At 103 feet 6 ins., coal 13 ft. Coal shale 4 ft.	108 14 6	0 14 0	.....	109 12 6
„ 8	Oct. 5th ...	Oct. 14th ..	105	Borings made to prove the existence of the coal-bearing sandstones in the vicinity of Warora preparatory to commencing pit sinking.	89 14 6	1 2 0	.....	91 0 6
„ 9	„ 20th ..	Nov. 16th ...	166		196 5 0	18 15 0	.....	215 4 0
„ 10	1871 Nov. 23rd ...	Jany. 5th ...	197					678 2 10
					315 11 6	36 11 6	... ..	352 7 0
Yekarjoon.	1870							
No. 1	Oct. 20th ...	Nov. 4th ...	96		113 7 3	2 0 0	.....	115 7 3
„ 2	Nov. 10th ...	Dec. 13th ...	156		276 13 6	4 3 0	.....	281 0 1
				By Steam Borer.				
Warora.								
No. 1	June 11th ...	Aug. 16th ...	250	No coal, but firm stratum of sandstone with 44 feet of interbedded blue shale.	1523 12 3	887 11 2	1046 7 11	3,460 15 4
„ 2	Sept. 3rd ...	Sept. 26th ...	140		781 0 3	608 0 4	573 0 9	1,962 1 4
								5,819 8 0
							Tl. for 1870	12,763 12

* These two holes passed through sandstone strata into decomposed trap rock.
† The borings Nos. 2, 3, and 4 at Ekona were put down in consequence of coal being said to have been found in a similar stratum on the Berar side of the river Wurdha.

PRICES OF FOOD THROUGHOUT INDIA.—OCTOBER 1871—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

BENGAL. (Rice, the staple food.)		Rice	Wheat		
				Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27¼	22	,,	,,
	Bancoorah	27¼	19	,,	,,
	Beerbhoom	32	16	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	21	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam ,,	Durrung	21	8½	,,	,,
	Goalpurah	17	30	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	..	,,	,,
	Seebsaugor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	23	18	,,	,,
	Mymensing	22½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	24	23	,,	,,
	Sarun	22	20½	,,	,,
	Shahabad	24	22	,,	,,
	Tirhoot	23	21	,,	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	20	27	,,	,,
Sonthal Pergunnah	Godda	...	...	,,	,,
	Nya Doomkeh	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	29	21	,,	,,
Presidency Division.	Calcutta			,,	,,
	Nuddea			,,	,,
	Jessore	25½	15	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 3 16	21 0 15	,,	,,
	Bograh	33½	15½	,,	,,
	Dinapore	35	17½	,,	,,
	Maldah	30	28	,,	,,
	Moorshedabad	28	25	,,	,,
	Pubna	21	20	,,	,,
	Rungpore	24 11 10	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazareebagh	25	20	,,	,,
	Manbhoom	32	16	,,	,,
	Singbhoom	86	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25	..	,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES. (Wheat and Joaree, the staple food.)		Rice.	Wheat	Joaree.	Bajra
Meerut Division	Dehra Dhoon	14	27	31	28
	Saharunpore				
	Moozuffurnugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	12	17	14	14
	Gurhwal				
Rohilkund ,,	Bijnour	20	20	25	27
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
	Terai Pergunnahs	25	35		
Agra	Muttra	14	26	27	25
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	10	26	34	26
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	14	21	26	18
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
	Goruckpore	21	23	..	..
	Bustee				
Benares ,,	Azimgurh	15	20	23	19
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	8	14	21	18

OUDH. (Wheat and Joaree, the staples.)		Rice.	Wheat.	Joaree.	Bajra.
Lucknow Division	Lucknow	15	24	31	16
	Oonao				
	Baraburkee				
Seetapoor ,,	Seetapoor	10	33	24	23
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	19	26	40	16
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	19	24	...	...
	Sultanpoor				
	Pertabghur				

PUNJAB. (Wheat and Joaree, the staples).		Rice.	Wheat.	Joaree.	Bajra.
Delhi Division.	Delhi	9	23	32	20
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	21	26	23
	Rohtuk				
	Sirsa				
Amballa	Amballa	12	24	37	32
	Ludhanah				
	Simla				
Jullundhur.	Jullundhur	13	20	40	32
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	9	26	32	27
	Sealkote				
	Gurdaspore				
Lahore.	Lahore	10	22	25	23
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	8	20	26	24
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	7	20	25	22
	Jhung				
	Montgomery				
	Mozuffurnuggur				
Dera I. Khan.	Dera I. Khan	9	21	28	25
	Dera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	7	15	19	21
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree, the staple food.)		Rice.	Wheat.	Joaree.
Nagpore.	Nagpore	16	19	22
	Bhundara			
	Chanda			
	Wurdah			
	Balaghat			
Jubbulpore.	Jubbulpore	16	31	22
	Saugor			
	Dumoh			
	Mundla			
	Seonee			
Nerbudda.	Baitool	12	22	21
	Hoshungabad			
	Chandwara			
	Nursingpore			
	Nimar			
Chuttesghur.	Raepore	32	35	12
	Belaspore			
	Sumbulpore			
Upper Godavery	Seroncha	8	12	25

MADRAS Rice and Cholum (Joaree) the staple food.		Rice.	Joaree.
Northern Section.	Ganjam	246	125
	Vizagapatam	311	166
	Godavery	194	107
	Kistna	272	180
	Nelloro	235	133
Ceded Districts	Cuddapah	294	157
	Bellary	286	131
	Kurnool	344	154
East Centre	Madras	209	184
	North Arcot	221	114
	South Arcot	207	91
Cauvery.	Tanjore	220	124
	Trichinopoly	232	127
Southern Section.	Madura	315	146
	Tinnevelly	340	152
West Centre	Combatore	201	137
	Neilgherries	427	213
	Salem	243	110
West.	South Canara	272	...
	Malabar	300	...

BOMBAY PRESIDENCY (Rice, Bajra, and Joaree, the staples.)		Rice.	Joaree.
Northern Division.	Ahmedabad	Rs. 4	Rs. 2½
	Kaira	3½	2½
	Surat	3½	3
	Tannah	...	..
Southern Division.	Poonah	3½	2½
	Ahmednuggur	..	..
	Kullaghee	3½	1½
	Rutnagherry	3	..
	Belgaum	3	1½
	Dharwar	3	1½
	Sattara	4	2½
	Carwar	..	2½
Sindh	Kurrachee	..	2½
	Hyderabad	...	2½
	Sukkur	3	2½

BURMAH. (Rice, the staple.)		Rice
Arakan.	Arakan	2 4 0
	Ramree	
	Sandoway	
	Northern Arakan	
Pegu	Rangoon	2 7 0
	Bassein	
	Myanoung	
	Prome	
	Toungboo	
Tenasserim	Amherst	2 0 0
	Tavoy	
	Mergui	
	Shevegyeen	

Quotations are—so many Rupees per Garce = 8,960 lbs.

2nd sort Rice quoted.

Rupees per maund of 82 lbs.

Per maund of 82 lbs.

No Returns since January.

No Returns since April 1870.

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THE BANK OF BENGAL.

Statement of Affairs.	5th Dec. 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,41,584 7 0
General Treasury Balance at Head Office	3,13,59,774 4 9
Do. Do. at Branches	1,67,42,155 6 6
Other Deposits at Head Office and Branches	2,09,30,726 14 7
Bank Post Bills, &c.	6,88,865 0 8
Cash Credit undrawn	....
Sundries	9,64,838 4 9
Total Rs.	9,42,27,944 6 3
Assets.	
Government Securities	1,04,80,410 0 0
Loans on Government Securities at Head Office and Branches	1,09,68,422 15 0
Accounts of Credit on do. do.	1,18,30,011 11 8
Mercantile Bills discounted at do.	1,96,62,727 8 11
Dead Stock	12,05,132 9 1
Stamps	14,242 8 0
Balances with other Banks.	3,65,855 8 10
Sundries	48,987 14 6
Cash and Currency Notes at Head Office.	1,37,70,127 4 11
Cash and Currency Notes at Branches	2,58,82,026 5 4
Total Rs.	9,42,27,944 6 3

THE NEW BANK OF BOMBAY.

Statement of Affairs.	9th Dec. 1871.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance at Head Office	2,33,77,400 0 0
Do. do. at Branches	15,66,343 0 0
Deposits at Branches	1,35,28,302 0 0
Bank Post Bills outstanding	31,476 0 0
Reserve	5,00,000 0 0
Undrawn Cash Credits	16,60,266 0 0
Total Rs.	4,66,63,787 0 0
Assets.	
Government Securities	52,17,905 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	16,40,103 0 0
Credits Accounts do. do. on Gov. Sec.	96,56,539 0 0
Current accounts, overdrawn	8,047 0 0
Bills discounted and purchased at do.	93,18,843 0 0
Dead Stock and Less written off	4,36,200 0 0
Stamps.	6,645 0 0
Balance with Agents and Correspondents.	3,84,653 0 0
Government Reserve Cash.	....
Cash and Currency Notes at Head Office.	1,82,33,774 0 0
Do. do. at Branches.	....
Bullion at Head Office and Branches	17,61,078 0 0
Total Rs.	4,66,63,787 0 0

THE BANK OF MADRAS

Statement of Affairs.	25th Nov. 1871.
Liabilities.	Rs. A. P.
Capital.	56,25,000 0 0
Public Deposits at Head Office	50,82,532 10 11
Do. at Branches.	34,08,299 13 8
Other deposits at Head Office and Branches	88,76,254 7 9
Cash Credits undrawn at do	1,95,176 9 0
Post Bills	4,051 9 5
Reserve Fund.	6,37,500 0 0
Rest	1,52,931 10 3
Total Rs.	2,89,81,746 13 0
Assets.	
Silver and Notes at Head Office	37,82,164 0 11
Silver and Notes at Branches	63,27,605 8 0
Government Securities	10,79,062 4 11
Government Reserve—Cash	25,82,532 10 11
Securities	....
Loans at Head Office and Branches	16,20,133 8 10
Accounts of Credit at Head Office and Branches	3,77,430 0 0
Mercantile Bills discounted at Head Office and Branches	54,76,622 12 10
Dead Stock at Head Office and Branches.	2,29,480 12 10
Bills of Exchange do	18,65,804 1 0
Due by other Banks.	6,40,911 0 0
Total Rs.	2,39,81,746 13 0

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54	4 per cent Loans.							4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
														2 years.		3 years.		5 years.	10 years.	15 years.	
		of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	of 1856-57.	Transfer Loan dated 15th July 1870.	P. W. of 1854-55.	of 1856-57.		Repayable Jan. 1869.	4½ per cent Transfer Loan.	Repayable Jan. 1870.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1888.	
15th March 1871.	53,100	34,133	2,347	19,62,347	41,41,100	1,53,45,300	1,23,92,200	1,67,04,200	14,500	48,73,500	70,200	5,95,92,400	4,81,89,600	.....	.....	1,65,000	18,60,000	33,85,000	33,46,000	33,14,000	17,57,72,227
15th April 1871.	53,100	34,133	2,347	19,62,347	41,34,600	1,51,66,400	1,22,97,800	1,59,07,500	14,500	48,28,100	69,700	5,78,69,000	4,81,63,400	.....	.....	1,65,000	18,60,000	33,15,000	33,46,000	36,50,000	17,29,43,227
30th April 1871.	53,100	32,640	2,347	19,59,680	41,37,000	1,50,80,000	1,23,92,200	1,51,24,800	14,500	46,36,100	69,700	5,72,51,800	4,69,84,900	.....	.....	1,65,000	18,96,000	33,15,000	33,46,000	36,00,000	17,00,24,767
15th May 1871	53,100	32,640	2,347	19,59,680	41,10,000	1,51,16,000	1,22,97,800	1,46,77,700	14,500	45,49,900	69,700	5,67,07,900	4,67,64,800	.....	.....	1,65,000	18,60,000	33,16,000	33,46,000	36,00,000	16,86,43,067
15th June 1871.	53,100	32,640	2,347	19,62.027	40,56,200	1,50,93,200	1,20,75,700	1,46,69,900	14,500	47,09,000	68,700	5,40,90,900	4,43,50,100	.....	.....	1,65,000	10,61,000	31,81,000	33,46,000	37,11,000	16,23,42,314
31st July 1871	53,100	28,906	2,347	19,57,653	40,95,300	1,49,21,600	1,23,24,700	1,42,85,600	14,500	39,43,700	67,700	5,30,05,900	4,36,00,100	.....	55,000	.....	.....	31,70,000	33,46,000	36,66,000	15,93,70,106
15th Aug. 1871	53,100	28,906	2,347	19,52,213	40,87,200	1,49,36,200	1,23,50,000	1,42,71,000	14,500	39,24,200	67,700	5,23,95,600	4,30,37,100	.....	55,000	.....	31,70,000	33,46,000	36,76,000	8,72,000	15,82,39,066
15th Sept. 1871.	53,100	28,906	2,347	19,52,213	40,88,700	1,49,79,900	1,22,53,300	1,41,22,000	14,500	33,32,800	10,700	5,09,77,100	4,32,52,800	.....	26,600	.....	.....	27,03,000	33,46,000	36,76,000	15,56,91,366

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 15th and 22nd days of November 1871.

Date.	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1871.							
7th Oct.	33,83,690	17,44,500	21,25,950	63,80,900	26,81,000	2,98,23,000	4,61,89,040
25th „	33,85,690	16,94,300	22,21,600	61,96,400	27,35,500	3,00,54,000	4,62,37,490
15th Nov.	33,79,150	17,43,080	23,05,550	63,13,700	26,18,000	2,86,43,000	4,50,02,480
22nd „	33,49,860	17,54,180	22,43,300	60,86,700	26,03,500	2,85,01,000	4,45,38,540

SILVER received and coined in the MINTS of CALCUTTA, MADRAS, and BOMBAY, 1870-71.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examine during the month valued in Rupees
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
March	607	1,089	...	...	...	...	...	4,84,798	2,02,999
April	1,874	2,058	...	...	357	...	14,174	2,43 515	50,474
May	493	536	...	...	..	...	...	1,73,804	2,00,456
June	56,025	12,866	...	...	...	...	15,964	1,31,480	2,03,382
July	2,197	15,832	...		...	...	...	46,973	...
August	33,651	62	...	...	...	...	..	19,257	...

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION, of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Returned by other Offices of Issue.	Currency Notes in circulation	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
31st Oct. 1871	Calcutta ..	1,34,55,170	4 61,210	1,29,93,960	1,68,65,876	34,58,488	72,495	1,42,42,231	3,46,39,090
Ditto	Madras ...	1,14,32,490	7,00,510	1,07,31,980	67,07,056	...	...	17,28,404	84,35,460
Ditto	Bombay ...	4,56,87,940	76,74,920	3,80,13,020	2,66,26,467	26,11,531	...	1,37,35,209	4,29,73,210
Ditto	Allahabad ..	37,38,840	3,64,170	33,74,370	17,27,169	...	...	11,03,291	28,30,460
Ditto	Lahore ...	84,50,000	12,19,050	72,00,950	75,36,373	...	...	7,00.037	82,36,410
Ditto	Calicut ...	13,73,930	1.42,680	12,31,250	7,20,321	...	...	1,00,059	8,20,380
Ditto	Trichinopoly	6,02,540	1,87,880	4,14,660	4,75,801	...	...	1,00,059	5,75,860
Ditto	Vizagapatam ...	3,94,370	18,690	3,75,680	2,67,331	...	...	1,00,059	3,67,390
Ditto	Nagpore ...	52,19,760	8,80,0 00	43,69,760	36,57,568	...	...	5,47,902	42,05,470
Ditto	Kurrachee ...	52,17,980	31,07,970	21,10,010	46,49,571	..	...	5,00,106	51,49,680
Ditto	Akola ...	54,87,890	2,31,930	52,55,960	48,38,190	...	...	...	48,38,190
	Total ...	13,10,90,109	1,80,19,310	11,30,71,600	7,10,71,726	60,70,022	72,495	3,28,57,357	11,30,71,600

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1870 71, contrasted with previous Years.

	April 1871.	May 1871.	June 1871.	Aug. 1871.	Sep. 1871.	Oct. 1871.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	3,78,93,140	3,27,89,228	3.99,40,681	3,92,77,872	3,89,72,852	3,59,15,905
Bengal	2,11,85,661	2,01,22,711	2,15,32,913	1,79,50,429	2,08,27,000	1,84,17,325
British Burmah	32,70,156	32,61,744	30,62,151	34,53,591	41,82,232	43,65,308
North-Western Provinces	1,81,59,055	2,25,97,199	2,68,11,724	2,54,18,247	2,26,47,816	1,96,68,189
Oudh	43,00,459	54,07,392	65,09,676	58,66,363	51,26,262	42,12,414
Punjab	1,19,88,811	1,11,44,344	1,33,45,801	1,26,99,032	1,30,89,900	1,13,10,001
Bombay	3,66,21,588	4,09,67,211	4,31,38,454	3,74,32,152	3,64,55,763	3,76,99,545
Central Provinces	78,27,972	86,43,209	89,58,742	82,36,688	79,07,239	76,69,827
Madras	2,87,66,337	3,22,41,593	3,11,87,203	2,71,84,195	2,34,57,269	2,07,68,534
	17,00,13,079	17,71,74,631	19,44,87,345	17,75,18,569	17,26,66,333	16,00,48,548
The same month 1868-69	13,05,88,834	11,73,38,501	14,22,29,01	10,02,49,204	9,04,93,920	7,89,69,348
Ditto 1869-70	10,45,09,269	13,63,02,461	11,81,90,260	12,29,02,765	11,28,90,937	10,73,15,338

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, MONDAY, 22ND JANUARY 1872. [No. 6.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden	From Bombay every Monday at 3 P.M. from Mazagon.
Suez	
Brindisi	
Malta	
Gibraltar	
Southampton	
Galle	Tuesday, the 30th January ; 13th, 27th February ; 12th, 26th March ; 9th, 23rd April.
Madras	
Calcutta	
Penang	
Singapore	
Batavia	
Hong Kong	
Shanghai...	
Japan	
King George's Sound... ...	Tuesday, the 13th February, 12th March, and 9th April.
Melbourne	
Sydney	

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London, Liverpool, and New York.

A considerable reduction has been made in the rates of passage money. For further particulars apply to

GEORGE F. HENRY,
Bombay, January 1872. Superintendent.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*. The Steamers "APIS" and "SPHINX" have only limited accommodation for a small number of Passengers. The rates for Cabin Passengers include food and table wine, transit through Egypt, and free conveyance of 3 cwt. of Luggage. For baggage in excess £4 per ton is charged.

The "SPHINX," 1,400 tons, will be despatched from Bombay on or about the 10TH FEBRUARY, and the "MINERVA," 3,124 tons, on or about the 10TH MARCH.

PASSENGER RATES FROM BOMBAY PER "APIS" AND "SPHINX."

	Cabin.	Deck with food.
To Trieste	£ 40	£ 19-0
To Port Said	„ 30	„ 14-6
To Suez	„ 28	„ 13-7
To Aden	„ 16	„ 7-13

The Imperial Mail Steamer "MINERVA," 3,124 tons, 430 H. P., which has excellent accommodation for a large number of Passengers, and carries a Doctor and a Stewardess, will leave Bombay on or about the 10TH MARCH.

RATES OF PASSAGE PER "MINERVA."

	1st Class.	2nd Class.	Deck.
To Trieste	£50 0	£35 0	£19 6
To Port Said	37 0	23 0	11 6
To Suez	36 0	22 0	13 7

Children under 3 years of age, FREE; above 3 and under 10 years, HALF FARE. Cargo taken for Trieste, Venice, Constantinople, Odessa, Aden, Egypt, England and the Continent generally.

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PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS ..... £13 | SECOND CLASS £9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together :—FIRST CLASS, £10-16 per head. SECOND CLASS, £7-10 per head.

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To Aden	£22	£15	£4
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Bombay, January 1870. W. NICOL & Co., Agents.

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THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870. W. NICOL & Co., Agents.

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WITH WHICH IS NOW UNITED

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An amalgamation having been formed between the *Standard Life Assurance Company* and the *Colonial Life Assurance Company*, the business of the united companies will henceforth be conducted under the title of

THE STANDARD LIFE ASSURANCE COMPANY.

The annual revenue of the Standard Company is now upwards of £630,000, and the accumulated funds amount to upwards of £3,500,000 sterling. The new business transacted during the past year amounted to the large sum of £1,375,000 sterling, the corresponding premium amounting to £45,337 per annum.

Moderate rates charged for residence in the Colonies, India, and other places abroad.

Local Boards and *Agencies* in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where premiums may be received and claims paid.

Immediate reduction of premium on return to Europe, or other temperate climate, without medical certificate.

Profits divided every five years.

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COMMERCIAL UNION ASSURANCE COMPANY.

HEAD OFFICE: 19 & 20, CORNHILL, LONDON.

Capital fully subscribed..... .....£2,500,000.
Amount paid up..... .. .. £250,000.

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BANKERS.

The Oriental Bank Corporation.
The Chartered Mercantile Bank of India, London and China.

SOLICITORS.

Messrs. Berners, Sanderson, and Upton.

LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent., of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid. Subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office.*

Yearly premium for the Assurance of Rs. 1,000.

Age next Birthday.	For the whole term of Life. without Profits.	For the whole term of Life. With Profits.	Age next Birthday.	For short periods, &c For One Year.	For Three Years.	For Seven Years.	
	Rs. a. p.	Rs. a. p.					
30	35 0 0	39 0 0	30				
31	35 0 0	39 0 0	31				
32	36 0 0	40 0 0	32				
33	36 0 0	41 0 0	33	33	Rs. a. p. Rs. a. p. Rs. a. p.		
34	37 0 0	41 0 0	34	& under 34	0 0 28 0 0 29 0 0		35 & under
35	38 0 0	42 0 0	35				
36	38 0 0	43 0 0	36	36	0 0 29 0 0 29 0 0		36
37	39 0 0	44 0 0	37	37	0 0 29 0 0 30 0 0		37
38	40 0 0	45 0 0	38	38	0 0 29 0 0 30 0 0		38
39	41 0 0	46 0 0	39	39	0 0 29 0 0 30 0 0		39
40	42 0 0	47 0 0	40	40	0 0 30 0 0 31 0 0		40
41	43 0 0	49 0 0	41	41	0 0 30 0 0 32 0 0		41
42	44 0 0	50 0 0	42	42	0 0 31 0 0 33 0 0		42
43	46 0 0	51 0 0	43	43	0 0 32 0 0 34 0 0		43
44	47 0 0	53 0 0	44	44	0 0 33 0 0 35 0 0		44
45	48 0 0	54 0 0	45	45	0 0 34 0 0 36 0 0		45
46	50 0 0	56 0 0	46	46	0 0 35 0 0 37 0 0		46
47	51 0 0	57 0 0	47	47	0 0 36 0 0 38 0 0		47
48	53 0 0	59 0 0	48	48	0 0 37 0 0 39 0 0		48
49	54 0 0	60 0 0	49	49	0 0 38 0 0 40 0 0		49
	55 6 0	62 0 0	50	50	0 0 39 0 0 42 0 0		50

The above rates will compare favourably with the *civil rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, at the Division of Profits, 31st December, 1867.

Age at entry.	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	£. s. d.	£. s. d.	£. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	108 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.* Medical fees are paid by the company.

Claims are paid *one month* after satisfactory proof of death.

Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.

The office is a comparatively young one (first policy issued in 1862), and *is therefore free from old liabilities.*

It possesses a very large capital, *the whole of which is fully subscribed.*

Its investments are all *of a first-class character.*

The life funds are allowed to accumulate *in special trust* for the primary security of life policies

The expenses of management are guaranteed by the deed of settlement *not to exceed 10 per cent of the premium income.*

The London Direction consists *of first-class city merchants, who look after the business themselves, who are all shareholders in the company, and nearly all of whom have been on the Board from the commencement.*

The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.

The first-class position which the office holds at home, *as shown by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bulloch Brothers
Bankipore	W. Fraser, Esq., Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Whentley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal
Ditto	Bank of Upper India.
Ditto	T. Lucas & Co.
Chittagong	Messrs. Bulloch Brothers.
Chumparun	James Begg, Esq.
Chumparun Districts	E. C. Lamb, Esq.
Cochin	Peirce, Leslie, & Co.
Coconada	W. M. Abell, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Jhansie	Buzenjee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Watters, Esq., Bank of Bengal.
Lucknow	W. Dickson, Esq., Bank of Bengal.
Ditto	W. A. N. Langdon, Esq.
Madras	C. L. O'Brien, Esq., Secretary to the Local Board
Moulmein	Messrs. Bulloch Brothers.
Meean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nagpore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq., Bank of Bengal.
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Rangoon	Messrs. Bulloch Brothers.
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Sylhet	E. G. Foley, Esq.
Sangor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Arhoot	E. Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December 1870, exceeded £127,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built and tiled, or roofed with metal, slate, or chunam.	Per Rs. 100 12 months	6 months	3 months	2 months	1 month
	as.	as.	as.	as.	as.
Private Dwelling Houses...	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade { Warranted that no jute or cotton in a loose state be deposited in the building. } from to	10	7½	5	4	2½
	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton..	16	12	8	7	4
Presses or screw-houses cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer*.
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,

No. 1, Hare Street, Calcutta, 31st March 1871. } C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, MONDAY, 22ND JANUARY 1872. [No. 6.

The Indian Economist.

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THE RISE IN PRICES.

WE pointed out in our last issue that there is a tendency to exaggerate the effects of the American war upon the modern range of prices in India, and to attribute the rise too exclusively thereto. We believe that careful enquiry would shew that it is to the Crimean war 1854-55, and the birth therewith of the oil-seeds trade of the country, that the rise is primarily attributable. The movement was marked and well defined, long before the American war, which simply intensified and strengthened it. In the papers recently published by the Bombay Government concerning the revision of certain talookas in the Ahmednuggur Collectorate in 1852-53, there is an interesting appendix in the shape of a memorandum by Colonel G. S. A. Anderson, dated August 1870. Colonel Anderson was formerly the Superintendent of the Ahmednuggur Revenue Survey and Assessment, and in this memorandum he reviews the results that followed the introduction of the new leases into the districts in question during the seventeen years of their currency, 1853-70. In doing so he gives us the following tabulated record of prices therein for the last twenty years:—

Years.	*Jowaree.*	*Bajree.*	*Wheat.*	*Remarks.*
1850	25½	20½	18½	Seers per rupee.
1851	31½	22½	20½	
1852	39	26½	22½	
1853	39½	32½	23½	
1854	24	19½	18½	
1855	27½	23½	17½	
1856	25½	19½	17½	
1857	29½	20	19½	
1858	26½	22½	20½	
1859 to 1870				

It is necessary to remind the reader that the quotations are given in the local and not the Indian seer, 115 instead of 180 tolas weight, and that jowaree, bajree, and wheat are the staple food of this part of the Deccan. The power of a foregone conclusion was perhaps never more clearly shewn than Colonel Anderson's statement, with this table before him, "that there was no very "decided or long continued rise in prices until 1862, the period of "enhanced values and profits from which the ryots have doubtless "benefited largely commenced therefore about the year 1862-63." Surely the table shews that the rise began in 1854. Let us average the term in periods of four years each:—

	Jowaree.	*Bajree.*	*Wheat.*
1850-53	33¾	25½	21½
1854-57	26¾	22	18½
1857-61	27	21	17
1862-65	14½	10½	9½
1866-69	16½	10½	9
1870	15	13	6½

We have omitted the year 1859 from the calculation, as the prices in that year would seem, from what Colonel Anderson says, to have been abnormal. Three facts seem to force themselves upon us:—(1) that the rise began about the year 1854; (2) that it was greatly intensified by the American war in 1862; and (3) that although it is now nearly six years since the close of that war, prices can hardly yet be said to have materially receded. Jowaree has fallen a little, and bajree somewhat more, while wheat has not fallen at all, but on the contrary has continued to rise. Now, while we should judge it both unsafe and unwise to calculate upon a continuance of the range of prices since 1862, we do not think there is any chance, in view of the steadily growing export trade of the country, of our ever seeing prices return to the level of 1854-57. For the basis of the new assessments therefore we might safely, it seems to us, take the average prices of the last twenty years. There is but one ground for fearing any very important fall in prices, and that arises from the effect of the Secretary of State's drafts upon the bullion imports of the country.

THE *Indian Observer* was doubting the other day whether there had really been any very material change in prices in the North-West Provinces during the last 30 years, beyond what was attributable to what it called the "oscillations of the seasons." If our contemporary will refer to Mr. Neale's Report of 15th April last, on the new assessment he proposes to levy in pergunnah Burtna, of the Etawah district, he will there find all reasonable doubt upon the matter set at rest. In para. 11 of the Report, Mr. Neale tells us that "it is safe to conclude that in the main land of the per-"gunnah, prices have about doubled, and across the Jumna a little "less than doubled," and in one of the appendices to the Report he shews the prices of the last 30 years to have been as follows:—

	1840-50	1850-60	1860-70
Wheat	31¼ seers.	28 seers.	21 seers.
Bejur	53¼ ,,	43¾ ,,	22½ ,,
Chenna	44¼ ,,	39 ,,	21½ ,,
Cotton	14¾ ,,	12¾ ,,	5 ,,
Goor	12¼ ,,	18¾ ,,	7½ ,,
Jowaree	65 ,,	42¾ ,,	28½ ,,
Bajree	60 ,,	44 ,,	20½ ,,

With these figures before us, who can be in any reasonable doubt of the vast change that has taken place in the price of produce in these Provinces? The total cultivated area of the pergunnah is 135,858 acres, and the chief crops are as follows:—

Cotton	21,043 acres.
Bejur	30,026 ,,
Jowaree	28,049 ,,
Bajree	24,759 ,,

Thus cotton has risen to nearly three times its price 30 years ago, while bejur, jowaree, and bajree are considerably more than double the price they then were. And yet the new assessment proposed by Mr. Neale is but 16 per cent. higher than the old, as we have noticed at length below. There is something radically at fault in our whole system of assessing.

THE American war came to a close in 1866, and the Exports of that year are officially declared to have amounted in value to

Rs. 65,40,11,230. The returns of the four years since and of the Imports are as follows:—

Exports.—1867	Rs.	47,72,00,000	
1868	,,	50,87,00,000	
1869	,,	53,06,00,000	
1870	,,	52,47,00,000	
			Rs. 204,12,00,000
Imports,—1867	Rs.	30,64,00,000	
1868	,,	35,70,00,000	
1869	,,	35,99,00,000	
1870	,,	32,92,00,000	
Add Nett Import of *Treasure* 1867-70	,,	40,10,00,000	
			Rs. 175,35,00,000
Deficiency of Imports	Rs.	28,77,00,000	

It is hardly possible we think that these figures should be correct, for the Secretary of State has been steadily drawing upon India for the Home Charges throughout the whole of this period at the rate, if we mistake not, of nearly £10,000,000 a year. The drafts for 1871 amounted to £9,800,000, and the deficiency in the imports must under these circumstances have been considerably larger than these figures would seem to shew. If these returns are to be any real worth, the Custom House valuations of the trade should be more closely looked after. The reader will be able to form some idea of the economic effect of the Home Charges upon the country by observing how heavily the bullion imports have fallen since 1866. The following are the returns from the date of the Mutiny:—

Nett Imports of Bullion into India.

1857-58	15,002,021
1858-59	12,154,795
1859-60	15,431,797
1860-61	9,560,578
1861-62	14,270,881
1862-63	19,308,313
1863-64	21,695,025
1864-65	19,918,762
1865-66	21,364,149
1866-67 (eleven months)	10,805,101
1867-68	10,203,428
1868-69	14,760,374
1869-70	12,012,154
1870-71	3,227,446

During the last year there has been an all but total cessation of imports, the Mints lying idle for months. Now this is a most abnormal state of things, and its effects upon the country will need to be watched with the utmost care. It arises from two causes: (1) The cessation of the American war, and the consequent fall in the value of the exports; and (2) The resumption of the Secretary of State's drawings for the Home Charges. There being no more guaranteed railway capital to pay into the India Office to meet these drafts, they are now steadily coming forward at the rate of nearly ten millions sterling a year—£800,000 a month. But for these drafts, India might have imported £13,000,000 of bullion in the year 1870-71 instead of £3,000,000 only. We pointed out several years ago the coming of this state of matters, and the Finance Department ought to concentrate its whole attention upon it. Silver is so rapidly absorbed in India by the propensity of the people to convert it into ornaments, or to bury it in hoards, that we may again find the evils of a restricted currency upon us almost before we discern the cause.

The following extract from a paper read by the Editor of this Journal before the East India Association in London in 1868, is perhaps of sufficient importance in connection with this subject to be reproduced:—

"I must be allowed to digress for a few moments, that I may refer to the unreasonable talk we hear of "the *abnormal* flow of bullion 'to India.' I affirmed, at the outset, that a flow of bullion to India was the *normal* condition of things, and its suspension unnatural and indicative of mortal sickness in the country. She has absorbed, you observe, 260,000,000*l.* of bullion in the last fifty years. Well what was the world's production during those fifty years, and what was India's fair share of that production? It is estimated then that the annual production of bullion during the thirty years ending in 1848 was 12,000,000*l.* sterling a year, excluding China from the account, as she stands outside the rest of the world in this trade. Since 1848, that is during the last twenty years, the production is estimated to have been about 50,000,000*l.* a year. To sum up then, the total production was:—

1819 to 1848	£ 360,000,000
1848 ,, 1867	1,000,000,000
	£1,360,000,000

Now, as I have explained, the condition of India is such, and her population so enormous, that *normally* she ought to carry off year by year a fourth of the total bullion yield of the world. In other words, she ought to have absorbed 340,000,000*l.* sterling of bullion since 1819, instead of 260,000,000*l.*, and certainly would have done so but for the Home Charges. Moreover, exhausted as the country was by the first half century of our rule, there were enormous arrears due to her, while she has not been able to absorb her fair share within 80,000,000*l.*

"But what if it should turn out that the so much talked-of import of two hundred millions of bullion is in large measure a delusion? Startling as the suggestion may seem, it is a fact that from these two hundred millions of bullion, we must strike off just one-half, thus reducing her nett imports since 1819 to little over one-tenth of the world's production. For *India is owing at this moment for one-half her bullion imports of the last twenty years.* In other words, she has received 100,000,000*l.* of that import, simply upon credit as a loan, and has to return every rupee of it. These imports have been possible, simply because the Secretary of State for India has been borrowing upon her credit during the period 100,000,000*l.* sterling in London. You will remember that I attributed the present prosperity of the country, in the first place, to the enormous growth of the export trade, and in the second, *to the suspension of the Home Charges.* Well, the Home Charges have virtually been suspended for the last eighteen years, and in this way. The *fiction* has been that the capital subscribed in England for the Indian railways was remitted to India. The *fact* is that not a shilling of the money paid by the railway companies into the India office has ever been so remitted. *It has been retained there to pay the Home Charges every year,* while the treasury in India has advanced every rupee that has been sunk in the works. It thus happens that though every sixpence of railway outlay in India has come from its taxes, the railways have still to be paid for. Instead of borrowing the money in London, openly and avowedly to meet the Home Charges, the money has been professedly borrowed for making railways; while it has been *used* to defray the Home Charges, and the Indian Government has constructed the railways out of the Indian taxes.

"During the Mutiny, moreover, the India office, without any disguise, suspended all effort to defray the Home Charges by drafts upon India, and borrowed 40,000,000*l.* sterling in London to meet them from 1857 to 1861. From these two causes then, India is to-day one hundred millions deeper in debt than she was twenty years ago. The claim for these arrears of Home Charges is now being presented in the shape of the Secretary of State's drafts month by month upon the Indian treasuries; and his drafts would be nearly double their present amount, were it not that he is still receiving large sums of money from the various railway companies, who have not yet paid up the full amount subscribed by them.

"The present position of India therefore is one which must excite the deepest concern in her friends. The ground that has been gained is in danger of being lost. The annual drain upon her resources, which twenty years ago was only 5,000,000*l.*, has now mounted up to 16,000,000*l.*, the drain being moderated however at present by the amount still paid year by year by the railway companies into the treasury in Downing-street. When that ceases, the drain will set in with full force upon her; and the question is, Can she stand up under it? The American war is at an end, and cotton rapidly finding its old prices. The opium trade rests on too uncertain a foundation to be confidently calculated upon; and *if it should ever disappear, I do not hesitate to avow my conviction that India will sink under this enormous drain upon her.*

"The wonderful prosperity of India of late years is directly traceable to the circumstances I have described:—1. The growth of the export trade; 2. The suspension of the Home Charges. The export trade has received a tremendous blow in the fall of cotton, and at this juncture we are resuming our demand for the Home Charges with arrears."

NORTH-WEST PROVINCES SETTLEMENTS.

RE-SETTLEMENT OF PERGUNNA BHURTNA, BY W. E. NEALE, ESQ.

In attempting for the first time, directly to review the work of the Settlement Department in the North-West Provinces, we feel it necessary to make the reader understand clearly at the outset, the special difficulty which embarrasses our officers there. Justifiably or otherwise, the State recognises throughout the North-west, a class of men whom it calls the proprietors of the soil. For the most part, these men themselves are simply cultivators, claiming an ancient prescriptive right to a monopoly of the village lands, and therefore the right to exclude all strangers therefrom. The best lands, in general, are farmed by these men themselves, and they let the remainder, or outlying lands of the village, to a class whom we allow them, under certain restrictions, to treat as their tenants-at-will. Having given these men the status of zemindars, or landlords, or allowed their claim to be so regarded, the assessment of a North-west talooka becomes a more complicated matter than that of a ryotwaree district, where the State deals directly with each cultivator, and recognises no middleman. Instead of fixing his regard upon the capabilities of the soil, the cost of cultivation, and the returns thereto, the Settlement Officer has to direct his chief efforts to ascertaining the *rental* exacted of his tenants by the zemindar. For the principle formally laid down for his guidance is that he is to *assess the land at half the rental*, or 50 per cent. of the nett assets, as it is technically called, in the Settlement rules. But the difficulty of ascertaining the real rental is so great, that its amount has to be assumed by the officer in almost every case. The difficulty of the inquiry will be seen from the following extract from Mr. Neale's Report:—

"Rent, as found recorded in the village papers, can hardly be called more than a distant and capricious index of the full value of the soil. It is scarcely more the result of competition and market prices, than of a balance arrived at between certain personal elements. The personal bias towards a high or low Government demand on the part of the officer who settled the estate, the disposition or ability of the zemindar to recover his own share in full from his tenants, and the power of the latter to compel or induce indulgent rating—all go far in determining the interval left between the amount of rent each village might pay, and the amount it does pay. Absentee proprietors, who take no personal interest in their estates, small zemindars living on terms of close intimacy with their tenants, the latter being in the majority of instances their relatives, and large coparcenary brotherhoods, who form too clumsy a body to act in unison, are almost always found to underlet their estates. Again, there are landlords in this district who, on sentimental grounds, never enchance; one from a sort of religious quietism, another from a wish to maintain his influence unimpaired in his village. This latter however compensates himself by buying up produce below the market rate: and a third is said to have till recently kept a lock-up, dispensing justice, and pocketing the fines of offenders in cases of trifling importance. In fact, it is hardly doubtful that powerful zemindars, where they let at low rates, have means of reimbursing themselves, which are not avowed. And finally, to these classes must be added that class of proprietors, largest of all, who, from pure indolence, never work up their estates to their full value. The opinion of all Native district officials and of all European by-standers—such as indigo-planters and others, who have an opportunity of judging—is unanimous in supposing that concealment is tolerably universal, and no general argument or extensive proof to the contrary has ever yet been made good.

This extract leads us to hazard a general remark concerning Settlement proceedings in the North-west generally. In so far then as the record of these proceedings has come under our notice, it certainly seems to us that far too much effort is expended upon this question of *rental*, and far too little upon the actual returns to cultivation. The settlement of Mr. Bird was framed upon the principle of taking 66 per cent. of the net profits of cultivation. In 1854 the department was directed by Circular Order to reduce the assessment in all cases from 66 to 50 per cent. But in recent Settlement proceedings in the provinces, it seems to be the rule to waive all close enquiry into the profits of cultivation whatever, and to assess the land at half the rental supposed to be exacted by the zemindar. But the two quantities may be—and we are persuaded, are—anything but an equation. So much attention is concentrated upon the rental which the zemindar levies, that the assessment which the land ought to pay appears to drop out of sight altogether. Thus Mr. Neale tell us (para. 11) that "it is safe to conclude that in the main land of the pergunnah "prices have about doubled, and across the Jumna a little less "than doubled." Under these circumstances we might reasonably have expected, under the half-assets rule if it really be the rule—an assessment approaching to double the former amount. Instead of which the total enhancement upon the pergunnah is just 16 per cent! As to the immense rise in prices there can be no doubt. Mr. Neale's figures are as follows:—

	Wheat.	Bejur	Cheena.	Cotton.	Goor.	Jowar.	Bajree.	Total.	REMARKS.
	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	M. S. C.	
Puchar and Ghar, ...	0 31 8	1 13 9	1 4 6	0 14 2	0 12 4	1 24 11	1 20 0	7 0 7	First 10 years' average.
Do.	0 27 15	1 3 4	0 35 14	0 12 14	0 13 2	1 2 7	1 3 14	5 22 6	ditto. 2nd
Do.	0 24 1	0 22 12	0 21 4	0 5 7	0 7 7	0 29 12	0 28 8	3 16 3	ditto. 3rd
	0 27 13	1 0 0	0 34 13	0 10 13	0 10 15	1 5 2	1 3 7	5 12 15	30 years' ditto.
Rice per Cent.	23·33	54·9	60·85	60·71	39 0	55·37	55·83	51·4	
Par.	0 32 0	1 0 0	0 33 12	0 12 9	0 12 0	0 37 8	0 35 0	5 2 12	First 10 years' average.
Do.	1 10 0	2 20 0	2 0 0	0 15 0	0 12 0	2 0 0	1 35 0	10 12 0	ditto. 2nd
Do.	0 26 0	1 0 0	0 30 0	0 12 8	0 13 0	1 0 0	0 37 8	5 1 0	ditto. 3rd
	0 36 5	1 20 0	1 7 14	0 13 5	0 12 5	1 12 9	1 9 2	6 31 15	30 years' ditto.
Rice per Cent	12·5	....	11·11	....	Dec. 8·33	Dec. 8·33	Dec. 7·142	1·72	

The table is somewhat clumsily constructed, but the following figures will shew its significance at a glance:—

Average Prices per Rupee.

	1840-50	1850-60	1860-70
Jowaree	65 seers.	42 seers.	20 seers
Bajree	60 ,,	44 ,,	28 ,,
Cotton	14¼ ,,	12¾ ,,	5¼ ,,
Bejur	53½ ,,	43¼ ,,	22½ ,,

Now these crops are the staples of the district, occupying nearly 105,000 acres out of a total cultivated area of 1,35,000, and the quotations show clearly that the rise has been steady and continuous, and that prices have *more* than doubled during the currency of the old leases. But why did Mr. Neale not give us the prices of the ten years *preceding* the old settlement? For it was upon the prices of those years that the former assessment was based, and to make an effective comparison of the present assessment therewith he ought to have given us earlier prices. What he has given us however, will answer our purpose well enough. How then we ask, can Mr. Neale possibly justify to himself, or to us, in view of these prices, the proposal to fix the new assessment for 30 years to come at an enhancement of no more than 16 per cent. upon the old one? Is it not as clear as the sun, that the half-assets rule has been dropped out of the question altogether, and that the assessment has been fixed upon considerations that we submit ought to have no place therein whatever? At all events we stand upon one or other horn of the dilemma that either the old assessment was ruinous, or the new one is ridiculous. Mr. Neale states his belief indeed that "on the whole" the former assessment *was* heavy, and it must have been heavy indeed if the new one is not absurd. And in favour of whom is this abandonment of the State rights made—for that is really what it is? Let the following extract tell:—

Mr. Gubbins carried out an anti-talookdaree policy, and broke up all the large estates settling them either with the tenants, or where these

could not scrape together the required amount due for arrears, selling them by public auction. The result has been the establishment of many poor coparcenary communities in the one case, while in the other most of the estates have accumulated in the hands of two individuals, keen speculators, who had enterprise enough to invest in land when it was at a discount. These persons, who have already been referred to in para. 14, are both Brahmins,—one was the agent and servant of Rao Khooman Singh, much of whose talooka he now owns, and the other a money-lender and trader. Both have resolutely bought up land wherever they could find it, and they now own 32 whole villages, and 13 shares in villages, besides innumerable mortgages. The annual admitted profits on the original outlay amount in the case of one of them to 13 per cent. after deducting all village expenses. Probably the real profits are from 20 to 23 per cent. As landlords, both these new zemindars are well spoken of by their tenants, though they have everywhere raised the rents. They are however always ready to make advances at from 24 to 30 per cent., sometimes 36; they seldom or never resort to the Courts, and are always ready to renew the loan at compound interest. Both the parties speak of this system with equal freedom; the tenant admits with indifference that his utmost efforts can never relieve him altogether, and that it merely depends on a good or bad harvest, whether he is a little more or a little less in debt than before. How his account stands he does not pretend to know, for he cannot read. The profit accruing to zemindars who combine usury with farming is thus enormous, and if the usurer is a distinct person, the result is the same for the cultivator. The mass of the profits of his cultivation goes in interest, especially as accounts are settled in kind at harvest. The money-lending zemindar thus gets grain cheap, and keeps it till the market rises, and the tenants, as they say of themselves, "are as ants beneath the foot of an elephant." As long however as the elephant does not absolutely crush them out of existence, they are content."

And Mr. Neale proposes to hand the talooka over for 30 years to come to these zemindar-usurers at an enhancement of 16 per cent. only upon the former assessment, although prices have more than doubled since that assessment was imposed. The State will have to make short work with these zemindar rights, we fear. Here is a district through which we have sent a railway (costing £25,000 a mile) and a canal in the last few years (para. 1) with the effect of doubling the price of all the produce of the district, and we are now to be content it seems with an enhancement of 16 per cent. upon the assessment of 30 years ago, for 30 years to come. Such an enhancement will not even pay the interest upon the cost of the great public works carried through the district. This whole question must be grappled with by the State in earnest. We are now only playing with it.

THE NEW LEASES IN DHARWAR.

As THE leases of some of the Dharwar talooks will be falling in immediately, and we believe it to be certain that these districts will admit of a very heavy enhancement of the assessment, without interfering in anyway with the well-being or progress of the people, we think it desirable to point out to the Government the propriety—we should be justified in saying the necessity—of submitting the terms on which it is proposed to renew these leases, to public criticism, *before* sanctioning them. The demand is so reasonable, and the necessity for it so obvious, that we shall resent warmly any attempt to renew them without submitting their terms to the approval of the public. The mistakes which have been made in these Settlement Proceedings in the last few years, justify and necessitate the demand that before sanctioning any more of them, the Government shall loyally submit them to the criticisms of the press. Of what use is it, we ask, to tell us all about the Soopa settlement, or the settlement of Indapoor, when their terms have been formally sanctioned, and the new leases issued to the people? It has been made abundantly clear within the last two years, that the proceedings of the department have *not* been revised by the authorities, whose business it was to revise them, but in the most perfunctory and superficial way. No new Settlement whatever ought to receive the sanction of the State, until at least six months after public proclamation of its terms. The land, at all events in *this* Presidency, belongs to the Commonwealth, and if it is again to be leased for 30 years upon terms at all approaching the former ones, full opportunity should be given to the public to express a judgment upon the reasons adduced for such renewal. We are, far from wishing to see competition rents introduced into Bombay but in renewing these leases it should be borne in mind that the right of occupancy is simply a right to hold at "a fair and reasonable rent," and that if the rent is pitched so low as to be *unfair* and *unreasonable*, a great wrong is inflicted upon the urban classes, who have just as much right to the enormous margin of profit abandoned to the cultivator, as the cultivator himself. That owing to the revolution which has taken place in prices in the country in the last 20 years, the Dharwar assessments have become all but nominal is certain. It is now twenty years since Colonel Wingate recorded the following testimony as to the accumulations of capital made at that early date (1852) by the farmers of Dharwar, under the new Settlement:—

> These accumulations in the aggregate are, I am certain, from personal observation and enquiry, quite enormous. From the improved cultivation of this Collectorate, the many improvements such as the conversion of dry crop land into rice land, the construction and repair of small tanks by the cultivators, the planting of trees, the building of houses, the purchase of carts, &c., of which evidences meet the eye at every turn, I am quite satisfied that I do not overstate the fact in saying that the capital now employed in agriculture is double what it was eight years ago, when the first survey settlement was made. The success of the settlements in Dharwar has gone beyond my most sanguine expectations, and it really would be difficult to paint it in too high colours.
>
> The cultivators are chiefly Lingayuts, and, as a class, are intelligent and frugal, except on great occasions, such as marriages, &c., and with a keen love for money and great aptitude for trading. Many of them lend money to their poorer neighbours, and in addition to their agricultural operations take up the trade of the Marwarree in the Deccan, besides.
>
> As an instance I may mention—— ——of Gudduck, a small agricultural town, about 40 miles from Dharwar, who died last month, leaving a fortune of 9 lacs of rupees, of which the better half is said to have been made within the last five or six years, by fortunate speculations in cotton, *i. e.*, since the survey settlements gave the great stimulus to the extension of the cultivation of the crop. He contracted with the cultivators for the crop at a certain price, and made them advances of capital to enable them to grow it. The same course was followed by hundreds of others; and the hoards of these Sowkars, which before the new settlement had lain unproductive in the shape of coin and jewels, were, on the reduction of assessment, drawn forth and applied to agriculture. I have no doubt whatever that a very large amount of hoarded unproductive capital was liberated in this way by the introduction of the new settlements. I know of many instances of it myself, and have no reason for believing that such instances were at all exceptional.
>
> However this may be, by far the greatest effect has been produced by accumulations of capital by the farmers themselves, consequent on the greater profits obtained under the new settlements.

Now this was written in 1852, twenty years ago, and *before any rise in prices whatever had taken* place, and if these men had grown thus rich, and had made immense accumulations of capital even then, what we ask, may their circumstances reasonably be believed to be to-day? They have grown rich by the wise moderation of the State, and the time has now come when it is but just and fair to all other classes, that the wealth conferred upon them in the abandonment of the State claim to the rental of their land, should yield its full quota towards the reduction of taxation upon the towns, which depend for their wealth solely upon their own industry and frugality. The question has really come to be this:—Are we going to convert the right of occupancy which we cheerfully allow these men to possess, into a positive landlordship of the soil, by abandoning to them for another generation of years, almost the whole rental of their lands? If the assessment was so low twenty years ago, that Colonel Wingate could justly describe the accumulations of capital thereunder as "quite enormous," what can the assessment be now? We know exactly what its amount was then, and what it has remained ever since, *namely* 14 *annas per acre*. Let then the Settlement department and the Government understand distinctly that any attempt to renew these leases, upon terms at all approaching 14 *annas per acre*, will not be allowed. We rejoice heartily at the good fortune of these men, but it is now our turn to have a share in it. Let no one think we want to rack-rent the Dharwar ryot. We simply want to see the new leases issued to him upon fair and reasonable terms; such terms as the State necessities and the revolutionized condition of values in the country, compel us to insist upon;—such terms as Wingate and Goldsmid themselves would have imposed.

INCIDENCE OF TAXATION,

BOMBAY.

A CURIOUS illustration of the general incompetency shown in dealing with economic questions in this country, was furnished a little while since by one of the Bombay journals, which introduced to its readers with a good deal of ceremony a paper upon the incidence of the municipal taxes in Bombay, which it declared to be the production of a very able citizen of that town. A more feeble production could hardly have been essayed upon

the subject, the writer plainly not understanding the process, by which alone the enquiry could be conducted. The substance of the memorandum was as follows:—

If it be an axiom in well-regulated taxation that "every individual in just proportion to his means ought to contribute to the expenses of the State," I think these figures will show satisfactorily that the incidence of taxation in Bombay is contrary to such an axiom, that the richest classes of this city are not taxed in just proportion to their means, and that the burden of Municipal taxation increases in proportion as it descends the social scale of the people paying it. One of our wealthy citizens with a yearly income of, say, 1¼ lakhs, contributes at the rate of scarcely ⅛th per cent. therefrom towards Municipal expenditure, while the daily labourer and working man, out of his scanty annual earnings, contributes for the same purpose as much as 4¼ per cent.

The indirect taxes at present levied in Bombay for Municipal purposes are as follows, and I am here quoting the figures of last year:—

Town Duty	On Grain and Pulse	Rs. 1,77,669
	On Wines and Spirits	,, 1,21,358
	On Beer	,, 10,042
	On Ghee	,, 1,06,584
	On Timber	,, 56,126
	On Metals	,, 51,306
	On Sugar	,, 1,07,639
		Rs. 6,30,144
	Less refund, &c. ..	.. ,, 13,437
		Rs. 6,16,707
	Tobacco Duty and Licenses ..	.. ,, 1,39,830
	Liquor Licenses	.. ,, 1,23,092
	Total Indirect Taxes	.. Rs. 8,80,229

A glance at the above items will show that these indirect taxes fall with almost scrupulous equality on all classes of the people. Of grain and pulse a larger quantity is consumed by the labouring than by the other classes. Ghee and sugar are largely consumed by those well-to-do portions of the natives who contribute little for wines and spirits, while again, on the other hand, the tobacco duty and liquor licenses may be said to fall almost exclusively on the lower orders. Therefore assuming the present population of Bombay at 8 lakhs (a number which is supposed by some to be an over-estimate), the above amount of indirect taxes comes to Rs. 1-1-8 per every man, woman, or child, or taking five as the average number of each family, it would amount to Rs. 5-8-4 per family. Thus Rs. 5-8-4 would be the annual contribution in Bombay to the Municipality in indirect taxes by each head of a family indiscriminately, whether a wealthy land-owner or capitalist with an income of 2 or 3 lakhs of rupees a year, or a poor carpenter earning but Rs. 15 per month.

The writer does not seem to know that the only way to show the incidence of the indirect taxes upon a city or empire, is to make careful enquiry into the *consumption*, by each class of the population, of the articles taxed. The author of this memo., it will be seen, simply divides the annual yield of the indirect taxes by the number of the people, and assumes that the quotient represents their incidence upon every man, woman, and child therein. In the next place, he assumes that every adult man in Bombay is the head of a family of five persons, and proceeds to multiply his quotient by five; and then holds up the product as the amount contributed by the labouring classes to the town duties. But the chief peculiarity of the labouring population of Bombay is that it is an *adult immigrant population* whose families are living in the Mofussil. The census of 1864 shewed clearly that the labouring class of the island is, in the main, an adult labouring class of both sexes burdened with very few children. Now this is a statistic fact which must be taken into full account in such calculations as that under notice. There are for instance 54,000 harbour and boatmen in Bombay; 94,000 domestic servants; 34,000 hamals, ramoosees, and soldiers; 40,000 musicians, prostitutes, and beggars; and 300,000 of the workman class; while the author of the Memo. assumes that four out of every five of these classes are women and children, and that the fifth pays the taxes of the other four. In the last place, he assumes that the house-tax and the direct rates fall equally upon the population in much the same way, forgetting that the assumption is denied, and that a strong *primâ facie* presumption lies against it, in the fact that these rates fall upon no more than 25,000 persons out of 800,000.

If the author of this memo. were to study Mr. Dudley Baxter's book upon the Incidence of Taxation at home, he would there see the process by which alone an enquiry of the order he has attempted can be conducted. He makes the wild assumption that every working man in Bombay has to pay for the consumption of five persons who dispose of as much wine, beer, spirits, tobacco, metals, timber, sugar, ghee, and grain as the English merchant, or the Parsee millionaire, at the head of a family of the same number, and then says: Behold! what the indirect taxes are. He might prove in the same way that the property and income-tax at home falls at the rate of 4s. per head upon the working man, who is exempt from it altogether. Large classes in Bombay never touch wine, beer, spirits, or tobacco; eat sugar only on rare occasions as sweetmeats; contribute the most infinitessimal sum to the metal and timber duties; and pay their share of the indirect taxes simply in the impost upon their own personal consumption of grain and ghee. It is doubtful indeed if they pay any part of the impost on even those articles, owing to the unintelligent way in which the impost is levied. For all practical purposes, the working classes of Bombay, when temperate, pay no municipal taxes whatever, and the proof is patent to all candid enquirers.

As to the so-called House-tax of the island, we pointed out several years ago that the men who drafted Act II. of 1865, and the Council which passed it, were under the belief that the tax which the bill imposed upon the owners of real property in the island, was of the same order as the parochial rates levied upon the occupiers of houses in England. That their so-called house-tax was simply an income-tax in disguise, never presented itself to the mind of anyone, although the fact that the tax was a special tax upon house-owners, seems to have been hazily floating in the mind of the Council. The Indian house-tax is unknown to English municipalities, for it is simply an income-tax upon one kind of property, veiled under the name of a house-tax. The speeches of the Advocate General of Bombay in Council in 1865, show beyond the possibility of question, that the Municipal Bill was passed through Council, under the belief that the system being set up in the island was the English system. One speech of Mr. White's is of so much importance to the correct understanding of the controversy, that we re-produce a passage from it:—

"Taxes," said Mr. White, "should not be raised by illegiti-
"mate means, by means of town duties, [we are puzzled to
"know where the speaker got hold of this notion.—Ed. *I. E.*] of
"license duties, of capitation taxes, or any of those objec-
"tionable methods of taxation which had long ago ceased
"in England. The proper source out of which the municipal
"expenditure should be met was the lands, houses, and
"buildings of Bombay, forming an enormous capital out of
"which a very large sum could be raised. It was out of
"the same capital that all rates for county, town, and paro-
"chial purposes in England came, and there was no reason
"why they should not be raised from the same source here in
"India. The Council was aware that in England the taxes
"amounted to 30, or in some places 40 per cent. on the rental
"which a man paid, and everybody who had lived in England
"knew that the question which was asked when a house was
"about to be taken, was not so much what rent there was to
"pay, as what taxes there were to pay. A man might pay
"£100 a year of rent, and he might have to pay £40 more for
"taxes. Bombay was very highly favoured as regards taxation,
"because a great deal of the expenditure here was borne
"by the Government, which in England was thrown upon the
"parishes and towns. He did not need to remind the Council
"that in Bombay there were no poor rates, which in England
"constituted a very heavy tax. There was nothing corres-
"ponding to a great portion of the county-rate, for instance,
"the rate on gaols, and there were no Church rates. The
"Justices now raised a tax of 5 per cent. on houses and lands,
"and the bill empowered them to increase the rate to 10 per
"cent. Why then should they not increase it to 10 per cent.?
"If the Council repealed the [town] duties as he proposed, they
"might force the community to increase the house-tax. He
"(Mr. White) thought 5 per cent. on houses and lands was a
"ridiculously small sum to be levied in this town. If he had
"been asked, he should not have hesitated to give the Justices
"power to increase the tax to 20 per cent."

This passage admits of no misinterpretation. The speaker

honestly believed that the house-tax of Bombay was the same kind of tax as the direct parish rates of an English municipality. He was imposed upon by the traditional designation which the tax bore, a house-tax. He did not know that under this specious name, the tax was simply a disguised income-tax, an income-tax upon *rents* alone, in a community the great mass of whom are merchants and traders. Now this hopelessly confused speech, nay the very extract we have made from it, was quoted before the Bench in 1868 for its great political wisdom, the Justices being as hopelessly confused upon the subject as the speaker. "The proper source," says Mr. White "out of which the Municipal expenditure should be met, is the lands, houses, and buildings of Bombay, forming an enormous capital out of which a very large sum could be raised. It was out of the same capital that all rates for county, town, and parochial purposes in England came, and there was no reason why they should not be raised from the same source here in India." Well let us designate this capital 'A,' and proceed :—"The Council was aware that in "England the taxes amounted to 30, or in some places 40 "per cent. on the *rental* which a man paid, and everybody "who had lived in England knew that the question which "was asked when a house was about to be taken, was not so "much what rent there was to pay, as what taxes there were to "pay. A man might pay £100 a year of rent, and he might "have to pay £40 more for taxes."

But this is plainly no longer 'A.,' but something else, B. For 'A' represents rates for county, town, and parochial purposes coming out of *capital*, out of the owners of lands, houses, and buildings, rates unknown in England. The rates levied there, are the rates described as falling upon the *rental* of the occupier, and which we designate B; rates of the same order as the Bombay police and lighting rates. The Bombay house-tax belongs to the class of taxes known at home as taxes on income, and not perceiving this difference, but jumbling one of the schedules of the English income-tax up with the parochial rates of the kingdom, Mr. White positively wanted the Council to empower the Justices to raise the tax to 20 per cent. or four shillings in the pound upon all income from land and houses, leaving all other sources of income untouched. But the Bombay community is a trading community. There are very few wealthy landlords in the place. Five-sixths of its wealthy classes are native merchants and shroffs, European houses and banks, and the class of native speculators. The landlord class is a very small and uninfluential class. It has been affirmed that there are only fifteen really wealthy landlords in the island, while the Municipal Bill singles out this class for a very heavy income-tax; an income-tax of 17*d.* in the pound which can be raised under the Bill to 2*s*. And the publicists of Bombay wonder and protest against our stigmatizing such a system as confiscatory.

The economists declare, as we have pointed out over and over again, a house-tax to be one of the fairest and most unobjectionable of all taxes, only when "it falls upon the occupier." As levied in Bombay, the tax has been a property or income-tax. We make the owner pay, and give him no power to recover from the tenant. If we are to have an ever-augmenting property-tax in Bombay, then it ought to be supplemented by a tax upon profits and wages, rising *pari passu* with it. When the Municipal Bill of 1865 was upon the anvil, there seems to have been no one in Council who had any exact idea of the system of taxation of which the bill was an embodiment. A vague sort of notion pervaded its members, that if a tax was put upon houses, the tax would find its way to the *occupier*, and that therefore the tax was a just tax. If the tax really *did* find its way to the occupier, it would be an unobjectionable tax for a part of the Municipal means; but as a matter of fact, the tax does *not* reach the occupier, does not touch him, but falls all but wholly upon the house-owners. The assumption that it reaches the occupier is based of course upon the belief that it *ought* to reach him. This is allowed. Well, if that be so, on what principle do we force the house-owner into the position of the Municipal Collector? Why is the tax not levied directly upon the right person? It is right to add that we believe Mr. White himself was long since convinced of the error made in the Bill.

THE SETTLEMENT DEPARTMENT:

A PROFESSION.

Has it never occurred to Government, as the great landlord of India, that it is very desirable that it should have a body of servants in its employ acquainted with scientific agriculture? Now that we have made up our minds that the State shall not trifle away the interests of the Commonwealth in the soil, is it not time that we enlisted in our service a body of gentlemen possessing a practical knowledge of the best and most profitable modes of cultivating that soil? The neglect of our great Estate has surely lasted long enough, and it is time that somethin g were done for the improvement of its husbandry. We trust the time has come when Government recognizes the fact that the Settlement Officers of the country are not a mere provisional body engaged in temporary service, but that they form the nucleus of what must be a great and permanent and distinct branch of the Administration. We are not surprised that appointments to the Settlement department should be the ambition of the great majority of the younger servants of Government, but we *are* surprised that so little attempt has yet been made to give these gentlemen the technical education which it seems to us every Settlement Officer ought to possess. The reports of the department constitute a rich and unique literature of which any people might be proud. But these reports, able as they are, shew clearly how susceptible the whole system of our land revenue management is of improvement. Thus many of the officers of the department are themselves painfully conscious of the disadvantage they are under in these Settlement Proceedings from having no practical acquaintance with agriculture. Settlement work is not yet made sufficiently a *profession*, and we would very earnestly suggest to Government the propriety of requiring its officers to go through a course of scientific agriculture in one of our agricultural schools at home, and to make a thorough acquaintance with one or two of the best writers on political economy as it affects production. We are but just beginning to discern what we have to do in India. The chief thing of all, is the administration of the land, and were Government to require all the younger members of the Settlement department to go through a course of agriculture in one of the European schools, giving them the necessary two or three years leave for the purpose, the country would possess in the course of a few years a body of administrators, such as was never yet seen in the world. With such a staff, the Agricultural department would revolutionize the husbandry of the country, and double its production we believe within a very few years. The Settlement departments of the country should be made, we say, a permanent and scientific body. They are characterised already by an amount of administrative talent that has never before been seen in the world, and were we to complete the education of these gentlemen by making them pass through a course of agriculture at the great European schools, we should we believe take the most direct course open to us to improve the husbandry of India. They want educating with closer reference to their employment, and should be taught to consider Settlement work as a *profession* to which their whole mind should be given. As a rule it *is* so given even now, from the fascination which the work seems to possess, and if we will but give to these young officers a technical acquaintance with agriculture, we shall find in them a staff of Administrators who will do all that men can do to stimulate the enterprise of the people, and develop the latent powers of the soil.

THE LATE PROFESSOR GREEN AND COL. WINGATE.

The late Professor Green of Bombay, after a careful and prolonged enquiry in 1852 into the results of the New Revenue Set-

tlement of this Presidency, which had been then in operation for eight or ten years in certain talooks of the Deccan, summed up the conclusions at which he had arrived in the following six propositions, which he submitted to Colonel Wingate, whose comments thereon, to each severally, we append :—

1st. The reduced rates appear almost everywhere to be followed by a rush on the land, and far more land is taken up than the ryots have properly capital for, leading, as a necessary consequence, to a great deal of very slovenly cultivation.

Note by Colonel Wingate.

"1st. The deficiency of capital may have been compensated by increased industry, and the evidence seems to shew that it was so to a considerable extent. The slovenly cultivation referred to under this head, is not I think proved, unless it refer to the new land taken into cultivation immediately following the introduction of the new settlement."

2nd. There occurs subsequently, in almost every instance, a period of reaction. Cultivation carried on without sufficient capital exhausts the soil, and a time usually arrives when the lands reported in the annual revenue returns as thrown up during the year from "poverty and exhaustion," that is to say from the poverty of the ryots and the exhaustion of the soil, to which may perhaps be added, though this is less certain, from the discouragement arising from glutted markets, exceeds the new land taken into cultivation during the same year.

Note by Colonel Wingate.

"2nd. I am not satisfied that cultivation carried on without sufficient capital exhausts the soil. It is not in my opinion the want of capital so much as a bad style of farming that exhausts the land. It is continued cropping without manure that does the evil, and the greater the capital employed in this style of farming, the more rapidly will the exhaustion proceed, because the heavier will be the crops taken off without anything being given to the soil in return."

3rd. This reaction—this unfavourable balance of lands thrown up over new lands—taken into cultivation, is in no case very important in amount. The gross produce in spite of the imperfect tillage being, from the greater breadth of land under cultivation, decidedly greater, agricultural capital does everywhere on the whole increase as do also, although (except perhaps in Dharwar) very much more slowly than could be wished, the exports which are to relieve the overstocked markets.

Note by Colonel Wingate.

"3rd. The remarks on 1st paragraph apply with greater force to this. I am not aware of anything in the evidence that supports the conclusion that, *after the reaction*, the land in cultivation is more imperfectly tilled than before the settlement. This is a point to be established by testimony more than by statistics. Frere's account of Indapoor and my own observation, if not overbalanced by the evidence of equally competent witnesses, lead, I think, to the conclusion that improved tillage is a general result of the survey settlements, and consequently that a gross produce has been increased by this, as well as by extension of cultivation. A further inference from this would be, that agricultural capital increases not slowly but rapidly. Without having seen your appendix on prices I am not in a position to offer an opinion on your conclusion that the markets are overstocked. Prices in this country are ultimately dependent on the necessity of exporting enough to meet our Home Charges, and this will probably always keep them at a low standard."

4th. In the best districts some improvement is perceptible in the style of agriculture, and in the implements in use among the people, the result of increased means, and of an increase of independent feeling and energy on the part of the ryot. We have already noticed the successful introduction of New Orleans cotton, and of a modification of the American Saw Gin ; and we may here add to them the rapidly increasing number of convenient light two-wheeled bullock carts—a conveyance introduced into these provinces by our revenue officers. The only Collectorate from which we have been able to obtain returns under this head, is the Sholapore one ; and for that district the statement is as follows :—

1834-35, Number of carts in the district	430
1846	1,907
By last returns	2,643

Also in Kurmulla, a talooka previously included in the Nugger Collectorate, but now combined with Sholapore.

1846	391
By last returns	983

Note by Colonel Wingate.

"4th. The remarks on the improvements in tillage already given, apply also here. I may as well mention in this place, that I greatly understated the number of saw gins sold to natives in this Collectorate [Dharwar] in a former letter. I have now obtained from Mr. Blount the Superintendent of cotton experiments in this province, the following information as to the number, size, and price of gins sold in this Collectorate up to the present time, which may be relied on as correct :—

Number of Gins sold.	Number of Saws in each Gin.	Price of each Gin—Rs.	Price of the whole—Rs.	
1	25	225	225	All purchased by Natives.
2	24	225	450	
3	20	220	660	
48	18	200	9,600	
9	14	170	1,530	
3	13	170	510	
5	10	100	500	
1	8	80	80	
115	7	50	5,750	
187			19,305	
5	Purchased by European dealers.			
192	Total number sold up to this time.			

"The first sales were made in 1848, so that in four years the cotton dealers of this Collectorate have invested 20,000 rupees in the purchase of these machines. This is I think a fact worth recording, and I wish you could manage to substitute it for the former incorrect allusion to the number sold."

5th. There is on the other hand everywhere a lamentable amount of indebtedness, and of a thraldom to money-lenders most depressing in its effects on the ryots' energies. But this again is certainly diminishing in the best districts, and perhaps also very slowly in the others.

Note by Colonel Wingate.

"5th. I agree entirely with you in regard to this head. Have you noticed a sad illustration of its correctness in a report published in the *Bombay Gazette* of 6th instant, of a village money-lender in the Sholapore Collectorate having been murdered by some of his debtors, under circumstances that give strong grounds for suspecting that the whole body of villagers approved of the deed ? This casual withdrawal of the curtain for a moment discloses a state of things quite appalling, if we consider the case, as it is to be feared we must, as a result of the general relations which our administration of civil justice has brought about between debtor and creditor in agricultural villages."

6th. Although whoever set himself to look for pauperism and misery in the province, may find quite enough of them to excite the most painful feelings in him ; and although the five shillings an acre of returns from the land, and the shilling or fifteen-pence of rent tell a most sorrowful tale of wretched unskill, unenergy, and unproductiveness generally, and cry aloud to us to do whatever may be in our power to increase the intelligence and to rise the industrial character of the people ; yet, leaving individual cases, and perhaps peculiarly unfortunate talookas, and looking to the result in the mass, there are certainly quite unmistakeable indications to the effect that the tide is slowly turning. We have already stated many of these, and will only here refer our readers again to the rapidly increasing exports and imports, and especially to the large and growing absorption of silver and copper, a fact which can only, we believe, be explained by supposing that in some of our districts silver ornaments and copper vessels, the indisputable signs of growing prosperity in a Hindoo community, are decidedly on the increase.

Note by Colonel Wingate.

"6th. I question the propriety of the use of the word pauperism in the paragraph, and doubt if any enquiry would discover anywhere in the surveyed dirtrict the existence of what is termed pauperism in Europe. I understand the word to refer to a state of things in which the able-bodied and willing to work can find no work, and would starve but for the aid of others. I cannot recollect having ever met with this in any of the surveyed districts, and should say that pauperism is unknown in them all. Pauper cultivators in the phraseology of revenue reports are to be met with, but these are bankrupt farmers, and they would have no difficulty in finding work as labourers. If you refer to the latter, it would be desirable I think to explain the sense in which you use the word."

EDITORIAL NOTES.

THE Export trade of the country is steadily recovering from the blow which it received in 1866 by the close of the American war. The returns of the last ten years shew clearly that in spite of the great depression that followed the close of the war, the Exports are steadily growing in value :—

1861	£ 32,970,000	
1862	„ 36,310,000	American War.
1863	„ 47,859,000	do.
1864	„ 65,625,000	do.
1865	„ 68,020,000	do.
1866	„ 65,490,000	do.
1867	„ 47,729,000	
1868	„ 50,870,000	
1869	„ 53,082,000	
1870	„ 52,471,000	

These returns are very satisfactory, but few persons perhaps appreciate their full significance. It is not extravagant to say that the whole future well-being of the country depends upon a steady growth in the production of its exports.

THE prices realized at the Opium sale held on the 4th instant in Calcutta were as follows :—

Opium.	Chests.	High.	Low.	Aver.	Proceeds.
Old..... Behar.	345	1,430	1,125	1,426- 2- 6½	4,92,025
New	1,675	1,170	1,115	1,152- 4-11½	24,01,575
Old..... Benares.	623	1,115	1,385	1,390-10- 3½	8,66,370
New	952	1,115	1,115	1,133-13-3	13,65,005

The budget estimate it may be remembered was Rs. 1,075 per chest. The results of the current year's sales will shew an outturn, we suppose, £1,500,000 in excess of the estimates.

THE coinage of silver at the Indian Mints during the last ten years has been divided between the three Presidencies as follows :—

	Calcutta.	Bombay.	Madras.
1861-62.....	2,57,16,119	4,05,92,876	13,99,069
1862-63.....	2,51,14,525	6,08,87,898	67,32,248
1863-64.....	2,50,80,140	7,60,17,394	1,27,76,701
1864-65.....	1,12,26,501	5,50,09,146	61,48,286
1865-66.....	6,57,11,729	7,39,09,120	54,49,615
1866-67.....	3,47,11,482	2,49,96,284	11,86,795
1867-68.....	1,66,59,199	2,61,25,891	3,17,657
1868-69.....	1,54,21,611	2,65,05,930	1,87,510
1869-70.....	3,17,07,691	1,30,27,910	Mint abolished.
1870-71.....	11,17,021	1,24,34,850	

The official year 1870-71 ended on the 31st March last, since which the Mints have been nearly idle, there having been for months an almost total cessation in our imports of silver.

Observer writes from Upper Sind to the *Indian Public Opinion* :—

"It will perhaps be some satisfaction to Mr. Knight to know that Sind, the poorest soil in India, is paying a land tax of Rs. 2-8 and 3 per acre, besides local rates. And this when the rich districts closer to Bombay, and the fertile plains of the Punjaub are assessed at 6 annas to Rs. 1-8 per acre only! Would he wish to see these rates increased, when he himself has said that a "tax of 5 shillings the acre is too much for India?"

We are anxious to see the Land Settlements of the various provinces carefully collated and compared together. We do not attempt to verify *Observer's* figures: we simply say that if such a discrepancy as he asserts exists, and there are no reasonable grounds for it, the one assessment should be raised, or the other lowered.

THE State Note circulation of India has risen upon the whole very steadily. The average circulation of each year from the first issue in 1862 down to the close of 1870-71 was as follows:—

1862-63	Rs.	4,11,91,285
1863-64	,,	5,24,25,000
1864-65	,,	6,88,20,116
1865-66	,,	7,72,57,063
1866-67	,,	8,98,93,170
1867-68	,,	9,28,50,848
1868-69	,,	10,11,55,327
1869-70	,,	10,00,90,777
1870-71	,,	9,81,32,210

The average circulation in Madras, including its Mofussil circles, has never yet amounted to a million sterling. The Bombay circulation has fluctuated very heavily, the highest point Rs. 4,73,04,000 being reached in 1867-68, while it had fallen to Rs. 3,88,07,454 in March last. The normal amount of the Bombay circulation is probably about £4,000,000. The circulation of the Calcutta circle reached its highest point in 1869-70, when it was Rs. 4,14,57,000. It has since fallen to Rs. 3,50,93,000. The Mofussil circles of Allahabad, Lahore, and Nagpore, have a normal circulation of about £1,000,000 between them, and Kurrachee and Akola about £[illegible]0,000 each.

The circulation is almost wholly what may be called "mercantile". The people will never use the notes until they are of much lower denomination. For ourselves we do not think Rs. 5 low enough. We know no valid reason why India should not have notes as low as the dollar or the rouble, and can see strong reasons why they *should* have such notes.

IN commenting upon the fact that the breadth of land sown with cotton of late years in Guzerat has been greater than that under either jowaree or bajree, the staple food grains of the people, the *Indu Prakash* says :—

"No wonder that the prices of agricultural produce went up so extravagantly high during the American war. Our Revenue Settlement Officers cannot be too cautious how they rely upon even a partial permanence of this inflated state of things, for there can be no doubt that India cannot hope to outbid America in the English market, and must be elbowed out sooner or later. The fact is, no calculations based on the prices of the last ten years can ever be safely adopted to fix the anticipated average prices for the decade on which we have now entered."

This is no doubt true, but there is a wide difference between making these prices the standard by which to regulate future assessments, and the ignoring of them altogether. It seems to be forgotten that the prices of the last ten years have been a great *fact* that has changed the whole aspect of the question of assessments. We think with the *Indu Prakash* that it would be unsafe to fix the assessment for the next 30 years upon the basis of the last ten years' prices, but to ignore those prices altogether, and to make the averages of a long antecedent period their basis would be folly. In the main, the causes of the rise are permanent, as we shewed in our last issue, and if we are to ignore the prices of the last ten years altogether, a great and most needless sacrifice of revenue will be made.

Two institutions have grown up under British rule in India to the repression of which the whole energies of the State should be directed: we mean the Bunia and the Dram-shop. The extortion which we allow the sowkar class to practise upon the cultivator, was never tolerated under native rule. The ryots were slaves, it is true, to the zemindar on the one side of India, and to the Mahrattas on the other, but while not allowed to become wealthy, they were seldom or never reduced below the level of a tolerable subsistence. They were no doubt the milch-cow of the zemindar or of the Sirkar, but the Marwaree was not allowed to finger the udder at all. Under us, the Sirkar has abdicated in favour of the sowkar, who has installed himself as the great man in every village of the country, and in many places practises the most cruel extortion upon the people. Side by side with the sowkar is the dram-seller, completing the ruin which the former has begun. In his report upon Pardee, the Settlement Officer writes very recently as follows, concerning the condition of the Kali Paruj cultivators :—

"Their skill varies considerably from the unsettled tribes on the Dhurumpoor frontier, who scratch up just enough ground round their temporary huts to produce sufficient nagli or kodra for their own use, to the comparatively civilized Dondias and Dorias, who abide in villages, are less migratory in their habits, and endeavour to cultivate and improve their fields. They are however unfortunately alike in their improvident and intemperate habits, being all in debt to the sowkar, who takes advantage of their ignorance and degraded condition, to extort from them the whole produce of their labour, minus just as much as will supply them with the harvest necessaries of life. They rarely taste rice, and almost entirely subsist on the coarsest and cheapest grain, consumed in the shape of porridge once a day, supplemented of course by large draughts of toddy.

"Their supplies of even kodra and nagli generally fail before June, so that they are compelled to beg from the sowkar seed and food to suffice till the next harvest, when the loan has to be returned at the rate of 1½ maunds per maund lent, a clear loss of 50 per cent. Any thing that the sowcar's interest does not absorb, goes to the liquor-seller, so that he is either in the clutches of one or the other, who successfully manage never to permit him to be solvent. Knowing as the Kali Paruj do, that the profit of any extra labour will go to fatten their creditors, it is not at all surprising that their improvidence and intemperance should become more and more confirmed."

Are we really to accept it as a fact, that this state of matters is irremediable, and that we can do nothing to remove these evils? Is the State no match for the sowkar and the dram-seller, that we allow the people to remain their slaves in this way? Are there not among us younger men growing up who will find out a way to remove this stigma from British administration?

THE carpings of the Bombay press against the assessment of the land are reflected in the vernacular press, as might be expected, in the most exaggerated form. Thus the *Indu Prakash*, a very able and in general moderate paper, led on by the statements of the English press, now positively affirms that Government is exacting from "one-half to two-thirds of the gross produce from the miserable tillers of the soil" throughout the Tannah, Rutnagherry, and Canara Collectorates:—

The blighting influences attendant upon the conquest, and the working of the doctrine of lapse, and the hateful Inam Commission, have succeeded in rooting out of the country the classes who were in enjoyment of alienated

revenue, and with them destroyed forever all chance of an independent landed gentry. In the times of Mahratta rule, the normal condition of things were just the reverse. The direct State receipts were inconsiderable by the side of the larger alienations by way of Jehagir, Saranjam, and Inam lands. Sattara, our latest acquisition, retains the trace of this type of things even in the present day. The proportion of Government to alienated lands is as two to one in that province :—

Sattara.....	Government villages, 1,019	Alienated villages, 484	Total villages, 1,503
	Net Government Revenue, 17 lacs.	Alienated Revenue, 8½ lacs.	Total Revenue. 25½ lacs.

Now we regard this as the most desirable state of things. Tannah, Rutnagherry, and Canara stand at the other extremity. If the reports are to be trusted, out of a total of 4,667 villages in the Konkan districts, yielding a gross revenue of 33 lacs of rupees, only 293 villages, with about two lacs of Revenue, represent the alienations. Canara has absolutely no alienation throughout her 1,000 villages, yielding a total revenue of 12 lacs. In these countries the dreams of the enthusiastic upholders of the State's monopoly of the soil are realized to their bitter extreme, for while the State permits no intermediate landlord, it exacts as an acknowledgment of its landlord rights, from one-half to two-thirds of the gross produce from the miserable tillers, whom it obliges with its irresponsible protection.

We are here told that the State permits no intermediate landlord either in Tannah, Rutnagherry, or Canara, but itself exacts from "a-half to two-thirds of the gross produce from the miserable "tillers whom it obliges with its irresponsible protection." It is really a very serious question how far Government should permit the publication of such statements, without check or restraint of any kind. We do not, we confess, see that there would be the least hardship in compelling any journal, English or native, to publish a full and explicit withdrawal of statements so false and so calculated to beget disaffection amongst the people, under penalty of suppression. In spite of the unprecedented prosperity of the country, the notorious fact that our assessments are little more than nominal, and that under the Mahratta rule, the agricultural masses, high and low alike, endured the severest and most capricious exactions, the people are assured that the English rule has had a most "blighting influence" upon their fortunes, and that we have "destroyed for ever all chance amongst them of an independent landed gentry." Now this is either the tall, silly writing of some half-educated boy from our Colleges, who has no knowledge of what he is writing about, or the disaffected utterance of some bitter demagogue who thinks he best shews his appreciation of the liberties secured to him under the 'conquest' against which he rails, by libelling its authors. We have not the slightest wish to see the freedom of the press curtailed, but situated as we are in this country, the safety of allowing such writings to go unnoticed seems to us most questionable. The journalist, whether native or European, who adopts and propagates falsehoods so circumstantial and so mischievous, should we think be required to substantiate them, or to publish their full and complete recantation in terms dictated by the State itself, in the same columns in which the falsehood appears. That the present wholly unfettered condition of the press is the ultimate expression of all legislative wisdom upon the subject. we take the liberty to doubt.

NOTES FROM CONTEMPORARIES.

A CORRESPONDENT of the *Jubbulpore Chronicle* tells us that he has ascertained from personal enquiry of landholders in the Hoshungabad district, that for land held by them in the adjoining territories of Bhopal and Indore, they are allowed 22 to 30 per cent. only of the net assets, for the very same proprietary rights which are everywhere being settled by ourselves at 50. The same correspondent points out further, that in consequence of the lowness of the assessment "the sale value of land in Hoshungabad and Nursingpore is appreciably higher than it is in Jubbulpore." The assessment does not represent, as is supposed, half the profits, it being often less and sometimes more.—*Indian Statesman.*

WE have advices from Mr. Login as to the results of his cotton experiments on the Egyption system to 13th instant. He says, "my yield of cotton for the new field is already 462 lbs. of "clean cotton per acre, and I hope to pick nearly 500 lbs. by the "end of the season." These results are really very extraordinary. —*Id.*

THE following figures shows the quantity of cotton exported from the stations of the G. I. P. Railway of the Central Provinces and the Berars, for the season up to the week ending 6th January 1872 :—

	Total.
Full-pressed..	23,324
Half ,, ...	4,202
Dokras ,, ...	3,524
Total bales of lbs. 400 each ...	31,050.—*Id.*

THE average prices realized at the Opium sales of the 4th instant in Calcutta were as follows :—

Behar, New.....	Rs. 1,452 per chest.
,, Old	1,390 ,,
Benares, New.....	1,433 ,,

In addition to these quotations, we observe that 345 chests of what is called simply 'Old opium' sold at an average price of Rs. 1,420.

These prices are much above the averages of the last ten years, which have ranged from Rs. 938 in 1804-5 to Rs. 1,377 in 1868-9. As the Budget Estimate was framed upon an expectation of Rs. 1,075 only, the *actuals* will not improbably come out better by £1,500,000 than the estimates.—*Id.*

THE one thought, says the *Indian Daily News*, "that no direct taxation, however perfect it may be in theory, can be practically enforced in India without grave injustice, ought to disenchant Indian statesmen of all such taxation for the future." Our contemporary is strongly in favour of a tobacco-tax, concerning which he says :—"A tax on tobacco would be novel, but it seems to be the opinion of those who have studied the subject that nothing that is likely to occur in the collection of such a tax could possibly create the discontent which necessarily follows in the wake of the tax on income. A small duty, for instance, on the retail sale of tobacco, realised at the time of granting licenses to vendors, would return as large a yield as the income-tax, and probably a larger, and would also—and this is its best recommendation—bring about no direct contact between ignorant and helpless tax-payers and extortionate tax-gatherers."—*Id.*

SIR CHARLES TREVELYAN has renewed his protest against the Indian income-tax, in a letter to the London *Times* of 9th ult. He writes :—

"Having felt the warmest interest in India since I was a boy, and still watching its progress with the same unflagging attention, I must again record my opinion that the income-tax is, in an especial manner, unsuited to India, and that its continuance must alienate from us the great body of the people who remained faithful to us during the Mutiny, and whose insurrection would cause even that frightful episode to be regarded as child's play. I am also of opinion that this tax is unnecessary in the present state of the finances of India. If the Select Committee on East India Finance succeeds in finally disposing of the question, it will do more than a national service."

We do not suppose that anyone will longer insist that the state of the finances is such as to make the tax necessary. The propriety of its continuance is suggested rather by the belief that some such tax upon the rich is required as a sort of counterpoise to the salt-tax upon the poor, than by the conviction that the Finance Minister really requires it.—*Id.*

THE Secretary of State's draft upon the Indian Treasury for payment of the Home Charges amounted during the last year to Rs. 9,80,00,000. The drafts came forward regularly throughout the year at the rate of Rs. 4,000,000 by each mail, except by the December ones, each of which brought a demand upon the Treasury for Rs. 5,000,000. The drafts were issued against the three Treasuries in the following proportion :—

Upon the Calcutta Treasury	Rs. 7,88,20,000
,, Bombay Treasury	,, 1,76,90,000
,, Madras Treasury	,, 14,90,000
	Rs. 9,80,00,000

The effect of this enormous drain upon the country is happily very largely counteracted by the immense tribute which Calcutta and Bombay contrive to levy upon China by the heavy export duty imposed upon opium. But for this compensation, it is exceedingly doubtful whether these Home Charges could be borne by the country at all. Our heavy export duty upon opium is quite as real a tribute upon the Chinese, as the Home Charges are upon India.—*Id.*

THE *Bombay Gazette* points out that there has been a great want of wisdom shown in the construction of certain roads in Khandeish for employing the people who are in distress through the dearth. One of these roads, 22 miles long, from Parola to

Kujraum, is said to be of very trifling utility, while to make it, very fine crops had to be destroyed. The work, moreover, was gone about in such a hurry, that the embankments were all but completed before it was found out that the ryot could not do the masonry work. "But not only did the Government sanction very considerable expenditure on imperfect information, but they allowed the Khandeish Collector to be *twice* changed, besides permitting an interregnum for some time." How, asks our contemporary, "can a Collector who has never before seen the district have that intimate knowledge, which is so necessary in the case of an impending famine of the country under his charge? This is a fair instance of the ruinous way in which the present system of 'acting' appointments is carried out!"—*Id.*

A CORRESPONDENT, in noticing a recent article in this journal upon the grain trade of the country, casts considerable doubt upon the appropriateness of the quotations made by us from the Official Price Lists of Bombay. He says:—

"You quote the price of rice in Bombay at Rs. 5-4 to Rs. 6-4 per maund (of 82 lbs. ?) This may be the retail price, but the wholesale rate of the kinds chiefly used by natives, is from Rs. 7-2 to Rs. 8-12 per bag, of *two* maunds. Wheat is from Rs. 26 to Rs. 26-2 per candy of about 700 lbs. (say 7½ maunds), or from Rs. 3-5-4 to Rs. 1-4-3 per maund of 82 pounds, so that with bagging and railway charges, cartage and wastage, it does not cover for wheat, of which I have seen samples from Raipore, that at present would not bring more than from Rs. 27 to Rs. 29 in the Bombay market. The qualities and values of rice are so various that it is difficult to say exactly anything about it. Some Raipore rice was valued here at from Rs. 6-12 to Rs. 7 per bag or from Rs. 3-6 to Rs. 3-8 per maund, which does not quite cover the railway charges and cost of transit, interest and waste to be allowed for.

The official quotations are given in the maund (82 lbs.), but if they really represent the *retail* price, they should be given in so many "seers per rupee."—*Id.*

THE *Pioneer* has collected the following information on the important subject of the financial position of France:—

The *Revue des Deux Mondes* gives a summary of the financial position of France so far as this has been produced by the late war. The receipts for 1870 should have been, according to the budget estimate, £73,600,000; they realized however no more than £61,200,000; and the income of 1871 was a little less. On the other hand the expenditure in 1870 amounted to no less than £135 millions sterling, and that of 1871, after all possible rectifications, cannot, we are told, be put at less than 128 millions. The deficit therefore—the regular deficit so to say—on these two years alone amounts to upwards of 140 millions sterling. But this sum includes no part whatever of the £80,000,000 already actually paid as part of the German indemnity. How was this raised? Of course by loan: as the deficits of 1870 and 1871 had to be met by loan. In this way France has borrowed nearly 200 millions since August 1870. But there are still £120,000,000 to be paid to Germany before the 1st May 1874! There is still the immense indemnity promised to the departments which have suffered from the invasion! There is still the indemnity to the railroads, and other enormous liabilities! Altogether the first cost of the war is moderately estimated at £360,000,000, with a permanent additional taxation of £24,000,000 per annum.—*Id.*

THE course of the Exchange throughout 1871 shows steady improvement in the value of the rupee from the beginning to the close of the year. The lowest rates accepted in London for the Secretary of State's drafts upon this country, were month by month as follows:—

	s.	d.
January	1	10½
February	1	10½
March	1	10½
April	1	10½
May	1	10½
June	1	10½
July	1	10⅝
August	1	10⅝
September	1	11
October	1	11⅛
November	1	11
December	1	11⅛

A rise of 5 per cent. in the value of the rupee was thus established by the close of the year. It is hardly creditable we think to the bankers of India that none of them have yet given us a book upon the Indian Exchanges. The subject is no doubt intricate and difficult, but it ought to have been mastered by some of these gentlemen long since, and made the subject of popular exposition. The late Mr. David McCulloch used to declare in his crotchetty way, that the course of the Indian Exchanges was so arbitrary as to defy reduction to rule, but we should like to see the attempt made. Why does not some one of the young bankers of Bombay take hold of it? Mr. Göschen became Secretary of State *per saltum* on the mere strength of his *Theory of Exchanges.*—*Id.*

THE Trade and Navigation returns of British India for the month of September 1871-72, and for the six months ending 30th September 1871-72, are now before us. From the General Summary, we collate the following tables:—

		September 1871.	*Six months ending 30th Sept.* 1871.
Total value of Exports (excluding treasure)	1869-70 ..	Rs. 3,08,59,896 ..	Rs. 28,22,26,184
	1870-71 ...	„ 2,84,24,689 ..	„ 29,75,93,463
	1871-72 ...	„ 3,81,84,814 ..	„ 29,82,27,443
Total value of Imports (excluding treasure)	1869-70 ..	„ 2,98,67,543 ..	„ 15,47,28,111
	1870-71 ..	„ 2,71,09,122 ..	„ 16,91,44,198
	1871-72 ...	„ 2,83,52,092 ..	„ 14,82,85,426
Net value of Imported treasure.	1869-70 ..	„ 1,66,27,357 ..	„ 6,60,05,925
	1870-71 ...	„ 37,28,614 ..	„ 1,91,91,027
	1871-72 ..	„ 33,15,112 ..	„ 1,36,18,146

The effect of the Home Charges is seen in a very striking way in these figures. It will be seen that the imports of the country during the last six months have amounted to little more than half the value of the exports:—

Total Exports, April to Sept. 1871		Rs. 29,82,27,443
Imports *Merchandise*	Rs. 14,82,85,426	
Treasure	„ 1,36,18,149	
		Rs. 16,19,03,575

This immense deficit is somewhat modified however by the fact that nearly two millions of enfaced paper were remitted to India during the period, reducing the apparent deficit to about £11,500,000 sterling.

This subject is so important and requires to be treated with so much care, that we shall probably recur to it in an early issue.—*Id.*

A CORRESPONDENT of the *Jubbulpore Chronicle* affirms that some modification of the Mundlah settlement is contemplated, as well as a revision of the Nimar assessments. He adds that "if Mr. Knight had only written in time, it is probable that "the settlements of other districts would also have been over-"hauled." Our attention was first directed to these settlements by Mr. Pedder, the present Acting Commissioner of Nagpore, who wrote several very valuable articles upon the subject in the *Times of India* towards the end of 1868. The importance of the disclosures made by Mr. Pedder was very vividly apprehended by us, and we took an early opportunity of enforcing our convictions upon the subject in the *Economist*. We insisted that a great and needless sacrifice of revenue had been made in the Central Provinces, and this is now generally admitted; but we very soon found, that a tendency to under-assess, was a *general* feature of all the settlement proceedings of the time. We are as far as any of our opponents can possibly be from wishing to see the land unduly burdened; but the settlement of the revenue to be got therefrom for a generation of years is a step of immense consequence when we bear in mind that it is to the Land we must look for the means to meet the immense expenditure being made upon Public Works in all parts of the country. It was the failure of the Supreme Government to show any discernment of the connection between the two things that made us insist with so much earnestness upon the subject, as *the* financial question of our times. We were too late to influence matters much in the Central Provinces, but have happily been in time to arrest the tendency in Bombay, the N. W. Provinces, the Punjab, and elsewhere to the same error.—*Id.*

ONE of our local contemporaries affirms that if "the members "of the Viceregal Council would give up their own abstract ideas "about taxation and be at the trouble to ascertain facts, they "might perhaps discover that neither the salt duty nor the land "tax is so cheerfully aquiesced in by the people as the tenor of "official reports would lead the world to believe."

As to the salt duty, we remark that not one man out of a thousand in the country knows even of its existence, except in the neighbourhood of the Customs Frontier Lines. All that can be truthfully said as to the readiness of the people to pay the land revenue is all that could reasonably be wished in such a matter. They recognize fully the *right* of the State to share with them in the produce of their fields, but as they are human they are glad to get the State share fixed at as low a rate as they can. The suggestion that the land revenue is unpopular, or that it excites disaffection is untrue within the knowledge of every man in the administration of the country.

The same contemporary cherishes the hope that "Sir Richard "Temple, having at last a prosperous financial year to report "upon, will at least endeavour to turn his good fortune to the best "account by reducing the burdens of the over-taxed poor, instead "of gratifying the selfishness of the rich, and that the tax on the "incomes of well-to-do traders and professional men may be "maintained and the salt duty reduced to the lowest limit that "the state of the finances will allow."

Upon this the *Indian Examiner* remarks—"There could "be no fairer tax than an equitably assessed and equitably re-"alized income-tax; but to equitably cess and realize such a tax "has been found practically impossible in even the most advanced

"country in the world. The unfitness and impolicy of the tax "in this country may be summed up in a single phrase :—

A foreign or non-homogeneous Government may not prudently resort to direct taxation."

Our contemporary states a great truth very forcibly in these words. If the income-tax is to be retained at all, it should be confined to the really wealthy classes of the country, who are comparatively few in number and too powerful to be at the mercy of the tax collector.—*Id.*

A LATE number of the *Oudh Excelsior* contains a valuable article on the traffic rates of the East India Railway. The writer points out that the rate for the transport of grain is one-fifth of a pie per maund per mile for distances of 300 miles and upwards and for a freight of not less than 140 maunds. Reducing these figures to their equivalents in English currency and weights, the *grain* rates of the E. I. Railway for long distances and for quantities not less than 5 tons (140 maunds) are thus *pies 5·4 or 0·04d.*, or a little more than a half-penny per ton per mile. This rate is very little over 1-10th of a penny per English quarter per mile, or fifty pence (*4s. 2d*) per quarter for a distance of five hundred miles. Now we can remember well when wheat was selling at Jubbulpore at twelve shillings the quarter, and had cheap transport been procurable in those days, Jubbulpore wheat might have been laid down at Bombay for shipment to Europe, at about *17s.* the quarter! The *Excelsior* appears to prove, that under the conditions named, the East Indian Railway can really carry at these rates without loss. It says :—

"The cost of working a locomotive engine, including fuel, wear and tear &c., has been very carefully calculated at Rs. 4 a mile, or Rs. 1,200 for 300 miles : add three days' pay for one 1st guard Rs. 15, for one 2nd guard Rs. 10, brakesman Rs. 6, telegraph messages between 36 stations at 3 each, Rs. 108. To this add the proportional pay of 36 station masters, goods clerks, platform assistants, carriage examiners, store-keepers, traffic superintendents and their establishments, engineers, plate-layers and their gangs, with numerous other expenses too numerous to detail, at Rs. 300, which is considerably less than the truth, and we have a balance of Rs. 111 as profit or ·012 of a pie per maund per mile. Lower the rate to one-sixth of a pie per maund per mile, and it will be seen that the grain would be carried at a dead loss to the Company, and this is a difference of only one-thirtieth of a pie.

"When the distance is less than 300 miles, and the consignments under 140 maunds, it will not pay to carry at less than one-third of a pie per maund per mile, because greater expense is incurred in extra shunting, consequent detention of trains involving waste of fuel, while the waggons are scattered over the line and remain idle, or wander up and down for days together looking for a load. Hence we consider, that with regard to the grain rates, the East Indian Railway tariff has been excellently framed and no reduction could possibly be made without the Company working at a loss."

If these figures may really be trusted, and they seem to be reliable, and the Company can carry grain without loss at little more than a half-penny per ton per mile, and the other railways of the country should find themselves able to do so too, the price of food in Western India ought to fall heavily at no distant date. We should be very glad to hear something from Mr. Conder, the very able Traffic Manager of the G. I. P. Railway, upon this subject. —*Id.*

THE INCOME-TAX.

REPLY OF THE N. W. P. GOVERNMENT TO THE CENSURE OF THE GOVERNMENT OF INDIA.

From C. A. Elliott, Esq., Officiating Secretary to Government, North-Western Provinces ; to A. Colvin, Esq., Secretary to the Board of Revenue, North-Western Provinces, dated Allahabad, the 16th November 1871,—*No.* 108*A of* 1871.

SIR,—In calling the attention of the Board to the orders of the Government of India, No. 4708, dated the 25th October, on the administration of the Income-tax in these provinces, I am to add the following remarks :—Throughout the discussion, the District Officers, the Commissioners, the Board, and the Lieutenant-Governor himself have dwelt much on the liability to corruption of the lower agencies through whom the Assessors have to work. And I am to express His Honor's solicitude that the occasion may not pass away without some tangible advantage being derived, as well from these admissions as from the strictures of the Government of India upon them. The selection of Assessors is already confined to a rank above that of tehsildar. The prohibition therefore against assessments being made by any officer below the rank of tehsildar, announced in paragraph 13 of the orders of the Government of India, will not affect these provinces. The present arrangement is already much within the limit there enjoined. But the difficulty still remains that the Assessor having for the most part no personal knowledge of profits and incomes, is forced to make reference to some one who has and it is obvious that the higher the rank of the Assessor, the more he is removed from personal acquaintance with the individuals to be assessed and their income, and the more he must lean upon the knowledge or local investigation of others. This is the crucial difficulty, and it must be grappled with. The Lieutenant-Governor, after gravely and anxiously considering the subject, has (with the exception noticed in the following paragraph) failed to think of any change that could be made with advantage in the agency or system. After all, it is only by vigilance of control on the part of the Collector, by the personal inquiries of his staff of Assistants in their winter tours, and by continual cautioning and encouragement of the tehsildars, that, so far as His Honor sees, the abuses to which the tax is so liable can be reduced to a minimum. It might perhaps do good strictly to prohibit the preparation of any lists by an officer of lower grade than a tehsildar, and the tehsildar might be instructed to compile his lists from the *oral* statements of those whom he must inquire from and consult. The Lieutenant-Governor looks to District Officers to redouble their efforts and their vigilance, so that there shall be no opportunity given, that can possibly be avoided, for the interposition of underlings. The raising of the limit of taxable profits will greatly strengthen the hands of the District Officers and their staff. His Honor will also look to Commissioners to make it more than ever their duty to see that no exertion is spared for this end. And the Lieutenant-Governor need not add that he has the fullest confidence that the members of the Board themselves will loyally and earnestly aid the Government in carrying out these views. A copy of the reply, which I have been directed to submit to the Government of India, in reply to the despatch, is enclosed, in order that the Board may be the more fully in possession of the Lieutenant-Governor's views on the questions that have been under discussion :—

From C. A. Elliott, Esq., Officiating Secretary to Government, North-Western Provinces, to R. B. Chapman, Esq., Secretary to Government of India, Financial Department, dated Allahabad the 16th November 1871,—*No.* 109*A of* 1871.

SIR,—Having laid before His Honor the Lieutenant-Governor your letter, No. 4708, dated the 25th October, I am instructed to forward the copy of orders issued in pursuance of those orders to the Board of Revenue. His Excellency-in-Council cannot be more solicitous than the Lieutenant-Governor himself is that the evils and abuses to which the assessment of the Income-tax is found to be so liable should be restricted and obviated to the utmost possible degree. The limitation however enjoined in your 13th paragraph, *viz.*, that assessments shall not be made by any officer below the grade of tehsildar, will not benefit these provinces; for (as His Excellency-in-Council was probably not aware) the power of making assessments is already confined in these provinces to grades of officers higher in rank than that of tehsildar. But the Lieutenant-Governor has not the least thought to improve the occasion by directing attention to the urgent need of vigilance and caution in the investigations which must precede assessment by those superior officers. It is in these inquiries, and in the necessary reference to those possessing local and personal knowledge of the inhabitants, the great mass of whom are beyond the personal knowledge of the Assessors, beyond even that of the tehsildar, that abuses and corruption are most liable to occur. And His Honor trusts that the views enjoined upon the Board in paragraphs 5 and 6 of my despatch will meet the approval of His Excellency-in-Council.

The Governor-General-in-Council has been pleased to contrast the administration of the Income-tax as reported in 1861, with the state of things now existing, and to attribute the deterioration to laxity of control under the present Government. His Honor submits that it would have been reasonable—perhaps only just—to have considered whether causes may not have been an work other than want of effective supervision, before assuming and publishing to the whole of India, the imputation against the Government of a lax control. An implied contrast is drawn in your despatch between the administration of Sir G. Edmonstone in respect of the Income-tax and that of Sir William Muir. His Honor would not venture to place his administration in competition with the Government of that most eminent and lamented statesman. Fortunately, moreover, no such necessity exists. For, as remarked by his Excellency-in-Council, the present Lieutenant-Governor was the Member of the Board, through whose agency alone Sir G. Edmonstone worked the Income-tax, and in whose labours he reposed a generous and implicit confidence. The present Lieutenant-Governor, as Member of the Board of Revenue, not only had occasion then in conjunction with his colleague, the late Mr. Rowland Money, to carry out the instructions of the Government, both as to the agency and the *modus operandi* of assessment, but also on his circuits had the opportunity of closely watching the results. He has had similar opportunities in his annual tours as Lieutenant-Governor (which have reached to every district in these provinces, excepting Bundlekund and the Jhansie division) of watching the present system, and he is able from personal knowledge to

say that there were no precautions enjoined in 1861 which are not now enjoined, and that there is not any lower agency now made use of that was not then employed. Nor is His Honor conscious that there is any falling off in the care or vigilance of the District Officers and their staff. On the contrary, profiting by the experience of the past, there have not been wanting intelligent and earnest endeavours to introduce improvements in the system. The Lieutenant-Governor cannot say that any of these have proved of much efficiency; but he conceives that this arises from the nature of the tax, and not from any lack of zeal and ability in the officers of Government. There are many possible causes of the growing unpopularity of the Income-tax. When first it was introduced it was regarded as a War-tax, the inevitable result of the disorganization of 1857-58, and was no doubt as such expected to be only temporary. Its subsequent discontinuance must have confirmed the idea; and feeling that its re-imposition betokens the intention of a permanent imposition, may have added to the impatience and dislike with which it is now regarded. Moreover, the frequent changes, and especially the sudden doubling of the assessments, on one occasion in the very middle of the year, have induced a feeling of uncertainty. It is not as in England, where the occasion and necessity for such sudden measures can, by means of the public press, be made known fully and immediately throughout the land. Here, as His Honor explained in my former despatch, it is quite beyond the ability of the Government agency to make known the causes of such changes beyond the most limited circle, or to explain them at all to the vast masses of the population. The first intimation is the rude demand of the tehsildar's peon; and it can easily be conceived what power is thus put into the hands of the subordinate establishment, and what dissatisfaction any such unexplained and seemingly arbitrary enhancement must spread abroad. It is also certain that as the people become familiar with the working of the tax, they have learned the comparative helplessness of the officers of Government in the ascertainment of real income and the checking of evasion; and antagonism has thus grown up between the people and the Government Assessors, which has not tended to the popularity of the measure. For the same reason, their experience of the vagueness of the grounds we have to go upon, has no doubt emboldened through whom the Assessors are obliged to make their investigations, to profit by our ignorance. It is not surprising that people so venal in their habits should rapidly become more practised adepts in corruption, and should be able year by year to turn the opportunity to better account. The Lieutenant-Governor does not say that these are all the causes; he merely puts them forward as probable causes. He was called upon to state facts, and he did so to the best of his ability. The causes must be matter for speculation. A reflection is made upon the Board and Government for passing without animadversion, "the confessions of wide-spread mal-administration made by subordinate Revenue Officers." His Honor was not aware that any such confession had been made, and he may be permitted to express the hope that if any "mal-administration" had come to his notice, whether confessed or not, it would have met with appropriate censure and punishment. Certainly in the few cases of corruption which have come to light against subordinate Government officials, immediate punishment has followed; but indiscriminate animadversion would do more harm than good. The Lieutenant-Governor, as before submitted, though giving the subject his best attention, and endeavouring when in his circuits to ascertain the causes of discontent, has nowhere found reason to attribute it to lack of zeal or judgment on the part of the local officers. The local inquiries instituted by the Government and the Board have altogether failed to bring out any evidence of mal-administration. His Honor would submit that animadversion under such circumstances would have been out of place; for to produce salutary results animadversion must be based on some distinct ground or presumption of error or laxity. It is perhaps not of material consequence, but the "miscalculation" entered in paragraph 2 of your letter, is not apparent. The tax-payers are all presumably heads of families, and comparing them with all other heads of families in the province, one person was assessed in 80, or 1·25 per cent, or nearly four in 300—the figure stated in my letter of the 16th May. It must be remembered moreover that to single out those four persons in 300 the inquiry must be made into the circumstances of a very much larger number. In conclusion, I am to assure His Excellency the Governor-General-in-Council, that every exertion will be redoubled to reduce the occasions of discontent and the opportunities for corruption; and the Lieutenant-Governor is happy to think that the raising of the limit to Rs. 750 gives the prospect of the redoubled efforts thus made being crowned with far greater success than hitherto has been found possible.

From A. B. Chapman, Esq., Secretary to the Government of India, Financial Department; to the Officiating Secretary to the Government of the North-Western Provinces,—Fort William, 19th December 1871.

Sir,—I am directed to acknowledge the receipt of your letter, No. 109A., dated 16th November, with copy of the instructions issued by the Government of the North-Western Provinces, to the Board of Revenue, with reference to the Resolution by the Government of India, No. 4708, dated 25th October, upon the subject of the administration of the Income-tax. There has been a misapprehension of the meaning of the 13th paragraph of the Resolution of the Government of India. Therein it is laid down positively that no assessment to Income-tax is to be made by officers below the grade of Tehsildar.—The North-Western Provinces' Government rejoin that this prohibition will not apply, because already by law each assessment must be made by the Collector. This is so far true. But the real substance of the previous representation, in the apprehension of the Government of India, was this, that although nominally the Collector was the officer to make the assessment, yet, virtually and really, the inquiries for assessment,—in fact the real business of assessing,—fell into the hands of inferior officials. This in effect was stated in various forms of expression by many officers. Now it was this which the Government of India meant, and still means, distinctly to prohibit in the 13th paragraph of the Resolution. The Governor-General-in-Council is therefore not satisfied that the instructions contained in paragraphs 3rd and 5th of your letter to the Board of Revenue, No. 108A, dated 15th November, will sufficiently meet the evils which were so forcibly represented in your previous letter, and the papers which accompanied it. No *inquiries for the purpose of assessment* should be made by any officer below the rank of Tehsildar. The Tehsildar, in whose jurisdiction any assessment is to be made, *or some superior officer*, must, himself in person, visit the place where the person believed to be liable to assessment resides, and their conduct *personally* the necessary investigations. As pointed out in my previous letter, the rule of proportion applicable to agricultural incomes reduces this work within very practicable limits. In the Resolution by the Government of India it was remarked that the civil officers had confessed the existence of evils of magnitude, and of wide-spread mal-administration. The Local Government now seems to doubt whether such a confession was actually made. But the Government of India must still consider that when district officers declared that the assessment and collection of the tax had been practically left in many places to inferior officials not fitted from their position for such duties, in consequence of which oppression was alleged to arise, the existence of these evils and of this mal-administration was really confessed. The Government of India would not perhaps originally have noticed the miscalculation referred to in your 12th paragraph, had the Government of the North-Western Provinces not grounded upon it a charge of error against the Supreme Government. The Supreme Government has stated incidentally that "the tax was paid by only about 1 in every 300 of the population."

You wrote, in the passage quoted in the Resolution—"The total number of persons assessed to the tax was 1·25 *of the total population*,* or nearly 4 in 300, not 1 in 300, as has been erroneously stated."

It is now explained that the Government of the North-Western Provinces meant to say that the assessment fell upon 125 per cent. not of the total population, but of the *heads of families* in the North-Western Provinces. The Government of India cannot however admit that "the total population" and "heads of families," are convertible terms, or that it would be a proper deduction from the fact that the assessment fell upon 1·25 per cent. of the *heads of families* in the North-Western Provinces, that it was erroneous to state that the tax was paid by only about 1 in every 300 of the population. In conclusion, the Governor-General-in-Council entirely accepts the assurance given by the Local Government that everything possible shall be done to reduce the occasions of discontent and the opportunities for corruption. His Excellency-in-Council trusts that the anticipations expressed by His Honor the Lieutenant-Governor will be fulfilled, and that the efforts of the officers entrusted with the administrations of the tax will be crowned with far greater success than has hitherto been found possible.

CURRENCY AND BANKING.

THE ENGLISH BANK ACT.

In spite of all that has been written upon the laws which should regulate the currency of a nation, and the positive and dogmatic teachings which abound upon the subject, it is involved in darkness and confusion to this hour. Thus nothing is more common than to hear the English Bank Act praised for its simplicity, and Sir Robert Peel's currency arrangements of 1819 and 1844 declared to be unimpeachable. And yet the Act, instead of being the simple affair that it is popularly believed to be, is an exceedingly artificial and elaborate piece of legislation, and to it, as we have long been convinced, does the country owe the great monetary convulsions which have now become periodic in the commercial world. The weight of authority by which the Act is sustained, is the real cause of the deference which is so commonly expressed for its provisions. Does not Mr. Gladstone uphold it, and Mr. Goschen,

* Italics not in original.

and the *Times*, and the *Economist*? How then should the mere merchant, who has so little acquaintance with political economy, or the science of Exchange, presume to differ from authorities so great? It certainly *does* seem to him perhaps, that it was the impossibility of obtaining the accommodation to which his balance-sheet entitled him, that compelled him in 1857 or 1866 to sacrifice half his fortune to surmount the crisis, but he settles down into the belief that the loss was simply his misfortune, and that to impeach the Currency Law of the country as its occasion, is impossible, while such authorities as Mr. Gladstone and Mr. Goschen declare that law to be an expression of the highest wisdom.

Now we have given close attention to this subject for twenty years, and the result of our study is the full conviction that the English Bank Act is one of the most unhappy pieces of legislation that ever found its way into the Statute Book of a civilized people. And we are anxious to spread this conviction in India. For young and uninfluential as many of the European merchants and bankers of India at present are, they contain within their ranks the future leaders of the great mercantile communities of Europe. We have probably amongst us at this moment in embryo the future Governor of the Bank of England itself; at all events, the men who twenty years hence will form the mercantile opinion of London, Manchester, Glasgow, Havre, Hamburg and Paris. And we want to excite the attention of these gentlemen, and to interest them in what we believe to be by far the most important question of our times in commercial matters—the great question of currency reform. We are entitled perhaps to assert some claim upon their attention, for it is given to few men to change the whole course of popular and governmental thought and conviction upon more than one great economic question of their times. The highest authorities were once arrayed against us upon these questions, as they now are though happily by no means unanimously, upon the currency question. We shall best accomplish our purpose perhaps in this opening article by directing attention to a single point of the Bank Act in proof of our statement,—that in spite of its apparent simplicity, the Bill is really a most elaborate and far-reaching piece of legislation.

Everyone, we suppose, knows that the Act disallows the circulation of notes in the country of a lower denomination than £5. Now this is a provision that certainly seems exceedingly harmless and simple, and yet has, as we shall presently shew, the most unlooked for and weighty results. The one pound note is a far more convenient currency than the sovereign, while its use is forbidden to Englishmen, and the *sole* reason of its prohibition is the presumed ease with which such notes are forged. That the presumption is false is proved conclusively by the experience of every people that have used notes of a low denomination. The danger is purely fanciful, and the currency of England might be changed to £1 notes, instead of the sovereign, with nothing but advantage to all interests in the country. Now mark what the effect of such a change would be upon the currency and the Bank of England. The note is so enormously superior to the sovereign as an instrument of small change, that an issue of £1 notes would at once send all the gold of the country into the coffers of the Bank of England. For it is not the commerce of the country, but its retail trade that requires and absorbs such vast quantities of gold. It is the private purse, and the till, and the secret hoard, that holds the £90,000,000 to £120,000,000 of gold floating in the currency. An issue therefore of £1 notes would, within three months, send the Bank reserve of gold up from its present limit of £10,000,000 or £20,000,000 sterling, to seventy, eight, or ninety millions, while a run upon the Bank for such notes would be simply impossible. Observe now the changed condition of the Bank under such circumstances, towards the question of the foreign exchanges. The gold which the Bank now holds is simply the small substratum of metal upon which the *mercantile currency* of the country rests, and it has been reduced to the lowest limit by the use of cheques, bills, promissory notes, and other instruments of credit, floating in the commercial world to the extent as is estimated of about £400,000,000 sterling. Not five pounds of this vast amount of commercial currency is real money, is legal tender, while like a vast inverted pyramid it rests upon the narrow apex of the few millions of gold—the only money English law recognizes—lying in the Bank of England.

The moment this vast pyramid of *credit* shews the slightest instability, every eye is directed with intense anxiety to the apex of gold upon which it rests, and the least narrowing of the apex by a foreign demand for two or three millions of the gold of which it consists, calls for an immediate council in the Bank parlour, and creates potential panic in every market of the country. Observe then the profound folly of not widening this apex, by drawing into the Bank coffers, in exchange for £1 notes—for which there *can* be no run—the vast supply of gold now clinking in the tills or wearing holes in the pockets of the people. The pound note will serve their wants far better than the gold, with great economic saving in wear and tear, while the presence of these seventy or eighty millions of gold in the Bank coffers would make *panic* a simple impossibility. A drain, as it is called, of three or four millions of gold for rectifying the foreign exchanges of the country, which now excites profound alarm—the whole stock of the Bank being perhaps but £10,000,000 or £15,000,000—would pass unnoticed were the Bank reserve seventy or eighty millions. Nothing but a run of £1 notes upon the Bank could materially reduce this reserve, while every commercial note (as we may call notes of £5 and upwards) might be presented and paid without a moment's uneasiness to any one.

Thus this very simple Act, as the *Times*, and *Economist*, and the authorities call it, by forbidding the use of one pound notes in the country, prohibits the very thing required to give stability and confidence to our commercial currency—a large reserve of gold that neither foreign demand nor Home panic could possibly affect. And yet the authorities have never discerned this matter. It is the fact that though we have studied the question for twenty years, we have never once seen this most obvious effect of the Act noticed by any writer whatever. We stop here to-day, but hope that we may have succeeded in interesting some of our readers in the subject, which we shall gladly discuss with them as we go along, if they will address us upon it. Great discoveries are often found to be simplicity itself when once made.—*Indian Statesman.*

INCIDENCE OF TAXATION IN ENGLAND.

(BY MR. DUDLEY BAXTER.)

I HAVE framed three estimates, which I think worthy of some reliance, concerning families supposed to expend in the year 40*l.*, 85*l.*, and 500*l.*, respectively.

Each family is supposed to consist of man and wife, one child over ten years of age, and one under that age, this being the family which most nearly represents the average composition of the population. Their consumption is taken equal to that of 3¼ adults. The family expending 500*l.* a year is supposed to include also three adult servants, making altogether 6¼ adults.

The consumption of necessaries in the families of the poorest class is taken from Dr. Edward Smith's 'Report to the Poor Law Board on the Dietary of Workhouses' (20th Annual Report of Poor Law Board, 1868, p. 62), but as Dr. Smith has given no information concerning the earnings of the families, I have assumed them, after comparing information concerning the various rates, at 15*s.* a week.

In framing the estimate concerning an artisan's family, I have been assisted by information gathered from 43 families in Manchester, partly procured by minute personal inquiry, and partly through the aid of some large employers of labour.

I have met with little success in endeavouring to obtain direct information from more wealthy families, and their consumption of necessaries is assumed from somewhat narrow data. As however the whole of the taxes on necessaries paid by a family spending 500*l.* a year or more is less than 1 per cent. of the income, no great inaccuracy can have been committed, and many of the larger items, such as income-tax, house-tax, local rates, &c., can be estimated on very simple data.

In calculating the duty paid, I have considered it indispensable to make an allowance for the interest and profit which dealers will receive upon the amount of the tax. Great stress has been laid upon this element of the question in many writings, and I have endeavoured to be on the safe side by taking it at 20 per cent.

I have considered that licenses required for the sale of tea, coffee, beer, wine, &c., are always paid for ultimately by the consumers of the articles, and I have calculated the effect by adding the license duty to the customs or excise duty, and ascertaining the addition to the customs or excise duty which would have been equivalent to the license duty. The rates of duty thus arrived at are as follows:—

Flour—4¼*d.* per cwt., with profit 5·4*d.*; but as only half the corn consumed is supposed to be raised in price by the duty, the average effect of the duty is 2·7*d.*, which is the rate employed.

Tea—6*d.* per lb. Effect of licenses, 15*d.* per lb. Total 6·15*d.*, with profit 7·4*d.* per lb.

Coffee—4*d.* per lb. License included in tea, with profit 4·8 per lb.

Sugar.—Average rate of duty 9*s.* 6*d.* per cwt., or just 1*d.* per lb. with profit 1·2*d.* per lb.

Fruits—7*s.* per cwt., or ¾*d.* per lb., or with profit ·9*d.* per lb.

Beer—The effect of the malt duty amounts to about ½*d.* per quart. (Select Committee on the malt-tax, 1868, query 3347). Effect of the license duties 1·20*d.* per quart. Total with profit ¾*d.* per quart.

Wine—Strong 2*s.* 6*d.*, per gall. With license 2*s.* 9*d.*, with profit 3*s.* 3½*d.* per gall. Weak wine 1*s.*, license included in strong wine. With profit 13·2*d.* per gall.

Spirits—Duty, 10*s.* 2*d.* per gall. Effect of licenses 5*d.* Profit 2*s.* 2*d.* Total, 12*s.* 9*d.* per gall.

Tobacco.—Average duty as imported, 3*s.* 4*d.* per lb. Effect of licenses inconsiderable (= ½*d.* per lb.); with profit, 4*s.* per lb.

The income-tax is calculated at 5*d.* in 1*l.*, the average of the four last years.

The rent is taken at one-eighth part of the income, and the rateable value at six-sevenths of the rent, that being the average proportion between rateable value and rental in England and Wales.

Family of 3¼ adults expending 15*s.* weekly, or (say) 40*l.* a year :—

	Per Adult per Week.	Family in Year.	Tax. £ s. d.	Per Cent. upon Income.
Flour	12 lbs.	20 cwt.	0 4 6	·56
Tea	½ oz.	5½ lbs.	0 3 6	·44
Coffee	—	—	—	—
Sugar	¼ lb.	91 lbs.	0 9 0	1·12
Fruit	—	—	—	—
			0 17 0	2·1
Rent 2*s.* weekly, 5*l.* 4*s.* yearly. Rateable value 1*s.* 8½*d.* weekly, 4*l.* 9*s.* yearly at 4*s.* 6*d.* in the pound, rate			1 0 0	2·5
Beer, 1 quart per day			1 0 4	2·5
Tobacco, 6 lbs. in the year			1 4 0	3·0
Total distributed Taxation			4 1 4	10·1

Family of 3¼ adults expending 33*s.* weekly, or (say) 85*l.* a year :—

	Per Adult per Week.	Family in Year.	Tax. £ s. d.	Per Cent. upon Income.
Flour	10 lbs.	16½ cwt.	0 3 8	·22
Tea	1 oz.	11½ lbs.	0 7 1	·11
Coffee	1 „	11½ „	0 4 6	·26
Sugar	¾ lb.	137 „	0 13 8	·80
Fruits	—	10 „	0 0 9	·05
			1 9 8	1·7
Rent 4*s.* weekly, 10*s.* 8*d.* yearly. Rateable value 3*s.* 5*d.* weekly, 8*l.* 18*s.* 4*d.* yearly, at 4*s.* 6*d.* in the pound			2 0 0	2·4
Beer, 1 quart per day			1 0 4	1·2
Spirits, 2 gallons in the year			1 3 6	1·5
Tobacco, 6 lbs. in the year			1 4 0	1·4
Total Stimulants			3 9 10	4·1
Total distributed Taxation			6 19 6	8·2

Family of 6½ adults expending 500*l.* a year :—

	Per Adult per Week.	Family in Year.	Tax £ s. d.	Per Cent. upon Income.
Flour	7 lbs	21 cwt	0 4 9	·05
Tea	2½ ozs.	52 lbs	1 12 0	·32
Coffee	1½ „	26 „	0 10 5	·10
Sugar	1 lb.	338 „	1 13 9	·34
Fruits	—	26 „	0 2 0	·02
			4 2 11	·8
Rent 63*l.* a year. Rateable value, 54*l.* at 3*s.* 6*d.* in 1*l.*			9 9 0	1·9
Income Tax, 5*d.* in 1*l.*			10 8 4	2·1
House Duty, 9*d.* in 1*l.*			2 7 3	.5
Insurance, 1*s.* 6*d.* per 100*l.* on 800*l.*			0 12 0	·1
			22 16 7	2·7
Legacy and Probate Duty on property of 100*l.* a year			3,17 0	·8
Beer, Tobacco, Wine, and Spirits, with 20 per cent. profit added			9 6 0	1·8
Total distributed Taxation			39 16 6	8·0

As is afterwards explained, many of the stamp, license, or assessed taxes are not included in the above statement, because they cannot be distributed without the free use of conjecture.

Summing up the above results we get the following Table :—

Description of Tax.	Percentage of Income paid in Taxes by Family expending in the Year— £40.	£85.	£500.
On Necessaries	2·1	1·7	·6
Rates and Tolls	2·5	2·4	1·9
Direct Taxes	—	—	2·7
Legacy and Probate Duty	—	—	·8
On Stimulants	5·5	4·1	1·8
Total distributed Taxation	10·1	8·2	8·0

One fact which is very apparent in the foregoing Table, is that about half of the taxation of the poorer families is yielded by the taxes on stimulants, and may therefore be avoided by those who are willing to abstain from their use, whereas the upper classes could escape in this manner only a comparatively small part of their taxation.

It must be clearly understood that the preceding numbers are not intended to represent the whole pressure of taxation. No notice is taken of the self-immoderate drinkers and smokers, because the taxes on spirits and tobacco are maintained and defended on the ground of their beneficial action in checking intemperance. Nearly ten millions of the revenue is probably contributed in this manner, and is unrepresented in my estimate.

Nearly ten millions more of the revenue is unrepresented either because it is not the produce of taxes, or because its effect upon incomes cannot be calculated.

The following statement shows the amount of these portions of revenue :—

Undistributed Revenue.

	£	£
Crown Lands	345,000	
Miscellaneous Receipts	2,586,000	
Net raised by Taxation	—	2,931,000
Minor Customs Duties	581,000	
Miscellaneous Customs Receipts	105,000	
Part of License Duties	1,007,000	
Part of Stamps	3,208,000	
Post Office net Revenue	1,421,000	6,322,000
Total	—	9,253,000

The undistributed portions of the customs, license, and stamps, and the Post Office revenue, fall to a great extent as a charge on industry, and are thus spread in a very equal manner over the whole population. The remainder falls mainly upon the upper classes in the form of postage, receipt, and other stamps, charges on the conveyance of property, &c.

If we accept Mr. Baxter's estimate of the income of the country (1,815 millions in 1867), the proportion of imperial and local revenue to income would be about 11 per cent., the amount raised being in the year ending 31st March 1868, as follows :—

	£
Imperial Revenue	69,600,000
Local Taxation, about	24,000,000
	93,600,000
Excluding Crown Lands, Revenue, and Miscellaneous Receipts	2,900,000
Total raised by Taxation	90,700,000

But if we allow a profit of 20 per cent. to dealers in taxed articles as I have invariably done, there is an increased pressure on the tax-payer of 8½ millions, which brings the whole amount up to about 100 millions, and the percentage to about 12 per cent.

If in the above estimates we make allowance for recent modifications of the tariff, namely, the final removal of the corn duty, and the reduction to one-half of the sugar duty, we shall arrive at the following statement of the present incidence of those taxes of which the effects can be calculated :—

	Family spending per annum— £40	£85	£500
Taxes on Necessaries—Tea, Sugar, Coffee, Fruit	Per Cent. 1·0	Per Cent. 1·1	Per Cent. 0·6
Local Taxes	2·5	2·4	1·9
Income-Tax, House, and Legacy Duty	—	—	3·4
Stimulants - Beer, Spirits, Wine, Tobacco	5·5	4·1	1·8
Total per cent. of Income	9·0	9·6	7·7

ABKAREE REVENUE.

LICENSING SHOPS FOR THE SALE OF LIQUOR.

From C. J. Daniell, Esq., Officiating Collector to the Commissioner of Excise, North-Western Provinces, Furruckabad,—dated the 11th February 1871.

I HAVE the honour to reply to your request (contained in your docket No. 927 of the 12th Decembr.) for my opinion as to the best method of licensing shops for the retail sale of liquor under the Abkaree Law as follows. The old plan of farming out the right of setting up shops throughout large tracts of country, such as whole pergunnahs, has been definitely abandoned as leading, under certain circumstances, to any increase of drunkenness among the population, and in others to a diminution of the supply of liquor, and of necessity to illicit distillation of spirits, and need not therefore be discussed. The main object which Government has in view in working the Abkaree Mehal, is to obtain the largest revenue from the sale of that amount of liquor which is sufficent for the reasonable wants of the wine-drinking classes. This object being kept in view, any arrangements for licensing liquor shops, which prevent its attainment, must be disallowed. There are three ways of licensing the retail sale of liquor :—

1*st.*—To sell by auction the exclusive right of setting up one or more shops in a defined locality.

2*nd.*—To fix a single rate, such as Rs. 5 for licenses for all shops, or a maximum and minimum rate, such as from Rs. 240 to Rs. 12, between which the license fee for different shops should be made to range, and to let every one who chooses (subject only to Police considerations) open a shop.

3*rd.*—To ascertain from the experience of the past the number of shops required by the drinking classes in different localities, and to license these shops on a scale of fees regulated by the profits of each retail dealer.

In your docket under reply, you speak of the two methods entered under my 2nd head as being different from one another, whereas they are exactly the same in principle, are obnoxious to the same objections, and only differ in the degree of loss which their employment entails on the revenue. The method entered under my 3rd heading appears not to have been taken into consideration by the Board of Revenue, though (as I shall attempt to show) it is the only scientific method of raising a revenue from this source (the licensing of retail liquor shops), and has been proved by at least one experiment to be a fiscal measure more successful than any of the three. 1*st*,—The auction system. This has, I think, been wisely discarded. There is a peculiarity attaching to auction sales in India which is not usually seen in Europe. In Europe a sale by auction at most always excites competitions amongst the purchasers, and the article put up for sale generally fetches its true, sometimes more than its true value. The spirit of competition is an incident in the European character—very little calls it forth ; and the conditions under which auction sales are carried on in Europe is generally favourable to its exhibition. The contrary is the case in India. It not unfrequently happens that those who are called together to an auction sale, instead of competing with one another, combine against the salesman. The spirit of combination is as characteristic of the Hindoo as the competitive spirit is characteristic of the Englishman. The purchasers thus combining together have one man to bid for the right of opening a considerable number of shops : they fall to him at a low rate, are then divided among the parties to the combination. This, with various modifications, is one result of auction sales. It is generally the case that persons who bid at these auctions are men of straw, and if one or two amongst them are men of capital, they outbid the rest ; they obtain the right to open all the shops in a large area to the exclusion of their poorer competitors—each creates a monopoly in his own favour over the large tract of country, in respect of which he obtains the privilege of opening shops and being released from any fear of competition. He raises the price of liquor, adulterates it, or closes any shops which, for personal reasons, it is inconvenient to him to open. The sales of liquor diminish, the still-head duty receipts fall off, illicit distillation or the use of drugs instead of liquor is excited, the population and the Government revenue equally suffer, and the monopolist shopkeeper gains at the expense of both. This is a second result. It is for these reasons I think that the license fees on retail liquor shops should not be regulated by auction.

The 2nd heading,—The principle of a fixed rate for shops, or a rate ranging between arbitrary limits, and the concession of a right to anyone to open a shop are, I think, all three objectionable. I believe I am right in stating that the plan of granting licenses for shops at a uniform rate of Rs. 5 each, was employed by the Board of Revenue in connection with an increase in the still-head duty under the idea that whatever the State lost by reducing the license fees, it would recover by an increase of the still-head duty. This theory is not strictly correct, and, as a fiscal measure, it has proved abortive. In the first place it is clear that the still-head duty not being imposed according to the strength of the liquor, a gallon of wine at 30 degrees above proof is only drinkable after being mixed with two gallons of water. These three gallons pay the same duty—say Rs. 1-8 (*i.e.*, Rs. 1 for the original rate, and 8 annas for the enhanced rate of duty)—as one gallon. If the retail salesman sells 1,000 gallons of this adluterated liquor, he probably makes a profit of at least Rs. 250, at 4 annas a gallon. Against this profit the salesman must set off Rs. 5 for license fee, and the increased rate of still-head duty at annas 8 per gallon of the pure spirit, in the amount of one-third of the mixture sold, or say Rs. 150, total Rs. 155—giving the salesman a profit of Rs. 95 on every 1,000 gallons sold. Another salesman, who, I will assume to be unable to procure excessively strong spirit, is obliged to sell it neat, or only adulterated with one gallon of water to the gallon of spirit ; in his case he pays a duty of Rs. 1-8 per gallon of saleable liquor, and his profit on the sale of 1,000 gallons is reduced to say Rs. 64, as contrasted with the first salesman's profits at Rs. 95 on the same quantity. This inequality in the incidence of the tax must be repeated with every variety of condition under which wine is manufactured and sold, and it is clear that in no case can an increase in the still-head duty be a gauge of the retail salesman's profits, since the conditions under which the liquor is sold in the retail shops, or technically speaking brought to market, vary in nearly every shop, and only begin to operate after the liquor, in its pure form, has left the distillery, each gallon being so to speak equally weighed for an unequal competition among the salesmen. The only case under which an increase of still-head duty would yield a revenue, equivalent to that derived from license fees, would be that in which each salesman sold exactly the same description of liquor to exactly the same number of persons at exactly the same price ; and this is a condition of things which we know can never exist. There is another point of view from which the unsoundness of the principle I am discussing is evident.

It apears from the Circular Orders which I have seen, and the discussions in which I have taken part on this subject, that the entirely different character of the two taxes—(1), the still-head duty, and (2) the license fees—are not sufficiently kept in view ; any system of taxing spirits which proceeds on an assumption that the two taxes are similar, must necessarily be faulty. The still-head duty is a tax on the consumers. Each salesman—provided he makes spirit of the same strength as his neighbour, or provided that the duty is levied upon the strength of the spirit—sells spirit under exactly the same conditions, as far as the cost of manufacture is concerned, as every other salesman, and the difference of their individual profit solely arises from the difference of demand which the peculiar situation of each man's shop may involve. A cannot say to his customer I will sell my liquor a little dearer than B : because B's liquor having cost no more than A's, A would immediately be undersold by B, and lose his business, and *vice versa*, B cannot afford to sell his liquor cheaper than A ; for the prices of A's liquor being driven down to the lowest remunerative figure by competition, B would be compelled to sell at a loss, and be ruined himself. But it requires no proof to support this axiom, that where the cost of manufacture is the same to all sellers, it is entirely paid by consumers. It therefore follows that, if the duty is raised by 8 annas, the salesmen are in exactly the same relative position as before, and the profits which each salesman makes bears the same relation to the profits of his neighbour as at first, and is not in anyway altered by the increase of the tax which is paid by the consumer. If the increase is so high as to restrict sales, the salesmen's absolute profit will be diminished with diminished sales, while the proportion between their profits remains unaltered ; and, as it is not likely that any such increase of the still-head duty would be made as would restrict sales, this point in the case need not be discussed. I will state the same argument in another form. Let A sell 100 gallons of liquor under a still-head duty of Rs. 100, and make Rs. 50 of profit. Let B sell 200 gallons under the same duty, and make Rs. 100 of profit. Let C sell 400 gallons, and make a profit of Rs. 200. Let the duty be raised by 8 annas per gallon of the liquor, and A will have to pay Rs. 150 for duty on his 100 gallons ; but as he only makes a profit of Rs. 50 on their sale, he will, unless he can throw the increased duty on the consumer, make no profit at all. In like manner B's profits of Rs. 100 will be swallowed up in paying the extra duty, and C's profit also, and the whole of the liquor sold will bring no profit to either of the salesmen—a *reductio ad ab surdum* which can only be avoided on the hypothesis that the consumer must pay the increased duty. This being the case, it follows that in taxing the liquor an extra 8 annas of still-head duty, the profits of the retail salesmen are not in anyway affected. He makes as much profit as he did before, and the remission of the license fees, or their reduction to a nominal figure, is a gratuitous abandonment of a source of revenue of the most legitimate kind. The fees for licensing shops are not a tax on the consumption of liquor as the still-head duty is: they are a tax on the profits of the retail salesman, and these profits depend for their existence on local circumstances, and the State is entitled to, and able to utilize, the circumstances to its own advantage. It says, in fact, to the salesman,—"I know from experience that if you set up a shop in such and such a street, you will make 10 times the profit you would make if you set up your shop in another street. You may set up your shop in whichever of the two streets you choose, but if you set it up in the one street, you shall pay me 10 times as much for the privilege of doing so, as I shall charge you for setting your shop up in the other street." The State and the salesman thereupon make a bargain for the sale and purchase of the privilege of setting up a wine-shop in any place they may agree upon, and the purchase-money is that portion of the salesman's profits which the State appropriates as the price of the privilege it concedes. No one is the worse for this arrangement, no one is injured by it, as no one has any vested right to open a shop at all, and the State is clearly entitled to make the best bargain it can with individual purchasers. No one will contend that the State in charging a nominal fee of Rs. 5 per shop does make the best bargain, and the plan of fixing rates ranging between an arbitrary maximum and minimum is equally defective, since there is no reason for supposing that to charge either Rs. 240, or Rs. 12 for the privilege of opening a shop, is the best bargain that can be made in any particular case,—the latter plan only differs from the former in degree, that is, in the amount of loss it entails on the revenue. For these reasons I would reject both these methods of fixing the rates for licensing shops.

As regards the principle that every one should be allowed to set up a shop where he likes, I can conceive no argument of any weight to support it. Police considerations alone, to say nothing of the increase of immorality and drunkenness, which would arise from anything of the kind being allowed, makes it necessary that the executive officers of Government should have authority to control the number of shops and fix the places where they are to be set up; and this being admitted, there is an end to all these arguments which I have sometimes heard used in favour of unlimited free trade in liquor. Such a system is quite unknown in any civilised country, and is quite inconsistent with the obligation which all Governments recognise of restricting the sale of liquor within limits which admit of the public satisfying their reasonable requirements without inconvenience. If I have succeeded in proving

that the State has a right to sell the privilege of setting up a shop, it follows that it must fix the number of shops which in any given locality it allows to be opened, otherwise there would be no purchasers of the privilege, since no man will buy a privilege of setting up a shop in any particular street, the value of which may be reduced the next day by the same privilege being sold to his next-door neighbour. This brings me to the consideration of the third method of licensing shops, which, as I have said above, I believe to be the only true one, and which I know to be more remunerative in its operation than any other. If I have shown that the license fees for the retail of liquor are a tax on the profits of the salesman, it follows that this tax should be so regulated as to be in each case proportionate to the tax-payer's profits. A rate of tax which falls on the profits of the tax-payer, with a varying incidence in each case, is neither scientifically regulated, nor is it fair to the tax-payers, since it puts those upon whom it falls unequally at a disadvantage in disposing of their liquor to all the rest, and the amount of the tax thus ill-arranged will often turn out to be in inverse ratio to the profits which are taxed. We have seen that the ascertainment of the proper rate of tax by an auction sale of the right of setting up a shop involves a risk of loss of revenue from the still-head duty, and it has this further disadvantage, that while the tax on his profits, which a liquor salesman, under the competition of an auction may undertake to pay, will really be far beyond his means to discharge. On the other hand, there is a danger that a considerable number of shops may, by the combination of the auction purchasers, and from other reasons, be set up at a rate of fees far below what the tax on these profits ought to amount to. It is hardly too much to say that the fees paid for licensing shops, if arranged by public outcry at an auction, never stand in the same relation to one another, which is found to exist between the different amount of profits which these fees are designed to tax. Such a method of determining these fees errs from the true principles of taxation, and cannot therefore be recommended. To tax a nominal rate of fees for all shops alike, or to allow the fees to range between fixed arbitrary limits, is a method with the same defect. The first plan clearly ignores the principles I am advocating, since each man's profits are taxed alike without reference to their amount, and, in the second case, no classification which is at all arbitrary can be possibly made to act as a gauge of the tax-payer's profits. I have therefore to propose that the license fees should be regulated according to the amount of profits taxed; to this end it is only necessary for the Collector of a district to ascertain the average yearly sales of liquor at each shop in his district. These are all recorded day by day: their ascertainment is as easy as possible. He should then deduct the actual expense (which can be ascertained with a close approximation to truth) which each salesman is put to of bringing his liquor to the market, the selling price of liquor being perfectly well-known, the amount of profit realized by each salesman can be struck within a few rupees more or less without difficulty. The profits of each salesman being ascertained, he should then assess the tax at 1 anna, 2 annas, 3 annas, or 4 annas, per gallon sold—or even higher if any salesman has very large sales. It is necessary that the tax should be assessed on a differential scale where the profits are low for this reason. If the same rate of tax is taken rateably from all alike, the proportion previously existing between the profits of individual dealers is indeed maintained; but the smaller retail salesmen, who live from hand to mouth, and have no capital, would not be able to live; their profits would be too low for it to be worth their while to engage in the business. What I have therefore urged above as to the necessity of framing the tax, with a rateable incidence, must, in these few cases, be accepted with a modification which the circumstances of the retailers of liquor impose, and this modification is consonant with an acknowledged principle of the economy of taxation—*viz.*, that a tax-payer should "only pay on that part of his profits which are in excess of the obligatory expenses necessary to his support." Let therefore retail dealers, with a sale as above calculated,—(1) under 5 gallons, pay one anna per gallon of tax; (2) between 50 and 100 gallons, 2 annas per gallon; (3) between 100 and 150 gallons, 3 annas per gallon; and (4) those doing a large business than this, at 4 annas per gallon. I believe I am right at estimating the ordinary profit on selling liquor 10 degrees under proof at from 6 annas to 8 annas per gallon. This may be increased if the liquor is a little stronger and admits of being considerably diluted before sale, or if the wine-seller has any unusual facilities of obtaining liquor slightly cheaper than others; and if the calculation is found to be erroneous, the scale of fees can be altered without interfering with the principle I have laid down. Under this plan, No. 1 would pay, on 50 gallons of spirits, Rs. 3-2 on an assumed profit of about Rs.10; No. 2, on 100 gallons, would pay Rs. 12-8 on a profit of Rs. 37-8; No. 3, on 150 gallons, would pay Rs. 28-2 on a profit of Rs. 56-4. In the same way a large dealer, with a sale of 1,000 gallons (and I believe that in some of the cities and cantonments a sale of 2,000 gallons of liquor and upwards per annum is not unusual), would pay a tax of Rs. 250, at 4 annas per gallon, on a profit of Rs. 875, calculated at 6 annas per gallon; and a profit, calculated at the same rate on 2,000 gallons, would yield a tax of Rs. 500 per annum. I would fix 4 annas per gallon as the highest rate of tax, as a retail dealer can hardly be expected to pay more than two-thirds of his net profits by way of fees, the risks of his business being taken into consideration. I have more confidence in pressing this scheme on the notice of Government than I should have if it was merely theoretically correct: because I tried it for a year when Officiating Collector of Jounpore in 1868, and with the following result: In 1867-68, the license fees amounted to Rs. 5,647, fractions of a rupee omitted, on a still-head duty of Rs. 50,190. In 1868, when I resorted to the plan I am advocating, the license fees rose to Rs. 9,231. On a still-head duty of Rs. 50,190, that is to say, on the profits arising from the sale of the same amount of liquor in each year, Government obtained nearly double the tax under my plan than it obtained under the ordinary method then in use of licensing shops at various rates ranging below a maximum arbitrarily fixed. I see from the figures in the yearly reports, that in the next year after, I may add, I had left the district, the license fees fell to Rs. 2,283, on a still-head duty of Rs. 33,681, from which I infer that my successor gave up the plan I had introduced, and I think the result he obtained proves that its relinquishment was unwise; scarcely a single shop was thrown on my hands during the year 1868, which shows that the tax assessed, as I have above described, was in no case too high for the retail dealers to pay, and it amounted to a sum nearly equal to one-sixth of the still-head duty; whilst the abandonment of the plan resulted in an amount of tax from licensing fees only equal to about one-sixteenth of the still-head duty. No argument can be stronger than these facts. I give the following figures for facility of reference:—

Receipt on account of Spirituous Liquors, Jounpore.

	By Fees.	Duty on Spirits.
1865-66	7,472	17,092
1866-67	8,600	18,770
1867-68	5,647	50,490
1868-69	9,231	50,170
1869-70	2,283	33,681

In order to prevent mistakes, I must notice that the increase of still-head duty shown in the table is the result of my predecessor's (Mr. C. Currie's) arrangements for increasing the still-head duty, which I observe are justly commended by your predecessor, in his report for 1869-70. Mr. Currie however left the matter of retail fees alone. I, succeeding him in the district, carried on his arrangements of 1867 in the following year 1868, and in addition revised the system of licensing the shops; the result being, I have shown, that the revenue from license fees was nearly doubled. You can for yourself work out what the result would have been, if, by the adoption of a similar plan over the whole province, the revenue from license fees had been in like manner increased. It is possible that an increase of Rs. 2¾ lakhs might have been attained, and this increase would have been derived—not from an increase in the consumption of liquor, but solely from making the retail dealers pay on a systematic plan for the privilege of opening shops, at a rate which they willingly accepted, and with scarcely a single default discharged. I hope that the arguments I have urged will be held to prove, that under no system of still-head duty can the profits of the retail dealers be taxed at a rate equitable in each case, or on an amount which the State has a right to take from them, and that the scheme I propose meets every requirement of the case, with the certainty of a successful result from a fiscal point of view. I have heard the objection made, that to give a retail dealer the exclusive right of setting up a particular shop is to grant him a monopoly of sale. No one is more opposed than myself to the introduction of anything like a monopoly of sale, and I contend that my scheme is open to no objection of the kind. If in a city, say, with an area 10 or 15 square miles there are 30 or 40 wine-shops, every square mile will have on an average 2 or 3 shops, no man therefore can go further than half or a one-third of a mile under any circumstances for liquor, and as a matter of fact, no one would have to go more than a few yards for the purpose, since the wine-sellers would of course only pay fees for setting up shops in those streets, where the wine-drinking classes would be found in the greatest numbers. Under an arrangement, therefore, whereby every liquor-drinker could, if one liqour-seller adulterated his liquor, or raised his price, go the shop of another a few yards off, no such thing as a monopoly of sale could possibly grow up from the introduction of the plan I propose. In the interior of the district, as well as in the cities, it is only necessary for the Collector to fix that number of shops which the experience of past years has proved to be necessary, and in those localities where the real dealers consider they are likely to make most profit; and so to arrange in establishing the shops, that no man has more than one shop, or, if the Collector allows one man to open two or three shops, care should be taken that they are set up at some distance from one another—the intervening shops being held by other persons, and no risk of any monopoly of sale is incurred. The real risk of monopoly of sale, which has proved so fatal to the Abkaree Revenue, arises from a monopoly of manufacture, and the great success which Mr. C. Currie had at Jounpore in raising the still-head duty, arose from his breaking up a partial monopoly of manufacture, and opening the Government distillery to anyone who chose to set up a still. If distillers are numerous, it is evident

that the wine they sell to retail dealers cannot be vended if a monopoly exists; since any retail vendor who managed to obtain a monopoly of sale would, of course, obtain liquor by driving down the manufacturer's price to the lowest figure at which the manufacture would pay him, the retail vendor would get all his liquor from one or two distillers, and the rest would close their stills. If therefore a considerable number of stills belonging to different distillers are at work, they compete with one another—each sells his liquor to different retail vendors, and the competition of manufacture becomes a competition of retail vend. The arrangements I proposed secure the State against any monopoly of retail vend growing up; and it only remains for the Board of Revenue to enforce that part of Mr. Currie's plan by which anyone is allowed to distill spirit in the Government distilleries, and to take care that no indirect monopoly of distillation grows up, which those who are interested in the matter are incessantly trying to effect: and for the rest to arrange the licensing system in the way I propose. I cannot too strongly point out the necessity of preventing a monopoly of distillation. If this once grows up, no licensing system can bring in any large revenue, since it depends on the monopolist distiller whether any particular shopkeeper can get his liquor at such a price that he can profitably retail it; and, in a vast number of cases, the monopolist distiller will not be inclined to sell at low rates when he can obtain a high price for the liquor he distills: nor be sufficiently intelligent to understand that his own interest lies in as extensive a retail sale of liquor as he can possibly excite. My own experience leads me to think that where the still-head duty shows returns which are considerably lower than the known conditions of any district would authorize one to expect, that there a monopoly of manufacture is in some form or another growing up, and it is therefore to this point that the attention of those who have the management of this branch of revenue should be carefully directed. I have only to add that the still-head duty should be levied on strength, and not as now without any regard thereto, otherwise an element of uncertainty is introduced into the retail vendor's calculations of profit on their business; and they are compelled in making their arrangements with the State to protect themselves against possible loss, by agreeing to pay much less in license fees than they otherwise would, if the basis of their calculation was of a more certain character.

RIGHT OF PRE-EMPTION

AMONG HINDOO VILLAGE COMMUNITIES

From W. Jardine, Esq., Government Advocate, to the Secretary to the Board of Revenue, North-Western Provinces (No. 109),—dated Allahabad, the 12th August 1871.

I HAVE the honour to submit to you, as requested in your No. 1107 of 1870, a review of the answers of District Officers on the subject of pre-emption. It had been my intention to compile a small treatise on this subject; but, partly because it has been in a measure anticipated and partly from want of leisure, that project has remained unaccomplished. To assist me in the compilation, the Board of Revenue very kindly furnished me with the valuable information which I now review. I shall take up the question in their order, and shall annex some of the more suggestive replies in the form of Appendices.

Question 1.—To what extent does the custom of pre-emption prevail among Hindoo villages in the districts with which you are acquainted?

From the answers to this question, it would appear that the custom has been generally recognized among the Hindoo communities of the North-Western Provinces, and that in some parts of the Provinces, as in the North-Western Districts, it is almost, if not quite, universal. All the Commissioners, except the Commissioner of Jhansie, speak of it as a custom very generally recognized throughout the province. Of the Collectors, those of Dehra, Boolundshuhur, Allygurh, Saharunpore, Meerut, Moozuffernuggur Bijnour, Moradabad, Budaon, Bareilly, Muttra, Agra, Mynpoorie, Etawah, Etah, Futtehpore, Allahabad, Humeerpore, Jounpore, Goruckpore, Bustee, Jaloun, and Shahjehanpore, and the Settlement Officers of Boolundshuhur, Etah, Moozuffernuggur, Azimgurh, Allahabad, Jaloun, Etawah, Mynpoorie, Furruckabad, Budaon, Bijnour, and Allygurh, concur in declaring the custom to be universal or very general in their districts. Mr. S. O. B. Ridsdale remarks that in all the 2,040 coparcenary villages in Tehseel Deonga, Zillah Goruckpore, the custom is universally admitted. On the other hand, Mr. Forbes says that in the Meerut District it is rather "a custom existing by sufferance, and one which the Hindoo communities wish to see introduced by authority, than one actually prevailing;" and the Commissioner of Jhansie does not think the custom prevalent in the districts of that Division. The Deputy Commissioner of Lullutpore says that the right is little valued on account of ignorance and of the low value of land. Upon the whole, I come to the conclusion that the custom of pre-emption is almost universal throughout these provinces, except, perhaps, in parts of the Jhansie Division. It becomes a question whether, under these circumstances, the custom might not with advantage be elevated into the character of a law, instead of being proved with difficulty and trouble in special cases as now. At present a Hindoo who sues for pre-emption is bound to prove either a provision to that effect in the Wajib-ool-urz, or the existence of an established custom in the particular locality. Perhaps, it would be more fair, as the custom is almost universal, to allow the *onus* to rest upon the party who disputes it. The chief difficulty would be in determining which of the various forms of covenants for pre-emption should be presumed to exist until a different form was proved.

Question II.—In what proportion of Hindoo villages is a provision for pre-emption inserted in the Wajib-ool-urz?

To this question nearly all the Officers asked have replied that this is universally or very generally done since Regulation IX. of 1833. The following may serve as illustrations. The Collector of Saharunpore says that out of 1,915 villages, it is not omitted in more than 100 or 150 administration-papers. The Collector of Etawah says it occurs in two-thirds of the administration-papers of Hindoo villages. The Collector of Futtehpore says in 308 out of 555. In Ghazeepore it occurs in 1,362 out of 1,794 Hindoo estates. The Settlement Officer, Mynpoorie, finds it recorded in 253 out of 269 estates held in coparcenary. The Settlement Officer of Shahjehanpore says it is recorded in the Wajib-ool-urz of 220 out of 323 Hindoo villages, and that the remaining 103 were at the time of the Settlement owned by single proprietors. In three Tehseels in Bareilly the proportions were—Crore 318 out of 373; Fureedpore 362 out of 436; Meergunge 74 out of 85. In Moradabad it occurs in 100 out of the 600 extant administration-papers of the last settlement, and is universal in all recent cases of partition. The Collector expects it will be universal at the next settlement. The Settlement Officer, Boolundshuhur, reports that fresh administration-papers have been drawn up in 433 villages. Of these the following is the proportion in which the custom is recognized:—

	Recognized.	*Not recognized.*
Hindoos only	211	91
Mahomedans . .	75	18
Christians	0	27
Mixed Hindoos and Mahomedans	7	1
Mixed Hindoos and Christians	3	0

The Settlement Officer of Kumaon says it is not in the settlement papers of 1844, but is inserted in the administration-papers of every village at the present settlement.

In Banda it occurs in the Wajib-ool-urz of 582 Hindoo villages out of 1,119; in 12 out of 56 mixed villages, and in 31 out of 83 Mahomedan villages. This is curious, as it shows that the omission of the provision from the administration-papers may indicate that the custom is generally received as among the Mahomedans. The Collector of Cawnpore says that at the last settlement this provision was generally recorded. "It does not however appear that the wishes of the people were consulted. But it is certain that in all byachara villages the people themselves do not know the meaning of the words "Huq Shufa."

Question III.—When the custom of pre-emption prevails among Hindoos to what do you trace its origin, and how far? Is it of recent growth?

Question IV.—To what extent is the growth of the custom among Hindoos due to the Mahomedan supremacy, and to what extent to our own policy?

On these questions there is a very wide divergence of opinion. Some officers consider that it was adopted from the Mahomedan conquerors; many that it was unknown among the Hindoos prior to our rule; and many that it was known, and to a limited extent practised from the time of the Mahomedan rule, but largely developed during our occupation, and especially since the Regulation of 1833. Only the Collectors of Mirzapore and Saharunpore think that the custom is of ancient Hindoo origin. It seems difficult to believe that a custom for which there is no surviving Hindoo name is really of Hindoo origin in its present form. But the general result of the authorities collected appears to be that prior to Mahomedan influence in India, a very strict custom of exclusion—not unlike pre-emption—was prevalent in Hindoo villages. (Elphinstone's History of India, p. 126.) But it is probable that in the crude state of the country strangers were deterred from intruding more by fear of consequences than by the processes of law. With customs so suited to its introduction, the Hindoos were ready to accept a system of pre-emption, founded on that of the Mahomedan conquerors; and as under our rule the security of property and life increased, and it was no longer possible to kill off any objectionable strangers, it became important to devise legal safeguard for the integrity of the village. It appears therefore that our rule and our Settlements affording the necessary protections, were gladly employed for this purpose, and that the custom of pre-emption—common but seldom *expressed* in earlier times—has become general, and promises to become universal. I quote the more suggestive answers.

Question V.—Give any statistics on the above points that may be easily within your reach?

To this question the answers are very meagre, and no inference can be drawn from them.

Question VI.—How far do Hindoos, in providing for pre-emption, follow the rules of the Mahomedan law of pre-emption?

The answers to this question are contradictory, and are not generally precise enough to be of any value.

Question VII.—What is the usual form in which the condition for pre-emption occurs in the Wajib-ool-urz?

I find it difficult to epitomize further the full extracts of answers to this question contained in the Board's precis, which I therefore annex to this report as an Appendix. The forms in use display some variety, but the most common is one which provides for sale (1) to brethren; (2) to co-sharers in the puttee; (3) to co-sharers in the village; (4) to outsiders.

APPENDIX.

Collector of Moozuffernuggur.—Hindoos of learning claim for it a Hindoo origin, and it has been stated that authority for it can be quoted from one place in the Shastra, but Collector has not the means of verifying the quotation cited. On the other hand, the certainty that the Mahomedans brought it with them to this country; that the name by which it is known has a purely Arabic root, and that the Hindoo name, if any ever existed, has been entirely lost, constitute an overwhelming presumption in favour of the theory that it is of purely Mahomedan origin.

Collector of Allahabad.—As far as the custom may be said to exist among Hindoos, apart from Mahomedan law, its origin may be traced to two causes,—(1) a primary precept of Hindoo law is that the hereditary property should be strictly kept in the family: (2) again the lawlessness of the earlier time tended in a great degree to foster the principle of pre-emption. Though it is not found in the Vedas or Shastras, it is found in the Commentaries as a recognized principle—a custom rather than a law.

Settlement Officer of Etah.—Mr. Ridsdale attributes the origin of the custom to the prohibition imposed by the Shastras against any member of an undivided family transferring his rights without the consent of the other members, which prohibition extended to coparcenary communities on analogy of the family.

Settlement Officer of Allahabad.—In so far as the express provisions of the Wajib-ool-urz are concerned, the custom is of comparatively recent origin. Its general acceptance dates apparently no further back than 1840, the first year of the Settlement that is just expiring. But the Hindoos adopted the custom to *some* extent under Mahomedan supremacy anterior to British rule. Under the *second form* (by private arrangement, according to Hindoo customary law), the custom is undoubtedly of ancient origin—its adoption having been probably a result of the necessity everywhere urged in Hindoo didactic writings, as well as in the positive law to preserve hereditary property intact.

Settlement Officer of Jaloun.—Intrinsically the usage is simply one of the incidents of that ancient institution—'The Village Community.' With reference to these village communities, Elphinstone records in his History of India (p. 126) that 'a landholder 'can sell or mortgage his right *but he must first have the consent* 'of the village,' (and the temporary breach in the institution is immediately repaired by the provision that 'the purchaser steps 'exactly into his place and takes up all his obligations.') This rigid condition of the antecedent consent of the brotherhood necessarily carried with it all the privileges of pre-emption and more. The play now of our own views of expediency or policy upon it, releasing that condition, has given it instead the colouring of the Muhumadan right of Shufa, from which it is in its sources quite distinct. In this sense alone can the custom be called of recent growth, otherwise it is in its essence of the same antiquity as the village community.

Settlement Officer of Mynpoorie.—The origin of the custom may be traced to the natural instinct of village communities to protect themselves from intrusion from strangers. In times prior to British rule, the tenure of property was very insecure, and outsiders were well aware that it was as much as their lives were worth to attempt to introduce themselves into a village community without the previous consent of the remaining sharers. Hence the necessity of pre-emption did not exist.

The custom formed part of the Code of the Mahomedans, and during their supremacy was freely exercised in regard to houses, tenements, groves, &c., but seldom or never to malgoozaree estates. It was not till after British accession, when security of property was established, and village communities found they could no longer keep out intruders by violence, that the Hindoos claimed the recognition of the right of pre-emption.

Collector of Mynpoorie.—The Collector, Mr. C. W. Moore, does not think our laws have had much effect on the growth of the custom, but he believes it has grown under our rule very considerably owing to the old race of Settlement Officers, including—of their own notion—a condition as to pre-emption in the Wajib-ool-urz. Mr. Moore thinks they did this either from a mistaken notion that the custom was peculiar to the country, although really it was at the time almost purely followed by the Mahomedans, or else they thought it was a good custom, and likely to keep the village communities together. Mr. Moore further does not think that the entry of the stipulation as to pre-emption would, as a rule, have been demanded by the Hindoos if left to themselves, though they perhaps had no objection to the custom.

Settlement Officer of Etah.—Mr. Ridsdale is inclined to attribute the growth of the custom among Hindoos more to the natural progress of the social wants of a community than to either the influence of Mahomedan supremacy or our own policy. The only effect of our own policy has been to compel Hindoo communities to reduce the principle to a distinct definition for the purpose of recording it in the Wajib-ool-urz.

Settlement Officer of Etawah.—Any increased inclination on the part of Hindoos to take advantage of the right is attributable to the increased value of landed property. Under the Mahomedan law they had the same title to claim the privilege as the Mahomedans. We, on the other hand, have (for the last twenty years at least) only allowed the right where it was supported by custom or special agreement. The growth of the custom, therefore, is not due to our policy, except in so far as the growth of all rights and customs is due to our policy of affording open courts of justice and ready redress.

OPIUM.

OPIUM CULTIVATION IN CHINA.

THE Peking Official Gazette of October 15th contains the following representation by one of the Censors with reference to the growth of the poppy:—

Memorial by Wu Chen, Superintending Censor of the Chegiang Circuit.

Your servant, kneeling, memorializes, requesting that the practice of assessing the levy (of opium-duty on growers of the poppy) may be forbidden, in order to further the execution of the laws.

He humbly observes that what should be aimed at in Government is, uniformity of practice. With uniformity, the confidence of the people is gained and obedience may be looked for; without it suspicions prevail, and obstructions easily arise. Of late years Imperial edicts have repeatedly been issued, prohibiting the cultivation of the poppy, and commanding that any officials who should show themselves remiss in carrying out these orders should be stringently impeached upon statement of the facts of their case. In this it is impossible not to recognize the true method for giving due protection to agriculture, and a far-reaching system of administrative policy. Nevertheless, in despite of the reiterated issue of Imperial exhortations, the growth of the poppy goes on as before. On inquiring into the cause of this it is found that the people have an excuse to rely upon, in the fact of the legalization of the duty on opium. The establishment of the duty on opium, however, was but a concession to temporary exigencies, and even although it may be said that it is a question affecting foreign relations, and involves a large amount of revenue, it would seem at least that the levy should take place nowhere except at the ports and customs' barriers. Granting even that no inconsiderable number of Chinese subjects are engaged in the carriage of the drug, still whatever impost is levied should fall only upon merchants and traders:—to assess farmers with the levy of a duty which should be collected only from the trading class is wholly unwarrantable. Your servant, being a native of the province of Sze-chuen, has learnt that not only is the illegal cultivation of the poppy not prevented by the district magistrates, but that actually an opium duty is assessed and levied by them, in proportion to the amount of land-tax paid. Their idea is, that it is by this means easy to obtain the full amount of revenue which they are bound to collect, whilst the method of levying the tax is extremely convenient to them. They pay no attention to the fact that traders on the other hand manage to escape taxation, whilst the farmer alone is burdened with difficulties. The policy of encouraging agriculture, and keeping the trader down, is thus wholly lost sight of; and the action taken is moreover not in accord with the Imperial mandates, prohibiting the cultivation of the poppy. It is obvious that when the officials of Government levy a duty of this kind upon the farming class, they cannot but be conscious that they are directly conniving at the practice; whilst the farmers, in paying such an impost to Government, are naturally emboldened openly to continue the cultivation. Hence it follows that the laws remain unexecuted. Your servant feels it incumbent upon him to request that a decree be issued, laying injunction upon the Viceroy that stringent orders be given to his subordinates to the effect that in so far as the duty in question is concerned, steps should only be taken to maintain supervision over mercantile traffic, and forbidding the imposition of a duty in proportion to the land-tax, to the detriment of

the agricultural class. Thus it will be plainly impressed upon the minds of the people that husbandry is one of the highest interests of the State. Should there still be any who are regardless of evil in their greed of grain, and who continued the illegal cultivation in despite of prohibitions, the local authorities should be required to keep a strict eye upon them, and inflict the punishment which their offence deserves. If officials themselves wilfully continue to levy the impost, it should be permitted to the farmers to denounce them, and they also should have due punishment meted out to them. By this means, both officials and people, being mutually on their guard, it may be hoped that exhortations and punishments will be duly regarded, and the laws will be carried into effect. Your servant submits the expression of his humble view, and entreats the sacred glance of Your Majesty thereupon.

To the foregoing memorial the following Imperial reply was issued on the 5th October:—

With reference to the memorial by the Censor Wu Chen, stating that he has learnt that the district magistrates of the province of Sze-chuen have not yet prevented the illegal cultivation of the poppy, and on the other hand levy a duty in proportion to the land-tax, which practises he proposes shall be forbidden,—it is the duty of the local authorities strenuously to prevent the cultivation of the poppy where carried on among the people. With respect to the duty on opium, this impost is collected from the trading class, and no right exists to assess it upon the cultivators of the soil. If the facts be as stated by the Censor, obedience is rightly yielded in the province of Sze-chuen, whence it arises, that the abuses cited by him have come into existence; and it is to be feared that a similar state of affairs may likewise prevail in other provinces. Let stringent orders be issued by all the Governors concerned, directing their subordinates to take cognizance only of traders in the levy of the opium duty, and forbidding them to assess the impost proportionately to the land-tax, in order that oppression may be guarded against. Notifications must also be issued from time to time, warning farmers against the violation of the enactments they would commit by illegally cultivating the poppy. Respect this!

MINERAL RESOURCES.—TIN.

(Rangoon Gazette.)

THIS ore is so superabundant and wide spread in Tenasserim proper and even in the very town of Mergui, that it is difficult to say to which class to give the preference, the stream, varying from a good size pea, to a marble or the massive veins which are found traversing in eccentric courses, throughout the several low ridges of hills, which may be seen grouped for miles around, far and near, extending from the once-flourishing city of Tenasserim at the mouth of the little Tenasserim river, to beyond the boundaries of Siam. Shortly before and for centuries previous to our conquest of Tenasserim, it is recorded in various travels and histories that vessels laden with this most useful and valuable metal, from all parts of the world, used to come and go with their precious freight from what was then termed the port of Tenasserim, viz, Mergui, since our possession of that division of British Burmah, the first attempt to work or mine this ore, to any extent, after the various localities were reported on and samples forwarded by Doctor Melfeir to the Government of Bengal was made, at their request, by Capt. Gremenhere, an Engineer officer at the time attached to the Tenasserim division. At a place near a small village, about 7 or 8 miles, by water, from Mergui town, called Kaban, that gentleman with the few implements, such as pick-axes, shovels, mammooties, and other rude instruments, from the jail of Mergui, with wooden trays, or washers, obtained in the town and villages adjacent thereto, with convicts, and some Burmese, excavated the ore from a series of low ridge of hills at the base of which were a few huts, with fruit trees, and here and there reservoirs, or petty tanks, of sufficient water to wash and clean the ore. Each man was to obtain a viss of clean ore per diem, it was found to be so profuse and so easily worked that many used to have their stipulated quantum cleaned and delivered to the superintendent before noon, the rest of the day was his own to do as he pleased. Thus a large quantity was obtained from a single vein about a foot in diameter, varying from that to a few inches. All of a sudden one day further operations were suspended, the vein was found to take an almsot perpendicular dip, and thus some years after in tracing its eccentric course, I found the course of this particular vein having been abandoned. Capt. Gremenhere returned with his colony of workmen and miners, and no attempts have since been made to work the ore of the Kaban hills, beyond those of a few settlers who reside near, and on the spot. These occasionally when they have no other occupation, extract a few viss, bring it into town and sell it or barter it for necessaries, to take back home with them, with Chinese, and others, who in to baining a sufficient quantity, have it smelted, and ship it in Junks for sale to the Straits' Settlements. Not long after the Kaban ridge of hills was explored and worked, a Chinaman commenced extensive operations at a place called Sullasseree, on a similar ridge of hills, as those at Kaban, situated near Thesea board, at Whale Bay, and about 70 miles by water from the town of Mergui, who has been successfully working, and obtaining large quantities of the ore for years uninterruptedly, with Chinese and Siamese miners, shipping the tin in large square blocks with his mark on them, in Junks, calling in once a year for that purpose, bound for Penang or Singapore, and in return the junks bring the superintendent opium, and arrack smuggled without let or hindrance for the special use of the miners and himself, without which, during the severe monsoon and inclemency of the weather, as in that particular region, (the ore can only be worked during the south-west monsoon) the men could not, without being subject to severe privations or sickness, go to work with a good will, through the mining operations so lucidly described in Doctor Oldham's report—the ore being then carefully stored away till the change of the monsoon or dry season, when the smelting operations are commenced and finished. I used, while at Mergui, occasionally to obtain some of the metal from this Sullasseree man, brought in by him in small ingots, of a conical shape, at the rate of 55 Rs. the 100 viss. He used to visit the town once a year or so, to lay in his stock of provisions for the ensuing wet season, for his men and himself. The Penang merchants however hearing of this, gradually raised the price up to 95 Rs. per 100 viss, at which figure it remained before I left Mergui. During my stay there I had visited various localities, not without some little risk to life and limb, up the numerous creeks and mountain streams, leading into both the Tenasserim rivers, where I found the tin ore in great profusion, sometimes mixed up with other valuable ores, some fine specimens of which I had obtained and brought away. On one occasion I had begged of Professor Oldham to accompany me up the Lenyea river, and pointed out a spot where, many years ago, some hundreds of pits had been dug, and were then visible, at which some thousands of Shans, Siamese and Chinese, must have been extensively at work, and abandoned only on our annexation of the country. They are supposed to have emigrated over to the Siamese territories, leaving the place to the sport of the Rhinoceros and Bison, or wild Buffaloes, the fresh foot-prints of which were well defined in and around our temporary encamping ground. Here the ore was everywhere seen in and on the surface of the pits, and along the course of a mountain stream within a few yards of the pits, samples of which we had washed and obtained with the greatest ease, and found to be equal to the best samples of Cornwall. Such, I may take the liberty of saying, was Doctor Oldham's emphatic professional opinion at the time.

METALLURGY OF IRON IN ANCIENT INDIA.

(Engineer.)

A *resumé* of the methods of working iron in India, which is probably the best that exists in English, has been given by Dr. Percy, in his "Metallurgy of Iron," but it is all comprised in about twenty pages, and though a good deal of scattered information on the subject may be found elsewhere, it probably would add but little of importance to what he has collected.

Dr. Percy, however, passes by the historical side of the subject altogether, or contents himself with the following paragraph as to it, with which his statements open (p. 254): "The Hindoos appear to have carried on the *direct process* (*i. e.*, making *wrought iron* direct, without it passing through the *indirect* stage of cast iron) from time immemorial, as we may infer from the large accumulations of slag which occur in various localities in India; and as it is scarcely possible to imagine anything more rude than their appliances or anything more diminutive than their scale of operations, it would seem that they have not made any substantial progress in the art, at least in many districts. Their furnaces are frequently not larger than a chimneypot, and hours of incessant toil are sometimes required to produce a few pounds weight of iron." This may be taken as a rough account of the *present* state of iron-working in India. But without going back so far as "time immemorial," the facts now to be adduced prove it to be a very incomplete, or rather inaccurate view of the history of iron-working in India only a few centuries back.

Within the cincture of the ancient mosque of the Kutub, situate near Delhi (so-named from the celebrated and grandly lofty Kutub minar forming part of the mosque), and not far from the principal gate, exists a wrought iron pillar. This wrought iron pillar is as large as the screw shaft of one of our first-class steam-ships, and a forging of the same size would be deemed a piece of first-class work for anyone of our great steam-hammer forges in Europe, and yet it *is more than a thousand years old, and may be as much as fifteen hundred.* Its form is either that of a conic frustrum or of some curvilinear spindle, giving it a very slight swell towards its mid-height. The capital consists of an elaborate Indian design,

the whole of which good observers deem to have been carved by the chisel out of the solid iron. The shaft too near the present ground level is beautifully smooth and true, and presents the character of having been "swaged," or if not, "sledge planished" to its finished form. The lower part for 3 feet or 4 feet, above the present ground and below it, is rough and but carelessly rounded; there appears to be some rather large cavities in this part of the shaft. This pillar has been known to Europeans for many years. The earliest printed notice of it which the writer has seen is in the "Journal of the Asiatic Society of Bengal," vol. vii., p. 659, *et seq.*, being part of a memoir "On Lithographs and Translations of Inscriptions," taken in ectype by Captain T. S. Burt, Engineer. A much more extended account may be found in vol. xxxiii. after p. 612 of the supplement to the same journal, forming part of the Report of the Archæological Surveyor to the Government of India for the season of 1862-63.

The dimension of the pillar may be approximated from paint marks in a vertical line placed upon it, at distances of 12in. apart. The following are those given by the "Archæological Surveyor" above referred to at p. 34., &c. "The total height above ground is 22ft., that of the capital (of which an enlarged engraving is given on page 403) 3½ ft., and that of the rough part near the ground the same. But its depth under ground is considerably greater than its height above ground, as a recent excavation was carried down to 20ft., without reaching the foundation on which the pillar rests. The whole length of the iron pillar is therefore upwards of 48ft., but how much more is not known; although it must be considerable, as the pillar is said not to be loosened by the excavations. I think therefore it is highly probable that the whole length is not less than 60ft. The lower diameter of the shaft is 16·4in., and the upper diameter is 12·05in., the diminution being 0·20in., per foot. The pillar contains about eighty cubic feet of metal, and weighs upwards of 17 tons.

There may be some doubt as to the correctness of the great depth under ground assigned here, but the dimensions above ground seem reliable, and agree with the photograph in the writer's possession, and are from actual measurement. The total weight assigned seems somewhat in excess, even on this author's assumption as to length. An inscription of six lines exists on the pillar itself, about half-way of its height, which records in fact all that is known as to its history. Of this Captain Burt (*ut supra*) gives the following account:—"The principal inscription on the Delhi iron pillar is in Sanscrit, the character, that form of Nagari which has been assigned to the third or fourth century of the Christian era, ... the curves of the letters being squared off, perhaps on account of their having been *punched* upon the surface of the iron shaft with a short *cheni* (punch of steel and a hammer as the actual engraving of them would have been a work of considerable labour." The inscription itself is of a most disappointing sort—its purport is merely to record that "a prince, whom nobody ever heard of before, of the name of Dhava, erected it in commemoration of his victorious prowess; that he was of the Vaishnair (Hindoo) faith, occupied the throne he had acquired (at Histinapura?) for many years, and seems to have died before the monument was completed; as no royal ancestry is mentioned he was probably an usurper." A transcript of this inscription, showing the squared letters exists in vol. vii. of the "Journal of the Royal Asiatic Society," and in vol. xxxiii. of the same, a copious mass of archæology and mythology bearing upon it, which those interested in those branches of knowledge can consult. Our business with the pillar is exclusively as a metallurgic monument.

The date of its production is, as we have seen, fixed by the inscription as the third or fourth century, A.D. Its form and chief dimensions are before us. Now what is the material of the pillar, for upon this depends the nature of the processes by which it must have been made; is it of cast iron or of wrought iron? As to this the evidence is as yet not absolutely decisive. The "Archæological Surveyor," in his report above referred to, appears to have thought it to be *cast iron*; he says, "The Delhi pillar is a solid shaft of *mixed metal*.....There are flaws in many parts which show that *the casting* is imperfect, but when we consider the extreme difficulty of manufacturing a pillar of such vast dimensions, our wonder will not be diminished by knowing that *the casting* of the bar is defective."—p. 34. What this writer means by *mixed metal*, it is hard to conjecture; he obviously had no knowledge of practical metallurgy, and his opinion must pass for what it may. Captain Burt, who appears to have had some such practical knowledge, obviously deems the pillar to be of *wrought or forged iron*, and supports that opinion by his ingenious and practical remarks as to the punching on it of the inscription. This latter view receives the following corroboration; the writer's accomplished and accurate friend, Mr. James Fergusson, Archt., F. R. S., who has carefully examined the pillar, is clearly of opinion that it is of forged iron. A fragment of it has been recently sent to England, and the writer is informed on, he believes, good authority, that Dr. Percy has heated and drawn out upon the anvil a portion of it, and considers it to be *forged iron*. This test, probably all that so small a specimen admitted of, is not absolutely conclusive, as Dr. Percy himself would no doubt admit, for some cast irons, especially those made from hematites with charcoal fuel, admit of being heated and at once forged and drawn out hot into a sort of wrought iron. The photograph, as examined with the lens by the writer, presents to the practical eye several minute characteristics which incline him to believe it to be forged and not cast iron.

There will be seen clearly in the photograph the mark of the graze of a heavy round shot on one side, at about mid-height of the pillar—and so far as can be decided by examination of the photograph—the shaft is slightly cracked across the widest part of the crack being at the side opposite to the graze mark. The blow then was *just not enough* to break completely the pillar by its own inertia, when thus suddenly bent beyond the limit of elasticity. Did we know the *vis viva* of the striking mass, and the density and exact dimensions of the pillar, it would be possible to calculate approximately the cohesion per square inch of the outside film of the shafts at this crack, assuming it really to exist; but wanting such data, and judging by tact or experience only, the writer is of opinion that if of British *cast iron*, the pillar would have been broken completely off by the blow of a heavy shot.

The existence of a doubt as to the material of this pillar, one of the most marvellous metallic monuments in the world—shows with how little completeness it has yet been examined, and how entirely ignorant those who have described this pillar have been of the importance in elucidating the ancient working of iron in India of an exact metallurgical examination of its material. Let us hope this will forthwith be remedied—by cutting from the pillar (below the surface, it may be) and sending home a piece sufficiently large and long, not only for chemical investigation, but for experimental determination of its insensibility and cohesion per square inch; for physical and chemical examination together can alone determine with certainty whether it be of oriental *cast iron* or of wrought, *i. e.*, *forged* iron.

How then was this Delhi pillar forged in India, even assuming that some means for heating it existed? Forging by power in some form, of course, suggests itself, but upon what source of power can we even speculate? Human muscles, and the "bullock walk," by which the water skins, or "bheesties," are drawn up from the wells or tanks appear the only present sources of power in India. The water-wheel, or *noria*, for *raising* water by the application of such animal power is common; but the production of power by the *descent* of water on a wheel seems never to have been known in India, where, indeed, except in the hill districts, no "falls" for water-power exist. The wind-mill though said to have been known in Persia from some very remote period, has never been seen in India, and it need scarcely be said steam-power is out of the question.

It is barely imaginable that some form of falling tup-hammer raised by men acting on ropes, after the manner of the old ringing engine for pile driving, may have been employed, or some rude form of tup or tilt hammer moved by bullocks acting on a walking wheel; and it is for Indian archæologists to discover if there be any records or traditions of such appliances, without which the methods by which this huge pillar was forged must remain inexplicable. The pillar itself stands before us, so far, a metallurgic enigma; if it stood alone, and were this great ancient forging in wrought-iron alone known to exist in India, we might pass it by content to suppose it too isolated an instance on which to found any conclusions as to the iron metallurgy of that country in former ages; but, although little noticed and apparently quite unknown to our European writers on iron metallurgy, this pillar does not stand alone.

Not to lay any stress on the probable existence in India of *other* iron pillars, as affirmed to the writer by an accurate Indian officer well-acquainted with the country, the following facts are recorded by Mr. James Fergusson, in his "Illustrations of Ancient Architecture in Hindoostan," fol., London, 1848, p. 28, and Plate III.

In the Temple of Kanarac, or Black Pagoda, in the Madras Presidency, "the walls of the *mantapa* or porch (which is about 60ft. square inside) are about 10ft, in thickness, and the depth of the doorways is, consequently, 20ft., and their lintels are supported by *large iron beams of about 1ft. section*, laid across from side to side. The roof is formed after the usual bracket fashion of the Hindus, each course projecting beyond the other, so as to give (from the inside) the appearance of inverted stairs. . . . At about half the height, where its dimensions narrow to about 20ft., a false roof has been thrown across, the remains of which now lie heaped up as they fell on the floor of the apartment. Among them may still be remarked *several beams of wrought iron about 21ft. in length, and 8in. section*, and a great many blocks of stone, 15ft. and 16ft. long, (and they were probably broken in their fall), and of a section of 6ft. by 2ft. or 3ft." Here then we have employed as mere building material wrought iron bars of 8in. square and 21ft. long. Mr. Fergusson views this temple as having been built between A. D. 1236 and 1241.

In another temple examined and described by Mr. Fergusson—that of Mahavellipore, standing alone on a solitary rock of granite, projecting into the very surf on the coast, near Madras—and the date of which he refers to the tenth or eleventh century A.D., but deems may be as late as the thirteenth or fourteenth century,

and described in his great work as above, p. 57, and Plate XVIII.—he informs me there are empty sockets for beams like those just noticed; the beams he justly argues must have been of iron, as the sockets show a scantling, which would have been if in timber perfectly useless under the load carried.

It is highly probable that at Kanaruc the ceiling beams thrust themselves out of their sockets by alternate expansion and contraction, and so brought down the "false roof," as the filling above is called; but the place affords a bad foundation, and is said to be subject to earthquakes. However, our business with these iron beams is simply as metallurgic monuments. Here then we have the fact that at Delhi, in the north, and at Madras, in the far south of India, massive forgings exist, such as all Asia, so far as we know, could not produce at the present day, and of a size rivalling those upon which Europe to-day prides itself. The earliest of these dates from the third or fourth century, and the latest from the eleventh to the fourteenth centuries of our era. With such an interval in time as 900 or 1,000 years, and such a diffusion in space as from north to south of India, it seems impossible not to conclude that the evidence of these monuments attests the existence in India for that long period of *a great iron manufacture*, well established, and with a relative cheapness and certainty of product that admitted of the use of iron as a material for public monuments and as a building material in sacred edifices, and that this manufacture was extinct, and the art and methods lost long before any modern European occupation of India. So that far from Indian iron working having been the same feeble thing we see it to-day from time immemorial, it was once a great and flourishing craft, and extended over parts of the entire Indian Peninsula.

Nothing heretofore brought to light in history of metallurgy seems more striking to the reason as well as the imagination than this fact; that from the remote time when Hengist was ruling in Kent, and Cerdic landing to plunder our barbarous ancestors in Sussex, down to that of our Third Henry, while all Europe was in the worst darkness and confusion of the Middle Ages—when the largest and best forging producible in Christendom, was an axe or a sword blade—these ancient peoples of India, the forerunners of those now so enfeebled and degraded, possessed a great iron manufacture, whose products Europe, even half a century ago, could not have equalled.

SILK.

Despatch from the Right Honorable the Secretary of State for India, (Revenue), to His Excellency the Right Honorable the Governor-in-Council, Fort St. George, dated India Office, London, 11th October 1871, *No.* 27 :—

On the receipt of the despatch from your Excellency-in-Council of the 25th of April, No. 18, and after its consideration in Council, I at once caused a communication to be addressed to the Silk Supply Association, requesting that body to procure and send to Madras the Silk Reeling-machine for which you applied. Your Excellency-in-Council will see, by the accompanying copy of the reply received from the Association, that a Silk Reeling-machine has been forwarded to you direct from Genoa.

From the Honorary Secretary to the Silk Supply Association, to the Under-Secretary of State for India, dated London, 23rd September 1871.

With reference to your favour of 1st June (6149) and my reply on 3rd of same month, I have now the pleasure to inform you that a Reeling-machine, upon the most approved principles, has been forwarded from Genoa by Rubattino's steamer to Alexandria, and thence overland to Madras, addressed to his Excellency the Governor there. In order to facilitate the putting together this machine correctly, drawings have been taken and the different parts numbered to correspond with the numbers in the drawings. This has added somewhat to the cost, which, including forwarding and shipping charges, amount to £20. The freight is payable at Madras, and is to be the equivalent of 320 francs at the exchange of 25 francs per £1 sterling. In reply to your favour of 8th instant (5300), I annex a list of the publications likely to prove of most service to the Council of India in the improvement of silk culture.

The Association will be at all times available for advice, if furnished with meteorological and geological information as to the different districts in which it may be thought desirable to experimentalise. Specimens of cocoons, lately received from Kongrah, prove beyond a doubt that there is a breed of worms acclimatised in that part of India, scarcely inferior to those of Italy.

INDIAN FORESTS AND INDIAN RAILWAYS.

THE SOCIETY OF ARTS.

An "India Conference" was held in the theatre of the Society of Arts on Friday evening, Dec. 1st, the subject being to discuss the question of Indian Forests and Indian Railways.

Hyde Clarke, Esq., who occupied the chair, in opening the proceedings, observed that he thought it would be gratifying to those of the members of the Society of Arts who had taken an interest in the proceedings of the Indian Committee of the Society, if he said a few words by way of retrospect, as to what had been done in the past Session in regard to India. He thought the Indian Committee of the Society of Arts might congratulate themselves on the progress of that measure in which the Society took active part—the establishment of an Indian Agricultural Department. But while the India Office acceded to the request which the Society made, it ought not to be forgotten that many of the friends of India have expressed great regret that the Department of agriculture has not been placed on a sufficiently independent position, but is placed in a subordinate position under the Board of Works or the Board of Revenue. What is wanted with regard to Agriculture is that there should be a department having, in the various presidencies and provinces, Directors who should be, as it were, the official representatives of the agricultural interests, and who will be able to attend particularly to the Revenue Department, which exercises so large an influence upon agriculture; while on the other hand the Agricultural Department, if it is made simply dependent, it will not be possible to carry out these views. In the next place, the Indian Committee are entitled to congratulate themselves with regard to the continued prosperity and maintenance of the Manchester Cotton Supply Association. At a period of the past year when there was a prospect of that Association discontinuing its labours, the proposition was made that in such a case the Society of Arts should be asked to supply, as far as it could, the place of the Cotton Supply Association, by establishing a permanent Cotton Committee. That proposition had a considerable effect in stimulating their friends in Manchester to maintain that institution which they have carried on for so many years with such great benefit to India by its labours in advancing the culture of cotton in the country. Another topic to which reference might be made was with regard to the East India Association. In the early part of the past year the council of that Association were in a state of great despondency, arising from various circumstances; and some conferences took place between the Society of Arts and leading members of the East India Association, to ascertain whether further support could be given to the East India Association for its perpetuation and maintenance. In that case also the Society of Arts were justified in considering whether, with a further measure of support, they could strengthen the exertions of their friend, Mr. Dadabhai Naoroji. The encouragement which was given induced Mr. Dadabhai to start with some degree of firmness and confidence upon the tour in India, which has resulted in endowing the East India Association with new funds, and has begun for it a new era of prosperity. Looking back to the labours of past Sessions, the Indian Committee have every hope that during the approaching Session they may, in their humble way, be able to render new services to the cause of the advancement of India. They could not expect that any subjects of this nature can be popular; they could not expect that there could be any degree of general interest in regard to Indian questions; but if they could succeed in bringing together and keeping together a small band of labourers who could profit by the facilities given by the Society of Arts to communicate their ideas to the leading men of the commercial and political world in England and abroad; and if they could profit by the means the Society of Arts' *Journal* affords of disseminating their ideas still further, aided by the co-operation of the Indian newspaper press, it would be a great encouragement to those friends who came there to contribute their ideas or to engage in discussion. (Cheers.) On the present occasion they had been invited to hear the views of Lieutenant-Colonel Wragge upon the important question of "Indian Forests and Indian Railways," and he would now call upon his gallant friend to open the Conference.

Lieut-Colonel A. Romaine Wragge—said: Mr. Chairman and gentlemen,—No doubt many of those who have honoured me with their attendance upon the present occasion, have asked mentally the question why have I coupled Indian Forests with Indian Railways? Those however who have read my previous address, published in the *Journal* of this Society in the early part of the present year on the utilization of those natural deposits of fuel which are at present available and untapped in various parts of India, to provide remedial measures for reducing the working expense of some of the Indian railways, will readily understand why I coupled them; but to those to whom the subject is now presenting itself, for the first time, I would briefly submit that, owing to the absence of a supply of cheap coal—the great element of cost in locomotive expenses—the economic supply of wood fuel from Indian Forests is a matter of vital importance to the railway success on those lines which are using wood in the endeavour to lower their working expenses; and there-

fore unless every exertion is made to work the forests at as low a remunerate price as is compatible with the due provision of a cheap supply of firewood, those railways interested must be the sufferers from a needlessly enhanced rate of production which will and does tend to an increased percentage of the consumption of their gross receipts by their working expenses; and you have now my reasons for coupling the forests and railways together. The recent discoveries of coal in Central India, of vast import to some of the lines, cannot be utilized economically over their entire lengths, as from their great extent and consequent distance from such collieries, the cost of haulage along the line to remote spots becomes a heavy burden. For instance, when the Great Indian Peninsula Railway begins to use the Mopani coal, it will be able to reduce its working expenses materially within certain limits by its substitution for a high-priced English coal; but it could not effect such a desirable object at its terminus towards Bombay, for the simple reason that the Railway Company would have to convey it over more than 480 miles before it reached the terminus, and of course the cost of its carriage would be a serious item in their working expenses. The recent discoveries of good coal in the Chandah district again, owing to its great distance from Madras, and the want of cheap water carriage to the Madras Railway, precludes the hope of its being able to compete with English coal on that line, or the Great Southern of India Railway; and therefore it is to the forests that Madras must turn its attention, as it has hitherto ignored the existence of its cheap and valuable deposits of peat, which nature has so bountifully placed at its disposal to help it out of its present fuel difficulties. Why Government has not made much of the goose that has laid them golden eggs, I know not; but I have no hesitation that such neglect is subversive of economy. When the Government which cannot provide a sufficiency of firewood, rejected certain proposals of mine, made three years ago, to utilize the peat deposits, I offered, if they wood place a bog or two at my disposal, to go out there and prove to them not only that a most economical fuel might be made to assist the railways in their dilemma, but that such would also prove a new source of revenue to the Government. To this second request I have, up to the present time, received no reply; so that it is being considered at leisure, while the working expenses of the Madras and the Great Southern of India Railways have been rising half-yearly gradually higher and higher, and cotton remains locked up, unable to move, from the high cost of transport, entailing thereby a great loss on the capital and labour employed in its production, and discouraging its cultivation this year; a great loss to the railways from the withdrawal of the anticipated transport, and is highly detrimental to Manchester (from the non-arrival of cotton for manufacture) whose market is now somewhat depressed. I trust therefore that Manchester will use its influence to further views having, for one of their objects, the setting free of that commodity without which its factories would be idle, trade impeded, and a large body of its hard-working productive population suffer great want and privations. To illustrate the great want of firewood, I quote the following remarks of the Government Director of Indian Railways in his published reports on them, addressed to Her Majesty's Secretary of State for India, which will show for how protracted a period the fuel question has been impeding the efforts of the railway authorities to arrive at commercial success. In the report of 1862-63, he says: "It is satisfactory to learn that this state of things may soon be, as measures have lately been taken by the Government of India for organizing a new system of administration for the management and conservation of forests, with the view of making their produce available for the railways and other public works of the country." From this paragraph we see that the Government Director of Railways began to hope something from the forests, as far back at least as 1862, nearly 10 years ago. In the report for 1863-64, he says: "Compared with English Railways, the Indian lines—some more than others—labour under the disadvantage of expensive fuel, and of a more rapid deterioration of works under atmospheric influences and on expensive European agency. The first will be seen in the increased cost of locomotive power; and to show the importance that is to be attached to the question, the following statement of the Locomotive Superintendent of the Madras Railway on the saving he expects to effect by the use of wood may be taken as a single illustration—'As regards wood burning, the number of engines fitted with spark catchers has been greatly increased, and if I can continue to get ample supplies of firewood at anything like present rates, the saving in cost of fuel will be very great. The total cost of fuel consumed by engines on capital and revenue account in the month of November was £921, 10 less than July last, although with an increased mileage and heavier average loads. This is entirely due to the decrease in the consumption of coke and coal by the substitution of firewood." The report of 1865-66 says: "With regard to the working expenses, there are two items which at present are particularly high on Indian lines, and these are the European establishments and the fuel, both of which, compared with the railways in Europe, entail a heavy charge. As regards the highest of fuel, however, this does not apply to the Bengal lines, the coal for which is obtained from collieries at Burdwan, Raneegunge, and Kurhurballee. The great advantage of these sources of supply will be understood, when it is stated that the price of coal at the pit's mouth to the East Indian Railway is about 10s. per ton; while English coal has lately cost the railways in the Bombay and Madras Presidencies from 40s. to 70s. a ton at their maritime termini. This high price is at the present time caused by the rise in freights from this country to India; but the cost at the most favourable times will not be less than 40s. On some lines wood is used instead of coal; and with proper precautions against the escape of sparks, it answers admirably. On the Madras Railway it is calculated that the cost of wood fuel is less than half that of coal and coke. When some 150,000 tons or 200,000 tons of fuel are consumed annually, and when from 40s. to 50s. per ton has been paid for it, it is time to look round for relief. Australian coal has been tried, with what success has not yet been reported; but from India herself the supply of fuel should ultimately come. By the judicious planting and preservation of forests, and by the development of the mineral resources of Central India, means will, it is hoped, be afforded for rendering her independent of foreign support." From this paragraph we see that in 1865-66 the Director was of opinion that "it was time to look round for relief," which he might have had now three years ago; for from that time I took the question up, and relief might have been allowed next year if my suggestions had been listened to. And I would also observe that the coal fields of Central India have not furnished the Director with their mineral resources up to the present, as he had every right to expect. I adduce this to show the general procrastination this fuel question has received; but I believe a railway is now being made, or is about to be constructed to supply the railway with this coal. In the report of 1866-67, the Director says "various questions connected with the traffic and working of the railways have engaged the attention of the Government and the railway companies during the past year. The most prominent were those relating to the supply of fuel; the use of iron or wood for sleepers; and the employment of steel for rails; the formation of roads as feeders; and the rates and fares. The importance of the fuel question can hardly be exaggerated. Cheap and dear fuel may, in some cases, be almost equivalent to success or failure." And now this failure is at hand from dear fuel in 1871; and further apathy and listlessness will entail heavy misfortunes on the Madras railways. The Director proceeds, "It will be seen by the following statement that the high rate of freights from this country at the present time makes the value of coal and coke, before it is landed in India, something like 50 per ton. When to this is added the landing charges, and the cost of conveyance down the lines, the average cost of coal for the railways on the western and southern sides of India may be taken at about 60s. per ton. Thus, while the cost of coal per train mile on the East Indian Railway was 3¼d., on the Great Indian Peninsula Railway it was 1s. 6¼d. last year. A recent report from Mr. Oldham, the Superintendent of the Geological Survey of India, on the coal resources of the country, does not encourage the hope that coal will be found in many parts of India where it could be of very great value to the railways. 'Viewed as a coal-producing country,' Professor Oldham says, 'the British territories in India cannot be considered as either largely or widely supplied with this essential source of motive power. Extensive coal fields do occur, but these are not distributed generally over the districts of the Indian Empire, but are almost entirely concentrated in one—a double-band of coal-yielding deposits, which, with large interruptions, extends more than half across India, from near Calcutta towards Bombay." He adds further on in his report—'There still remains however much to be surveyed, and until careful mapping has been carried out of all the fields, any estimate of the coal resources and productions of British India must be defective. Up to the present time it may be said that little more than surface workings have been carried on in India. In parts of the Raneegunge field these open workings are of marvellous extent and size, covering hundreds of acres. We may conclude from these remarks that a supply of coal will be available for the lines passing through Bengal and Central India. The Bengal Railways have indeed already obtained their fuel from the collieries near Raneegunge. The Central India coal has not been used by the Great Indian Peninsula Railwy, as the line is not yet sufficiently near the collieries, and the cost of conveying it by the road would make it too expensive. In the upper, western, and lower parts of India it may be presumed that the railways will not possess the advantages of native coal. The importance therefore of obtaining other sources of supply increases every year. Coal from Australia and from Labuan is being tried. But wood is what we must look to chiefly if economy is to be secured. The subject has engaged the serious attention of Government both at home and in India. Several despatches pointing out the importance of the subject and suggesting the necessity of adopting immediate measures for increasing the plantation of suitable timber, have been addressed to the Government of India by the Secretary of State during the year. It has been calculated that a plantation of 20 acres will be the average proportion required to meet the requirements of every mile of railway; and Lord Cranborne observed that it was evidently necessary that planting on an extensive scale should take place

annually for several years to come." Nevertheless these despatches appear not to have been efficacious in producing, even up to the present, a sufficiency of wood fuel, though we are still relying upon the forests; and moreover that it will require at least 50 acres of plantation to each mile of railway, to supply the annual demand for firewood, for the consumption per mile is over 100 tons per annum; and you must not calculate on obtaining more than two tons per acre when the forests are sufficiently advanced to be productive, as no doubt much firewood will be stolen, as of old, therefrom. It is no slight undertaking now that there are 832 miles of rail open on the Madras line, and 168 on the Great Southern, with many more sanctioned to be constructed. These 1,000 miles of railway ought to be provided with 50,000 acres or more than 78 square miles of forest; and if they go to distant forests remote from the rails, the cost of firewood will be so enhanced, that we shall probably hear of English coal being burnt for economy!

The report of 1867-68 says:—"A marked difference will be observed between the expenses in the locomotive departments of the Bengal and Bombay lines, showing the great importance of the full question. On the Madras lines, the difference is not so great, although they are as dependent upon England for coal as the lines in Western India. This is partly due to the more general use of wood, but partly also to an economical system of management which reflects credit on the railway authorities in the Madras Presidency. With regard to wood fuel measures have been taken by the Government for planting and preserving forest for the purpose. With respect to coal, an abundant supply is obtained in Bengal, but the beds in Centeral India have not yet been made available for railway purposes, access to them having been delayed by the tardy operations on the Great Indian Peninsula Railway. A short branch to the mines will be required when the trunk line to Jubbulpore is completed; and it is to be regretted that arrangements have not already been made for carrying out this work, so that the coal may be ready by the time it is wanted. Other places in the neighbourhood of the Great Indian Peninsula Railway, where coal is known to exist, have been explored, but the result of the exploration has not yet transpired." The report of 1868-69 states that "the next item of expenditure which present the greatest contrast on different lines is that of the locomotive department. While the train mileage cost of this department on the East Indian is 16·48d., on the Great Indian Peninsula it is 29d., and on the Scinde 39·5d. The reason of this is plain. The East Indian pays on an average about 20s. a ton for native coal. The lines on the Western Coast are at present dependent for coal upon England or Australia, the cost of which comes to from 60s. to 80s. per ton. The railways on the Madras Coast are however equally deficient in a supply of native cost, and have during the past year paid even a higher rate for English coal; and yet the cost of their locomotive department is less than those in Bengal, amounting only to 13·4d. the Madras, and 13·5d. on the Great Southern. This may in some measure be accounted for by the lowness of wages and the lightness of their trains compared with those on the East Indian; but it is also due to the use of a considerable proportion of wood fuel, and also to good management. Fuel must always be a source of great expense on those lines which are at a distance from coal-producing districts, or from forests." This however is not necessarily so, unless you despise the bounties of nature in the shape of peat fuel, which coal had such a struggle to displace three centuries ago, that Acts of Parliament were passed to prevent its being burnt, and peat remained triumphant for a long time. Still some wicked sinners would burn it "on the sly." And this is the fuel that is now being treated with contempt, when its services would be of such vast use to Government, while the proposed plantations are being formed. "It is therefore," adds the Director, "most important in the interest of railways to develop the coal resources of the country, and to regulate and preserve the forests." Still the forests! The Government is very anxious to promote both these objects. I have referred to Australian coal; it has been tried on some of the lines of Western India, and has been well reported on; the experience of the Locomotive Superintendent of the Sind Company is that "it is equal to Welsh coal in all respects; its evaporative power is nearly equal to Welsh coal, but consumption per mile is less than with Welsh coal. The price hitherto has been under that of English or Welsh coal. Fuel made of compressed coal-dust and certain cohesive ingredients had also been used and found to answer well. Experiments have lately been made in this country by Mr. F. C. Danvers, of the India Office, with the view of devising means for the manufacture in India, with materials on the spot, of blocks of this kind of fuel." Patent fuel made of coal-dust is more expensive than coal. What is wanted to reduce the working expenses is a much cheaper fuel than either coal or Indian wood at its present price; for it is yearly, now in 1871, as dear as coal owing to the mistaken policy pursued by Government in regulating its price up to the standard one of coal in India. My friend, peat, certainly begins to look up, and may afford the Government Director of railways the relief he has been so long looking for, if he will only take it by the hand. The report of 1869-70 states that "it will be observed that the proportion of working expenses to gross receipts in some cases was above 80 per cent., while in others, viz., the East Indian and the North-West line of the Madras, it was about half the proportion. The average expenses of the thirteen lines which realized profits were in 1868, 61·77, and in 1869, 64·05 per cent. of the gross receipts. It may be expected that when the lines have more fully developed the traffic which they ought to command, and when—(ah, when indeed!)—by the use of cheaper fuel from native sources the present heavy charges in the locomotive department are reduced, the average rate of expenditure will be under 50 per cent. If this had been the case during the past year of depression, nearly £350,000 would have been added to the net receipts." I showed in my proposals how much might be saved annually to the railways three years ago; but such saving did not seem to be deemed important. "Strenuous efforts," continues the report, "are being made both by the Government and the Companies to reduce the expenditure in every way, and to bring the working establishment charges as low as is compatible with efficiency." This I cannot accept, as the expenditure has not been reduced in the most important matter, and providing a cheaper fuel for the Madras railway, because the Forest Department cannot supply a sufficiency of wood fuel at a reasonable rate, and have hitherto availed themselves of an economic fuel from native sources, ready at hand. By the report of 1870-71, we learn that "the fuel question is always an important one in connection with the working expenses of Indian railways, and it is satisfactory to find that native coal will soon be more extensively used. The coal from the Nerbudda fields is at length likely to be available for the railways in Central India. A tramway from the pits to the Great Indian Peninsula Railway is now being laid down, and the Railway Company has engaged to take a certain quantity monthly at a fixed price. Sanguine hopes are also entertained with respect to the Chandah coal-fields, specimens from which have been favourably reported on after experiments with them. The mines are situated to the south of the Nagpore branch of the Great Indian Peninsula Railway, and a line is being laid down by the Government with the main object of obtaining a good supply of fuel from this source. With these aids a considerable reduction should take place in the working expenses of the Locomotive Department of the Great Indian Peninsula line, and more favourable results produced by the traffic. A regular system has been organized in the Madras Presidency for obtaining an adequate supply of wood fuel for railway purposes. It has been estimated that nearly 100 square miles will be required to meet the demand; and already measures have been taken by the Forest Department for demarcating 20 miles in the districts of Cuddapah, North Arcot, and Coimbatoor, to be used for the cultivation of trees suitable for the working of the railways. Similar measures have also been adopted in the Punjaub and Scinde." Here we are again upon the forest tack, and the Government Director of Railways, I trust, feels happy after his prolonged and indefatigable exertions which seem to have been so thoroughly thwarted for so protracted a period, in the hope that at last his reiterated requests will be attended to, and that he will be able soon to give a better account of the working expenses of his railways. It is always a disagreeable thing to throw a damper upon brightening prospects, but my duty must be done to my protege, peat, and I am therefore bound to tell him that measures for demarcating forests are only preliminaries to the production of wood fuel, and that after demarcation comes preparing the ground, raising the young trees in the nurseries, and planting them out and carefully tending them for a time, and guarding them while in the plantations from various dangers to which their young life is exposed, such as excess of moisture, sudden floods, want of moisture, the depredations of cattle, the attacks of insects and wild animals, such as rats, who create great havoc in many parts of India; porcupines, deer, camels, goats, accidental fires, hurricanes, clandestine felling, wholesale robbery, incendiarism, &c. And when the survivors have successfully run the gauntlet of such minor juvenile complaints, he will have to wait eight years before these new plantations, if they have been planted in judiciously selected sites with suitable soil, &c., can be made available to provide his railways with a sufficient supply of wood fuel, supposing that all these requisite plantations are started at once, which they will not be. How then I ask is he going to tide over this deferred consummation of his hopes? The new plantations cannot be available sooner, which is greatly to be regretted, as he has ever done his utmost to reduce the working expenses of these lines. But have his constant appeals been met with equal earnestness? or has he received the assistance which a judicious economy would have provided for his often repeated demands? He most assuredly has not; and therefore I would again venture to whisper in his ear the panacea for his railway maladies; the good and great medicine "peat," which is kept in store on purpose for use. And I am ready to show how the dose is to be taken for the recuperation of his railways. I feel assured that you, like myself, will feel exceedingly delighted that we have at last got over the railway reports, which I think you will agree with me fully establish that the Forest Department is a broken reed to rely upon for the production of an economical supply of firewood for the railways; they have long been weighed in the balance and found wanting; and, therefore it is to some other source

that we must look for a present remedy. I know at the same time that the Forest Department have many elements to contend against, but they do not appear to me to have profited by experience; and with their present system all their attempts must result in failure. It is not a wise measure reducing the working expenses of the railway to argue that because coal is at a high price, they can afford to pay a comparatively high price for wood,—which has been proved by the experience of the Madras line to be of less than one-third of the value of coal, weight for weight, for locomotive purposes. And therefore when that railway has to pay 18s. a ton for it at Bangalore and elsewhere, it is more than equivalent to having to pay three times 18s.—or 54s.—a ton for coal. Surely then, wood at such a price cannot be deemed an economical supply, and it is really taking advantage of the fueling necessities of the railways. The object of the Government should be to supply wood at as low a rate as possible, consistent with a slight remuneration to cover interest on outlay, and not to endeavour to realise a large revenue out of the unhappy position of Indian railways with regard to their fueling requirements. In my judgment, an error has been made in clearing away all the trees upon certain favourable localities, and then handing the cleared land over to the ryots for cultivation; and instead of re-stocking such eligible lands as had been already pointed out by nature as well adapted for forest trees, seeking fresh sites for the formation of plantation upon soil which afterwards turned out unsuitable for the growth of the trees planted thereon, thus causing a terrible loss of time, capital, and produce. Since Dr. Cleghorne's departure (who was officiating Inspector General of Forests), foresting seems to have greatly fallen off in Madras. Again, it has been stated that the chief object of Government was not to derive revenue from the forests, but rather to provide a supply of timber and firewood for public purposes; but that this object has been systematically lost sight of cannot be doubted, when, as I shall presently show, they derive over 40 and 80 per cent. upon the outlay expended annually, and cannot supply anything near the amount of fuel required. To prove this in a satisfactory manner, we will proceed to the examination of the last forest accounts circulated for general information; but before we do so, I should like to offer a few remarks on the relative values of coal and peat in India, which are to the following effect:—That the comparative advantages of using peat and coal in England are vastly different from what they would be in India; for while in England coal is plentiful and to be obtained at what is now unfortunately considered a moderate price, there is not much margin left for the employment of condensed peat economically, as its price would not fall very much below that of coal. But these circumstances are totally reversed in Madras, for there coal is very costly, while peat could be provided at a comparatively low price, as is done on the Bavarian lines. It is time that some more powerful voice than mine should lend a helping hand to this important question, and I trust that either Her Majesty's Secretary of State for India, or his Excellency the Viceroy, will not allow this fuel question to be longer dragging its slow length along.

PUBLIC WORKS.—RAILWAYS.

VENTILATING CARRIAGES.

Sir,—I notice in your impression of the 3rd instant, you allude to my invention for cooling railway carriages and compliment my design by comparing it with the proposed means for the "luxurious" journeyings of the Imperial family of Russia.

I am however not so ambitious as to entertain the idea of placing the travelling public in India on the same footing as royalty, but I have given much thought towards rendering railway carriages cool and free from dust, and the few experiments which have been made with carriages fitted up with my apparatus prove my invention to be successful.

The objection which has been raised regarding them, viz., "that a damp atmosphere is combined with the reduction of temperature, is one, which, if carefully considered, cannot be an objection.

There are many people in India who object to the use of "kuskus" and would not sit behind one upon any consideration, and there is an infinitely greater number who would consider the annihilation of "kuskus tatties" as the deprivation of their greatest comfort.

A case has come to my knowledge of a passenger, who, depriving himself of his coat and other superfluous clothing, lay on his back over the grating in the bottom of the carriage in which he was travelling, and then complained that he suffered from rheumatism in consequence. This is not at all surprising; if he were to similarly unrobe himself and stand with his back against a kuskus tattie over the doorway of his own bungalow, with a strong hot wind blowing through it, the effect would be the same.

There is the use and the abuse of everything, but the latter should not condemn an invention which, by judicious management, promises to be a great comfort to the travelling public in India.

Everyone has experienced the sensation of dampness which pervades a room cooled by the use of tatties. The cold air is blown into it and allowed to accummulate without any attempt whatever being made for ventilation. The formation of dew is therefore the natural result as exhibited by the moisture upon any metal or cold surface exposed to it.

This moisture is in my carriages entirely removed by the windows which effect thorough ventilation. When properly opened they draw off the cold air which enters the compartment through the floor of the carriage, and thus prevent the accummulation of moisture, which otherwise would take place. In addition to which they entirely exclude the hot air from without and prevent the entrance of dust, which, to travellers in India, is a great discomfort.

Experiments have proved the efficacy of this arrangement, and carriages have run from Bombay to Calcutta, arriving at the latter station almost as free from dust as they were when leaving Bombay.

Jan. 5. R. D. SANDERS.

OBSERVATIONS ON THE RAJPOOTANA RAILWAY—PROJECT FOR AGRA DISTRICT FROM AGRA TO SAMBHUR.

It having been determined by the Government of India, with the consent of Her Majesty's Government, to construct a railway from Agra by Bhurtpoor and Jeypoor to the Sambhur Salt Lake with the immediate object of facilitating the transport to British territory of the salt so largely produced there, as well as to form an important section of a railway which should eventually traverse Rajpootana and unite with the existing railways of the Bombay Presidency, instructions were issued on the 30th October 1869 for the immediate commencement of the surveys for the preparation of a project. These were carried on during the season of 1869-70, and resulted in the submission to the Government of India, during the recess of 1870, of an excellent preliminary project, from which it was evident that the several alternative alignments and deviations throughout the route, that seemed to call for consideration, had been very carefully investigated. This project was very creditable to the Superintending Engineer, Colonel Peile, R. E., and the staff employed under his orders. In the execution of the surveys, two especially important matters presented themselves for the investigation of the Engineers. These were the point of junction of the line from Delhi with that from Agra, and the general location of the line from the neighbourhood of Jeypoor to the Sambhur Lake. On these points it was decided, after full consideration of the several alternative lines examined by the Engineers, that Khera (Bewai), 86 miles from Agra, is the most suitable point for the junction, and that the importance of the city of Jeypoor is such that the main line should be taken as near to it as is conveniently possible notwithstanding the steep gradient, and the detour involved by the topographical features of the ground in its vicinity. From Jeypoor it was settled that the line should be taken direct to Sambhur; but in view of the disadvantage to the through traffic and the special nature of the Sambhur trade, it was further decided that the extension line towards Ajmeer should take off about four miles east of Sambhur. This place would thus be on a branch; but this will not be a disadvantage under the circumstances, because it can be worked as the extension of the sidings that will have to be laid down on the margin of the lake for the economical handling of the salt. Before proceeding further, it is desirable to place on record the reasons which prevailed with the Governor-General-in-Council in forming these conclusions on the two points above referred to. As respects the locations of the line between the vicinity of Jeypoor and the Sambhur Lake, the question presented for decision chiefly turned on the expediency of placing Jeypoor and Sambhur on branches in order to save through traffic from the detour involved in the adoption of a circuitous line. Sambhur, on account of its important salt product, is an obligatory point, whether it be reached by a branch, or the main line be carried to it. Jeypoor is by far the largest city in Rajpootana, having, it is believed, 250,000 inhabitants, and it is manifestly inexpedient to leave a place of this magnitude at a distance from the railway. Owing to the peculiar topography before referred to it would be six miles from the line unless a specially abrupt deviation were made to reach it. If therefore the main line were not diverted to reach the city, a branch would be necessary. The estimates (prepared for the broad gauge) of the proposed alternatives showed that the more direct line with branches would cost £60,000 more and demand three additional miles of railway compared with the circuitous line; but allowing even that there would be no additional length of line to be constructed, the direct line would still be somewhat more costly owing to the difference of the country, and there would be the constant extra expense of working the branches. The transport of the salt might however be confined to a certain season of the year, this branch being closed for the remainder; and as respects the Jeypoor branch, it was suggested that the traffic should be worked in and out from the junction, while the through train is standing there, and, in favor of the branches, there is no doubt that the country traversed by the through line would be less desert than that immediately between Jeypoor and Sambhur, by which the

circuitous line would have to be taken. Jeypoor is not only a very large city, but it is the capital of the State, and between it and the surrounding districts there must of necessity be much inter-communication, which it is obviously undesirable that the railway should fail to serve to the utmost. The trade of the city is almost entirely with the east, and, in its interests, shortness of through transport to and from the west is comparatively of little moment. An inspection of a map, showing the boundaries of the Jeypoor State, affords no reason for the supposition that the more direct or southern line towards Sambhur would obtain more short local traffic to and from the city than is due to the towns and villages in its vicinity. The distances within the Jeypoor territory from the south-west districts of that State are in the aggregate so small that those resident at any distance from the line of railway would probably travel direct, and by one means of conveyance, to and from the city, so that the northern route, though less populous would not, if adopted for the railway, deprive it of any serious amount of traffic. The general traffic on this line must, for many years, be light, and therefore the first cost as well as the cost of working should be kept down to the utmost. With branches to Sambhur and Jeypoor, the through traffic would be saved, paying toll over a certain length (perhaps 10 miles) of line; but while this would benefit trade in a small degree, the general public who pay for the railway would suffer, for the construction of the branches would require an outlay which would be excluded from participation in the earnings from through traffic. Considering the subject in all its bearings, the conclusion arrived at by the Governor-General-in-Council was in favour of the northern location by which Jeypoor would be on the main line, and the railway would be taken direct to Sambhur. Further, by selecting a point about four miles east of Sambhur for the bifurcation of the extension towards Ajmeer, the lead of salt towards the east would still be a minimum, while the disadvantage to through traffic would be somewhat lessened, albeit at the disadvantage of having to work a branch. As however the Sambhur junction will be an engine-changing station, the inconvenience and expense will be minimised. Next as to the point of junction of the two districts of the railway. The various sites proposed for the junction are shown on the attached sketch. The dotted lines are those recommended by the Government, North-Western Provinces, and the Railway Officers. For a through line to Agra, the lines recommended are the best as giving a minimum mileage to be constructed, and as presenting fewer difficulties in construction. The one objection to the dotted line to Ulwar is that it does not pass close either to Buswa or Rajghur. Buswa is however a place of only 2,500 inhabitants, and as the line is within three miles of Rajghur with its 12,000 inhabitants, it was determined to waive this objection. The eastern or Khera junction adds five miles to the through distance to Delhi, and diminishes the distance to Agra by two miles, compared with the western or Goodha junction. It also reduces the length to be constructed by nearly nine miles. The Bundikhera junction, intermediate between the eastern and western junction, would require nearly five and half miles more of line than the Khera junction, but would decrease the distance to Delhi by nearly three miles. The sketch exhibits the great detour that must be made by any line from Agra towards Jeypoor in order to serve the salt field of Bhurtpoor, which extends from the city of Bhurtpoor for 28 miles in a northerly direction, or for eight miles beyond Deig. Were the Agra line taken *viâ* Deig, Rajghur would be the junction with the Delhi line, the Agra traffic would have to be carried over 22½ additional miles, and 11½ additional miles of railway would have to be constructed. To take the through line so far out of the way for the purpose of serving this salt tract did not seem expedient. A more direct line to Agra would certainly pass near to Bhurtpoor, a large city which it is of importance to bring on to the railway, and should it hereafter be found expedient, a tramway could be laid traversing the whole extent of the salt field. In the face of these considerations, the Governor-General-in-Council had no hesitation in accepting the recommendation of the local Government and Railway Officers, and in deciding on the Khera site as the most suitable for the junction in the interests of the railway generally. Its position is also convenient for an engine-changing station which it is desirable to place at a junction like this. These points being settled, the general alignment was practically determined, and the only deviations from the surveyed lines that were called for were due to the adoption of a steeper ruling gradient than that ($\frac{1}{330}$) originally contemplated. The population beyond British territory is sparse, and the traffic for many years must be small. It was therefore decided, after examination of the longitudinal sections, to economise in this part of the undertaking by adopting a gradient of $\frac{1}{150}$ wherever it would reduce earthwork in any important degree. In this way a considerable saving in outlay became possible, while the demand on the labour market would be materially reduced—a matter of moment considering the sparseness of the population. One other point of importance required a decision, *viz.*, the location of the line in the immediate vicinity of Agra, and in connection therewith the crossing of the Jumna to unite with the East Indian Railway, and the station arrangements on both banks of the river. This question, as well as that of the location between Jeypoor and Sambhur, were reserved for the Viceroy's decision during His Excellency's visit to Rajpootana in October 1870. Colonel Peile had examined two lines for the approach to the Jumna at Agra, which involved different crossings of the river. The city of Agra is on the right bank of the Jumna, which here has a course nearly north and south, and immediately below it and on the same bank is the fort. The Military Cantonment is a short distance to the south-west of the fort and away from the river. Directing his line generally on a point between the fort and the city, so as to serve both the cantonment and city by a single station, Colonel Peile contrived by taking advantage of a ravine to bring his line up to the Tripolia (now an enclosed market and formerly a kind of outwork of the fort), situated immediately between the fort and the great mosque which is on the confines of the city, and thence to the river bank without interfering with any property of value, or involving exceptionally costly works. But the crossing of the river thus presented is 2,100 feet in length, whereas above the city a crossing can be obtained 1,280 feet in length. Accordingly, an alternative line was run from a point as convenient to the cantonment as could be obtained under the circumstances, passing round the city to this northerly crossing; and these alternatives were examined by His Excellency the Viceroy when at Agra. On the one hand there was the advantage of a much shorter bridge in a well-defined channel, on the other hand, there was an extra length of railway to be constructed and worked over, on an alignment involving heavy compensation for property, intersecting almost every road of approach to the city, and requiring the construction and maintenance of a second station for its convenience. Balancing the advantages and disadvantages in point of convenience and cost, and throwing into the scale the superiority of the fort-crossing in a military point of view, it was decided by His Excellency that the line should be carried by the Tripolia to the river bank, that a station with a sufficient accommodation for the passenger and local goods traffic should be built between the Tripolia and the river on the esplanade intervening between the fort and the city, and that the interchange of through traffic and other terminal arrangements should be provided for in the vicinity of the East Indian Railway station on the opposite bank. It had been previously settled by the Governor-General-in-Council that the bridge over the Jumna should have a roadway for ordinary traffic, and it has now been decided on further consideration of the convenience of the local traffic of this large city that the bridge and station arrangements at the Tripolia shall admit of the East Indian Railway trains running in and out of that station. For the foundations of the piers of the bridge, three wells, each 12½ feet in diameter, to be undersunk to as great a depth as may be found practicable, will be adopted. The economic length of span indicated by such piers is about 150 feet, but the Consulting Engineer for State Railways will consider this point further, and make a definite recommendation, bearing in mind that the larger the span the more convenient will the roadway for ordinary traffic be. As, in so far as the passage of the waters is concerned, a bridge of the shorter length might be adopted at either site, it is recorded here that in order to avoid the risk of deflecting the current of the river in floods and thereby causing a possibly dangerous erosion of the bank near the Taj Mehal, it has been determined not to reduce the length of bridge at the fort-crossing by advancing the eastern abutment, but to bridge the entire width of the flood channel. The points considered during His Excellency's visit to Agra being determined, it only remained to locate the line permanently throughout its course to Sambhur, and the staff accordingly entered upon this duty in November 1870, under the direction of Mr. Furnivall, who succeeded Colonel Peile on his departure on furlough. There being some apprehension of famine, extension surveys were ordered by His Excellency the Viceroy when at Ajmeer to be made between Sambhur and that place, so that in the event of such a calamity, the railway works might afford employment to the starving people at their doors. Happily this cloud passed away. Early in January of this year the gauge question was settled and the narrow gauge adopted on this railway. Mr. Furnivall's project for the finally located line and on that gauge was submitted in July last, and having on examination been approved as sufficiently complete to admit of the invitation of tenders for the construction of the railway by contract on a schedule of prices, that course was decided upon. Tenders where invited for the works both by divisions and for the whole line. Nineteen tenders were received, varying in amount from about 24½ lakhs of rupees to 48 lakhs for the entire line. Only two tenders however were in excess of Rs. 35,33,000. In two cases the divisional tenders were promising, but on the whole the most favourable tenders were made by those who came forward for the entire line. That of Messrs Glover and Company, of Bombay, amounting to Rs. 25,44,181, was accepted on the 20th October 1871. This amount is inclusive of maintenance for two years, but is exclusive of English materials, rolling-stock and sleepers, which are to be supplied by Government. The length of line let between Agra and Sambhur is about 185 miles, and the term of the contract for construction expires on the 30th June 1874. The estimates of the Engineers give a rate of about £4,000

a mile. They are somewhat excessive in the item of permanent-way, telegraph, and fencing, but defective in bridging. Taking into account the preliminary expenses, the cost of establishment from the first and during construction, and of rolling-stock, there is good reason for the conclusion that the line may be completed and stocked well within £5,000 per mile. The details of the projects at present calling for the orders of the Government of India have been dealt with in a separate memorandum. The question of the compensation to the Agra Cantonment Funds for the interference with the Tripolia grain market should be considered in the Military Department. It will be observed that it is not proposed to close the market, but as some of the shops must be interfered with, to build others in the immediate vicinity at an estimated cost of Rs. 8,750. A plan with explanatory memorandum should be submitted for consideration in the Military Department. The plans of the station and station buildings at the Tripolia should also be submitted for approval in that department, when finally got out. It is to be understood that all banks or cuttings in the vicinity of the fort shall have such slopes as not to afford cover from the fort, and the station buildings shall be of such materials as will admit of their being quickly dismantled. If these points be attended to, it is believed that there will be no objections, on the part of the military authorities, to the location of the railway and station so close to the fort. It should be intimated to the Department of Agriculture, Revenue, and Commerce that of the alternative locations of the railway in the close vicinity of the Sambhur Lake, the western, as avoiding the hills of drift sand, and affording in other respects a better line, is approved, and will be adopted, unless any modification should be desired in that Department with the view of better serving the interests of the Salt Department. At the stations of Jeypoor and Bhurtpoor special accommodation should be provided for the Maharajahs; or if their Highnesses should prefer it, a convenient site should be indicated on which they might erect a small bungalow, at their own expense, for their accommodation when travelling. The Viceroy and Governor-General-in-Council is also desirous that State Saloon Carriages shall be built for their Highnesses' use, &c. The estimates should now be revised with all practicable despatch and submitted for orders, as it is important that divisional and separate work sanctions should be given for purposes of audit. In the meantime a distinct sanction may be recorded for the amount of the accepted tender; but as it did not exhibit the amount for each division separately, the Superintending Engineer should report, without delay, the distribution of its amount between the several divisions. The direction of the line into Ajmeer having been decided, and it having been lately ordered that the Agra District shall be extended to Nusseerabad, to which place trial sections have been run, the complete estimates for the extension from Sambhur junction to Nusseerabad should be submitted for orders as soon as ready. In conclusion, the Governor-General-in-Council desires that the satisfaction of the Government shall be recorded at the manner in which the preliminary and final projects have been respectively prepared by Colonel Peile and Mr. Furnivall, and the staff acting under their direction. The sanction recorded in this Resolution will be registered as No. 6 A D R R of 1871-72.

PUBLIC WORKS.—IRRIGATION.

NORTH-WESTERN PROVINCES.

"*Remodelling the Ganges Canal.*" Estimates amounting to upwards of 36 lacs have been sanctioned for this work, of which a great portion has already been expended. The remodelling consists in alterations and improvements to the bed of the canal, so as to admit of the full supply being conveyed without scooping or scouring the bed, and for increasing the efficiency of the canal for navigation.

During the past year several falls and Rajbuhas were remodelled, and a number of bridges and inspection houses constructed.

In the Northern division, two falls were improved, and the Tunsipoor Rajbuha remodelled, and the works required to increase the facilities of the Jowalapoor Navigation Channel were also completed, and additional inspection houses constructed. In the Meerut division, the Janikhoord escape was nearly completed, and the Jansuth Rajbuha has been disconnected from the Futtehgurh Branch Canal. In the Boolundshuhur division, some Rajbuhas, several inspection houses and bridges were constructed, and in the Allygurh division a Canal office was completed.

In the Cawnpore division, 22 bridges were in course of alteration, and nearly completed, while in the Etawa division 5 Rajbuhas were constructed, two others, and some bridges widened and improved.

"*Eastern Jumna Canal*" The Yarpoor Rajbuha was extended and one inspection house constructed.

"*Agra Canal.*" This Canal will be 110 miles in length, and will utilize the waters of the Jumna and irrigate and supply water communication between the district of Agra, Bhurtpoor, Muttra and Delhi. The estimated approximate cost is fifty-seven-and half-lacs of rupees of which detailed estimates have been sanctioned for upwards of 20 lacs. The discharge will be 1,100 cubic feet per second sufficient to irrigate about 300,000 acres. Good progress has been made in the excavation of the whole length of canal. Up to the fiftieth mile the excavation has been nearly completed, the remainder well advanced and several inspection houses and subsidiary works connected with the canal have been constructed.

"*Rohilkund Canal.*" This scheme will probably cost about 50 lacs of rupees, and is of rather a complicated nature, consisting of no less than nine different sets of canals, which must be each separately dealt with. Recently estimates amounting to four-and half lacs have been sanctioned for canal from the rivers Paha, Kylas, and Kitcha. The project is not however to be carried out from loan fund until satisfactory proof is before the Government of India of the scheme proving remunerative. This point is now under consideration. Two other extensive canals have been projected in the North-Western Provinces, viz, the "*East Ganges Canal,*" estimated to cost 100 lacs of rupees. This project is at present under revision, and the "*Lower Ganges Canal,*" the estimate for which amounts to over 180 lacs. This project is also under the consideration of the Government of India. Surveys for the extension of irrigation in Bundelkhund are also in progress.

Punjab. "*Baree Doab Canals.*" This canal, or rather system of canals has been estimated to cost upwards of 177 lacs of rupees, of which the total expended up to the 1st May 1868, amounted to 116 and half lacs. In May 1870, estimates amounting to 27 lacs were sanctioned for the Kussoor and Sobraon branches, on both of which great progress has been made. Upwards of 200 miles of canal are already open. The Kussoor branch will be 90 miles, and the Sobraon branch 64 miles in length.

The total length of main canal and branches, when completed, will be above 350 miles.

"*Western Jumna Canal.*" This project which has been estimated to cost 150 lacs, has just been under the consideration of the Government of India. The work consist of rectification of existing channels, the construction of new branches, with some navigable channels, and the provision of a proper drainage. The entire scheme has been referred to Her Majesty's Secretary of State for India, for approval and sanction.

"*Sirhind Canal.*" This canal takes out from the Sutlej at Roopur, and is estimated to cost upwards of two millions sterling. In June 1870 estimates amounting to 87 and-a-half lacs were sanctioned by the Secretary of State for the first 37 miles of canal. The progress in the excavation has been satisfactory, also on the preliminary works, and on shelters for establishment. On this canal 1,000 prisoners have it is said been employed advantageously, this number will soon be increased to 3,000, good progress was made in lining out other sections of the canal.

In Oudh, an expenditure of Rs. 2,65,188 has been incurred on preliminary operations, connected a project for a canal from the river Sardah, the details of which are under the consideration of the Government of India.

In the Central Provinces, a scheme for irrigation from the Kanhan river has been projected, which is estimated to cost 72 lacs of rupees.

This project will provide for a highly fertile, extensive, and well-populated tract of country, and for a water supply to the city of Nagpore, and the Contonment of Kamptee.

SILVER received and coined in the MINTS of CALCUTTA, MADRAS, and BOMBAY, 1871.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
June	56,025	12,866	...	...	...	...	15,964	1,31,480	2,08,382
July	2,497	15,832	...	...	...	...	...	46,973	...
August	38,651	62	...	...	...	...	...	19,257	...
September	12,439	...	...	...	...	...	...	27,736	...
October	25,938	...	...	...	...	...	73,092	80,319	...
November	1,887	13,19,754	...	...	...	...	...	10,94,183	

THE BANK OF BENGAL.

Statement of Affairs.	26th Dec. 1871.		
Liabilities.			
	Rs.	A.	P.
Proprietors' Capital, paid up	2,20,00,000	0	0
Reserve Fund	15,41,584	7	0
General Treasury Balance at Head Office ...	3,45,53,172	12	2
Do. Do. at Branches	1,58,42,658	4	9
Other Deposits at Head Office and Branches ...	2,00,46,914	6	8
Bank Post Bills, &c.	7,01,951	5	6
Cash Credit undrawn	.....	...	...
Sundries	10,43,758	9	6
Total Rs. ...	9,57,30,039	13	7
Assets.			
Government Securities	1,03,47,635	0	0
Loans on Government Securities at Head Office and Branches	1,10,94,395	4	7
Accounts of Credit on do. do. ...	1,60,76,116	8	2
Mercantile Bills discounted at do. ...	1,85,27,640	13	4
Dead Stock	12,05,373	13	1
Stamps	12,879	0	0
Balances with other Banks.	4,39,055	15	4
Sundries	49,275	15	0
Cash and Currency Notes at Head Office. ...	1,16,61,348	4	2
Cash and Currency Notes at Branches	2,63,16,319	3	11
Total Rs. ...	9,57,30,039	13	7

THE NEW BANK OF BOMBAY.

Statement of Affairs.	13th Jan. 1872.		
Liabilities.			
	Rs.	A.	P.
Proprietors' Capital, paid up	50,00,000	0	0
Subscriptions on account of new Capital ...	10,00,000	0	0
General Treasury Balance at Head Office ...	2,42,37,909	0	0
Do. do. at Branches	14,33,372	0	0
Deposits at Branches	1,25,94,220	0	0
Bank Post Bills outstanding	33,349	0	0
Reserve	5,00,000	0	0
Undrawn Cash Credits	9,99,087	0	0
Total Rs. ...	4,57,97,937	0	0
Assets.			
Government Securities	41,73,277	0	0
Loans at Hd. Office & Branches on Gov. Sec. &c.	27,28,457	0	0
Credits Accounts do. do. on Gov. Sec. ...	88,42,818	0	0
Current accounts, overdrawn	11,946	0	0
Bills discounted and purchased at do. ...	95,00,910	0	0
Dead Stock and Less written off	4,36,575	0	0
Stamps.	7,081	0	0
Balance with Agents and Correspondents. ...	3,09,270	0	0
Government Reserve Cash.	.....	...	...
Cash and Currency Notes at Head Office. ...	1,78,13,443	0	0
Do. do. at Branches.	.....	...	...
Bullion at Head Office and Branches	19,74,160	0	0
Total Rs. ...	4,57,97,937	0	0

THE BANK OF MADRAS.

Statement of Affairs.	9th Dec. 1871.		
Liabilities.			
	Rs.	A.	P.
Capital.	56,25,000	0	0
Public Deposits at Head Office	33,82,187	0	5
Do. at Branches.	38,33,886	5	7
Other deposits at Head Office and Branches ...	96,70,722	6	2
Cash Credits undrawn at do	1,65,437	3	6
Post Bills	4,686	5	11
Reserve Fund.	6,37,500	0	0
Rest	1,44,978	15	9
Total Rs. ...	2,34,64,398	5	4
Assets.			
Silver and Notes at Head Office	45,91,643	14	8
Silver and Notes at Branches	64,06,777	1	11
Government Securities	10,62,211	15	1
Government Reserve—Cash	8,82,187	0	5
Securities	.....	...	...
Loans at Head Office and Branches	18,49,651	2	11
Accounts of Credit at Head Office and Branches	3,73,480	0	0
Mercantile Bills discounted at Head Office and Branches	54,50,028	6	2
Dead Stock at Head Office and Branches. ...	2,29,344	5	3
Bills of Exchange do	18,13,510	6	11
Due by other Banks.	8,05,564	0	0
Total Rs. ...	2,34,64,398	5	4

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54.	4 per cent Loans.							4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
		of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	of 1856-57.	Transfer Loan dated 15th July 1870.	P. W. of 1854-55.	of 1856-57.		2 years.		3 years.		5 years.	10 years.	15 year	
														Repayable Jan. 1869.	4½ per cent Transfer Loan.	Repayable Jan. 1870.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1883.	
15th May 1871 ...	53,100	32,640	2,347	19,59,680	41,10,000	1,51,16,000	1,22,97,800	1,46,77,700	14,500	45,49,900	69,700	5,67,07,900	4,67,64,800	.....	.....	1,65,000	18,60,000	33,16,000	33,46,000	36,00,000	16,86,43,067
15th June 1871...	53,100	32,640	2,347	19,62,027	40,56,200	1,50,93,200	1,20,75,700	1,46,69,900	14,500	47,09,000	68,700	5,40,90,900	4,43,50,100	.....	.....	1,65,000	18,60,000	31,81,000	33,46,000	37,11,000	16,23,42,314
31st July 1871 ...	53,100	28,906	2,347	19,57,653	40,95,300	1,49,21,600	1,23,24,700	1,42,85,600	14,500	39,43,700	67,700	5,30,05,900	4,36,00,100	.....	55,000	1,65,000	18,96,000	31,70,000	33,46,000	36,66,000	15,93,70,106
15th Aug. 1871 ...	53,100	28,906	2,347	19,52,213	40,87,200	1,49,36,200	1,23,50,000	1,42,71,000	14,500	39,24,200	67,700	5,23,95,600	4,30,37,100	.....	55,000	1,65,000	18,60,000	33,46,000	36,76,000	8,72,000	15,82,39,066
15th Sept. 1871...	53,100	28,906	2,347	19,52,213	40,88,700	1,49,79,900	1,22,53,300	1,41,22,000	14,500	33,32,800	10,700	5,09,77,100	4,32,52,800	.....	26,600	1,65,000	10,61,000	27,03,000	33,46,000	36,76,000	15,56,91,366
31st October 1871.	53,100	28,906	2,347	19,52,213	40,75,300	1,49,85,200	1,22,15,400	1,38,53,400	14,500	32,98,900	10,200	5,02,41,200	4,23,44,300	.....	.....	.....	.....	27,03,000	33,46,000	36,65,000	15,36,60,966
15th Nov. 1871 ..	53,100	28,906	2,347	19,51,893	40,76,400	1,51,33,300	1,21,36,000	1,37,38,500	14,500	33,24,200	10,200	5,02,95,100	4,16,01,200	.....	.....	.....	.....	27,02,000	33,46,000	36,48,000	15,29,47,146
15th Dec. 1871...	53,100	20,374	2,347	19,98,615	40,59,700	1,49,51,400	1,22,56,700	1,33,86,400	14,500	33,36,200	. . .	2,42,42,600	4,14,43,400	.....	.....	.....	.....	22,82,000	33,14,000	36,50,000	13,80,33,636

PRICES OF FOOD THROUGHOUT INDIA.—DECEMBER 1871—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

BENGAL. (Rice, the staple food.)		Rice.	Wheat.		
				Seers.	₹ Rupee.
Burdwan Division.	Burdwan	27¼	22	Seers.	₹ Rupee.
	Bancoorah	27½	19	,,	,,
	Beerbhoom	32	16	,,	,,
	Hooghly	20	20	,,	,,
	Howrah	19	15	,,	,,
	Midnapore	28	10	,,	,,
Orissa ,,	Balasore	34	16	,,	,,
	Cuttack	21	12	,,	,,
	Pooree	31½	10½	,,	,,
Assam ,,	Durrung	21	8½	,,	,,
	Goalpurah	17	30	,,	,,
	Kamroop	20	20	,,	,,
	Luckimpore	13	10	,,	,,
	Nowgong	16	...	,,	,,
	Seebsaugor	16	10	,,	,,
Dacca ,,	Dacca	23	11	,,	,,
	Backergunge	24	13	,,	,,
	Furreedpore	23	18	,,	,,
	Mymensing	22½	18	,,	,,
	Sylhet	24½	16	,,	,,
	Cachar	19	13 5-16	,,	,,
Patna ,,	Patna	24½	24	,,	,,
	Gya	23	24	,,	,,
	Chumparun	24	23	,,	,,
	Sarun	22	20½	,,	,,
	Shahabad	24	22	,,	,,
	Tirhoot	23	21	,,	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,	,,
	Monghyr	27	27	,,	,,
	Purneah	20	27	,,	,,
Sonthal Pergunnah.	Godda	...	...	,,	,,
	Nya Doomkah	30	16	,,	,,
	Rajmehal	30	32	,,	,,
	Deoghur	20	21	,,	,,
Presidency Division.	Calcutta	...	..	,,	,,
	Nuddea	..	..	,,	,,
	Jessore	25½	15	,,	,,
	24 Pergunnahs	21½	19	,,	,,
Rajshahye ,,	Rajshahye	27 3-16	21 9-16	,,	,,
	Bograh	33½	15½	,,	,,
	Dinapore	35	17½	,,	,,
	Maldah	30	28	,,	,,
	Morshedabad	28	25	,,	,,
	Pubna	23	20	,,	,,
	Rungpore	25 11-16	18	,,	,,
Chota Nagpore ,,	Lohardugga	26	14	,,	,,
	Hazareebagh	25	20	,,	,,
	Maunbhoom	32	16	,,	,,
	Singbhoom	80	18	,,	,,
Chittagong ,,	Chittagong	21	11½	,,	,,
	Bullooah	25	..	,,	,,
	Tipperah	26½	15	,,	,,

NORTH WESTERN PROVINCES. (Wheat and Joaree, the staple food.)		Rice.	Wheat.	Joaree.	Bajra.
Meerut Division	Dehra Dhoon	14	22	23	23
	Saharunpore				
	Moozuffurnugger				
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	12	15	20	20
	Gurhwal				
Rohilkund ,,	Bijnour	18	22	26	25
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
	Terai Pergunnahs	20	34	...	25
Agra	Muttra	15	19	19	20
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jalaun	12	23	27	25
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	17	21	24	23
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
Benares ,,	Goruckpore	22	21	26	..
	Bustee				
	Azimgurh	14	17	20	21
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	17	22	26	25

OUDH. (Wheat and Joaree, the staples.)		Rice.	Wheat.	Joaree.	Bajra.
Lucknow Division	Lucknow	17	19	22	22
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	19	26	31	31
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	19	23	26	18
	Barnich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	18	20	24	22
	Sultanpoor				
	Pertabghur				

PUNJAB. (Wheat and Joaree, the staples).		Rice.	Wheat.	Joaree.	Bajra.
Delhi Division.	Delhi	9	19	23	22
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	17	22	19
	Rohtuk				
	Sirsa				
Amballa	Amballa	11	19	24	21
	Ludianah				
	Simla				
Jullundhur.	Jullundhur	10	24	29	25
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	10	19	24	22
	Sealkote				
	Gurdaspore				
Lahore.	Lahore	9	17	20	19
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	9	18	25	23
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	18	24	23
	Jhung				
	Montgomery				
	Mozuffurnuggur				
Deera I. Khan.	Deera I. Khan	7	22	29	27
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	6	15	22	21
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree, the staple food.)		Rice.	Wheat.	Joaree.	
Nagpore.	Nagpore	16	19	22	2nd sort Rice quoted.
	Bhundara				
	Chanda				
	Wurdah				
	Balaghat				
Jubbulpore.	Jubbulpore	17	27	32	
	Saugor				
	Dumoh				
	Mundla				
	Sconee				
Nerbudda.	Baitool	12	19	19	
	Hoshungabad				
	Chindwara				
	Nursingpore				
	Nimar				
Chuttesghur.	Raepore	35	37	...	
	Belaspore				
	Sumbulpore				
Upper Godavery.	Seroncha	7	11	20	

MADRAS Rice and Cholum (Joaree) the staple food.		Rice.	Joaree.		
Northern Section.	Ganjam	246	125	Quotations are—so many Rupees per Garce = 3,360 lbs.	2nd sort Rice quoted.
	Vizagapatam	311	166		
	Godavery	104	107		
	Kistna	272	180		
	Nellore	235	133		
Ceded Districts.	Cuddapah	294	157		
	Bellary	236	131		
	Kurnool	344	154		
East Centre.	Madras	260	184		
	North Arcot	221	114		
	South Arcot	207	91		
Cauvery.	Tanjore	220	124		
	Trichinopoly	232	127		
Southern Section.	Madura	315	146		
	Tinnevelly	340	152		
West Centre.	Coimbatore	291	137		
	Neilgherries	427	213		
	Salem	243	110		
West.	South Canara	272	...		
	Malabar	300	...		

BOMBAY PRESIDENCY. (Rice, Bajra, and Joaree, the staples.)		Rice.		Joaree.	
Northern Division.	Ahmedabad	Rs. 4	No Returns since January 1870.	Rs. 2	Rupees per maund of 82 lbs.
	Kaira	3½		3	
	Surat	3½		3	
	Tannah	...		..	
Southern Division.	Poonah	3½		2½	
	Ahmednuggur	....		..	
	Kulladghee	3½		1½	
	Rutnagherry	5		..	
	Belgaum	5		1½	
	Dharwar	5		2	
	Sattara	4		2½	
	Carwar	...		..	
Sindh	Kurrachee	...		..	
	Hyderabad	...		..	
	Sukkur	3		2½	

BURMAH. (Rice, the staple.)		Rice			
Arakan.	Arakan	2 4 0	Per maund of 82 lbs.	No Returns since April 1870.	,,
	Ramree				
	Sandoway				
	Northern Arakan				
Pegu	Rangoon	2 7 0			
	Bassein				
	Myanoung				
	Prome				
	Tounghoo				
Tenasserim	Amherst	2 0 0			
	Tavoy				
	Mergui				
	Shevegyeen				

THE INDIAN LIFE ASSURANCE COMPANY (*Limited.*)

REGISTERED UNDER ACT X. OF 1866.

Head Office—MEERUT.

DIRECTORS.

Chairman, W. McLeavy, Esq. ... *Manager, Bank of Upper India, (Limited.)*
C. J. Collins, Esq.
R. R. Dean, Esq. ... ... *Manager, Allahabad Bank.*
W. Hobson, Esq. ... ... ,, *Mussoorie Savings' Bank.*
J. C. Parry, Esq. ... ... *Late Genl. Manager, Delhi & London Bank*
F. Peterson, Esq. ... ... *Manager, Simla Bank Corporation.*
C. W. Stowell, Esq. ... ... ,, *Uncovenanted Service Bank*
E. Warner, Esq. ... ... *Barrister-at-Law.*
Sheikh Ellahee Bux

MEDICAL ADVISER.

William Moir, Esq., M.B., Civil Surgeon, Meerut.

SECRETARY.

D. Lancaster, Esq.

AGENTS.

Hill, Billman, & Co., Calcutta.

This Company was formed towards the end of 1869, and has already received substantial patronage from the public.

The object for which it was established with a full direction in India was to secure the Indian public against a repetition of such heavy losses as have recently been sustained by the collapse of certain Assurance Offices in England, where the entire management of those institutions was located.

Security.—To ensure absolute security, the funds of the company are invested *only* in Government securities. The company is strictly prohibited from making advances on house or landed property or on stocks, shares or obligations of any company whatever, though such advances are usually extensively made by other Assurance Companies.

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the assured. Policies are also granted for short terms from one to ten years at moderate rates.

The Proposal Form is simple in its terms and the *conditions* of the *policies* are liberal, all *unnecessary restrictions having been removed.*

The rates of premium are made as moderate as is consistent with *complete security* of the assured.

Advantages of Assurance.—It secures by a small monthly, quarterly, half-yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the borrowers' property from claims and sureties from loss.

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscriber loses the benefit of all he has paid, whereas in the case of a policy it still ensures and may be made available for any other purpose.

Forms of Proposal, tables of rates, and all further information may be obtained by letter or on application to any of the Agents or to the Secretary.

ANNUAL PREMIUMS.

Required for an assurance of Rs. 1,000 for the whole term of life.

Age	Civilians.				Military and Naval.			
	Without Profits.		With Profits.		Without Profits.		With Profits.	
	Rs.	As.	Rs.	As.	Rs.	As.	Rs.	As
20	31	9	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	3	50	15	57	14
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

Meerut, 12th November 1870. D. LANCASTER, *Secretary.*

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782

UNLIMITED.

The importance of this company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 9000,000*l.* sterling as losses under insured risks and without a single call on its proprietors whose liability is unlimited.

The undersigned are authorised to issue policies in Bombay and the Mofussil at the tariff rates of all the old established company, which are as low as the nature of the risks can justify.

The rates on bungalows in the Mofussil, and residences, offices, and godowns in Elphinstone Circle, have been lately much reduced. Particulars on application at the Agency office.

A. C. BRICE & Co., Agents.

No. 6, Rampart Row, Bombay, 1870.

THE QUEEN INSURANCE COMPANY

FIRE AND LIFE.

HEAD OFFICE.—*Queen Insurance Buildings, Liverpool.*

CAPITAL.—(£2,000,000) Two Millions.

Trustees.—Sir Thomas Edwards Moss, Bart., Christopher Bushell, Esq., and Edward Heath, Esq.

DIRECTORS,

Chairman—Bernard Hall, Esq.
Deputy Chairman—R. W. Kelly, Esq.

John Bateson, Esq.
John Bingham, Esq
T. Ridgway Bridson, Esq.
William Forbes, Esq.
Andrew Galbraith, Esq.
Charlton R. Hall, Esq.
William Hind, Esq.
Patrick Hunter, Esq.
Peter Maxwell, Esq.
Peter McLagan, Esq., M.P.
James Morton, Esq
John T. Pagan, Esq., J. P.
John Sharp, Esq.
N. W. J. Strode, Esq.
J. B. Thomson, Esq.
Geo. B. Kerferd, Esq.

Actuary and General Manager.—J. Moncrieff Wilson, Esq.
Sub-Manager.—Thomas Walton Thomson.
Bankers.—The Liverpool Commercial Bank, and the National Provincial Bank of England.
Auditors.—Messrs. Harmood, Banner & Son, Accountants.
Physicians.—James Turnbull, M.D., Liverpool; J. E. Pollock, M.D., London; and F. S. Stedman, M.D., Bombay.

The rates of premium for *Fire* and *Life* Insurances will be found as moderate as those of other first-class offices. Policies are issued under the *Life* branch of this Company recently established in Bombay, on civil lives and military lives in civil employ.

For further information and particulars, and for prospectuses, &c., regarding Fire and Life Insurances, apply to

LAWRENCE & Co., Agents in Bombay.

Bombay, 1st January 1871.

ALLIANCE BRITISH AND FOREIGN LIFE AND FIRE ASSURANCE COMPANY.

ESTABLISHED 1824.

CHIEF OFFICE:

Bartholomew Lane, Bank, London, E. C.

BOARD OF DIRECTION.

PRESIDENT—Sir Moses Montefiore, Bart., F.R.S.

DIRECTORS.

James Alexander, Esq. (Alexander, Fletcher & Co)
Charles George Barnett, Esq. (Barnett, Hoare, Hanbury, and Lloyd)
George Henry Barnett, Esq. Glympton Park.
James Fletcher, Esq. (Alexander, Fletcher & Co).
William Gladstone, Esq. (Thomson, Bonar & Co).
Right Hon. George Joachim Goschen, M.P.
Samuel Gurney, Esq.
James Helme, Esq., (Director of the Provincial Bank of Ireland)
Sir Curtis Miranda Lampson, Bart.
Sampson Lucas, Esq. (Lucas, Micholls & Co)
Elliott Macnaghten, Esq., (Member of the Indian Council)
Thomas Masterman, Esq. (Director of the Bank of England)
Joseph Mayer Montefiore, (Director of the Provincial Bank of Ireland)
Sir Anthony De Rothschild, Bart, New Court.
Baron Lionel Nathan De Rothschild, M.P.
Thomas Charles Smith, Esq Oxford Square, Hyde Park.,

AUDITORS.

Lord Richard Grosvenor, M. P.
Hugh Colin Smith, Esq.
Richard Hoare, Esq.

FIRE RISKS

of an eligible character are accepted at minimum current rates

LIFE DEPARTMENT.

The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorised to decide upon Proposals submitted, to issue Policies, and to settle claims

The Life Reserve Fund is over

NINETY-FOUR LACS OF RUPEES.

which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund), being about 30 per cent. of the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

FIVE CRORES OF RUPEES

coupled with the personal responsibility of a numerous body of wealthy Proprietors. For detailed Prospectuses, Forms of Proposal, &c., apply to

REMINGTON & Co.,
Agents for the Presidency of Bombay.

CHURCH OF ENGLAND ASSURANCE INSTITUTION.

ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic., Cap. XCII.

CAPITAL—One Million Sterling.

Life Assurances of every description granted.
Retiring provision combined with Life Assurance.
Free Policies issued which can never altogether lapse through non-payment of Premium.
No extra charge for sea-passage.
Reduction to European rates without Medical examination.
Premium may be paid annually, half-yearly, quarterly, or monthly, as desired.
Parsee and Armenian lives insured.
For detailed Prospectus, &c., apply to

REMINGTON & Co., Agents.

Bombay, 12th July 1870.

LIVERPOOL, LONDON AND GLOBE INSURANCE COMPANY.

Liability of Shareholders Unlimited.

Capital £2,000,000 Accumulated Funds £3,301,005

Revenue		*Invested Funds.*	
Fire Premiums	£ 836,916	Capital	£ 391,752
Life Premiums	,, 250,039	Life Reserve	,, 1,873,029
Interest	,, 162,680	Reserve Fund	,, 971,410
		Undivided Profit	,, 64,823
	£1,249,535		£3,301,005

Fire Department.

Policies of Insurance against fire upon dwelling houses and other buildings in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the company.

The rate on pucka-built bungalows situated out-side the Fort of Bombay, or in any part of the Bombay Presidency, is now reduced to (6) six annas per cent. per annum.

Life Department.

This Company offers the advantage of Fixed Bonuses accruing after five years annual payment of premium, *uncontingent* on profits. Policies are indisputable after five years. Claims are payable thirty days after admission. Annuities are granted on very favorable terms. The undersigned will issue Policies on behalf of the Company.

Agents in Bombay—RITCHIE, STEUART & Co.
Agents in Calcutta—GILLANDERS, ARBUTHNOT & Co.

NORTH BRITISH AND MERCANTILE INSURANCE COMPANY.

Incorporated by Royal Charter and Special Acts of Parliament.

Paid up Capital...			..£250,000
Fire Reserve Fund	297,153 10 10		
Fire Premium Reserve	138,514 15 1		
			435,668 5 11
Total Accumulated Funds			.. 2,839,118 19 11
Annual Income from Fire, Life and Investments.			801,801 13 9

Agents in Bombay,
W. NICOL & Co.

THE SOUTHERN INSURANCE COMPANY, (LIMITED.)

REGISTERED CAPITAL—ONE MILLION STERLING.

Paid-up Capital .....£ 100,000
Reserved Fund .....£ 40,000

HEAD OFFICE—MELBOURNE.

The undersigned having been appointed Agents, are prepared to grant Policies by Marine Insurance.

Bombay, 19th June 1869. J. N. WADIA, Sons & Co.

GEORGE W. WHEATLEY & Co.,

Established 1836.

ARMY, BANKING, TRANSIT, AND GENERAL AGENTS.

Offices .. .. LONDON. { 156 Leadenhall St. 33 Regent St. W.
" .. .. BOMBAY. 20 Sassoon's Buildings.

AGENTS IN ALL PARTS OF THE GLOBE.

ARMY DEPARTMENT.—Military, Regimental, and Mess Indents of all kinds promptly and economically executed.

BANKING DEPARTMENT.—Pay, Allowances, and dividends drawn, and Remittances and investments effected upon favorable terms. Interest allowed on Current as well as Fixed Deposit accounts.

GENERAL DEPARTMENT.—Indents for goods of every description executed. The Bombay Agency undertakes local indents of all kinds, and executes through the London House all orders for European or American goods.

N. B.—Constituents are reminded that time, trouble, and frequently expense are saved by instructions being made full and complete in the first instance. Where a margin is intended to be given, its limits should be stated.

TRANSIT DEPARTMENT.—THE GLOBE PARCELS EXPRESS undertakes the forwarding of goods and parcels by the quickest, safest, and most economical routes throughout India, Europe, and the World.

SPECIAL AGENCIES.

GEORGE W. WHEATLEY & Co. are Sole Agents in Western India for the following firms:—

Billiards (Patent)	ABBOTT & NICHOLL	Birmingham
General Joiners.....	SAML. WORSNAM & Co	London
Haberdashery	D. NICHOLSON & Co	London
Hardware	DAVID JONES	Birmingham
Ink & Printing	SHACKELL & EDWARDS	London
Jewellery	HARRISON & Co	London & Birmingham.
"	FARADAY & DAVEY	London
Lamps, Punkahs, ...	MADDEN & SON	London
Lithographic Presses.....	MACLURE, MACDONALD, MACGREGOR	
Marine Engines	JACKSON & WATKINS	London
Machinery, Saw Mills, &c	SAML. WORSNAM & Co.	London
Needles	ABEL MORAL	London
Printing Presses ...	HOPKINSON & COPE	London
Type	V. & J. FIGGINS	London
Sewing Machines	J. WEIR	London
Shoe Thread	ULLATHORNE & Co	London
Watches	DENT & Co	London
Wines	LOWENTHAL & SOLME	Frankfort.
"	STANDRIDGE & TURNER	London.

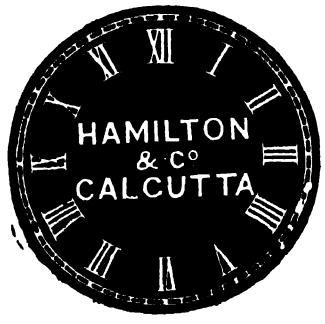
Select parcels of Watches, Jewellery, &c., are now on hand. Consignments of choice Wines, Printing Presses, and Inks, Printing Paper, Sewing Machines, &c., are daily expected.

Bombay, 1st August 1870. J. L. MADDEN, Agent.

THE EXHIBITION ENGLISH LEVER WATCH.

IN FINE SILVER, double-bottomed, engine-turned hunting case, of medium size, and with a first-class full plate Lever movement.

Rs. 50 Cash.



Rs. 50 Cash.

HAMILTON & Co.

Begs to state that for some years past, their endeavour has been to introduce to their Constituents a good, reliable, English Silver Watch, at a really moderate price. Owing to recent valuable improvements in the Watch-maker's art, by which the aid of machinery has been brought to bear with marvellous success, they are now enabled to offer the above Watch, which they guarantee to be entirely English-made throughout, at the hitherto unprecedented price of Rs. 50 cash, and the same Watch in Gold Engine-turned hunting case, at Rs. 160 cash.

NOTE.—*Our new Illustrated Watch Pamphlet can be had free on application.* Orders respectfully solicited.

HAMILTON & Co.,
Watch and Clock Manufacturers,
Jewellers and Silversmiths in ordinary to His Excellency Earl Mayo, K. P.
8, Old Court House Street, Calcutta.

ESTABLISHED IN 1820.

C. LAZARUS & Co.,

Incorporated with Shearwood & Co.,

CABINET MAKERS, UPHOLSTERERS, BILLIARD AND BAGATELLE TABLE MANUFACTURERS.

BY APPOINTMENT TO

His Excellency the Viceroy, Governor-General of India,

AND TO

His Royal Highness the Duke of Edinburgh,

CALCUTTA.

C. LAZARUS & Co., while thanking their numerous constituents for the solid support extended to their Firm since 1820, attribute their success to the following maxims which continue to guide their business transactions, *viz*:—

Good Work with unadulterated materials.
Skilful and trustworthy Workmen.
Uniform Scale of Charges.
Strict and competent Supervision.

NEW ILLUSTRATED CATALOGUE.

There are a few special features in connection with the expensively executed Catalogue, to which C. L. & Co. would ask their constituents' attention:—

1. The *newest* and *most elegant* designs only find a place in the volume. Many of these designs, it should be mentioned, represent an original result; that is to say, they have been elaborated with special reference to the household requirements of this country. In working to this end, reference has been had to the latest models of the first Cabinet Manufacturers of Europe. All that was recherche in style, or chaste in pattern, has been taken advantage of in the production of C. L. & Co.'s special designs for India, these desiderata, however, being combined with others which C. L. & Co.'s long experience has shown to be of the utmost importance. These it is scarcely necessary to detail; yet it may be observed, as a general principle, in modifying home designs to suit Indian requirements, that substantiality should never be sacrificed to a too slender elegance, and this principle has been steadily kept in view. Indeed, in the manufacture of Cabinet Ware in India this is a prime consideration, as climatic effects, not to speak of other agencies, have a most marked action in deteriorating such articles. It remains only to add, therefore, that, while all that is chaste, tasteful, and elegant has been freely appropriated from the sources indicated in the production of C. L. & Co.'s designs, regard has been had, at the same time, to the requirements of strength and substantiality; a judicious blending of both, in fact, has been aimed at, and, as C. L. & Co. humbly believe, has been most successfully accomplished.
2. C. L. & Co. have had each article of their stock photographed. The diagrams have been engraved at considerable expense in England from these photographs, and represent, therefore, each article with artistic fidelity.

PRICES.

C. L. and Co. are alive to the necessity that exists in these altered times for reasonable prices. The supplying, however, of a *bonafide* reliable article is the first consideration with a respectable and old established firm. Regard being had to this, and also to the fact that C. L. & Co. warrant every article that issues from their manufactory; they can confidently state that their charges represent only a slender margin of profit over and above actual cost of production.

IMPORTANT TO MESSES AND BILLIARD OLUBS.

THROUGHOUT INDIA, CHINA, BURMAH, CEYLON, AND THE STRAITS.

Consequent on the numerous applications that C. LAZARUS & Co. have lately had from parties, residing at a distance from Calcutta, to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the Tables to Calcutta for that purpose is attended with great delay, thereby occasioning much inconvenience, C. L. & Co. have been induced to keep a stock of Cushions on their new principle always on hand, which can be fitted to any Table, the accurate length and width of the slate-bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

BILLIARD AND POOL BALLS.

Billiard cloths, Cues, Billiard and Pool Marking boards, Tips, Chalks, and every requisite for the Billiard Table. Billiard cushions renovated. Billiard Table repaired and re-cushioned on their new principle, thereby making an old Table as good as new.

B. B. B.

In accordance with their established practice of introducing novelties to the Indian public, C. LAZARUS & Co. have pleasure in announcing that they have made arrangements to supply the latest novelty in social and family amusement, by importing the popular B. B. B. Tables. The peculiarity of these is that on the one Table the three favourite games of BILLIARD, BATTUE, and BAGATELLE may be played, thus affording a pleasing variety of amusements, concentrated on a single board at little more than the cost of one. Anticipating that the demand for these Tables will be large, C. L. & Co. are prepared to supply them on very favourable terms, it being a principle of their business to furnish the best and most approved articles of every kind, at the lowest rates consistent with excellence of quality and a fair trading profit.

THE ALEXANDRA BILLIARD TABLE.

C. LAZARUS & Co. beg to state that, with a view to procure for India one of the latest Home novelties, they have made up, on their own premises, a number of the new "Alexandra" Billiard Tables, so commonly patronised in Fashionable Circles at this time in England.

It is now shown that Ladies may, with perfect propriety, take part in a game where their naturally quick perception and power of skilful manipulation contributes, not only to the pleasure of this noble game, but enables them to compete for its honours with the more practised hands of the ruder sex.

The "Alexandra" Table, or which has now received the distinguishing epithet of the "Ladies' Table," and most in favour with the fair sex, is in every respect adapted to develop the fullest resources of the game. The size of the Tables is six feet by three, the height being so regulated, and the Cues and other requisites so specially arranged, as to admit of easy and graceful manipulation by a lady.

C. LAZARUS & Co.,
Calcutta.

BOMBAY:—Printed and Published for the Proprietor at the *Economist Steam Press*, by G. L. F. CONNELL, Manager.—22nd January 1872.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, WEDNESDAY, 21ST FEBRUARY 1872. [No. 7.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers for—

Aden	From Bombay every Monday at 3 P.M. from Massagon.
Suez	
Brindisi	
Malta	
Gibraltar	
Southampton	
Galle	Tuesday, the 30th January; 13th, 27th February; 12th, 26th March, 9th, 23rd April.
Madras	
Calcutta	
Penang	
Singapore	
Batavia	
Hong Kong	
Shanghai	
Japan	
King George's Sound	Tuesday, the 13th February, 12th March, and 9th April.
Melbourne	
Sydney	

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London, Liverpool, and New York.

A considerable reduction has been made in the rates of passage money. For further particulars apply to

GEORGE F. HENRY,
Superintendent.

Bombay, January 1872.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*. The Steamers "APIS" and "SPHINX" have only limited accommodation for a small number of Passengers. The rates for Cabin Passengers include food and table wine, transit through Egypt, and free conveyance of 3 cwt. of Luggage. For baggage in excess £4 per ton is charged.

The "SPHINX," 1,400 tons, will be despatched from Bombay on or about the 10TH FEBRUARY, and the "MINERVA," 3,124 tons, on or about the 10TH MARCH.

PASSENGER RATES FROM BOMBAY PER "APIS" AND "SPHINX."

	Cabin.	Deck with food.
To Trieste	£ 40	£ 19-0
To Port Said	„ 30	„ 14-0
To Suez	„ 28	„ 13-7
To Aden	„ 16	„ 7-13

The Imperial Mail Steamer "MINERVA," 3,124 tons, 430 H. P, which has excellent accommodation for a large number of Passengers, and carries a Doctor and a Stewardess, will leave Bombay on or about the 10TH MARCH.

RATES OF PASSAGE PER "MINERVA."

	1st Class.	2nd Class.	Deck.
To Trieste	£50 0	£35 0	£19 0
To Port Said	37 0	23 0	14 6
To Suez	36 0	22 0	13 6

Children under 3 years of age, FREE; above 3 and under 10 years, HALF FARE.

Cargo taken for Trieste, Venice, Constantinople, Odessa, Aden, Egypt, England and the Continent generally.

There is also a weekly service by Mail Steamers between Alexandria and *vice versa*, in conjunction with the P. & O. Co.'s mail steamer to and from Suez. The Austrian Lloyd's mail steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 200 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4½ to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers from Alexandria to Southampton, at a charge of 10s. per cwt. for the regulated allowance of 3 cwt. and of 20s. per cwt., for excess weight (both exclusive of Transit through Egypt), to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned grants also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria.

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS .....£13 SECOND CLASS.....£9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £10-16 per head. SECOND CLASS, £7-10 per head.

Personal Baggage allowed free: 1st Class 200 lbs., 2nd Class 130 lbs., overweight 10s. per 100 lbs.

Railway Tickets, from SUEZ to ALEXANDRIA, with all the privileges of passengers by the P. & O. Co.—FIRST CLASS, £3; SECOND CLASS, £2; CHILDREN over 3 and under 10 years at HALF FARE. Free Baggage: 1st Class, 3 cwt., 2nd Class 200 lbs. overweight, 7s. per cwt.

For further particulars, and for freight and passage apply to the Agency of the Austrian Lloyd's Steam Navigation Company.

A. C. GUMPERT,
Manager.

Bombay, 13, Madows Street, 15th January 1872

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.

ITALIAN STEAM NAVIGATION COMPANY of MESSRS. R. RUBATTINO & Co., GENOA.

THE REGULAR STEAMERS LEAVE

GENOA on the 24th, and BOMBAY on the 1st of each month.

PASSENGER RATES,

INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

		Including Wines.	Without food.
To Aden	£22	£15	£4
„ Suez	36	22	8
„ Port Said	38	25	9
„ Alexandria	39	25	9-10
„ Messina	50	34	14
„ Naples	50	34	14
„ Leghorn	50	34	14
„ Genoa	50	34	14
„ Marseilles (transhipment at Genoa)	52	35	14-10

Children under 3 years, free of charge. Children not above 10 years, half fare.

NEXT STEAMERS FROM BOMBAY—

"PERSIA" on THURSDAY, 1st FEBRUARY 1872.

"INDIA" on FRIDAY, 1st MARCH 1872.

The exact hour of departure will be fixed and published a day or two previous to sailing.

For hand-books of information, rates of freight, &c., apply to

VOLKART BROTHERS,
Agents, Rubattino Steam Navigation Company.

Bombay, January 1872.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.

THE British India Steam Navigation Company (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days.

This route is the most expeditious and economical for passengers for the Neilgherry district, Bangalore and Madras, who can land at Calicut for Beypore, and proceed from thence by rail.

Passengers for Calcutta can take the same route, picking up the steamer at Madras

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH THE PERSIAN GULF, VIA KURRACHEE.

Interchanging Cargo and Passengers at Bussora, to and from Bagdad, with the Euphrates and Tigris Steam Navigation Company.

THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, will despatch a steamer every 14 days to the PERSIAN GULF, touching at KURRACHEE, GUADUR, MUSCAT, BUNDER ABBAS, LINGA, BUSHIRE, FAO, MAHOMERAH and BUSSORAH.

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870. W. NICOL & Co., Agents.

THE STANDARD LIFE ASSURANCE COMPANY.—

Established 1825,

WITH WHICH IS NOW UNITED

The Colonial Life Assurance Company.

COLONIAL AND FOREIGN ASSURANCES.

An amalgamation having been formed between the *Standard Life Assurance Company* and the *Colonial Life Assurance Company*, the business of the united companies will henceforth be conducted under the title of

THE STANDARD LIFE ASSURANCE COMPANY.

The annual revenue of the Standard Company is now upwards of £650,000, and the accumulated funds amount to upwards of £3,500,000 sterling. The new business transacted during the past year amounted to the large sum of £1,375,000 sterling, the corresponding premium amounting to £45,337 per annum.

Moderate rates charged for residence in the Colonies, India, and other places abroad.

Local Boards and *Agencies* in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where premiums may be received and claims paid

Immediate reduction of premium on return to Europe, or other temperate climate, without medical certificate.

Profits divided every five years.

The new Colonial and Foreign Prospectus may be had on application at the chief offices of the Company, or to the Agents at home or abroad.

WILL. THOS. THOMSON, Manager and Actuary.

D. CLUNIE GREGOR, Colonial and Foreign Secretary.

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LIFE DEPARTMENT.

THIS company having a subscribed Capital of Two Millions and a half Sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Mutual Offices. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l* and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent. of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there are the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid. Subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office*

Yearly premium for the Assurance of Rs. 1,000.

Age next Birthday.	For the whole term of Life. without Profits	For the whole term of Life. With Profits.	Age next Birthday.	For short periods, &c. For One Year.	For Three Years.	For Seven Years.	
	Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.	Rs. a. p.	
30	35 0 0	39 0 0	30				
31	35 0 0	39 0 0	31				
32	36 0 0	40 0 0	32				
33	36 0 0	41 0 0	33				
34	37 0 0	42 0 0	34	33 & under 34	28 0 0	28 0 0 29 0 0	29 0 0 35 & under 36
35	38 0 0	42 0 0	35				
36	38 0 0	43 0 0	36	36	29 0 0	29 0 0 29 0 0	36
37	39 0 0	44 0 0	37	37	29 0 0	29 0 0 30 0 0	37
38	40 0 0	45 0 0	38	38	29 0 0	29 0 0 30 0 0	38
39	41 0 0	46 0 0	39	39	29 0 0	29 0 0 30 0 0	39
40	42 0 0	47 0 0	40	40	29 0 0	30 0 0 31 0 0	40
41	43 0 0	49 0 0	41	41	30 0 0	30 0 0 32 0 0	41
42	44 0 0	51 0 0	42	42	30 0 0	31 0 0 34 0 0	42
43	46 0 0	51 0 0	43	43	31 0 0	32 0 0 34 0 0	43
44	47 0 0	53 0 0	44	44	32 0 0	33 0 0 35 0 0	44
45	48 0 0	54 0 0	45	45	33 0 0	34 0 0 36 0 0	45
46	50 0 0	56 0 0	46	46	34 0 0	35 0 0 37 0 0	46
47	51 0 0	57 0 0	47	47	35 0 0	36 0 0 38 0 0	47
48	53 0 0	59 0 0	48	48	36 0 0	37 0 0 39 0 0	48
49	54 0 0	60 0 0	49	49	37 0 0	38 0 0 41 0 0	49
	55 6 0	62 0 0	50	50	38 0 0	39 0 0 42 0 0	50

The above rates will compare favourably with the *final rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits,* 31*st December,* 1867.

Age at entry.	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	£. s. d.	£. s. d.	£. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.* Medical fees are paid by the company.

Claims are paid *one month* after satisfactory proof of death.

Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.

The office is a comparatively young one (first policy issued in 1862), and *is therefore free from old liabilities*

It possesses a very large capital, *the whole of which is fully subscribed.*

Its investments are all *of a first-class character.*

The life funds are allowed to accumulate *in special trust* for the primary security of life policies.

The expenses of management are guaranteed by the deed of settlement *not to exceed* 10 *per cent of the premium income.*

The London Direction consists *of first-class city merchants, who look after the business themselves, who are all shareholders in the company, and nearly all of whom have been on the Board from the commencement.*

The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.

The first-class position which the office holds at home, *as shewn by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs. Bulloch Brothers
Bankipore	W. Fraser, Esq., Bank of Bengal.
Behar Districts	J. Almonds, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal.
Ditto	Bank of Upper India
Ditto	T. Lucas & Co.
Chittagong	Messrs. Bulloch Brothers.
Chumparun	James Begg, Esq.
Chumparun Districts	E. C. Lamb, Esq.
Cochin	Peirce, Leslie, & Co.
Coconada	W. M. Abell, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs. Kelly & Co
Dacca	N. P. Pogose, Esq.
Jhansie	Bazenjee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Watters, Esq., Bank of Bengal.
Lucknow	W. Dickson, Esq., Bank of Bengal
Ditto	W. A. N. Langdon, Esq.
Madras	C. L. O'Brien, Esq., Secretary to the Local Board
Moulmain	Messrs. Bulloch Brothers.
Mecan Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
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Saugor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Tirhoot	E. Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December 1870, exceeded £127,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built and tiled, or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months	6 months.	3 months.	2 months.	1 month.
	as.	as.	as.	as.	as.
Private Dwelling Houses...	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building.) from to	10	7½	5	4	2½
	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton..	16	12	8	7	4
Presses or screw-houses cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty..	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,

No. 1, Hare Street, Calcutta, 31st March 1871.

C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, WEDNESDAY, 21st FEBRUARY 1872. [No. 7.

The Indian Economist.

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LETERS TO THE EDITOR.

PRICES IN THE NORTH-WEST.

To the Editor of the Indian Economist.

SIR,—Your number of December 21st, you did me the honour of reprinting an article on the 'Prices of Produce in the North-West Provinces' contributed by me to the *Indian Observer*. In your comments on that article you do not, I observe, take particular exception to any of the arguments which I adduced for thinking that the great rise in prices of the last twelve years could hardly be due altogether to permanent causes, the main objection you make to my conclusion is that I first created a theory of cycles of good and bad years, and then grouped my figures in an arbitrary manner to prove it. Now as to the first matter, will you allow me to remind you that the cycle theory is no invention of mine. It is at least as old as the time of Pharaoh, king of Egypt, and Joseph his Prime Minister. As to the second objection, I cannot perceive how the term 'arbitrary' can be applied to a grouping of years which follows the actual rise and fall of prices. It seems to me that the arbitrariness is with those who strike averages on round decades of years, as if prices were bound to fluctuate in accordance with our system of notation. However to set your doubts at rest, I now send you a complete statement of the prices year by year for the period which I reviewed, and you can group them for yourself. I also send you a diagram, showing at a glance the rise and fall of prices in consecutive periods of three years. I do not know whether you can print it, but I think you will admit that it exhibits pretty plainly a series of violent oscillation.'

In conclusion permit me to remark that I by no means deny, as you seem to infer both in your number of December 21st, and in that of January 22nd, that there has been a large and permanent rise in prices. If you will look again at what I wrote, you will see that I estimated the permanent rise at no less than 30 or 35 per cent., and that I attributed the greater part of it, as you do, to the fall in the value of silver. My object was not to prove that prices had not risen, but to show that temporary causes had far more influence on their rise and fall than was commonly supposed.

THE WRITER OF THE ARTICLE IN THE *Indian Observer*.

1 FEB.

PRICE OF WHEAT IN FOUR MARKETS OF THE NORTH-WEST PROVINCES.

	Agra and Muttra.		Bareilly.		Ghazeebad, Meerut.		Allahabad.	
	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.	Seers.	Chittacks.
1805	..	.	....	35	8	....	. ..	....
1806	..	.	....	36	10	..	. ..	.. .. ..
1807	..	.	....	35	12	..	. ..	....
1808	..	.	..	10	8	..	. ..	....
1809	..	.	....	25	14	..	. ..	....
1810	..	. ..	....	29	12	..	. ..	....
1811	..	. ..	....	47	12	..	.. ..	....
1812	..	33 14	....	30	5	..	.. ..	....
1813	..	20 9	.	26	12	..	.. ..	....
1814	..	30 7	.	10	5	..	.. ..	....
1815	..	11 9	....	53	2	..	..	....
1816	..	34 10	..	34	6	..	.. ..	....
1817	..	28 0	.	24	12	..	. ..	....
1818	..	18 3	..	24	1	..	.. ..	....
1819	..	17 0	..	16	8	..	. ..	....
1820	..	17 1	..	15	12	..	. ..	....
1821	..	26 11	..	37	2	..	.. ..	....
1822	..	30 4	..	23	10	..	. ..	....
1823	..	24 5	..	21	8	..	.. ..	....
1824	..	31 6	..	30	6	..	.. ..	....
1825	..	27 14	..	26	12	..	.. ..	....
1826	..	19 12	.	16	0	..	.. ..	....
1827	..	21 14	....	25	0	..	.. ..	....
1828	..	30 12	..	40	0	..	. ..	....
1829	..	36 1	.	35	12	..	. ..	....
1830	..	34 13	..	31	12	..	.. ..	....
1831	..	31 7	..	28	2	..	36 0	.... 33 0
1832	..	34 7	..	39	12	..	36 0	.... 31 0
1833	..	31 2	.	31	6	..	29 0	.... 29 0
1834	..	25 0	....	30	14	.	32 0	.. .. 28 0
1835	..	29 0	..	34	4	..	40 0	.... 28 0
1836	..	32 0	....	23	8	.	42 0	.... 24 0
1837	..	23 3	..	17	5	..	18 0	.... 22 0
1838	..	13 9	..	16	6	..	12 0	.... 18 0
1839	..	20 4	..	22	8	..	20 0	.... 22 0
1840	..	23 1	..	22	10	..	21 0	.... 22 0
1841	..	25 12	..	24	10	.	27 0	.... 23 4
1842	..	28 1	..	31	12	..	28 0	.... 23 0
1843	..	30 8	.	35	2	.	34 0	.... 29 0
1844	..	30 0	....	33	0	..	33 0	.... 28 0
1845	..	34 8	....	27	0	..	36 0	.... 27 0
1846	..	32 4	....	28	12	..	31 0	.... 27 0
1847	..	31 4	.	36	6	..	33 0	.. . 30 0
1848	..	30 4	..	33	3	..	23 0	.. . 34 0
1849	..	37 1	....	37	5	....	35 0	.... 31 0
1850	..	40 0	.	37	1	....	44 0	.... 34 0
1851	..	41 12	..	..	..	..	42 0	.... 35 0
1852	..	28 12	....	..	..	....	32 0	.... 32 0
1853	..	29 8	....	..	..	....	27 0	.... 28 0
1854	..	30 12	....	.	.	....	35 0	.... 29 0
1855	..	40 0	.	..	..	....	47 0	.... 31 0
1856	..	36 8	.	..	..	....	38 0	.... 28 0
1857	..	33 0	....	..	..	....	47 0	.... 22 0
1858	..	29 0	....	.	.	....	30 0	.... 21 0
1859	..	28 12	..	26	2	....	32 0	.... 17 10
1860	..	16 8	..	18	9	....	17 5	.... 20 13
1861	..	16 0	....	15	12	....	14 1	.... 19 4
1862	..	30 12	..	29	10	..	27 0	.... 21 5
1863	..	26 12	..	32	3	..	31 13	.... 24 10
1864	..	22 8	..	17	0	..	24 10	.... 17 11
1865	..	18 8	....	18	2	..	19 5	.... 14 6
1866	..	20 0	....	18	5	....	20 8	.... 12 13
1867	..	21 0	....	19	5	.	21 7	.. . 16 13
1868	..	19 8	....	20	4	.	22 15	.... 16 7
1869	..	11 12	....	11	7	..	12 14	.... 11 5
1870	..	16 12	....	16	7	..	14 15	.... 13 14

NOTE.—We are sorry that we are unable to print the diagram sent us by our correspondent, whose letter we purpose noticing in our next number.—ED. *I. E.*

THE SINDH FORESTS.

(To the Editor of the Indian Economist.)

SIR,—In your issue of the 21st December, you have published a letter on the Sindh Forests, from a correspondent who signs himself X. Y. Z., in which he attempts to show that the Government Forest lands in Sindh are exposed to the danger of disappearing gradually, unless preventive measures are at once introduced.

It is not my intention to follow your correspondent's arguments, but I wish to correct the statement made in the 5th paragraph of his letter, where he says that "the system of deciding the ownership of cutcha "land is not properly understood, and that not two of our Revenue "Officers interpret the law alike." The laws referred to, are the rules regarding Alluvion and Diluvion, introduced by the Commissioner in Sindh as far back as 1852.

In order to enable your readers to form an idea of the rules, I subjoin an extract, as far as they have reference to the subject treated on by your correspondent:—

Extract of Rules regarding Alluvion and Diluvion, in the Province of Sindh.

1. Any land, separated from the main banks of the river, or sea-shore, by a channel which contains water throughout its length during the whole year, is to be considered an Island.
2. Islands newly thrown up by the river, or sea, are the property of Government.
3. All new land not separated from the main land by a channel containing water throughout its length during the whole year, is to be considered as the property of the owner of the old land to which it is annexed, subject to Government assessment in the cases provided for in the rules below.
4. These rules hold good only in cases of lands newly thrown up by the river in such a manner as to make it impossible to identify them with any lands which may have previously existed on the same spot, and been since swept away. If the river, by a sudden change in its course, *cut off a portion* of an estate without gradual encroachment, so as merely to separate such portion of land from the rest of the estate to which it previously belonged, without destroying the identity or preventing the recognition of the land so cut off, then, the land on being clearly and unmistakeably identified, will continue to be held on the same tenure as before its separation.
5. But no weight should be allowed to the pretended recognition of lands which have been so entirely swept away at some previous period, that they disappeared during the whole of a season and which, on the river again changing its course, are supposed to re-appear, merely because in situation or composition they somewhat resemble those previously swept away. These would come under rules 2 and 3.

* * * * * * * *

Now, I feel sure, you will agree with me in thinking that these rules are not only perfectly general, but so plain that a difference in interpreting them seems quite impossible, and I fear your correspondent is aiming at the singular glory of being the only person who does not understand them.

W.

THE LATE VICEROY.

The news of the assassination of Earl Mayo, at Port Blair, on the evening of the 8th instant by a Khyberee convict named Shere Ali, produced what may without exaggeration, be termed feelings of consternation and horror throughout India. Following so closely the murder of Chief Justice Norman, there was at first a tendency to invest the crime with a political character, which was however dispelled on receipt of fully detailed particulars of the melancholy event. Those details have long ere now been made known to all our readers through the daily press, but an occurrence so unparalleled as the assassination of the Governor-General of India, cannot be permitted to float down the current of events without comment. Hereafter, it is not to be doubted there will not be found wanting those who will judicially review the public acts of Lord Mayo, but amongst all classes of this large community there is at present but sorrow for the life of usefulness so abruptly ended, and sympathy with those on whom so dreadful a domestic calamity has fallen. In compliance with a numerously signed requisition, the Sheriff of Bombay convened, at the Town Hall of Bombay on the evening of the 16th, a meeting at which the most influential representatives of every race and creed assembled to express the deep sorrow felt by all classes, at the assassination at Port Blair of His Excellency the Earl of Mayo, and their "sympathy with the Countess of Mayo in her sad bereavement." Struck down by the hand of an assassin while investigating, with a view to ameliorating the condition of those outcasts of society, the convicts on the Andaman Islands, Lord Mayo "died a martyr," "to the highest calls of his Country and Faith."

Still in the prime of life with a magnificent physique, a genial and elastic temperament, and a constitution unimpaired by climatic influences, the deceased Viceroy might, in the common course of nature, have looked forward to many years of usefulness in his exalted position. *Dis aliter visum est*, and his fate may be recorded in the noblest, simplest, and most eloquent words which can form the epitaph of mortal man, "He died at his post."

Robert Southwell Bourke, P. C. L. L. D., 6th Earl of Mayo, Viscount Mayo and Lord Naas in the Peerage of Ireland, was born in 1822, and succeeded his father the 5th Earl. He married in 1848, Blanche Julia, daughter of Lord Leconfield, and is succeeded by his eldest son Dermot Robert Wyndham, born 1851. The Admiralty have been telegraphed to for permission to use the *Daphne* gunboat to convey, in accordance with a wish expressed by Lady Mayo, the remains of his Excellency to Ireland.

NOTICE.

Subscribers to the *Indian Economist* who are in arrears, will greatly oblige us if they will remit the amount of their subscription at once. There are many gentlemen who have been upon our list from the first establishment of the Journal, who have made us no remittance as yet whatever. The Subscriptions due in these cases, are:—

For Vol.	I	30 Rs. *arrears* rate
Do.	II	36 „ „ „
(Present)	III	30 „ advance „

Remittances should be addressed to Mr. Knight, Bombay.

THE CANARA LAND CASE.

We had intended to give a complete history of this case in the present issue of this journal. A rule *nisi* for contempt of Court however has been issued by the High Court of Bombay against its Editor for certain articles concerning the case, which lately appeared in the *Indian Statesman*, and pending the settlement of the rule, it would be manifestly improper for us to enter upon the case in these columns. We produce simply the report of the proceedings in the case.

HIGH COURT, BOMBAY.

Saturday, 17th February.

(Before the Hon'ble the Chief Justice, J. Gibbs, and M. Melvill.)

Vycoonta Bapoojee vs. *The Secretary and Settlement Commissioner for the District of Dharwar.*

Mr. Marriott said—In this case I am instructed to apply to the Court for an attachment for contempt of Court.

The Chief Justice—These motions are usually made on the Crown side of the Court.

Mr. Marriott—Not that I am aware of, my Lord. The precedents in the English Courts, and especially those to which I would draw your Lordship's attention, for an attachment by a Court in which a suit is pending, are very numerous. There is a case especially of which your Lordships must be well aware, *Tichborne* vs. *Mostyn*.

The Chief Justice—What case?

Mr. Marriott—A case in which the principle is laid down by the present Lord Chancellor, who granted a rule.

The Chief Justice—It must have been issued on the Crown side The Court of Chancery is on the Crown side.

Mr. Marriott—It does not appear that it was so.

The Hon'ble Mr. Justice Gibbs—What do you take exception to?—What are your grounds?—it may be there are none.

Mr. Marriott—The ground, my Lord, upon which application is made is that Mr. Knight, in his newspaper, the *Indian Statesman* published, on Friday, the 9th of February, and upon Monday, the 12th of the same month, certain articles tending to prejudice the Court, and my clients, the plaintiff in this case. An affidavit has been filed, with the copies of the newspapers attached, and I think the best thing that I can do is to read the articles we complain of.

The Chief Justice—Does the affidavit show Mr. Knight to be the publisher of the paper?

Mr. Marriott—Yes, my Lord, there is an affidavit to that effect. He is, I am instructed, both editor, proprietor, and publisher.

The Chief Justice—It does not seem that Mr. Knight is the registered publisher.

Mr. Marriott—No, my Lord. The first article, of which we have to complain, is one of the 9th of February, and runs thus. Mr. Marriott then read the article as follows:—

We do not quite understand what the effect will be of the rule *nisi*, granted by the High Court upon Mr. Anstey's motion, to restrain the Collector of Canara from recovering from the cultivators, the assessments levied under the new Settlements in course of progress therein. If the effect of the rule [made absolute] should be to prevent recovery upon the new scale, in any part of Canara, until the representative case is finally disposed of, the rule will be tantamount to declaring so much of the revenue, as may become due during the period, irrecoverable. But the Government can easily shew a *prima facie* right to increase the assessment, and should, we think, do so. For the rule will hardly we imagine be made absolute, unless (1) the ryots can satisfy the Court that they have strong grounds for affirming that the former settlement was "perpetual;" or (2) are prepared to give security for the eventual payment of the assessment, should their claim be finally disproved. For ourselves, we have no doubt whatever of their liability to pay an enhanced assessment in common with all others. The claim of these men to a special property in their land under Colonel Munro's settlement, should be interpreted with the utmost strictness, for they are claiming against the Commonwealth, and in cases of this nature, as Mr. Mill justly argues, "the balance in all cases of doubt should incline against the proprietor." For he claims a non-natural and unusual right, and should shew a strong *prima facie* ground that he really possesses such a right. Prescription is no bar in a case like this. The undoubted immemorial law and usage of the country, is for the State to vary the assessment upon the land according to its wants, and the cultivator who declares that a pledge was given to him 70 years ago, that the State would never again exercise this right in his case, must show a very clear *prima facie* title indeed, to warrant the entertainment of such a claim. It is as though one of the districts of Bombay, say Mombadavie, were suddenly to deny the right of the Justices to levy the house rate therein at 6 per cent. instead of 5, affirming that 70 years ago, the Government perpetually settled their tax at 5 per cent. No court in the world, we imagine, would allow such a claim any weight whatever as ground of injunction, unless strong *prima facie* evidence

of the reality of the settlement was offered. Prescription can be allowed no weight in a case where *all* districts of the country alike have been holding for long periods of time, without any increase in the assessment. In the case of the Canara assessment, there have been repeated *changes* within the century. Reduction after reduction has been made, and we have heard nothing of perpetuity until a change in prices necessitates a move in the opposite direction. So long as the Government reduced the assessment there was no perpetuity about it, but the moment it increases it, the old Settlement is found to be perpetual. In Bengal as we all know, the essence of the perpetual Settlement is that it admits neither of reduction, nor of enhancement. But Canara claims another kind of perpetual Settlement altogether; one under which constant reduction have been made, but enhancement is impossible. The *prima facie* claim should be made out very strongly we submit, to entitle the claimants to the rule. For these men are putting forward a right to refuse paying the main tax of the country. The case is very different from an ordinary claim between a common plaintiff and defendant. These men say "We refuse to pay the tax you are leaving upon Dharwar, and Poona, and every other district of the country, because you gave Canara a pledge 70 years ago that you would never increase the tax that was then imposed." The power of any Government to give such a pledge may be very fairly questioned, but there can be no question, we think, that they who put forward a claim of this order should be required to establish a strong *prima facie* case in its favour, before any weight is allowed to it whatever. We trust that nothing we have said will be construed into a want of respect for the High Court before which the rule will be argued. The case is an altogether exceptional one, and involves issues so grave that everyone who can help to its elucidation, should be encouraged to do so. The Regulations surely bar the interference (by way of injunction) of the Civil Courts with the collection of the Revenue. The tax-payer has his remedy at Law against improper exactions.

The word "perpetual" my Lord is between inverted commas, and although we complain very much of the statement made in this article, it is harmless compared with the second one I am about to read which appears in the *Indian Statesman* of Monday, February 12th. This is the one of which we especially complain, and I think it is, as your Lordship will see under the circumstances, one that should not have appeared in a newspaper in a case still pending. Mr. Marriott then read as follows :—

In noticing on Friday last, Mr. Anstey's application to the High Court for a rule *nisi* to restrain the Collector of Canara from distraining for the new assessment upon the cultivators in that province, pending the decision of the case that is to come on for hearing in June next—we stated our belief that the Court would certainly not make the rule absolute, unless strong *prima facie* proof was produced that the settlement of 1800 really was of the nature which the cultivators pretend. We are quite aware of course, that we are taking what will be the unpopular side in the case, and are prepared to see ourselves described—we are indeed already so—as defending gross oppression on the part of the State, and as the upholders of a policy of confiscation. We shall have in Court a torrent of indignant eloquence against the oppressions of the wretched "civilian" Government that tyrannizes over the country, from the lips of Mr. Anstey, which his faithful henchman the *Bombay Gazette* will no doubt echo in the press. "Mr. Knight" will be held up to the country as the base defender of what all other Englishmen regard with abhorrence, and as the "fulsome adulator" of the civilian tyrants who oblige "the miserable tillers of the soil with their irresponsible protection." This game has been played so often, that there is perhaps some danger of the public getting tired of it: but as it is certain to be tried again in this Canara case; and as the issues involved therein are of vital moment to the country, we think it desirable to inform the public as clearly as we can of its real nature. These Canara cultivators then, are setting up a claim that the settlement which Colonel Munro made with them in 1800 was "perpetual" in the same sense as the Cornwallis Settlement of Bengal. The enormous difficulty of the work, has made a scientific survey and settlement of the land throughout India an exceedingly protracted affair; and it is only within the last year or two, that the Survey department has been able to begin operations in Canara at all, although the necessity of the survey is probably greater in that province than in almost any other. But because, and simply because, the Government has been unable to begin the work before, an attempt is now made by some of the landholders in the Province to persuade the people that the State has no right whatever to make it, Colonel Munro having, they allege, in 1800 given them a pledge that *his* rough and incomplete work should never be revised, and the assessment fixed by him at that time never changed. Now, as a matter of fact, the assessment has been repeatedly changed in the Province, the Government having *reduced* the rates more than once in the first 20 years of the century, owing to the difficulty which the people found, or said they found, in paying Colonel Munro's rates, from the continuous fall that was taking place in prices. All necessity for change in *this* direction long since passed away, and the Province, owing to the profound peace it has enjoyed under British rule, the enormous expansion of the export trade of the country, the extreme lightness of the assessment for half a century, and the revolution that has taken place in prices everywhere, has become perhaps one of the wealthiest provinces in Southern India. As almost all our readers know, it contains several important ports, amongst them Carwar, to connect which with the country above the Ghats, the State is being urged and commanded, to send a railway right through the province. Now, instead of gratefully acknowledging the extreme moderation of the State all these years, and congratulating themselves that they have so long been allowed to hold the land under the purely provisional settlement made in 1800 when the country first fell into our hands, they set up a claim, upon the appearance of the Survey department amongst them, to hold their lands for ever at the quit-rent—for *that* is what it has come to be—at the quit-rent imposed by Colonel Munro. Let the public understand well, what this claim means. The land tax, or revenue, or whatever else you choose to call it, in Canara, as everywhere else, is the *one* source of revenue which the State possesses; and the claim of these men virtually is that *their* contribution for all time to the public treasury is never to be increased; and that Dharwar, Ahmednuggur, Poona, or Bombay is to furnish the extra quota of revenue required to make good *their* defalcation. They are to have a railway through the province as a matter of course, paid for out of the public treasury; but the *improved* value of the land which will result therefrom is to be all their own. Not one six-pence has the province itself contributed to the large sums spent upon improving Carwar, and if their present claim to hold the land perpetually at the rates of 1800 is to be allowed, the cost of administering the province itself, will have to be borne by the others. The statement that Colonel Munro made a perpetual settlement with them we have satisfied ourselves is a pure pretence, as will be shewn in the High Court by and bye: and in the meantime, we warn the public against being misled by the eloquence of Mr. Anstey and his henchman. We shall be sure to hear from them, passionate, indignant complaints of the 'atrocity' of the new rates imposed; the fact that the present ones are nothing but a quit-rent being carefully suppressed. We shall then have pathetic pictures of the cruel Collector and his myrmidons seizing upon the ancient homesteads of the people, and putting them up to sale, because the poor creatures cannot find the means of satisfying the rapacious tyrant who is driving them from the homes of their forefathers for a thousand years. "Bunkum: my indignant friend; Tell it to the "Marines." If any man's property is really *sold* by the Collector, it will not be because of the weight of the new assessment. The High Court will, we hope, require the counsel to support the sort of declamation which we are certain to get—[the thought suddenly strikes us, how gloriously we could ourselves shine in such a cause and on such an occasion, if we had only got the brief]—by two or three precise formal affidavits as to the exact weight of the new assessments, and the proportion of the produce which they really represent. And in the preparation of these affidavits, let it be well understood beforehand, that certain prosecution for perjury will follow any attempt to impose upon the Court. If such affidavits are required of the Counsel they will go far we are persuaded to end it. For it is admitted everywhere, and even by these men themselves, that the smallest share of the produce ever taken under native rule, was one-sixth of the produce. In this very Canara itself, the highest amount that Mahomedan ingenuity could screw out of the people, was being taken down to the very moment of their deliverance by us in 1800. It was not a sixth, nor a fourth, nor even a half, that was taken during the 40 years of Mahomedan rule that preceded ours, but every

seer of produce the fields yielded, beyond what was necessary to keep the people from starving; while so much do they appreciate the gentleness and forbearance we have shewn them that they'll be d——— if they now consent to pay a rupee more than they paid Colonel Munro. Let the High Court but require from the Counsel in the case, affidavits upon the following two or three points, with the distinct warning that men who are applying for the rule will be indicted for perjury, if their statements are proved to be false:—

(a) The real weight of the new assessments, *i.e.*, the proportion it absorbs of the gross produce.

(b) Their own conception of what the ancient rights of the State are, *i.e.*, the proportion of the produce exacted under the comparatively settled rule that preceded Hyder Ali's.

(c) The proportion of produce taken by the Mysore Government during the 40 years that preceded our coming.

The truth is that these Canara cultivators have ever been a most troublesome, law-defying, and litigious race. Let no one imagine we want to prejudice their case, or claim. This contest with them is not of yesterday. Its necessity has been foreseen for the last thirty years, and we are simply concerned to direct the public sympathies right. Should their claim even be shewn to be valid—what sort of Government would that be that did not put them to the severest proof of it, when we remember what the claim really is, *viz.*: that by an error made by the State in 1800—they are now to escape paying their fair and proper share of the public revenues! Their contribution was over and over again *reduced* when they pleaded that the assessment was heavy, but it is oppression ever to *increase* it, though it has become so light as to be only nominal!

To shew that we are not attempting to make a case against these men, but that the difficulty of dealing with them is notorious, we shall close this article by quoting a description given of them five and twenty years ago, by the Collector then in charge of the province. He complains that "the undefined state of everything concerning rights in land owing to the want of a survey," and the increasing value of the land, caused an immense amount of litigation in the province, the revenue officers being perpetually dragged into Court by the cultivators. He proceeds—

"A Canarese ryot of ordinary intelligence and cunning who wishes to take up new land does not think of going to the Collector; he has a variety of much better plans by which he secures it for nothing. One very common one always appears to have been, to get some neighbour to sell or mortgage it to him, and then by a fictitious suit procure the transfer to be confirmed by a decree of court. In other cases, the shanbogue or monegar who examines the land is bribed to insert the spot coveted as within the estate of a particular party, and this is produced years afterwards. It would, indeed, be impossible to describe adequately the ingenious and cunning manner in which evidence is got up, not only in the revenue departments but before the police, also intended to be afterwards made use of in establishing a right to lands.

"When it is considered that this system has been going on for the last 48 years, it may be readily imagined to what an extent lands have thus been appropriated. This has arisen from there being no public record of the extent of any man's land to which the public officers could refer. In suits between individuals, the rights of Government do not come under discussion, and the production of an admitted sale, or mortgage deed, or other evidence of a like nature, has always led to the land being decreed to one party. There has never been any application in Canara of the simple rule, that a man has only a right to as much land as he pays for, nor, is there any rate or rule of assessment by which the Collector can determine whether he has more or less than he ought to have or by which he can recover or re-assess it.

It is of no avail for him to say, You have three or four times as much land as is equivalent to the assessment you pay; the simple answer is that it is within the limits of his wurg, or the production of some document, or the evidence of friendly neighbours to prove that it is his, and if the claim be resisted there is the ready resource of carrying the case into the court.

"There is another point which I think it right to notice, and that is the subject of "Moolputtahs." These are grants of land upon a fixed assessment named, and where this assessment is unduly low they are essentially of the nature of Enam grants. It can, for instance, so far as the public revenue is concerned, make no difference whether land which, under the ordinary rules of assessment, would pay 100 Pagodas be granted on Moolputtah on the annual payment of 10 Pagodas, or whether it were granted under the name of Enam with a *Joree*, or quit-rent, of 10 Pagodas. In other districts, such as the Ceded districts, one of the first measures for determination, on taking possession of the country, appears always to have been to lay down some rule as to what grants should be held entitled to confirmation as being made by sufficient authority and what should be rejected. In Canara no such rule has ever prevailed in respect to Moolputtahs, but, on the contrary not only have private deeds been always admitted as the best evidence of the right to land, but every kind of grant by a public officer by way of Moolputtah, has been accepted, and decrees passed on them in the courts. Thus the Moolputtahs of Tippoo's corrupt asophs and amildars granting land at a nominal assessment, and obtained probably for some petty bribe, have met with the same respect that the most authoritative sunnud would command, another part of the country. The effect has been not only that a nominal or inadequate assessment has been confirmed of large quantities of land, but the very circumstances of their being so readily received has led to their wholesale forgery. There are parties in Canara who, it is well-known, maintain a regular manufactory of forged documents; and I could mention the name of an influential shanbogue in Ankola, from whom it is commonly said that documents of any dates and of any dynasty may be procured according to the taste of the applicant."

Now all this was written a quarter of a century ago, and it is with those very men that the State is now compelled, by the defiance of the Survey department, to enter upon a final struggle in the public interests. Let Mr. Anstey do his best for his Canara clients by all means. He is bound to do so; but let him spare us the appeals to popular passion, with which he has made us too familiar in former cases in. which he has been engaged. Let him speak respectfully of the Government which he is so ready to denounce as oppressive, forgetting the weight which his words carry. We are bound to presume that he wishes the *right* to prevail, whether that right is on the side of his clients or on the side of the Commonwealth. *We* are convinced that it is on the side of the latter, and therefore have no sympathy with these Canarese appellants. They are simply seeking to evade paying their fair and proper contribution to the public burdens, since we can reach them in no other way. Everyone will at once allow that if they are not to pay through the land they ought to be made to pay some other way. Their claim is therefore bad morally whatever it may be legally, and we believe it to be bad legally also: but that part of the case we may safely leave to the High Court, to which alone it belongs to determine the fact.

The "Henchman," is the *Bombay Gazette*, my Lord, I apprehend.

Mr. Justice Gibbs—Do you object to that?

Mr. Marriott—No, your Lordship. Anything relating to Counsel is fair game.

The Chief Justice—Upon whose behalf are you engaged?

Mr. Marriott—Upon the part of the plaintiff in this suit.

The Chief Justice—Do you read the affidavit as to this application?—Who is the publisher?

Mr. Marriott—The affidavit goes to say that Mr. Robert Knight was then, and now is the publisher of the *Indian Statesman and Gazette of Asia*.

The Chief Justice—But who is the publisher?

Mr. Marriott—The publisher is Mr. G. L. F. Connell; it states on the imprint "printed and published for the proprietor by G. L. F. Connell, Manager." I would ask your Lordships to grant a rule *nisi* against Mr. Knight, for as regards the tendency of the article it is not necessary for me to say anything.

The Chief Justice—You don't apply against Mr. Connell?

Mr. Marriott—No, my Lord, I am not instructed to do so.

The Chief Justice—I think you are entitled to a rule *nisi*; when do you propose making it returnable?

Mr. Marriott—It will proceed I presume, my Lord, in the ordinary way?

The Chief Justice—It will be returnable this day week, to give Mr. Knight time to prepare any defence he may have to offer.

The rule *nisi* restraining the Collector of Canara from enforcing payment of the new assessments in that province, pending the decision of the High Court—upon the claim set up by the cultivators to hold in perpetuity at the rates settled by Colonel Munro in 1800—was made absolute on the same occasion; the cultivators being reasonably required however to give security for the eventual payment of the State demand, should the judgment of the Court be finally against them.

THE KUKA OUTBREAK: WHAT IT MEANS.

As much public indignation is expressed against the measures taken by the authorities, to suppress the insurrectionary proceedings of the Kùkas, it may be of interest if we publish some observations sent to us by 'one near the spot' which go to shew that this fanatic sect is determined to do much mischief. "There can be no doubt, says our informant, that their real intention is to subvert the British Government and to restore the Sikh "Raj." This is openly given out, and given out prominently by even the orthodox Sikhs during the last year. The rallying cry is that cow-killing is an offence to the nation, it must be put down by complaint, failing that by concerted action, and if the cow-killing Government persists in its obnoxious proceedings, the Government must be opposed and be got rid of. Although at present these violent objections are chiefly entertained by the followers of the "new Guroo" Ram Singh, it is sufficiently known to our officers, that a large majority of the upper Hindoo classes, the heads of temples and their followers, and the stricter Sikhs of the rural order, are fast sharing the opinion that the English Government alone tolerates the spread of this offence, and it is no use to look to them to apply a remedy; so the sooner and the louder the people give vent to their feelings, the better for the peace and well-being of all.

"Whether Ram Singh has openly encouraged this, it is not easy to say. He is a quietly-disposed man, whose principal and original aim, was to appear as a new reformer of religion.. His *Soobahs* or Lieutenants are the real workers: they are ever on the move, and constantly inciting to active measures. They perceive that the most efficient way to bring over the old and conservative adherents to the Sikh faith, is by working on the sympathy of all who dislike the English for their cow-killing propensities. The policy laid down then is this—Do nothing at present by a general rising, the public mind is not ripe for this, but take every opportunity to show the Mahomedans, and through them the cow-eating English, that they must not offend our prejudices. Attack Mahomedan butchers, open out the grave-yards, attack such Mahomedan Chiefs as help the Sircar, with intelligence of our doings. Let it go abroad that we do this in the name of the Guroo, and in obedience to Hindoo aspirations, and we shall gradually *win the approval of all Hindoos and rural Sikhs.* We can then rise *en masse*; and by restoring the "Khalsa," get rid of the Government that gives umbrage to our prejudices, and tramples on our cherished institution by every new law they bring out.

"This is the settled policy of the Kúka movement, we have reason to believe, from an amount of evidence that has reached us. Some of the intelligent Sikh Sirdars have assured us that it is a dangerous association, and that unless vigorous measures are adopted and sustained, they will make their power felt by a succession of risings, and on each occasion when they do resort to murder and mischief, there will be an accession of strength, and new converts will be made in numbers, unless they are deterred by such prompt and severe punishments, as will inspire *fear* on every side.

"It is commonly believed that there are at least 200,000 Kúkas, the out-growth chiefly of the last five years. They have been steadily increasing, but even these numbers do not include the many who are afraid of avowing themselves such, for fear of being a mark for the Police. The authorities deny there are so many, and declare that they are not on the increase, but have of late fallen off. This is not however the fact, as known to those who are intimate with the leading *Soobahs.* It is openly given out that the Sikhs will regain their Kingdom (Padshahat) in 14 years from the commencement of Ram Singh's acceptance as the "Guroo." This year was to be marked by a great success for the cause. Move among the Kúkas as one of them, and we hear the encouragement, "Well wait for the month *Cheyt*, and you shall see that power is on our side." It is feared that the late *emeute* has been precipitated, and that is why it has failed. That the late meeting of 2,000 men at Bhenee, contemplated mischief of a serious order, is now admitted in the villages; that the 200 crossed the line, marched down in defiance, and followed Heera Singh and Sena Singh, the ringleadars, is a matter publicly accredited. They went straight to Mullodh for "arms and horses," and then marched to Mullair Kotla, hoping to seize that State from the Mahomedan Chief who ruled there. Heera Singh was distinctly told by Ram Singh—"If you have lost everything by being a Kúka and want a "Raj," let those who are brave step over the line, and take Mullair Kotla, and it will be the beginning of the many little places we shall conquer and *rule.*" 200 stepped across the line, and without stopping went off to Mullair Kotla. If they were misguided men, they had time to reflect and turn back after the affair at Mullodh. But they were one and all prepared to die for the cause, and establish the Sikh powers over the *Nawabee.*

"Now it was to suppress a revolt of this kind, that Mr. Cowan and Mr. Forsyth had to act in emergency. On the first news, the Deputy Commissioner and the District Superintendent of Police went straight off to Mullair Kotla. There were no troops at Loodiana. Bhenee, the head quarters of the Guroo, was within a few miles of Loodiana. Had he lifted up his finger, when news reached him of the authorities having left Loodiana, and of there being in all only 150 constables to protect that place and the Jail, 400 Kúkas might have made an attack on Loodiana, plundered the treasury, let out the prisoners, for there was no force to oppose them, and the consequences might have been most alarming. Successful at Loodiana and Mullair Kotla, the rallying cry might have been raised, and thousands have banded together to die for their religion, and it might have been long before order could have been restored. Even when at Mullair Kotla, news did come in of bands of Kúkas roving the country, meditating the rescue of such as had been apprehended at Kotla. Under such circumstances, what was the Chief Magistrate to do, to fight, wound, catch as many as he could and send them for protection to Loodiana? This would have at once provoked an attack on that place before the troops had arrived, and probably in the increasing *melee*, the authorities might themselves have been attacked and murdered by an excited mob.

"We think then in the very difficult position in which Mr. Cowan was placed, he might be accredited with having done the best to uphold the peace, instead of being run down by the press before even his explanations have been submitted.

"Whatever Mr. Cowan may have done, by carrying out the last sentence of the law without a trial, there can be no doubt of the propriety of the execution, as far as Mr. Forsyth is concerned. He was careful to see that the sentence was passed only *after a fair trial*, and the public have no more right to attack him, than they would have to attack a sentence passed by the Chief Court. In all cases the death sentence in Mullair Kolta, a Native State, came to him for sanction. There is no Procedure Code, and the Chief Court has no jurisdiction. His action then was *perfectly legal.* Whether the Government will pronounce it *wise* to 'blow away,' instead of to execute by hanging, remains to be seen; probably fearing opinion in England, they will say it was *not:* but it has been shown by overwhelming evidence, that there was an organized plan of rising, that had the Kúkas been successful in Kotla, they had intended to pull up the rails to prevent troops coming, and then to have attacked Nabha, Jheend, and Putteala, while the main body of the Kúkas in the Munjah was to rise. The province would then have been plunged into war.

"Now as to the execution; every man of the gang who was

present at Mullodh knew that from the moment of that attack, blood rested on the heads of the whole party. Had they all been caught at Mullodh, though the Penal Code declares all engaged in dacoity with murder liable to death, it is probable, nay certain, that a careful discrimination would have been made so as to separate the ringleaders from their misguided followers. But as soon as they had committed that dacoity, and went on to attack Kotla *deliberately*, it cannot be said, as it has been asserted, that they were misguided, or did not know what they were about. When therefore they attacked that place, killed many people, and were all captured, the whole gang was liable to the extreme penalty, and as we know that other bands of Kúkas were coming to Kotla expecting to find arms from their brethren who had gone before, it can scarcely be maintained that it was not wise to shew them how Government could deal with such men. To have stopped Mr. Cowan's executions, to have disavowed his repressive acts, and merely sentenced the remaining 16 rebels to imprisonment, might have been a *safer* proceeding no doubt, but it would have been exceedingly unwise to weaken Mr. Cowan's proceedings at such a juncture, and most probably would have involved the Government in very serious consequences; for the Kúkas would not have been slow to take advantage of the leniency of its officers. Government has already been too lenient with them, or this outbreak would never have occurred.

"Here and there Englishmen will condemn these strong measures; and all Englishmen will regret that 'blowing away' was the mode of punishment resorted to; but that a severe example was necessary, is believed by all who were near, and on the spot: and the verdict of intelligent natives, themselves Sikhs, and even some of them Kúkas of a less violent type, is unanimous in declaring that it was only by such strong measures *fear* could have been inspired, and *has been inspired*; that had the local authorities proceeded to trial in the usual way by resort to the Procedure, there would have been a series of complications; delay, emboldening others to come forward, would have led to rescue, rapine, an attack on Loodiana, and next to certain, the murder of the few English who represented authority in the Loodiana district, with a very serious loss of prestige, and an indirect encouragement perhaps have been given to a general rising in several of the adjoining districts and Native States.

"Even now the future may show that these measures, however to be regretted from their severity, have been justified by the facts, and have been in the end the most merciful, when we look at *all* the circumstances in a political point of view."

THE LUSHAI CAMPAIGN.

THE latest intelligence that has reached us concerning the expedition against the Lushais, or rather the Kúkas, is to the purport that the Government of India is understood to be well satisfied with the way in which Generals Bourchier and Brownlow, have respectively operated against the tribes. Up to the present, both columns have readily accomplished all they have undertaken, and the experience of the period which has elapsed since the opening of the Campaign, has abundantly demonstrated that the arrangements for the provisioning of the forces, the transport of *material*, road-making, topographical surveying, telegraph construction, acquisition of intelligence, &c., could hardly have been of a more efficient character. With Lord Napier at the head of the army, this was to be expected; but the Military Department of the Government of India has from the first been most anxious to secure for the expedition completeness of equipment and supply. So well indeed have matters in these respects been managed, that in not ill-informed quarters, apprehensions are already finding utterance that the Lushai expedition will ultimately prove a far more expensive one, than has been at all anticipated. We are however in a position to say that the returns of expenditure which have hitherto been sent in, and which are understood to afford a fair basis for an estimate of the total cost of the campaign, do not justify such a misgiving. No necessary disbursement, it is true, has been withheld; but on the other hand there has been the most ample check and supervision in the interests of economy, and for the prevention of waste, malversation, or over-charge. Before the columns took the field, it was surmised that any formidable opposition they would have to encounter would be experienced by General Brownlow's and the Chittagong columns, rather than by that from Cachar under General Bourchier; and at one time it was actually proposed that the latter force should be of considerably inferior strength. It is well that this suggestion was not acted on, and that the Cachar Wing, instead of being solely composed of frontier police and Tipperah levies, was made strong in Sikhs, Goorkas, Assam corps, and Mountain train Artillery. It has had rather smart hill fighting to do, and not a little of it, and the resistance it has had to overcome has, on several occasions; been of a respectable character. General Brownlow and the Chittagong column on the contrary, have not met with any opposition of significance, and were suffered to near the Howlong country (on the North-east corner of the Chittagong Hill District's frontier), without having had occasion to fire a shot. It is possible that the Lushai scheme of campaign, has been to muster their whole fighting power along the Cachar frontier, in order to be in readiness for an effective and profitable raid into the contiguous British districts, as soon as they should have disposed of the British column advancing against them—a fact they possibly did not doubt their ability to accomplish. At any rate the tribes have fought passably well on the Cachar side, and had not, up to a recent date, evinced anything like a genuine desire for terms. Their losses in killed have been heavy; and between the advanced position in which the latest accounts represent General Bourchier's force, and the eastern limit of *Regulation* Cachar, not a single Lushai village, indeed not a single hut now stands: all have been burned or razed to the ground by General Bourchier's column. Submission on the part of the inhabitants of any village would have saved them this punishment, but in no instance has there been any indication of a desire of the kind. The whole Kúka race are in fact, up in arms against us, and though beaten, hunted, and impoverished, as yet evince no disposition to acknowledge themselves worsted, and crave mercy of the victors. Throughout the long stretch of Kúka country—which intervenes between Regulation Chittagong and the settled districts of Cachar,—a stretch of fully one hundred and fifty miles of hill and jungle, but two of the numerous Kúka clans, viz., that of Sookpilal in Cachar, and that of Rutton Poea in Hill Chittagong, have declared for the British. The whole of the remainder, including the Lushais, Syloas, Shindoos, Howlongs, and a host of other Kúka tribes, have taken up arms against us. Sookpilal moreover has simply refrained from joining the enemy: he has rendered General Bourchier's force no aid of importance, and neither he nor any of his people accompany it. Rutton Poea, on the other hand, and notwithstanding that his villages are almost within gun-shot of Howlongs' stockades, and in ordinary times far away from any British post whence he might hope for succour, early joined General Brownlow's column with a number of his men, and has throughout rendered valuable service, especially in furnishing guides and information. It is to be hoped that when General Brownlow's force has begun to retrace its steps, there will be devised some means of ensuring the safety of this trusty follower. It may be that a British post will be established in the vicinity of his village. It is not improbable that even as we write, telegrams may reach Government announcing the overthrow of Poeboy by General Bourchier, and of the Howlongs by General Brownlow. Two emissaries, clansmen of Poeboy recently came in to General Bourchier to make overtures for a cessation of hostilities; but the General very properly declined to receive them, declaring that if Poeboy sincerely desired peace, he must in person sue for it. In the Howlong country, General Brownlow has just summoned that tribe to surrender, intimating that he would allow them but few days to do so.

SETTLEMENT ENQUIRIES—BOMBAY.

THE *Indu Prakash*, a native journal of Bombay,—conducted with marked ability but too ready at times to echo the statements

made by some of its English contemporaries concerning the weight of the assessments in Western India—proposes that the Select Committee upon Indian affairs should be moved to make the following enquiries of the witnesses to be summoned before them, in the next few months:—

1. Is the principle enunciated in the Court of Directors' Despatch of 1856 —"that the right of the Government is not rent, *i. e.*, surplus produce after paying costs of cultivation and profits on agricultural stock, but is land revenue only, to be so lightly assessed as to leave a surplus of rent to the occupier, whether he lets the land to others or retains it in his own hands"—the one which is practically carried out by the settlement officers in fixing the assessment of lands?

2. If so, to what extent is it carried out, or to what extent is it interfered with by the opposite view that the State is a landlord in the sense of a private proprietor, and entitled to take the fullest rent that may be levied?

3. Was it, or was it not, a breach of the engagement which the State entered into with the cultivating ryots at the time of the settlement, to levy extra cesses for local improvements and primary education during the currency of the lease?

4. When the leases have to be renewed, what is the principle which regulates the increase? Are all improvements made by the ryot excluded from consideration, and the increased levy made solely with reference to the rise in prices by reason of the general progress of the country?

5. What proportion does the increase in revenue bear to the increase in prices? Is there any fixed proportion observed?

6. Is there any room for a large addition to the land revenue in this Presidency?

(1.) From the cultivation of waste land?
(2.) From improved cultivation of cultivated lands, and their higher assessment at the time of the re-settlement?
(3.) From the assessment of exempted or alienated lands?
(4.) From extra cesses on land,—irrigation and water rates?

7. Can you state the average proportion which the Government assessment bears to the gross produce or net rental of dry crops, rice lands, or irrigated lands? Is it less than one-sixth of the produce, than Akbar's rates, or the old Maratha rates?

8. Is the rate observed in the North-West Provinces, that the Government assessment should not exceed fifty per cent. of the net rental of land, one which you would like to see practically carried out in the settlement operations in this Presidency?

9. In the Southern Districts of the Konkan, is it or is it not true that the State takes away, by its levy, one-half or two-thirds of the gross produce of the fields?

10. Can you state what the revenue of any particularly well-marked province, say Khandeish or Konkan, or any smaller Talooka or District under the regular government of the Peishwas was, and what proportion it bears to the land revenue levied at the present day?

11. Excluding the reign of the last Peishwa, what were the rates of assessment on different kinds of land? Can you state any reasons for the general opinion that the rates of assessment were almost of the nature of a rack-rent?

12. What was the total land revenue of the Peishwas, during the twenty years that Nana Fadnavis was Prime-Minister? What provinces were included in the revenue-paying territory? What part of it was alienated to military and charitable purposes?

13. What is your opinion of the comparative advantages, or otherwise, of the permanent and periodical settlements?

14. Can you suggest any method by which the advantages of both may be secured, and the disadvantages avoided, as far as may be?

15. Supposing that fixed corn rents, the staple produce of the country, were settled for all varieties of land, on the basis of the present money rents or on a calculation of the cost of production, and this corn rent was settled for ever, subject of course to commutation every ten years into money values based on the average prices of the last ten years, do you think such a settlement would combine the merits of both systems?

16. Do you think thirty years a long or short term for settlements of land revenue? What would you substitute in its place?

17. The present thirty years' settlement has been productive of great benefits to the agricultural classes. Can you state:

(*a.*) How far the actual cultivators are also the persons in whose names the numbers stand in Government books (in your village or Talooka?)
(*b.*) How many holders have transferred their numbers to the names of their Sowkars under strain or fear of civil process?
(*c.*) How many have redeemed their lands from those persons to whom they were mortgaged before the last ten years?
(*d.*) Had revenue-paying land any value in the market before the settlement? Has it any value now? If so, state how many years worth purchase it is now.
(*e.*) Do the people now feed better, clothe themselves better, have more live or cattle stock, manure more largely than they did before?

18. Are you of opinion that the growing exigencies of the British Government require that its revenue should increase at a corresponding rate, and that the increased expenditure cannot be met from reductions in the present cost of the existing departments?

19. Is Indian land revenue of an inelastic character? How has it advanced during the last 30 years?

20. What has been the average increase in the price of commodities during the last thirty years?

21. It is likely that prices will rise further, or do you think they have a tendency to go down?

22. What has been the proportion of the rise in the wages of labour? Has it been greater or less than the rise in prices?

23. Are the powers of attaching the crops given by law to the Collector often exercised since the settlement, more especially since the rise in prices? Are there any large unrecovered balances in any Talooka or district?

24. During exceptional years of bad harvest, are the ryots in your district able to tide over the first one or two bad years without having recourse to Government for remissions, or without requiring Government to open relief works? If so,

25. Why was it necessary this year to open relief works in Ahmednuggur and Khandeish?

26. Is there any large room for effecting reduction in the cost of the existing revenue-collecting establishments, by a separation of revenue from magisterial functions and enlarging of districts or introducing greater decentralization in the present system?

27. Are you of opinion that owing to the rise in the price of cotton and other foreign export staples, land which would otherwise have grown the food grains of the country was diverted to the production of these foreign staples, to an extent which proved mischievous to the whole country by causing a rise in the price of the food grains of the country?

28. Do the number, or the time of the revenue instalments provide for the convenience of the ryots? Can you suggest a change for the better, which will not inconveniently affect the security of Government revenue?

29. Are you of opinion that the rates previous to the settlement, when large remissions had to be made, were really not in themselves oppressive, but were felt to be so by reason of the dearth of silver in the country, and the commutation of the old corn rents into money payments?

30. Is a perenial flow of silver into the country the salvation of the people of the country? If so, what effect has the drain of English tribute upon Indian resources—upon this perenial supply? What are the prospects in the coming years in this connection?

Upon the whole, the questions are very good and pertinent, and furnish gratifying evidence of the extent to which this important question has been studied by educated natives. Some of the questions proposed however—notably those under head 17—could be answered only by requiring exact returns upon each from every province of the Presidency, as accompaniments to the re-settlement Reports now being periodically issued. And this leads us to enquire once more what has become of the new settlement forms, recommended by the Bombay department. We understand that they have been decided upon for some time past, and we would once more point out the necessity of submitting them to public criticism. The Punjab forms are published by us eleswhere in our columns, and the country would be glad to have an opportunity of comparing the Bombay forms therewith. A late Government Resolution told us that the Survey Commissioners were desired, as far back as October 1870, to submit detailed proposals as to the form in which these Reports should be submitted, and the statistics that ought to accompany them, and the prosposals were to be submitted without fail during the course of the last rainy season. It is now the end of February, and they have not yet seen the light.

AMENDED CRIMINAL PROCEDURE.

THE Select Committee of the Imperial Legislative Council to whom Mr. Fitz James Stephen's *Bill to amend the Code of Criminal Procedure* has been referred, have as yet, notwithstanding that they have held several sittings, each of some five hours duration, been unable to get through more than a moiety of their prescribed work. The new Bill is a stout folio of printed foolscap, of considerably greater bulk than the present code. It is receiving rigid attention at the hands of the Committee, among whom we observe are the two European non-official commercial members. We have not had a perusal of the draft, but understand that it almost completely re-arranges the existing code. Some wholly new provisions of importance have moreover been introduced, and there are considerable importations from the original draft of Mr. Fitz James Stephen's Evidence Bill. What however at present excite the interest of the Anglo-Indian community, are the clauses to render European British subjects amenable to the jurisdiction of British born Mofussil Magistrates and Sessions Judges who are Justices of the Peace; and the indirect recommendation of the Committee that the amended Code shall be extended to proceedings in the Presidency Towns, though not so as to vary the procedure in trials by jury in those places. The preliminary report of the Select Committee, in which these recommendations are made, has doubtless met with due attention from our readers. Nevertheless, it may be as well to reproduce, in substance, that portion of it which urges the subjection of Europeans in criminal cases to the jurisdiction of the European magisterial and sessions Courts of the Mofussil. These recommendations run:—

1.—That a full-power Magistrate, being a Justice of the Peace and an European British subject, shall be empowered to try European British subjects for such offences as would be adequately punished by three months' imprisonment and a fine of Rs. 1,000.

2.—That Sessions Judges, being European British subjects, shall be empowered to pass sentence on European British subjects, of one year or fine; and that if the European British subject pleads guilty, or accepts the Sessions Judge's jurisdiction, the Court may pass any sentence which is provided by law for the offence.

3.—That a European British subject, convicted by a Justice of the Peace or Magistrate, shall have a right of appeal either to the Court of Sessions or High Court, at his option.

4.—That in every case in which an European is in custody he may apply to the High Court for a writ of *habeas corpus*, and the High Court shall thereupon examine the legality of his confinement, and pass such order as it thinks fit.

A decade ago, any attempt to pass provisions of the above character would most assuredly have excited the Anglo-Indian community of Bengal to fever heat, and crowded the Town Hall of Calcutta with angry denouncers of Black Act-ism, and a Government seeking to degrade Europeans to the level of the native. Indeed, the *draft* Act of the existing Code of Criminal Procedure contained provisions for securing the full amenability of European British subjects to all courts without exception, or more correctly speaking, contained no proviso or exemption debarring the Mofussil courts of jurisdiction over such persons. But Sir Barnes Peacock, Sir Mordaunt Wells, and the non-official members of the then Legislative Council stoutly opposed the abrogation of the existing exemption, and after much fierce discussion in Council, and much angry agitation out of doors, Government had to give way, or rather was outvoted in division, and had the mortification, to see the exemption, theretofore enjoyed by European British subjects, not only re-enacted, but extended to Americans and Europeans in general. But since then, and especially within the last three years, a great change has become visible in the spirit of the relations existing between the Anglo-Indian community and the Indian Government. It is undeniable that since Lord Mayo became Viceroy, there has been little or none of that acrid antagonism to Government on the part of non-official Europeans, which, especially in Calcutta, was so apt under preceding Governor-Generals, to manifest itself, and in most acerbate mood, on the slightest cause. There is no room to doubt that Lord Mayo's fine personal qualities, during the last three years, had a powerful effect in bringing about a degree of cordiality between Government and the non-official European community of Eastern and Western India, the advent of which none could have ventured to hope for, even at so little remote a period as that of the first and second years of Lord Lawrence's Governor-Generalship. And this assuredly is one reason why the present project of making Europeans amenable in criminal cases to such of the Mofussil courts as are presided over by Sessions Judges and Magistrates, who are British-born and Justices of the Peace, has not excited a storm of external opposition. But there are additional, and very urgent, reasons why the present proposed partial abrogation of exemptive privileges which, but a few years ago, were deemed essential to the safety of European residents in the Mofussil, should now not only fail to excite clamour, but, judging from the tone and remarks of the Calcutta journals on the subject, seem to command the approbation of Europeans themselves. The truth is that the present complete exemption has proved upon the whole rather an evil than a benefit to the European residents without the Presidency Towns, with the single exception of one rather numerous and very influential class. The indigo planters of Lower Bengal constantly at war with the zemindars and other local native Magistrates—parties who were ever ready to sell them leases of estates, and still readier to reclaim by force or chicanery, the estates and rights so parted with—the indigo planters until recently, had to keep up little armies of bludgeon men to wage war, defensive and offensive, with the contiguous estate-owners. What was worse, they had constantly to coerce their own ryot-tenants into cultivating "plant" for the factory, at a loss to themselves. The planter had purchased entrance in, and possession of, the estate at a good round sum, and considered that so long as he did not treat the tenantry worse than they had been treated by the zemindar, lessor, or vendor, he was treating them with all fairness. But in 1854 came the sudden rise in the prices of Indian produce, a rise which made the rate of remuneration paid by the factory for "plant" inadequate, and caused the ryot who is sharp enough in such matters, to perceive that he was giving some of his best *beegahs* to a crop which the factory would not fairly remunerate him for, and yet constrained him to raise. The immediate results were intense discontent on the part of the ryotry, a discontent fanned and fostered by the zemindars, constant club-encounters between the myrmidons of the factories and the ryotry, and open war between the semi-organised hosts of the former, and those of the neighbouring zemindars who, though willing enough to make a good bargain with the planter, were at heart desirous of driving him out of the Mofussil. And thus things continued until 1859, when Act X. of that year, the Rent Law, "the Ryot's *Magna Charta* was passed. This notable enactment almost immediately placed the ryot on vantage-ground, with reference to both zemindar and planter. It secured him undisturbed occupancy of his holding, so long as he continued to pay a fair and equitable rate of rent, and empowered the courts, in each case, to define the precise amount of rent that would be fair and equitable. Nor had it been more than two years in operation, before the whole ryotry of the indigo districts were up in rebellion against their planter landlords. The latter appealed to the Local Government virtually for military aid to suppress the revolt, but Sir John Peter Grant, the then Lieutenant-Governor of Bengal, replied that if the planters had claims against the ryots which the latter contumaciously refused to satisfy, the local Courts were strong enough to afford all due satisfaction. Meanwhile the districts were flooded with police, not to crush the ryotry, but to preserve the peace, and prevent collision of any kind. The *finale* was that the Grant policy triumphed, elevating the long trodden-down ryotry into something very much akin to that state of equitable independence of both zemindar and planter, of which native British subjects of the cultivating tenant grade ought to stand assured, if the policy be not to regard and treat them as utter helots. Since that year of successful ryot assertion, it has been comparatively of little importance to the planter, whether he be made fully amenable to the Mofussil courts, or continue as at present, subject only to the jurisdiction of the High Courts; for it has ceased to be either profitable, or necessary, to him to keep in pay a host of bludgeon men to make war on either zemindar or ryot. The police of the district is now moreover an organised, numerous, and well distributed force, and though both zemindars and planters occasionally do illegal things, and very high-handedly, it is only in a small and very correct way. There is no longer the open defiance of the courts and of the executive, which was so rife a score years ago, and which courts and executive were then almost powerless to cope with. The ryot, if still poverty-stricken, is at least sure of the protection of the law, and quite ready and well informed enough to appeal for such protection when menaced with injustice. It is in great measure because things have come to be thus in the indigo districts of Lower Bengal, that no angry protest now arises from Calcutta against the intended subjection of European British subjects in criminal cases to the jurisdiction of Mofussil Full-power Magistrates and Sessions Judges who are Justices of the Peace, and British-born. As regards the great majority of Europeans resident in parts of India other than Lower Bengal, we think that they should gladly hail the proposed change. Under the law as it is, they are liable to be forced to travel from Upper Assam to Calcutta, from Upper Sind to Bombay, or from the Malabar Coast to Madras to prosecute, or give evidence in some case of petty larceny, or contemptible misdemeanour, at considerable direct expense to themselves, loss of valuable time, and to the neglect of their proper duties or business. These things considered, we, at any rate, do not hesitate to say, that so much of the new Criminal Procedure Code as provides for the modified subjection of European British subjects to the country courts, has our full approval.

LATIN AND GERMANIC COLONIZATION.

THE settlements of the Latin and Germanic races outside of Europe present such differences that, at first sight, one would attribute those differences to the diverse characteristics between these two foremost sub-divisions of the human race. It is our object to show that the principal features in the colonial system of the Latin and Germanic races are owing to the various stages of national development of these races, when their excess population sallied out to seek new homes in Asia and America. The Latin races occupy to-day, in America, the whole extent

of territory below the 15th degree of North latitude and in Africa almost all the European establishments belong to Latin races. The Germanic races occupy the northern parts of America, and that large continent seems to have been by providential arrangement equally divided between the two. Before we pursue the subject it will be convenient to establish the true signification of the word *colony*, because there generally prevails much vagueness and uncertainty about its true meaning, not only in common intercourse but even in some scientific writings. The prevailing idea is that a *colony* is any settlement made by a nation in a climate outside of its own territories, and especially among a different race. This definition embraces a larger extent of social phenomena than it ought, and creates confusion between the true ideas of colonization and conquest. When a portion of a people leaves its home for other lands, these may be situated in the same or in different latitudes, inhabited or desert, and if inhabited, the new comers may find the possessors in very different stages of social progress. The consideration of climate is very important, because it accounts for the direction of colonization. For instance, the complete division of America between the Latin and the Germanic races was the result of this climate law. An emigrating people seeks naturally a suitable climate because it is only in such that it can thrive well. The inaptitude of Germanic races to establish themselves steadfastly in tropical climate has been observed. In Africa, only the small Cape zone is occupied by them, while the remainder is in the possession of the Portuguese and French. It is easy to see that the work of colonization has been rationally divided between the Latins and Germans and that, far from being rivals, they are workers for the same end but in different places. Now, the inhabitants of the country where the settlement is made may be socially organized, and in a flourishing state of intellectual development. In this case the settlers are invaders, and what was to be a colony turns out to be a conquest. But for a settlement to deserve this name, the conquered people must have that amount of vitality, and organization which may offer fair resistance to the new system of the invaders, and only give way by a gradual blending of the two. In the other case when the new country is not inhabited or inhabited only by savage tribes, settlements are effected without opposition and a true colony is founded, it is just as if the settler's race itself had augmented in extent of territory and in population. Of a conquered nation it cannot be said with propriety that it belongs wholly to the conquerors: notwithstanding the severest restrictions that a despotic power may impose as long as the conquered maintain an iota of their pristine organisation, *that* at least is not conquered, it must subsist like an independent power, and meet with certain deference, and sometimes the conquerors are the conquered in this respect. It is indeed a consolatory idea for the philosopher, that this strengthened innate, *viz.*, of national institutions, forms the most effectual stronghold against the destroyer's sword. Indeed it was owing to this defence that the Huns could not overthrow civilisation in Europe completely. But in a colony, there is no collision either of men or of ideas, and the thriving community moves in a time continues its evolution parallel with the parent country differing only in the deficiency of some of the social elements. For example the United States have developed in a different course from England owing to the absence there of the aristocratic element. According to what has been shown the Germanic colonies are North America, the Cape, and Australasia. India is a conquest. The Latin colonies are the Brazils, the African Settlements, and the South American Republics. In Africa, Algiers is a conquest. It may be said that America, Australasia, and Africa are the true field for colonial enterprise, Asia is for the conqueror. When investigated thoroughly, the causes which took the Portuguese through unknown seas, and made one of the smallest nations in Europe the pioneers of the world, are found to be very few, and may almost be reduced to one main cause. Portugal was essentially an aristocratic (which was the medieval equivalent for military) nation; there was no plebs, everyone was a soldier, the labourer, the merchant and the navigator, the rich man and the poor man. In general the lower handicrafts were confined to the Jews, so that the proud nations had no occasion to condescend to them. And it was just the same in Spain. Portugal and Spain were so to speak countries of aristocracy, and it was owing to the aristocratic element that America was conquered and India discovered. This is the capital feature of Latin colonisation. The Latins did not go as peaceable merchants to exchange the products of this soil, to open new markets, to import new produce; they taught a people to be conquered and made servants; they sat about to establish everywhere the aristocratic exclusive institutions; to pull down American and Indian temples, and substitute the Cross. Commerce followed their conquests as a matter of course; it was not sought after in the first instance nor even thought of. It may be affirmed, however, that if a Germanic nation had led the way in the century of Latin enterprise, the result would certainly have been marked by many of the features of Latin colonisation, though the democratic element was much more active in England at least even during the fifteenth century, than in Spain or Portugal. Goa is a type of the aristocratical colonial system, and some of the Portuguese families that settled there, have preserved to the present day with jealous care the purity of their blood, and their traditional virtues. It is indeed a striking epoch, for the philosopher and the poet, that period of wild enthusian and bold adventure when the sword of the Latin nobility cut asunder the dark veil which the superstition on centuries had thrown over the mysterious ocean. The world was opened up, and Cortez might indeed make a bonfire of his ships; *man* had taken true possession of his abode and from pole to pole the earth was his own. With a feverish anxiety, long-secluded Europe threw herself into the opened path, searching every island, every bay every creek in the enchanted lands of the East and the West, and after all was investigated the aristocratic element, having under Providence performed its duty, retired from the scene, and another element was called in to turn to account the newly discovered riches and to continue the *prise de possession*. Germanic democracy—English and Dutch—took the field. It is curious to trace the obscure, humble beginnings of the present powerful Germanic colonies. Their first immigrants arrive in small groups of able, hard working men, making themselves everywhere at home even in the more secluded spots of the world, by their ingenuity and mechanical capabilities. The reformed religion (not aggressive) which they generally professed, was indeed well suited to aid them in their laborious undertakings. They traded, or they tilled the ground, with patience and perseverance, and everyone brought his stones for the monument they were unconsciously constructing; where they landed they remained, fertilising even the most barren deserts by unceasing toil, gradually increasing towards the utmost limits of strength and power. The accumulated labour of successive generations of the democratic English traders in India, easily overthrew the once powerful Mogul Empire, which the Latin aristocrats would have been unable to do.

The capital defect of the Latin colonies, one that reduced them to a lingering decadence immediately the first *eclat* of conquest and adventure was over, was the weakness of the democratic element. The conquering aristocracy sunk into a plutocracy in America and in Asia, while the social revolution in Europe gradually extirpated their military and adventurous spirit. A condition of union between colony and parent country is the equilibrium that has resulted from the social evolution of both. The Latin colonies did not get stronger, but the parent countries got weaker; at last the equilibrium was broken, and South America became independent. The reverse happened with the English American settlements; the democratic element being always renewed, in its race with the parent country fairly outran her, and the equilibrium was destroyed in this way. Portugal and Spain which still possess many valuable colonies, although the tide of decadence is not altogether kept back, must try to create at home a strong, hard-working, moral-toned democracy; this is the essential

condition of flourishing colonies, and indeed the social revolution of the Peninsula is bringing this powerful element into action, in an orderly and effective way, and though Brazil is no longer a dependent colony, it presents a very fair instance of Latin democratic energy, succeeding in latitudes where other races would undoubtedly fail. The value of colonies is very great, they increase a nation's power by putting its energies into action, augmenting its territory and population, and every nation strives to increase its power on the principle of self-preservation. Power is the health of nations. P. G. M.

THE KANGRA VALLEY.

THERE are some places in India whose ancient renown is more than eclipsed by their modern fame. The Kangra Valley, traversed by the Beas, and cut up into long narrow sections by the impetuous mountain streams which feed that river ere it emerges from the hills, must have witnessed Hindoo sacrifices and worship before Brahmins existed, when the head of the family was the priest of his home. Ancient temples show how early Hinduism took root here. The town of Kangra is said by some to be the Nagarcot which Mahomed of Guzni plundered of its fabulous riches just about the time that the Norman conqueror of England was born. Later still, Akbar took the valley. When the Mogul power began to decline, Kangra and its valley were the scenes of many and bloody struggles between claimants for its possession. Coming at last into the hands of Runjeet Singh, it finally with the Punjab, came into our possession. The valley is rather more than a hundred miles long by about fifty broad. Its surface is throughout about 2,000 feet above sea level, and is cultivated in nearly every spot. Viewed from a distance, the whole valley looks like one immense field of the most exquisite green, dotted here and there with hills crowned with forts. The numerous rivers which rush through it, are invisible from a distance, as their deep beds are hidden in the abounding foliage. But deep down though they run, the waters of each are most thoroughly utilized in the irrigation of the lands of the valley. Rice fields abound, and Kangra rice is famous throughout Northern India, as is also Kangra *gúr* or raw sugar. But the valley is chiefly famous for its tea, for the cultivation of which there are several large and productive plantations. Here European capital and energy have a splendid field of action; and each year sees considerable progress, not only in the amount of tea produced, but in its quality. The Kangra valley is happily free from the common element of danger from raids, whilst its teeming population supplies all the labour requisite for the manufacture of large quantities of the leaf. But besides tea, cinchona plantations have had much attention given to them in the valley. Here again is another field for the wise employment of capital. In this valley too, the Chinese nettle-like plant, the *Rheea*, which produces a fibre longer and stronger than that of the best flax, flourishes, and Government has a large plantation of it. When this fibre can be used profitably, a new industry will be created. In addition to all these useful products, the Kangra valley possesses facilities possessed by few others, for the growth of potatoes. Its toon wood is deservedly famous. Its mines of salt, lead, iron, and slate, yearly supply the markets. Its blankets and its puttoo cloth are eagerly sought after by merchants from the plains.

Producing all these various articles of commerce, its industrious inhabitants have but few wants that their valley cannot supply. Piece-goods, raw cotton with which to make their own cloth, and wheat and other kinds of grain, including, strange to say, rice from the plains, are the chief articles imported into the valley from without. It will at once be seen that the opening up of communication between the valley and the chief markets of the plains, is the work of a good and provident Government. We have possessed the valley in peace for five and twenty years, and as yet there is no finished road between Umritsir, the natural market for the valley's products, and the town of Kangra. The road is however commenced. But engineering here meets with considerable, indeed almost insuperable difficulties. River beds, half-a-mile wide, covered all over with boulders of immense size, and intersected with deep cuttings in which the river runs during the dry season, are often flooded for their whole breadth by a furious stream which carries everything before it. In all, there are no less than 327 bridges in the road in the valley. Of this vast number, not one was washed away during all the floods of the past year, although the Beas Railway Bridge, and that of the Suggin, and several minor ones, were either partially or totally destroyed. Government was particularly fortunate in its choice of engineers for this valley road. Its projector, Captain J. Browne and his successor, F. Kirby, Esq., have accomplished a work of which the English may be proud. Here in this valley, beneath the frowning hoary Himalayas, are two bridges which will be often visited by young engineers and studied as patterns. They are of *brick*, each of one arch, and span the rivers Nigul and Buneyr with a water-way between the abutments of 136 and 140 feet respectively. They are architectural feats. At another place called Kotleh, the river Delu is spanned by a suspension bridge of 214 feet water-way. But, strange infatuation! the road is in bits; parts are finished, and parts are only just beginning. In many cases, bridges are wanting where rivers are deepest and worst. At one place alone, where the abutments of the bridge have been built for at least eight years, and where the span is only 84 feet, lives are lost, we are assured, at the rate of six yearly. The centerings of the bridge were once in, but were taken down for want of 20,000 rupees; a fact all but incredible. Five or six lakhs of rupees are needed to finish the road from the mountain end of the valley at Byjnath to the plain end of Pathankote, and the whole work, we are told, may be finished in a couple of years. But if this sum be spread over a number of years, the greater part will be expended on the maintainance of an establishment, while the loss to the Imperial revenue will be immense, and the discouragement of enterprising capitalists fatal and ruinous. We say the loss to Imperial revenues will be immense. For in addition to its natural productions, and the advantages they confer on this favoured spot, one of the most enterprizing of eastern travellers and most far-seeing statesmen of India, Mr. Forsyth, has established a fair here, which will ultimately serve as a market for Indian and English and Tibetan produce. The Pahlunpore fair is an accomplished fact. This is not all. The Kangra teas are far from the sea-board and it is necessary that their transit should be facilitated. Though distant from the sea-board however, they are not far from the emporium of Affghanistan and Tartary, Umritsir. Now as Affghanistan and Tartary are great tea-drinking countries, and obtain their tea now chiefly from China, at almost fabulous prices, it follows that if Kangra teas can be got into the market much cheaper, there will be no need for sending them to the sea-coast. The late visit of the deceased Governor-General to the Kangra valley has we doubt not imtiated much, and we trust one result will be that funds will be available at once for the completion of what has been so well commenced and which will, when completed, be a national honour as well as an Imperial grace and benefit.

EDITORIAL NOTES.

OUR efforts to obtain the adoption of a uniform return for the official Price Lists of the country, is at last in a fair way of being crowned with success. The Government of India publishes a resolution requiring all the Governments of India to adopt the form of the North-West Provinces. We publish the resolution below, and the new forms to be adopted throughout the country. In prescribing them the Governor-General-in-Council hopes "that every effort will be made both by local Governments and Administrations, to make them a really valuable and accurate record of the current prices of food. To this end it is necessary *first*, that the statistics in their original form should be exact; and *secondly*, that they should be correctly reduced. Special attention should be directed to both points." With the old Price Lists, comparison was almost impossible: we may now look for fixed data, in our estimates of the condition of the provinces severally.

Having failed in their effort to uphold the present assessments upon the land, as at all commensurate either with the State necessities, or the just and immemorial liabilities of the soil to the Commonwealth, the conductors of the *Indian Observer* are now attempting to cover their retreat from the field, by assuring the world that there is no one in pursuit of them. "Mr. Knight," it seems, has changed his views altogether, and the readers of the *Economist* are told to take up our file "prior to August last, and to compare its tone with that of our numbers issued since." There is surely something unworthy in this. The *Observer* began by the warmest commendation of our views, upon this very subject. Falling into other hands, it found out that we were altogether wrong; and now although we have not changed our stand-point one inch, it seems that we have been converted to the *Observer's* views. There is a fear, however, it seems that we are not quite safe after all, for "the *Economist*, we may be sure, will neither slumber nor sleep," and there are indications that our conversion is only temporary, and not to be relied upon. Will the *Indian Observer*, pardon our saying that it would be well for it to get its own views upon the subject settled, and to remember that smart writing upon subjects so vital to the well-being of a country, as this great Indian Land Question, is somewhat out of place. Men who feel the discussion of it a *bore*, as our contemporary tells us almost every week *he* does, had better perhaps leave its conduct to those who, discerning clearly the magnitude of the interests mixed up therewith, will never cease discussing it, till the public interests are assured from the tampering of ignorance therewith, kept in countenance by plausible *dilettanteism* in the press.

The Bombay Association have, within the last few days, presented a memorial to the Supreme Government, against Section 176 of the revised draft Code of Criminal Procedure. The memorial is exceedingly well-drawn. The petitioners say :—

The revised draft Code of Criminal Procedure, introduced into your Excellency's Council by the Hon'ble J. F. Stephen on the 29th December 1870, lays down this principle in chapter III. in these terms :—

"No person shall, by reason of place of birth, or by reason of descent, be exempt from the rules of Criminal Procedure contained in this Act."

Instead of adhering to this just rule, a proviso is added for exempting all European British subjects from the jurisdiction of the ordinary Criminal Courts, and sending all offenders belonging to this particular race to be tried before the High Court at the Presidency Towns. In fact, Section 176 expressly gives to all European British offenders the option of being tried by the High Court or the Session Court, and even in cases where the accused says he wishes to be tried by the Court of Sessions, the committing Magistrate has a discretionary power to send him for trial either before the Court of Sessions or the High Court. Your Petitioners respectfully submit that in the present age it is not necessary to perpetuate this invidious and objectionable distinction in the administration of criminal justice throughout India.

We are somewhat in advance of most of our English contemporaries upon this subject; for we think with the memorialists that the time has arrived when this distinction should no longer exist. At present Europeans are, as the memorialists say, exempt altogether from the jurisdiction of the Criminal Courts of the Mofussil, except in cases of petty assault and trespass punishable by fine not exceeding Rs. 500; while even then the Magistrate must be a European Justice of the Peace. The result is, as the memorialists affirm, that Europeans in the Mofussil violate the law with impunity, owing to the difficulty and expense attendant upon prosecuting them in the High Court which is perhaps 800 miles distant.

The *Bombay Gazette* indeed declares "this assertion to be grossly and offensively untrue," and calls upon the memorialists to substantiate it, and appeals to Mr. Campbell's "testimony to the law abiding spirit of the general body of English settlers in disproof of it." But there is nothing inconsistent with this, in what the memorialists affirm. No one requires to be told that the English *are* a law abiding people; but are we because of this to shut our eyes to the patent existence amongst us of a class of degraded and brutalized Englishmen, who use their nationality as a mere engine of violence and oppression, and are able, as the memorialists point out, to a large degree to set the law at defiance. The compromise suggested by the Select Committee upon the Bill, goes perhaps as far as the English mind is at present prepared for, but it is not in our judgment satisfactory. The Committee say :—

We are of opinion that the jurisdiction of Magistrates and Sessions Judges who are Justices of the Peace, might with advantage be extended in the case of European British subjects.

We recommend—

(1.) That a full-power Magistrate, being a Justice of the Peace, and being, in the case of Mofussil Magistrates, and European British subject, should be empowered to try European British subjects for such offences as would be adequately punished by three months' imprisonment and a fine of rupees 1,000.

(2.) That a Sessions Judge, being an European British subject, should be empowered to pass a sentence on European British subjects of one year or fine; and that, if the European British subject pleads guilty or accepts the Sessions Judge's jurisdiction, the Court may pass any sentence which is provided by law for the offence in question.

(3.) That an European British subject, convicted by a Justice of the Peace or Magistrate, should have a right of appeal either to the Court of Session, or High Court, at his option.

(4.) That in every case in which an European is in custody, he may apply to a High Court for a writ of *habeas corpus*, and the High Court shall thereupon examine the legality of his confinement, and pass such order as it thinks fit.

An appeal lies, it will be seen, in every case to the highest Court of the province, and any prisoner has the power of bringing his case before the High Court by a writ of *habeas*. The most sensitive champion of the rights of Englishmen may accept this compromise without apprehension, and we confess frankly that we think the memorialists are right in protesting against the measure as perpetuating an anomaly essentially unjustifiable. They point out that in the city of Bombay, Native as well as European Magistrates are authorised to exercise summary jurisdiction over British-born and European subjects, whom they can sentence to six months' imprisonment with or without hard labour, and fine to the extent of Rs. 500 without appeal, whilst in the interior an officer of the Covenanted Civil Service, the class from which the majority of the Judges of the High Court is selected, is prohibited from trying and punishing European British offenders even for petty offences and misdemeanours, subject to appeal to a higher tribunal, and another appeal to the High Court.

We suppose the compromise is all Mr. Stephen is able to carry, but it is impossible that such a settlement of the difficulty should be final. The real strength of the conservative view lies of course in the claim of every Briton to be tried by a "jury of his peers." This very system of jury itself, however, is on its trial: thoughtful men being inclined to look upon it as having done its work; and where the practical inconveniences attending it are so overwhelming as in India, we may reasonably doubt whether the institution is sufficiently well-founded in reason, to have a much longer lease of life. That the jury in ordinary criminal cases is more often a device by which the guilty hope to escape, than a safe-guard and shield of innocence—is a conviction growing somewhat rapidly, if we are not mistaken, in the public mind.

A late number of the London *Economist* contains an article reviewing the temper of the European nations and of America upon the question of direct *vs.* indirect taxation generally. Our contemporary points out that there is a general reaction against direct taxes everywhere, and says that the advocates of the direct system "are being defeated at all points and in almost every quarter of the world":—

"The United Kingdom endures the income-tax, and so does Italy; but France, amidst all her difficulties, appears determined to reject the proposal; the United States, after establishing the tax, is about to abolish it again; and the Prussian Government, though it has not proposed to abolish it, has proposed to relieve the poorer classes entirely from its incidence. The general movement against the tax is the more remarkable, because it comes from the Governments and not from the Opposition, and because the motive of the Governments is everywhere the same—to avoid irritation among the masses of the people. In America it is well understood that, although the Secretary to the Treasury proposes the total abolition of the tax, he would like to keep it on and pay off debt with it, and only yields to the electors who dislike the tax more than they dislike the most oppressive tariff. In Prussia, it is the Minister of Finance who proposes that the poorer classes should be exempted from the tax—which is levied by ranging them in classes of incomes according to their supposed receipts—on condition that the exemption should be followed by the imposition of octroi duties in all towns—a measure which will really tax the poor more heavily than before, but will transfer the consequent odium from the Government to the Municipalities. In France, it is avowedly the President who resists the tax, on the distinct ground that, unless applied to the body of the people, it would be a socialist-tax, and if applied to them would create universal and dangerous irritation."

We have pointed out, with all the force we could command, the extreme unsuitability of direct taxes to a country like this, and have repeatedly insisted upon the fact that our statesmen are taking up the system in India, at the very time when it is being found unendurable at home. The *Economist* proceeds to tell us, with reference to Municipal taxation, that the difficulty of increasing the direct rates upon the cities is becoming so great, that Government may be "compelled before long to devise some new and less visible method of raising money for local purposes." Now, if this be the case even in our own land, in spite of its wealth and intelligence, how unwise is it to attempt to introduce and to rely upon such a system here, where its unsuitability is patent.

THE price of opium is still tending upwards. The sales of 5th instant in Calcutta were as follows :—

	Chests.	Highest.	Lowest.	Average	Proceeds.
Behar.....	2,000	1,470	1,460	1,464-8-0	29,29,100-0-0
Benares...	1,575	1,450	1,445	1,445-6-10	22,76,550-0-0

The averages of last month, were a little below these quotations :—

	Highest.	Lowest.
Behar..... ..	1,470	1,415
Benares	1,445	1,415

The budget estimate, it will be remembered, was Rs. 1,075, so that the actual price is now nearly Rs. 400 per chest above the estimate. Happy Sir Richard!

THE prospects of the Indian Tea gardens are bright and reassuring. Late advices from Calcutta tell us that Tea shares are firmly held, and that Cachar estates promise a full season, "the much-needed rain having fallen amongst them." Other districts have also excellent prospects. Speculators, we are told, are buying in quietly, the following being the favourite shares :—

Company.	No. of shares.	Amount of shares.	Paid up.	Last divd.	Present quotation of sales.
Assam Tea.....	9,358 ..	£ 50 ..	£ 20 ..	15 per cent. ..	Rs. 300
Bishnauth do.	2,750 ..	Rs. 200 ..	Rs. 200 .	10 ,, ..	207
Do. ...	2,750 ..	240 ..	50 ..	,, .	67
Central Cachar,	5,000 ..	200 ..	200 ..	2½ *ad intm* ..	88
Durrung do ..	4,650 ..	100 ..	100 ..	5 *ad intm* ..	56
East India .....30,000 ..		100 ...	100 ..	3 *ad intm* ..	61
Kuttul	200 ..	5,000 ...	5,000 ...	10 *ad intm* ..	7,000
New Mutual ...	4,000 ..	30 ..	20 ..	30 *ad intm* ..	115

Coffee planters will look upon these quotations with a sigh. But let them take heart. 'It is a long lane that has no turning,' and it is seldom the case that an industry so well established as coffee planting, comes finally to grief. A year or two hence, we may have to congratulate the Coffee planters of South India, as heartily as we now do the proprietors of the Tea gardens, upon a change in their fortunes.

A CONTEMPORARY tells us that Mr. Campbell, the Lieutenant-Governor of Bengal, is a great believer in the house-tax as a means of raising Municipal revenue. There must be some mistake in this. A few years ago he was not so at all events. Writing in 1859, he said :—

> On the whole I do not doubt, that, by a general house-tax unflinchingly carried out throughout all India, a considerable sum, say one million sterling per annum, might be realized. But still the doubt strongly arises to my mind, whether it would be worth our while to assess and collect an odious tax over so vast a surface, for such a sum as I have mentioned. I would rather avoid it; I do not think it would pay the soldiers required. I have no doubt whatever that a house-tax is the fairest of all direct taxes. But unfortunately it is everywhere the most unpopular, and it is particularly so in India, as our experience of the small chowkeedary-tax in towns has shown.

If therefore Mr. Campbell now advocates a house-tax, as our contemporary alleges, he must have very materially changed his views.

NO INDIAN Statesman has expressed himself more decidedly on the general question of direct *vs.* indirect taxes, than Mr. Campbell. In the same essay from which we have quoted above, he says :—

> I confess that I view, with great apprehension, the present apparent disposition to rely principally on direct taxes. In the countries lately re-subdued, such taxes of small amount may probably be collected without very serious opposition, but whether it would be so in other parts of India I should think very doubtful. I make no doubt that we may fairly, and without insuperable difficulty, enforce small direct and considerable indirect taxes, and such as fall on a limited class. But my impression is this that if we fix direct taxes at a pitch which will make them really remunerative, then although, by firmness and severity in the first instance, we may perhaps enforce them, it will not be prudent to attempt to do so without maintaining a large army, and that whatever we get by the tax we should spend on the army, and so after all the result will be negative, except in the odium and burden which will result.

CERTAIN of the Land Settlements of the Central Provinces, upon which we have commented at length in past issues of this journal are, if we may believe the *Pioneer*, about to undergo revision by Mr. Pedder of the Bombay Civil Service. The appointment of a Bombay Civilian, says our contemporary, "to examine and report on the work of officers brought up in the N. W. School, indicates a very great change of opinion since the days of Sir Richard." We suppose it does; but we fear the errors made in the Central Provinces are quite irremediable. We take them to have been these three: (1) the Malgoozar; (2) the enormous amount of cultivable land, called waste, allowed to each village; (3) the extreme lowness of the assessment. The fourth error committed in these Provinces was the giving away of the Waste Lands proper for nothing, with a pledge never to lay the land tax upon them. The country owes it to the late lamented Viceroy that this most suicidal policy was stopped some two years ago.

The *Madras Times* tells us that "the practice of ryots cultivating unassessed waste without permission has, of late, been found to prevail to such an extent in that Presidency, that the Board of Revenue have just given them to understand that such ryots will be liable to an "arbitrary rate of assessment" and also to have the land taken from them and given to others."

The Government should come to some settled conviction as to the fiscal policy to which it means to commit itself. If we are going to abide by the immemorial system of the country, and look to the land as our main source of revenue, then is it necessary that an amount of attention should be concentrated thereon, we have never yet given to the subject. The "administration of the land" has in the past been only a word: it requires to become the expression of a fact. The Agricultural Department has a great future before it, and its work in the main may be shortly described to be "the administration of the great Estate of the Commonwealth.

IN the quarrel between General Norman and Sir George Balfour, the question in which the public is vitally interested, is being lost sight of altogether. It is of very little moment to the public whether Sir George Balfour or General Norman is right, as to the respective merits of their military finance. What we want to know is, how it comes to pass that an army which is now numerically less by 100,000 men than it was before the mutiny, should cost four millions sterling a year more. We care little for the comparison of the cost of the army in 1872 with the cost of the same army in 1862. We insist upon the expenditure of 1872 being compared with the expenditure of 1856: we want in fine the following figures explained :

The Indian Army (1853-54)	Europeans..	50,356	
	Natives.....	238,000	
			288,356
The Indian Army (1871-72)	Europeans.	66,970	
	Natives.....	121,981	
			188,951
	Less in (1871-72) by		99,405

Now the average cost of the 288,000 men from 1852 to 1856, was £11,800,000, while the average cost of the present comparatively small army of 189,000 men, has been for the last six years about £16,250,000. An army of the same strength (189,000) under the old system, would have cost, by simple rule of three, £7,750,000 a year, while under the Crown it costs £16,250,000. And yet there are only 18,000 or 19,000 more European soldiers now than there were then. We take very little interest in the dispute between General Norman and Sir George Balfour, because we see plainly that it simply diverts public attention from the great facts which we have just re-stated. If ever a Committee of Enquiry were needed, surely it is in a case like this.

CATTLE disease consequent on famine appears, we regret to see, to be making terrible ravages in Kishnagur. The inundations of last year, we are told, drove the animals together into a comparatively restricted area, and when the waters retired, the silt spread over the pasture grounds, prevented the growth of the grasses on which the cattle are generally fed. And yet their cattle are the main wealth of the population. "Hundreds of thousands have died. One man complained to the authorities, that out of 180 he had only 3 surviving; but the usual lamentations are that out of, say 10, only 2 survive; out of 5, probably not one. The country, usually cheerful and pleasant, is rendered

melancholy in aspect by the countless skeletons of cattle spread over it."

The *Indian Church Gazette* urges strongly upon Mr. Hume the necessity of directing the attention of the Agricultural Department to the district. Could not the department "consider whether "some system of root cultivation, some utilising the refuse of the "linseed for oil-cakes, some plan, in short, devised by which the "recurrence of these cattle famines may be prevented, or the "distress which they occasion alleviated?"

In a paper lately read before the Statistical Society, Mr. Newmarch comments as follows upon a passage in Mr. Lowe's famous speech of last Session, upon the reduction of the National Debt:—

"Mr. Lowe's just and fitting affirmation of the necessity of maintaining indirect taxation, as a constant and considerable integer in our ways and means, suggests a reference to the conclusions arrived at, after long inquiry by the New York Commission under Mr. David Wells, regarding the attempts made in the United States to tax the capitals composing personal property—goods, furniture, stock-in-trade, flocks, herds, ships, bonds, bills, warrants, securities, and the like—in a direct form. In the most emphatic manner the Commissioners condemn the attempt as futile and mischievous—as leading to absolute and grotesque failure, as a resource of revenue—and as producing an amount of deceit and false-swearing beyond conception. Here is one of a host of instances:—

"A joint committee of the legislature held a session in New York, and examined into the manner and mode of the assessment of property in that city. They ascertained that only about 16 millions sterling of capital of personal property was placed upon the assessment of the entire city. The Committee inquired of those who came before them—and they were gentlemen of great intelligence and business capacity, one of them of the firm of Brown, Brothers, and Co.,—if they thought that one-third of the personal property of New York City was placed on the assessment roll. This gentleman said that his acquaintance was limited, compared with some other gentlemen, but he believed he knew persons within his own small circle alone owning as much personal property as the whole 16 millions. Another witness, Mr. Pierrepoint, of New York, stated that he could name in the State thirty men whose aggregate wealth was 40 millions sterling, or 5 millions sterling in excess of the official valuation of all the personal property of the entire State."

"The practical result of the inquiries of the Commission, and the recommendations which they unanimously and strongly urge is, that all attempts to tax directly the capitals representing personal estate be abandoned as futile and demoralizing, and that the American legislatures adopt at once the English principle of taking the rental of houses and occupied buildings as the best unit for direct assessment, and as the most certain index to the value of the personal estates of the owners or occupiers."

There can be no doubt that the house-tax, that is a tax on rentals, is the best form of direct tax almost any people can adopt.

The income-tax is borne patiently in England, says the *Economist*, "because the masses do not pay it, and because those to whom it is an annoyance—namely, the men of moderate fixed incomes—are for many reasons a singularly helpless class, and it is not borne patiently in America, because it touches the masses, and they, as electors, are all-powerfull. It comes therefore to this, that the diffusion of property and of knowledge, which all Radicals desire, is inimical instead of friendly to the system of taxation of which they approve."

Direct taxation is an article of the Radical creed in the main, because its incidence is confined to the comparatively wealthy. Where it is necessary to tax the masses in this way, the radicals no more believe in direct taxes than do the Tories. They believe in direct taxes, that they may exempt the poor from all contribution to the treasury. The system has had its trial and has broken down. Rich and poor alike prefer to be taxed indirectly.

The demand that the poor should be exempted from taxation is simply demoralizing, as Mr. Lowe pointed out to the House of Commons, in June last, in his famous speech upon the reduction of the national debt. Replying to those who demanded that the duties should be taken off tea and sugar as being "necessaries of life," and that the poor should pay on stimulants and tobacco only—he said "such a course of proceeding would be tantamount to declaring that those of the working men who had no taste, or but little taste, for stimulants, should pay no taxes, or be but slightly taxed. Nothing could be more dangerous than such a doctrine. As the electoral suffrage is now settled, the householders of the country have an influential voice in electing those who are to make laws for the country, and if it were made optional for them only to be taxed according as they consumed certain luxuries, the effect would be that you would have one set of persons empowered to impose taxes, while another set of persons would have to pay them. The poorer classes would tax the rich, while they themselves would be exempt from the burden of taxation." But this is precisely what is being advocated in some parts of India, and notably in Bombay, where it has been suggested within the last few weeks that a supply of water should be obtained for the island, by increasing the duties upon spirits, the masses of the people not drinking spirits at all. In other words the man who drinks his glass of arrack per day, is to pay for the gallon of water consumed by the man who does not. It may be very bad to drink arrack, but it would be monstrously unjust to attach such a penalty to it.

A Settlement Officer writes to us concerning the rise of prices in the North-West Provinces, as follows:—

The view I take of the whole question is, that it is one of naturally considerable intricacy, as to which our information is as yet far from complete; and it is obvious that if we are led to act upon false conclusions with regard to it, the consequences may be grievous. It is quite true that a rise in prices ought to produce an increase of revenue. But a Settlement Officer can only proceed upon the facts which he finds existing. The rise in prices, if produced by permanent causes, i. e., *not by deficiency of produce*, ought to have brought about one of two things; either it ought to have enabled landlords to enhance their rents in something like the proportion of the rise in prices, or it ought to have immensely improved the condition of the cultivators, and rendered them capable of sustaining enhancement in the future. So far as my experience goes, I can safely assert that it has done neither to anything like the extent it ought to have done, if there had really been a permanent rise of the amount you suppose.

This is very important, and well and clearly expressed. If the rise in prices has been produced by permanent causes, it ought, as our correspondent says, either (1) to have enabled landlords to raise their rents in proportion to the rise in prices; or (2) to have immensely improved the condition of the cultivators. And our correspondent assures us that it has done neither, to anything like the extent we imagine. We recognize the force of the statement, but has not the writer omitted to notice a *third* result that may have attended the rise, and gone far to make either of the other two impossible. The rise ought, he says: (1) to have enabled landlords to raise their rents; or (2) to have immensely improved the condition of the cultivators; and we add, or (3) *to have immensely increased the wealth of the Sowkar or lending classes.* The margin of profit between the State assessment on the one hand, and the actual cost of cultivation, including thereunder the support of the cultivator, on the other, may have gone either (1) into the pocket of the zemindar as increased rent; or (2) into the pocket of the Sowkar as increased usury; or lastly (3) it may have remained with the cultivator, to improve his status. Writing without any personal knowledge of the North-West, it would not become us to dogmatize about this matter; but we believe it is the case, that the cultivating classes, as a rule, are completely in the hands of the money-lender. In other parts of India, we know it to be so. The question of assessment in all such cases, is really narrowed to a mere contest between the State and the Sowkar. The moderation of the State becomes simply the opportunity of the usurer. Will our correspondent address himself to this point?

The *Pioneer* asks, "why should the *Economist* recommend that "the experiment of an inconvertible paper-currency be made on "the vile body of India? Already, we think, the Government "of India, in increasing its investments to more than half the "actual circulation, has made too near an approach towards incon-"vertibility; and any further step in that direction cannot be too "strongly deprecated."

It is not quite correct to say that we *recommended* the experiment, for we recognized the fact that it was impossible, because half-a-century in advance of the times. We certainly avowed however our conviction that one of the wisest steps the Government of this country could take, would be the gradual issue of an *inconvertible* paper-currency to the extent of the railway debt of the country, and pointed out that the annual issue by the State of three or four millions of inconvertible currency made legal tender would have precisely the same effect upon prices and upon the economic condition of the country, as the importation of the same amount of silver; neutralizing by so much the effects of the annual drain upon the country for Home charges. Were the issue made in one rupee notes, such a currency would become inconvertible

of itself, without any enactment to make it so. Our contemporary proceeds:—

> One result of an inconvertible currency must be the gradual withdrawal of coin from the country. This has always formed the subject of grave apprehension to economists, who hold that the effect of an inconvertible currency would be that we should be living in a fool's paradise till the absolute want of silver showed us the worthlessness of our paper-currency. The issue of notes of small denominations, advantageous as it would be if their convertibility were properly secured, would, if the currency was inconvertible, but aggravate the evil it is intended to remove.

We do not quite understand this: and may ask, we hope, without offence, whether the writer is himself sure that *he* does either. An issue of one rupee notes in the way we have suggested whether convertible or not, would have no effect we think upon the amount of silver retained in the country. It might prevent its appreciating in value, but that we think is all.

The *Indian Observer* makes so much capital out of our statement that, in the discussion of the Land Question it was necessary to "aim at the stars," that it is desirable perhaps to remind our contemporary that it is only the strong who can afford to make concessions. As a matter of observation it is necessary, when attacking dominant error to deal with it so as to fix attention upon the subject. When the public mind is once thoroughly awakened upon any question, and settled conviction begins to take hold of it, the victory is won; and you have to determine the extent to which it is wise to push it. Now we have ever admitted frankly that were we ourselves engaged in settlement operations, we should not dream of giving practical literal expression to the doctrines which we nevertheless hold to be true, and necessary to be remembered. Thus when we insist upon the fact that our predecessors were accustomed to take one-half of the gross produce of the soil, and that the people regarded themselves as moderately assessed when the demand was but one-third, we are accused of urging the English Government to exact the same proportion therefrom. The statement is most untrue. We insist upon the theoretic right of the State to do so, because as the land is the only sure source of our revenue, it is essential to keep the right alive in the memory of the people. But is this the same thing as counselling the Government to *take* half the produce? Is there no alternative between taking one-twentieth and one-half? We simply ask and require that our settlement officers shall be instructed to make exact enquiry into the produce of the land, and that the assessment imposed thereon shall bear some reasonable proportion to the change in prices and to the State necessities. We have never ventured to say *what* the exact proportion should be: but we say boldly that the error of the time has been making it too low! And we have proved it conclusively, we believe, to the satisfaction of candid minds everywhere. Were the State taking but an average 10 per cent. or 12 per cent. of the produce from the land, in place of the old 33 per cent. to 50 per cent., we should not know what embarrassment means, while such devices as the income-tax and export duties upon grain, would never again be heard of. We take 5 per cent. and abandon to the Sowkar class the whole 30 to 50 per cent. of margin between this 5 per cent. and the rack-rent which the Sowkar levies under the name of *interest* upon his advances. The statesman has yet to arise to deal with the problem in earnest: in the meanwhile let us take care to do nothing permanent, nothing that we cannot undo.

The *Friend of India* says:—

> "There is a report afloat that in the budget of the present year, provision will be made for the continuance of the income-tax at a low rate. We do hope that the Governor-General will himself step in before the matter goes too far, and insist absolutely that the income-tax shall cease. If it ceases at all, the cause will have to be in the Governor-General. The Finance Department will cling the tax to the last, if only from the boyish feeling that the Department 'won't be beaten,' and will show that it is beyond the reach of public opinion. "But it will be beaten."

For ourselves, we do not credit this for a moment. The last Viceroy and the Finance Department simply did not believe in the disaffection created by the tax, and therefore refused to withdraw it. It would have been wiser, we think, whether they were right or wrong, to have deferred to the strong and general expressions of opinion upon the tax. Remonstrances, we believe, have gone in to the Supreme Government from all parts of India against it, and the income-tax is not so vital to the finances that it was wise to uphold it in face of so general an opposition. It is matter of curious speculation, what course Lord Napier may take in the matter, but he is not likely, we think, to make any alteration of moment in the budget, the chief features of which have no doubt been already settled by the late lamented Earl.

It is healthy sign of the times that the radical notion of exempting the masses from taxation is provoking strong reaction everywhere. It is beginning to be seen that if the few only are to be taxed, the requirements of the age cannot possibly be met, and the progress of civilization must be indefinitely retarded. The latest formal protest against the doctrines of the Radical School, is from the pen of Professor Jevons, in an able and exhaustive essay he has just published upon the Match-tax. The Professor's conclusions upon the general question of taxing the masses, are as follows:—

> "The more carefully and maturely I ponder over the problem of taxation from various points of view, the more convinced I always return to the principle that all classes of persons above the rank of actual paupers, should contribute to the State in the proportion of their incomes." * *
>
> "I reject for two distinct reasons the dictum that necessaries should not be taxed. I question the theoretical validity of the rule, and I am sure that, even if there were any real basis for the rule, it could not be safely and consistently carried out with the means at present in our possession." * *
>
> "I hold that it is not right to exempt any class from taxation. We must carefully guard against imposing upon the very poor any charge disproportionate to their income, and from those who are actually paupers we cannot really take anything. We may strive privately to alleviate the extreme differences between the incomes of the poor and rich, but to allow any exemption from the duties and responsibilities of citizenship would be a concession ultimately fatal to the welfare of all." * * *
>
> "As it is quite impossible to discover any single tax which shall fairly press upon every subject in proportion to his ability, our English system, like that of all other countries, employs a variety of imposts, so that those persons who escape one tax may fall under the pressure of others." * *
>
> "From feelings of humanity we might desire to graduate the rate of contribution, and relieve persons who are comparatively poorer at the expense of those who are comparatively richer. But we must beware of obeying the dictates of ill-considered humanity. If we once professedly enter upon the course of exempting the poor, there will be no stopping. * *
>
> "Economists have brought themselves, as it seems to me, into a very puzzling dilemma. * * *
>
> "A close examination will show that their argument involves a vicious circle, and the only way out of it is to allow that the working classes may, and in fact must, bear their portion of the national burdens."

Our readers will observe that these are the precise conclusions which this journal has so earnestly attempted to fasten upon the public mind. If the many are not to be taxed, we may say good bye to Municipal and Imperial progress alike.

The total number of incomes assessed in the Punjab in 1870-71, the tax descending as low as £50 a year, was less than 43,000 out of a population of seventeen to eighteen million of persons, the result being that the tax, which was 3⅛ per cent., equivalent to an income-tax of 8 pence in the pound, yielded no more than £150,000. Now at home such a tax would have yielded eight millions sterling. It was found, we say, that there were but 43,000 assessable incomes in the whole Punjab, and of this number 33,435 were below £100 a year. The exact statistics are:—

Incomes	£ 50 to £ 100 a year	33,435
,,	100 to 1,000 ,,	9,007
,,	above 1,000 ,,	135

The Administration Report from Bengal for the same year tells precisely the same story:—Throughout the whole of the Lower Provinces, with their 40,000,000 of people, the general poverty is such that only 21,000 incomes were returned at above £100 a year to Mr. Wilson's income-tax, and only 64,000 at more than £50 a year. Under the 3⅛ per cent. tax of 1870-71, which goes down to £50, the total number of assesses was less than 128,000, more than half of whom are in Class I, the lowest of all. The returns for all India, with its 130,000,000 of people, under Mr. Wilson's income-tax, were:—

53,000	Incomes of	£100 and upwards.
141,500	,,	50 to £100
and 500,000	,,	20 to 50

Direct tax of some kind is absolutely necessary in Bengal, owing to the land revenue having been abandoned, but what it

should be, is a problem that defies human ingenuity. We cannot reach the masses of the Lower Provinces through the Custom House, any more than in other parts of India, while we have unfortunately abandoned to the zemindars the land revenue which the State should have retained in its own hands.

THE Administration Report of Oudh for 1870-71 gives us at last an account of the military expenditure made within the province itself, without which we can form no proper idea of the economic effects of our rule upon its people. The total amount of revenue raised during the year, and the expenditure were respectively as follows :—

Revenue raised in Oudh 1870-71 ..		£1,544,454
Expenditure *therein*, Civil	£ 458,410	
Military	£ 260,546	
		718,956
Withdrawn from the Province		£825,798

These figures shew that our rule drained the Province of about 83 lakhs of silver during the year. Now Oudh produces neither gold nor silver, and we should therefore very soon drain it of every rupee it possesses, unless the people, by exporting produce of some kind or other, are able to purchase silver from other provinces. Our rule is constantly abstracting masses of silver from the currency of *every* province, and were it not replenished by the exports of the provinces, money would disappear from them altogether, when we should be compelled to take payment of the revenue in kind. It is a very serious question, we believe, whether the State would not do well to do this in many districts of the country. We are so apt to take current notions as unimpeachable, that it is a real public service to be reminded of the necessity of frequently examining them for ourselves to their foundations.

THE prospect of our eventually obtaining coal in large quantities from Central India, seems to be steadily improving. We are now told, upon the most reliable authority, that extensive coal fields have been discovered in the Rajoor Manuk Ghud District of the Nizam's Dominions, and that mining operations have been commenced. The discovery is said to be due, in great measure, to the Nizam's engineer deputed to the duty, Mr. White, who although suffering much from fever contracted in the neighbourhood, worked with zeal and energy which have resulted in this discovery. The new coal field is at Sasti, about twelve miles from Chanda, on the banks of the Wurdah. At present only five square miles area have been tested by boring, but the coal is found in beds varying in thickness from eleven to fifty feet, and lies only about 100 feet below the surface, while it is declared to be equal to the best Indian steam coal. These coal-bearing strata have now been found to extend over 600 square miles in the valleys of the Wurdah and Pain Gunga rivers. They will prove an inexhaustible source of wealth for the Nizam, and when the railway from Hyderabad is open, and communication with other parts of India, an enormous revenue will be derived therefrom, as the wants of India would be supplied far cheaper by this coal than from Europe. Iron ore is said likewise to abound, facilitating the establishment of factories which might supply India with some of its iron. The Nizam has granted a bonus of a month's pay to the exploring party, it seems. The coal fields in the Kummumet District on the Godavery are also said to be engaging the attention of His Government, and an organized party will be sent as soon as the working season opens, to thoroughly investigate the coal beds there. We are indebted for these particulars to a Madras contemporary.

PAPER CURRENCY.

THE following is the Resolution of the Government of India on the report by the Head Commissioner of Paper Currency on the operation of his Department during the year 1870-71 :—

The Governor-General-in-Council observes that the average circulation from the commencement of the Paper Currency operations has been in :—

	Rs.
1862-63	4,41,94,285
1863-64	5,28,26,000
1864-65	6,88,20,116
1865-66	7,72,57,933
1866 67	8,98,93,179
1867-68	9,26,50,843
1868-69	10,14,55,327
1869-70	10,66,94,777
1870-71	9,81,32,240

and in the last two years, the maximum and minimum values of notes in circulation were :—

Year.	Maximum.	Month.	Minimum.	Month.
	Rs.		Rs.	
1869-70	11,42,07,120	January	9,80,32,010	April.
1870-71	10,75,53,170	,,	8,68,19,030	May.

For the first time in nine years the circulation shows a large decrease, having fallen back below what it is was in 1868-69. The falling off in the main circles of Calcutta and Bombay amounted to no less than Rs. 1,32,81,487, or nearly 15½ per cent. There was a counterbalancing increase in most of other circles, which reduced to decrease on the whole to Rs. 85,58,537 below 1869-70, or a little over 8 per cent.

The *Calcutta* circulation reached its highest point (Rs. 4,89,53,150) on the 22nd January 1870. It then fell rapidly to Rs. 3,51,79,910 on the 31st March 1870, from which date to the end of May 1871 it showed no signs of recovery. Since then it has risen again quickly till, on the 31st October, it was Rs. 4,29,93,960, since when it has slightly fallen, it having been reduced to Rs. 4,11,43,980 on 15th December 1871.

The *Bombay* circulation was at its highest point in recent years (Rs. 5,03,63,280) on the 7th April 1870. By the 7th July it had fallen to Rs. 3,16,18,750. It now stands rather below Calcutta, or at about Rupees 3,67,00,000 on 15th December.

The *Madras* circulation rose strikingly from about Rs. 60,00,000, at the end of February 1870, to Rs 1,15,85,270 on the 31st August 1871, having even reached a higher sum, viz., Rs. 1,20,41,130, on the 22nd June last. On 15th December 1871 it stood at Rs. 97,86,390.

These rather remarkable phenomena are not explained in the report.

No less than Rs. 1,42,16,200 of Lahore and Allahabad notes were cashed in Calcutta in 1870-71, and a far larger sum in proportion (Rs. 1,53,98,020) had been so-cashed to the end of August this year. This means that in the course of seventeen months Government has had to bear the cost of the exchange on nearly Rs. 3,00,00,000 from Allahabad or Lahore, or since the beginning of the year, from Bombay to Calcutta.

The absence of forgery is satisfactory.

The Head Commissioner argues that the note remittances in the year, amounting to Rs. 3,24,58,870, caused a large saving to Government. But doubtless *per contra* some expense must have been thrown upon Government by notes being received instead of coins at deficit treasuries.

The net profits of the Department are shown to be Rs. 11,57,637, but against this amount ought to be set the cost of the exchange on Rs. 1,42,16,200 of Lahore and Allahabad notes cashed in Calcutta, and taking this cost at 4 annas per cent., the set off would be Rs. 35,540.

IS IRRIGATION NECESSARY IN UPPER INDIA?

BY MAJOR COBBETT, B. S. C.

(Published by desire of H. E. the Viceroy.)

(Concluded from page 132.)

THE cultivators about Budaon have been enquiring how it was I obtained a better crop without, than they did with irrigation. Some say they irrigated four and even five times, and only got about half the return I did, and from the same description of soil. I merely tell them to "manure well and plough deeply," and have shown them my new plough, which they seem to have taken a fancy to, and say they will adopt.

As it is, my crop does not compare badly with the average crops of European countries, as mine was nearly 23 bushels per acre. In a late number of the *Farmer*, the average of wheat in bushels per acre in different countries is given as follows :—

Ireland 26 bushels, high farming 30 to 40; England and Scotland 28, high farming 44; Belgium, 21; France, 14; Russia, 17; Silesia, 10: Austria, 15 to 16 bushels.

The rain-fall at Budaon, from the 10th October to within two or three days previous to the time I cut my crop, was 1·3 inches. I do not include rain falling just previous to cutting the crop, as it delayed my harvesting and did it more harm than good.

The natives sow a large quantity of seed per acre, as they expect a great quantity of the young plants will be destroyed by white-ants. White-ants, I believe, will not attack strong healthy plants. It is only when, in the struggle for existence caused by the poverty of, and want of nourishment in the soil, the weaker plants begin to droop, that they become the prey of the white-ants.

After my crop was cut I could easily push a walking stick into my field to the depth it had been ploughed, but could not push it above an inch deep into the native's field. The soil of my field being thus light and porous, I ploughed it to the depth it had been originally ploughed, and left it in the rough, to get the benefit of the ameliorating influences of the air and rain. Had the occupier of the land next to mine attempted to plough his land after removing his crop, he could not have done so above two inches deep.

Under the present revenue system, unirrigable lands are assessed at a much lower rate than lands which are irrigable: if my theory is correct, there is no reason why the unirrigable lands should not be rated as highly as the irrigable. At present, in general, they are of a lighter or more sandy composition, and as such more suited to barley than wheat, but in ploughing deeply the sandy particles, now on the surface, would fall down into the furrows and be mixed with the minuter particles of the denser sub-soil, and the texture of the soil would be improved and become more suited for wheat: at the same time the soil of lands now irrigated would, by deep ploughing and ceasing to irrigate them, become more light and porous and better suited for all agricultural crops.

Every year we hear of the cotton crop being damaged in some district or other from either excess or want of rain. Were the land deeply cultivated, so that rain could easily penetrate to the sub-soil, I do not think we should hear of damage from either of these causes, and instead of getting a crop of from 50 to 70 lbs. an acre, we should have one of from 200 to 300 lbs., or even more.

As it is, a great amount of the vital energy of the cotton plant is expended in forcing its roots into the hardened pan, and we have a dwarfed plant.

With reference to lands barren from being covered with "reh," I believe wherever kunkur has been quarried from these lands they have become fertile. This probably is from the *reh* becoming mixed with a mass of soil, instead of being collected on the surface; it might be worth trying whether deep ploughing and thus mixing the *reh* with the sub-soil would have the effect of making these barren soils fertile.

Whether I am right or wrong is a question which could be settled by a few simple experiments carried on in different parts of the country. If I am right, the money spent in irrigational works, except, under certain conditions of the soil and sub-soil above explained, is simply money thrown away.

THE FIRST THIRTY YEARS OF BRITISH ADMINISTRATION IN BENGAL—JESSORE.

The Establishment of British Administration in the District.

(Continued from page 126.)

In April 1781 the Governor-General increased very greatly the number of Civil Courts in Bengal. There were only half-a-dozen before, and now twice that number were added. One of the new Adawluts (as they were called) thus established was the Adawlut at Moorly, and its jurisdiction included the whole of the present districts of Jessore and Furreedpore, and that part of the 24 Pergunnahs which lies east of the river Ichamati. Moorly was selected as the head-quarters of this district (or province, as it used then to be denominated), because it was the head-quarters of the Mahomedan Government, such as it was. The proximity of Chanchra, the seat of the Raja of Jessore, was probably the reason why Moorly originally had become the head-quarters of the district. The Adawlut or Civil Court thus established was indifferently termed the Adawlut at Moorly or the Adawlut of Jessore. The latter name of course superseded the former when ten years later the head-quarters of the district were removed from Moorly to their present location. The same Government order declared that the Judges of these Courts were to exercise also the powers vested in the Faujdars and Thannadars, a system which was thus abolished all over Bengal. The Faujdars were, as has been said, high officers of police, and the Thannadars were the police officers who had charge of police stations. Their abuse of power, and the oppressions they committed, had become notorious; and it was this chiefly that led to their abolition and the transferrence of their functions to an English officer located in the district. In respect of these police functions the Judge was denominated also Magistrate. He took the place of the Faujdar, being a pure officer of police, and the Thannadars who still remained in existence were made subordinate to him as Magistrate. This origin of the district magistracy will account for the name of "Faujdari," applied up to the present day to the Majisterial jurisdiction. The functions of the "Faujdari Court" have however entirely changed; for whereas it is now an almost purely judicial institution, it was at its first establishment in 1781 a purely police jurisdiction. The duty of the Magistrate was then only the management of the police: he had to apprehend offenders, but with their trial he had nothing to do. The duty of trying accused persons was performed by an officer called the "Daroga;" and within the Moorly jurisdiction there were two Darogas, one at Jessore and one at Bhusna. The Daroga was subordinate solely to the Nazim of Moorshedabad, and the Government was very particular to instruct the Magistrate, that he had over the Daroga no authority whatever. The Nazim had, in fact, never conceded to the British Government the power of trying and punishing criminals.

The British Government also had no authority over the Darogas, although, desirous to keep itself acquainted with the details of the administration of criminal justice, it induced the Nazim to direct the Darogas to submit to it, through the Magistrate, a monthly statement of their criminal proceedings. The Daroga's powers were exceedingly limited; in fact, he was rather an officer who reported cases for the order of the Nizam (or rather the Naib Nazim, an officer appointed for this and other duties), than a Judge empowered himself to deal with criminals. Petty cases he could deal with by inflicting small periods of imprisonment; but these cases were very few compared with the number he had to refer for order to the Nizamat. The Daroga also had charge of the jail and of the records. So far as regarded the execution of sentences pronounced by the Naib Nazim, the Magistrate had a certain supervision. It was through the Magistrate that the Darogas received the orders pronounced by the Naib Nazim, and the Magistrate on one occasion submitted to Government a complaint that the Daroga of Bhusna would not receive an officer whom he had sent to see the sentences carried into execution. In respect of the jail also we find that the Daroga was obliged to get the Magistrate's approval of his estimates for repairs before he sent them up to the Nizamat. Such then was the system of criminal administration when first established in 1781. The judicial part was performed by the Daroga, a Mahomedan officer acting under the Mahomedan Government, and the executive part was performed by the Magistrate, an English offer acting under the English Government.

The Governor-General, when he established the court at Moorly, appointed Mr. Tilman Henckell to be Judge and Magistrate, and Mr. Richard Rocke to be his Registrar. The Judge got Rs. 1,300 a month at first, but on 27th February 1784 his salary as Judge was raised to Rs. 2,000, and he got Rs. 600 more as Magistrate. A reduction was afterwards made, for on 9th May 1786 his pay as Judge is stated at Rs. 1,120. Besides pay he got also a proportion of the institution fees deposited with Civil Court plaints. The Register's salary was only Rs. 300. These two men, Tilman Henckell and Richard Rocke, remained a long time connected with Jessore. They were both men of more than ordinary ability. Mr. Henckell's name is still remembered in some parts of the district. His acquaintance with every subject affecting his district was most intimate; and no wrong was too remote for his energy to grapple with, no advantage too distant for him to strive after. The idea of his administration was, that it was the duty of Government to procure the peace and comfort of the mass of the inhabitants, though it might involve some harm in respect of the Company's commercial interests. These views were a little too advanced for his age, for there was then too great an inclination on the part of Government officials to look upon the natives as born only to be a means of profit to the Company. Mr. Henckell was never unmindful of his employers' mercantile interests, but he always set this before him as his duty—to guard the then almost helpless natives from the oppressions to which they were subjected by the commercial officers of the Company as well as by their own zemindars.

Mr. Henckell arrived at Moorly in the middle of May 1781, and shortly afterwards submitted his proposals for the re-modelling of the police force. The Faujdars of course had already been recalled, to the great satisfaction of the people whom they griveously oppressed. In fact, the whole police system appears to have been one of oppression and corruption. There had been four thannahs—Bhusna, Mirzanagar (near Trimohini), Noabad (now Khulna), and Dharmpur, and subordinate to these thannahs were several chaukies. A thannah at Shahujial is also in one place referred to. There were paid officers at the thannahs, but the chaukies worked by means of *goindas* or informers, who received no salary, and were, as a natural result, obliged to obtain a livelihood by capturing innocent persons and extorting money from them—a system which the Faujdars and Thannadars, their superiors, certainly made no endeavour to prevent, and perhaps even partook in the guilt of. How far these Faujdari police were a terror to evildoers, it is not easy to say. There were certainly a considerable number of people in jail, though one is disposed to think that the innocent were hardly safe from being mixed up with the guilty. Mr. Henckell goes so far as to say that the establishment of the four thannahs above mentioned "rendered it next to impossible for dacoits and robbers to commit depredation without meeting with their deserts." But this is hardly consistent with what he states about the oppressions of the Faujdars and the collusion of their subordinates with robbers, or with the undoubted fact that at the time when he joined the district there were bands of robbers, fifty strong, roaming about it. The Faujdars, no doubt, did something to check robbery and dacoity; but people were contented in those days with results that would now be considered disgraceful. What Mr. Henckell proposed was rather a change of *personnel* than a change of system. Assuming himself the position and authority of the two abolished Faujdars, he proposed to

station at each of the four thannahs a Girdwar, or head police officer, whose business it would be to apprehend dacoits and forward them for trial to Moorly. Their subordinates were not to be informers, but to be foreign sepoys, as native barkandazes were so apt to collude with offenders. His police were to possess more of the military than of the detective character, and this seems to have suited the then work. For the aim then proposed was not the prosecution of minor offences, but the checking of great ones—dacoity and murder, and such like. When a dacoity occurred, the investigation consisted chiefly in following up the gang to their homes; and as the gang relied rather upon their strength than upon the secrecy of their proceedings, this was simply a *quasi*-military expedition. When the pursuing detachment reached the lair of the gang, the zemindar, through his servants (who had always a semi-police character), was expected, and usually compelled by pressure on the part of the Government officers to deliver up the men. The zemindars, it should be noted, are not talked of as having separate police establishments. They were expected, by means of their ordinary servants, to protect property from plunder and hand over offenders to the authorities; and when Mr. Henckell's Girdwars and Thannadars were appointed, they were to help in and to see to the performance of these duties, and could always claim co-operation on the part of the zemindar's servants. It will be observed that the establishment of a thannah at Moorly was no part either of the previously existing system of police or of Mr. Henckell's proposals. Mr. Henckell himself intended to do the work which in other places was done by the Thannadars. When his proposals were accepted by Government, a force of fifty sepoys was established at Moorly, besides thirty each at Mirzanagar and Bhusna, and four at Dharampur, which was a small thannah. Noabad is not mentioned as having any such force; the force stationed at Khulna in connection with the salt department was probably considered to afford sufficient military strength. This system of police, which cost perhaps Rs. 800 or 850 a month, turned out far too expensive for the commercial ideas of the Government. The Government began by ordering, in opposition to Mr. Henckell's remonstrances, the substitution of barkandazes for sepoys; and before this was carried out they ordered the entire abolition of the police establishment, except that the force at Moorly was to be retained. The Government order which directed this step declared that "all zemindars, chaudhris, and taluqdars, conformable to the original and fundamental tenure on which they hold their zemindaris and other lands, are to take effectual care that on robberies, burglaries, or murders, be committed whithin their districts." They were to do their utmost to bring all offenders to justice; they were to erect thannahs wherever the Magistrate should direct, to appoint officers for them, and to be answerable for the good conduct of the people they stationed at them, and for their obeying the orders of the Magistrate. Persons suffering from robbery were to be reimbursed for their losses by the zemindar of the lands where the robbers lived, or of the lands within which the robbery was committed; and if any zemindar committed or connived at murder, or robbery, or other breach of the peace, he was to be punished *with death*. He was liable also to punishment for other misconduct according to the nature of the case. Under this tremendous order the zemindars were obliged to give recognizances to carry out the duties required of them. The number of thannahs was increased from five (including Moorly) to thirteen—a decentralization necessitated by the change of system. The zemindars naturally objected to having to bear all this expense, but no answer was vouchsafed to their remonstrances. This system, by which the zemindars bore the burden of the police establishments, continued in force from 1782 until 1791 or 92, when Lord Cornwallis reformed the administration. The Magistrates were however allowed, for temporary purposes, to employ Girdwars and Thannadars; and under this permission the Magistrate of Jessore managed practically to keep up two Government thannahs (Jhenida and Noabad), but with this exception the whole burden lay on the zemindars. With an active and energetic Magistrate like Mr. Henckell, the evils that would naturally spring from such a police system had less chance of development; but still the utmost that could be said for it, after some years of trial, was, that the police was better than it had been in the time of the Faujdars, that is, before any European officer was stationed at Jessore. What there was of good in it, arose from the circumstance that the Government and its officers practically took upon themselves, and away from the zemindars, the supervision and management of the police work. The peremptory declaration of June 1782 had, in fact, become a dead letter. The zemindars' liability to give compensation for robbery was never enforced except in extreme cases. The only part of the order that remained in force was that which laid upon them the obligation to keep up and pay for the thannah establishments; and even this part of the order was, as we have seen, not enforced in the case of Jhenida and Noabad. No other result was possible where a sort of joint responsibility and authority was given to the Magistrate—a man of energy who entered on these matters from motives of duty—and the zemindar, who no doubt did always as little as he could, and whose only motive was the fear of consequences. The plan of managing the police through the zemindars had broken down. For the Mahomedan Government, careless of details, and desiring nothing but the most superficial results, it might answer; but when English administration was carried into the districts, the new idea arose that the world was not made for the enjoyment of a few great families, who might manage everything as they chose. It was impossible to hope for the due performance of public duty from individuals who had nothing to gain by doing their work, and little or nothing to lose by not doing it; and zemindars could hardly be expected to co-operate zealously with the Magistrates, who had come to deprive them of their previously almost irresponsible authority. And thus the Magistrates ignored the zemindars, who were little more than obstructives, and expected from them only obedience to specific orders addressed to them. From that time till now the public duties of zemindars have continually diminished, and their responsibilities are always changing, from actual to nominal.

UNIFORM OFFICIAL PRICE LISTS.

RESOLUTION OF THE GOVERNMENT OF INDIA.

In considering the advantages of a uniform method of publishing the market prices of grains, the form of price current adopted in the *North-Western Provinces' Gazette* recommended itself to the Governor-General-in-Council as the most complete and convenient that had been devised, and it was accordingly circulated to local Governments and Administrations for their opinion on its fitness for universal adoption, and any suggestions for its improvement which might present themselves. This form shewed the prices of the various grains by the number of seers of 80 tolahs purchasable for a rupee; and for purposes of comparison, it shewed, side by side, with the current prices, those of the preceding week and of the corresponding week of the previous year.

2. The specimen form has been generally approved; but a few useful amendments have been proposed, and a revised form is now circulated for information and guidance.

The changes made are briefly the following:—

3. (*a*)—On the suggestion of the Financial Commissioner of the Punjaub, the general heading has been altered to—"prices current of food grains;" the groups of columns belonging to the two kinds of rice have been brought into juxtaposition, and their headings slightly modified. In provinces where the entry of one sort of rice is considered sufficient, the columns for the best sort should be left blank.

(*b*)—To meet the circumstances of the south of India, columns have been added for ragi, cholum, cumboo, and veragoo, and a group of columns for salt has been inserted, and will be obligatory for all provinces. The Board of Revenue, Madras, would also have columns for two sorts of "paddy." The Governor-General-in-Council will not however prescribe this addition, but it will be open to any Government to add such entries should it see fit. The proposal to include the prices current of cotton and indigo does not commend itself to the Government of India. The returns under this head are doubtless valuable, but they should be published separately. As suggested by the Government of Bengal, a column for "remarks" has been added.

(*c*)—The standard seer, as defined in Act XXXI. of 1871, has been substituted for the seer of 80 tolahs as the weight to which prices are referred. The Madras Government has urged the retention of the measure standard. But the main object of change being to obtain uniformity, the Governor-General-in-Council considers the proposal inadmissible, and believes that there will be no real difficulty in exhibiting price according to the weight standard now prescribed. A careful formula of reduction should be prepared for each district, and for each species of food entered in the table. This being once done, the labour involved in the actual working out of the reductions is infinitesimal.

4. A few general instructions need to be added:—

(1.)—The form, as its heading implies, should, if possible, be weekly. The Governor-General-in-Council trusts that the obstacles to this course in the Madras Presidency and Mysore may not be found insuperable.

(2.)—The fractions of the seer should be shown decimally, but only to one place of decimals.

(3.)—The statement should not be encumbered with arrear statistics. If the return for any district is received too late for insertion, it should be omitted altogether. But the Governor-General-in-Council hopes that such omissions will be rare.

(4.)—The statement for each province should be published in the local Gazette. But separate copies should be forwarded to the Government of India as soon as prepared.

(5.)—It will be open to each Local Government or Administration to insert additional triple groups of columns for other kinds of food which may appear to require special notice, or to omit the groups of columns pertaining to kinds of food which do not enter into the dietary of the people of the province.

5. In prescribing the accompanying form, the Governor-General-in-Council expresses a hope that every effort will be made both by Local Governments and Administrations and by district officers and others charged with the preparation of the original tables, to make them a really valuable and accurate record of the current prices of food. To this end it is necessary, *first*, that the statistics, in their original form, should be exact; and *secondly*, that they should be correctly reduced. Special attention should be directed to both points.

Price Current of Food Grains in the several Districts of _____ *during the week ending* _____ 187.

QUANTITIES PER RUPEE BY THE STANDARD SEER AS DEFINED IN ACT XXXI. 1871.

District No.	Districts.	WHEAT.	BARLEY.	RICE, BEST SORT.	RICE, COMMON.	BAJRA.	JOWAR.	GRAM.	CHOLUM.	CUMBOO.	VERAGOO.	RAGI.	SALT.	Remarks.
		Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	Present week ending	
		Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	Last week ending	
		(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	(Corresponding week of	

OBSERVATION ON THE LAW AND CONSTITUTION, AND PRESENT GOVERNMENT OF INDIA.

BY LIEUT.-COL. GALLOWAY, 1829.

On the nature of Tenures according to the law of India, under the Mohummudan Government.

Though the Mohummudan law be explicit as to the proprietary right of the cultivator, and although it be equally doubtless that the zumeendary right is official; yet that any given individual may be zumeendar, in the sense in which that word is loosely understood, and also a *malik* or real owner of the soil, such as I have defined the "cultivator" to be, it is scarcely necessary for me to say, because the original tenure of *milkeet* being transferrable might be purchased by the individual official zumeendar, and thus a large estate might be acquired: and doubtless many considerable properties thus grew up, and many more were unjustly got possession of. But then the difference between two individuals claiming, the one as a cultivator in possession of the soil, and the other as a zumeendar, just described, claiming the right of a malik over him, is, that the latter must prove his purchase or lawful acquisition, and shew that the cultivator-possessor holds under him; for the law has vested the original or radical right to the soil in the cultivator. Of this right no individual can divest himself legally, but by sale or gift; and *no individual* can acquire it from him, but by gift, purchase, or inheritance. The sovereign may grant to his favourite a sunnud of zumeendaree, or jageerdaree, or altumghadaree over the lands, and the grantee will draw the Government revenue, the *khuraj*; but the *property of the soil* remains with the owner, the *malik*, who may nevertheless sell, or let, or give it to whom he pleases.

But we are told "that all the lands in Bengal, and the greater part of those of Orissa and Behar, are in the hands of great zumeendars, who claim to be the owners of them in absolute right of property." From what has been said whatever it is obvious that the titles of these persons to the right of the soil will not bear investigation by the sure test of the law; nor indeed by any other standard whatsoever. On the contrary, it is beyond doubt and a fact, a matter of undoubted history, that at a comparatively late period there was no such thing as a great zumeendar either in Bengal or Behar.

"It is not," says the author of the Ayeen Akbaree, "customary, in the soobah of Bengal, for the *husbandman* and *government* to divide the crop. The produce of the lands is determined by *nussuk*; that is, by estimate of the crop. The ryots (husbandmen) in the soobah of Bengal are very obedient to Government, and pay their annual rents in eight months, by instalments, *themselves* bringing mohurs and rupees to the places appointed for the receipt of the revenue." And of Behar the same author says, "It is not customary in Behar to divide the crop. The husbandman brings the rent himself; and when he makes his first payment he comes dressed in his best attire."*

The date of this authentic record is little more than two hundred years ago; and we have before quoted the edict of Aurungzebe, as late as the year 1668, directing the *khuraj* to be levied *agreeably to the forms*, and in *the proportion* fixed by the Mohummudan law throughout all India. How, or by whom, has the right of property in the soil been totally subverted throughout a country containing twenty-five to thirty millions of people, *in so short a period*! If these, the great zumeendars, have acquired lawful right to the soil, it must have *been subsequent to this*. Let them shew the deeds by which they hold; for except *by inheritance a regular instrument* is required to establish their title. Sunnuds from the *King*, as late *as the middle of the eighteenth century* are quoted by Lord Teignmouth as establishing *undoubted right in the soil*. One in favour of the zumeendar of Rajshahy was granted, he tell us, "in consequence of the neglect of the former zumeendar to discharge his revenue." This may be good as a sunnud of zumeendary; but this was *not a grant of the soil*! not more than a commission, after superseding one collector of land-tax by the King of England, would be a grant of the estates within the district specified. So also the "zumeendary of Dinagepore was confirmed by a firmaun of Shah Jehan about 1650." So the origin of the "Burdwan zumeendary may be traced to the year 1680, when a *very small portion* of it was given to a person named Aboo." Nuddea and Lushkurpore zumeendaries are of later date, about 1719. See Mr. Shore's minute.

We have seen above, that at the very end of the seventeenth century the "*husbandmen paid their rents to the Crown.*" This goes to prove that whatever be the antiquity of the *families* of the zumeendars just mentioned, they were, at the date of the *Ayeen Akbaree*, considered "husbandmen:" and we know that the Viceroy of Bengal, Jaafur Khan "dispossessed almost all the zumeendars." I would again ask how this vast accumu-

* Ayeen Akbaree

lation of property has arisen? Some of those zumeendars pay half a million sterling of public revenue. Did they purchase the land? The value of 10 years' purchase would be five millions! The malikana of ten per cent. at ten years' purchase would amount to (four millions) four crores of rupees. Where was the capital to purchase this? It is evident *no purchase ever took place*; that, consequently, *no transfer of the soil was ever made*; and that, therefore, those zumeendars *are not owners of it.*

I shall conclude these remarks on the zumeendary tenure (referring to what I have said on the question of the law) by quoting the authority of an intelligent native, questioned by Mr. Shore (the present Lord Teignmouth), on the received opinion and custom of India with respect to the right of a zumeendar in the soil, and of the sovereign to confer such right. This intelligent person was the son of the former Nazim of Behar, and author of the *Seir-ool-Mootaakhereen* Gholam Hoseyn Khan. *Query.*—"How is a zumeendar appointed?" *Answer.*—"According to strict right, no person can become the proprietor of land but by one of the three above-mentioned modes, *viz.*, by *purchase*, by *gift* from the proprietor, or by *inheritance* though, by usage, the emperor or his representative may displace him (a zumeendar) for contumacious and refractory behaviour, and appoint another by sunnud in his room. The person so appointed is by usage considered as zumeendar and proprietor of the soil, though according to strict right he be not so." *Q.*—Is a zumeendary hereditary?" *A.*—"Whatever land a zumeendar may have become the *proprietor of by any one of the three above-mentioned modes* (*viz.*, purchase, gift inheritance) descends in the line of inheritance. but whatever is not *actual property*, is consequently not of an hereditary nature," (alluding to his official capacity of zumeendar which is not "actual property" doubtless). If a zumeendary buy the *actual property* of any person, his heir has an undoubted right to succeed without the sanction of the ruler."

Now here it is evident a distinction is intimated between lands the "*actual property*," which may be called the "hereditary" estate, and lands belonging to the zumeendaree, not "*actual property.*" For example, by sunnud from the king, the zumeendar might be vested with the management of the revenue of his own hereditary lands, and other lands adjacent, and the charge of the police, &c. (for that was an essential part of a zumeendar's duty); also the care of extending the cultivation of waste land, &c.; and it is worthy of remark, that throughout the whole series of answers to Mr. Shore's queries, Gholam Hoseyn invariably keeps this essential distinction in view; though from the questions, that great distinction seems to be entirely overlooked by Mr. Shore, who appears to take it for granted that an imperial sunnud is a full title to the actual property of the soil, as it is to the official rights of zumeendaree.

But a sunnud, firmaum, or by whatever name a grant from the crown may be called, can convey no right but what is vested in the sovereign; and that is, the collection of the public revenue: I mean over lands held by cultivators, such as I have defined. And let it be observed that this distinction is marked by the names given to the allowances which government granted to zumeendars, "*malikana*" and "*nankar*," the former meaning the dues belonging to a *malik*," or real owner of land, the latter to a *manager*. *Malikana*," says Gholam Hoseyn, "is the unalienable right of proprietorship; but *nankar* depends upon fidelity, and a due discharge of the public revenue. *Nankar* is expressly the reward of *service*. If a zumeendar is displaced, it would be undoubtedly taken from him. But *malikana* is the *right* of the *proprietor* of land, who receives it (malikana) under the ruler, and therefore if he receive it (malikana) under the ruler, how can an altumghadar, jageerdar, &c., withhold it from him?

Here then, notwithstanding the king's sunud of altumgha, &c., the owner's right remains entire. The sunnud conveys the king's right, and no more; and that is the *khurauj*. There are, indeed, instances of the sovereign *purchasing land from a zumeendar*. On this point Gholam Hoseyn is asked: *Q.*—"Why did the king purchase lands, since he was lord of the country, and might therefore have taken by virtue of that capacity? *A.*—"The emperor is not so far lord of the *soil* as to be able, consistently with right and equity, to sell or otherwise dispose of it at his mere will and pleasure. These are rights appertaining only to such a proprietor of land as is mentioned in the first and second answers. The Emperor is *proprietor of the revenue*, but *he is not proprietor of the soil.* Hence it is, when he grants *aymas*, *altumghas*, and *jageers* he only *transfers the revenue* from himself to the grantee." How different this from the Hindoo law; how different from our ordinary notions of sovereign right in India?

It may not be unedifying to note in conclusion, what in 1770, was the estimation in which the zumeendar and their titles were held by the English Governments. The Government proclamation on this point is dated 11th May 1772, notifying the determination of the English Government to assume the Dowanee by order of the Court of Directors, and enumerating the several branches of business appertaining to the Dewanee, among which are: "the constituting *and dismissing of zumeendars*, with the concurrence of the Nazim."

They then, 14th May 1772, proceed to divide the country into farms of purgunnahs; but so as not to exceed one lac of rent per annum. In this document the zumeendars appear to be understood merely as Government officers. "That in like manner the zumeendars, taluqdars, shiedars, *and other officers of Government* be forbid to lend money to the ryots."*

How far, under the Moohummudan kings, the practice of India coincided with the law, in the system of Government generally in matters of revenue and finance, in countenancing the right of the sovereign or of the zumeendar, or of the cultivator, to the property of the soil, may be further seen, in addition to what I have already quoted, by referring to the Institutes of Timour, which are formed so closely on the model and principles of the Moohummudan law, that it is impossible to mistake their origin. The Institutes of Akbar, *Ayeen Akburee*, are evidently formed from those of Timour; and are, in fact, in their most material parts, a copy of the former.

From the Moohummudan law, down through those two works, the eye of a Moohummudan lawyer has a view of the whole system of Indian Government; obscure latterly, it must be confessed, but still sufficiently marked to admit of his tracing the original. There is also the code of the Moghul Emperor of Persia, Ghaznan Khan, above-mentioned, promulgated about the year of our Lord 1260; all as indeed might be looked for, scions from the same stock. Where, indeed, at that early period of Moohummudanism, may it be supposed a moslem prince would go for law, save to the sacred repository of his faith?

But there are other documents extant, of still greater force and of recent date. Among these, I shall again mention Aurungzebe's firmaun, dated in 1668, directed to Moohummud Hashin, containing instructions for collecting the khurauj. These are eighteen in number, and profess to be issued "that the mutusaddees and amils, from one end of Hindoostan to the other, may be informed in all points regarding the khurauj as directed to be levied in the *enlightened law of the pure and holy religion*, and as approved by the good and authentic traditions." These rules for the collection of the khurauj are entirely copied from the writers on the Moohummudan law, following the practice adopted by Omer, when he settled the conquered provinces of Irauk and Syria, before alluded to.

There is also another firmaun of Aurungzebe, issued about the year 1676, addressed to Rishuk Doss, containing the minutest orders respecting the collection of the revenue, the encouragement of cultivation, the keeping and transmission of regular accounts, formed after the rules of Akbar; to which he indeed specifically refers. "You are to inform yourself of the usage with regard to the customs in the time of His Majesty, when Rajah Tudur Mull was Dewan."

This order contains fifteen regulations. It is collected in the *Rumoozat-e-Alumgeeree*; and a translation of it and of the former may be seen in Patton's *Asiatic Monarchies*, furnished to that author, I believe, by the present Lord Teignmouth.

"It is proper," says the learned *Shums-ool-Ulymah*, "that the sovereign appoint collectors to collect the khurauj in the most equitable manner from the people." These collectors were called *amul-een* (the plural of *amil*); and accordingly Akbur appointed a collector over every crore of dams, who was called *amil* or *amilguzzar*;† and the name is preserved to this day in the province of Oudh and other parts of India beyond the Company's territories.

"And," says Akbar, "let amilguzzar agree with the husbandman to bring his rents himself, that there may be no plea for employing intermediate mercenaries."

Here the written law says, the people shall pay to the Government-collectors, "and the practice of India was such." "*No intermediate mercenaries shall be suffered*," says Akbar, to come between the sovereign and cultivator."

"There shall be," says the Moohummudan law, "separate treasuries established; the first for the *khurauj*, and the *jizeeah* or capitation tax; the second, for the *ooshr*, or tithes, and the *zukaut*, or charitable imposts; the third, for the *fifth* of captured property, plunder, mines, and of treasure-trove; the fourth, for *waifs*, *escheats*, &c. All this shall be kept separate, because these *deent*, different branches of the revenue are appropriated by law to different purposes. The sovereign, however, in case of necessity, may borrow from one treasury to replace the same, if in his power."‡

Timour had seven establishments of this kind, "seven wuzeers or ministers, all under the dewanbegee, to regulate the affairs of the revenue and to lay them before him: one for the affairs of the royts, the state of cultivation, population, and police; one for the subsistance and pay of the troops, assignments of jageers granted for this, &c.; one to take charge of the property of absentees, defuncts, escheats, customs, and zukat, duties on cattle and pasture ground, &c.; one for the expenses of the imperial household, arsenal, &c. There are three others placed

* Proclamation of 1772. † Ayeen Akbaree. ‡ Zevlaaee.

over the frontier provinces, the khalsah lands, &c., all under the dewanbegee."*

Akbar established "provincial treasuries to receive the khurauj from the husbandman, and one grand treasurer in the capital." There were also "treasuries for peshcush, reversions (or escheats), offerings, charitable donations, and for money for weighing the king. The fauzdar, when he captures a place must act with fidelity in the division of plunder, a fifth part of which he shall send to the royal exchequer."

The khurauj, and the jizeeah, or capitation-tax, &c., shall be appropriated, says the Moohummudan law, to the use of the troops, in building and maintaining fortifications, guarding the highways, digging canals, maintaining those who devote their lives to the good of the people (as kazees, mooftees, mooazzins, public teachers); in feeding the poor, paying collectors of the taxes, building and repairing mosques, bridges, &c. "Finally, every moslem in want has a claim on the public treasury, according to his exigencies, for himself, wife, and children under age, for decent food and raiment; but holy men, and those learned in the law, the descendants of Aallee and the nobles, have a claim to a greater share, because dignifying them, dignifies the sons of Islaum." F. M.S.

"I appointed," says Timour, "as sudder (or chief priest) a man of holiness and of illustrious dignity, to watch over the conduct of the faithful, established in every city and town a kazee and a mooftee, a supervisor of markets, also a judge of the army (termed, as in the Moohummudan law, *kazee-oollaskur*), and sent into every province an instructor in the law, superintendents to watch over the cultivated lands and the husbandmen, ordered the ruined bridges to be repaired, new ones to be built, and placed guards to watch the roads, &c., &c. Also ordered that the descendants of the Prophet, the oolma, the foozla, the mushauekh, the durveshes, the gosha, nusheen, should have *seyoor ghulaut*, and *wuzeefah*, and *mursoon*, assigned them; also that the *fookra*, the *aujza*, the *musakeen*, should have *muddudo maaush*, and that the mausoleums and sepulchres of the great should have *fursh* and *ash* and *roshnaee*, allotted them."†

"Four classes of men," says the Ayeen Akbaree, have land or pensions granted them for their subsistence. 1st, the learned and their scholars; 2nd, those who have retired from the world, holy men, and goshanusheen; 3rd, the needy, who are not able to help themselves; fourth the *descendants of great families* [an error in the translator for *descendants of Aallee*], who from false shame, will do nothing for themselves; besides the army, the pay of which amounted to rupees 77,29,652."‡

But by the Moohummudan law, the land-tax is assessed by measurement; so much per *jureeb* of sixty measures square. The measure was settled to be the *guz*, or cubit, of the king Nosherwaun, which is said to have been seven hands' breadth, including the thumb, or nine hands' without the thumb: "accordingly," says the Ayeen Akbaree, "His Majesty, Akbar, adopted Nosherwaun's measurement of sixty squares, which he made to consist of that number of *ilahee guz*; settled the *guz*, the *tenaub* and the beegah; after which he ascertained the value of the land and fixed the revenue accordingly."

Timour ordered this before him. "The khurauj is to be settled," says the Institutes, "according to the produce of the *cultivated* land. The lands irrigated by water constantly flowing should pay one-third; if only by rain-water, therefore uncertain, to pay one-third or one-fourth. That the land should be measured and divided into three classes, an average taken, and to pay so much." § The *guz*, or yard, settled by Akbar, was forty-one fingers; and he called it the *ilahee guz*, instead of the *badshahee* (the *guz* of the king, meaning Nosherwaun) as the Arabs did theirs. §§

Akbar's beegah, or jureeb, consists of 3,600 (or sixty square) guz: the same number specified by the Moohummudan law.

(To be continued.)

ANCIENT MOGUL EMPIRE.

COINS AND MEASURES.

THERE are some incidents in 'Ala-ud-din's story, which more nearly concern these numismatic chronicles, such as his assumption of the title of the Second Alexander, and a notion entertained of a new religion, of which he was to be the oracle, both of which items are testified to by the coins. But the most curious record of this Sultan's reign is his attempt to increase his too-costly army by administrative regulations which should lower the prices of provisions and other necessaries of life, while it crops out, in an obscure way that he contemplated, a simultaneous reduction in the silver *tankah* from 175 grains to 140, for the special benefit of his own payments to the *Sipahis*. We have no specimens of these so inappropriately called '*Adalis*, but we meet with them on the first accession of Muhammad bin Tughlak (A.H. 725), to which occasion it may be as well to defer a more extended notice of them. The associate operation upon the prices of provisions has a far more general interest; as although the machinery employed implied a certain amount of force and compulsion, the main object was sought to be obtained by taking payment of the revenue in kind, the establishment of royal granaries, State advances to merchants, and other simple and obvious methods of facilitating the supply of the capital. So that, in effect, the official rates for the metropolis do not depart greatly from what might be styled the normal scale of prices, when distributed over an average of town municipalities; and this *quasi*-equity is indeed supported by the natural open-market rates obtaining at a later period, when money may have been supposed to have fallen in relative value.

'ALA-UD-DIN MUHAMMAD'S ENFORCED RATES OF PRICES OF PROVISIONS, &C.

	A.H. 703-715 = A.D. 1303-1315.	
Wheat	per *man*,	7½ *jitals*.
Barley	,,	4 ,,
Rice, in husk	,,	5 ,,
Mash, vetch (*Phaseolus radiatus*)	,,	5 ,,
Nakhúd, pulse (*Cicer arietinum*)	,,	5 ,,
Moth, lentil (*Phaseolus aconitifolius*)	,,	3 ,,
Sugar	per *sir*.	1½ ,,
Brown sugar, (*Gur*)	,,	1 ,,
Butter, *Ghi*	2½ *sirs*.	1 ,,
Oil of Sesamum	3 ,,	1 ,,
Salt	2½ *mans*.	5 ,,

The *jital*, as will hereafter appear, is $\frac{1}{3}\frac{1}{2}$ of a *silver tankah* of 175 grs.; at the exchange of 2*s.* per *tankah*, the *jital* would therefore correspond in value to 1½ farthing, or rather less, as the 2*s.* is a very high rate of exchange for the old silver piece. The Delhi *sir*, of an approximate date, is stated to have been 70 *miskáls*, and the *man* 40 *sirs*. Now, taking the weight of the *miskál*, at the even average of 72 grains, the *sir* would range at 5040 grains (or 720 grains less than the Troy pound of 5760 grains), and the *man* would amount to 201,600 grains, or 35 lbs. troy, and 28·8 lbs. avoirdupois, or a little over the quarter of a hundredweight, or less than half a bushel of wheat. To complete the evidence contributed by this foreign statician, we must examine a *second* or alternative test, which he introduces apparently for the more ready comprehension of the western world, in the form of the parallel estimate of the Indian *man* under its equivalent in Egyptian *dirhams*. Of these latter, 102⅔ are stated to correspond *in weight* with the Delhi *sir*. Now although the *dirhams* of the Mamluks of Egypt of this period, in their tangible and once current form, would only lead to endless complications as bases of calculation, yet the *quasi*-theoretical scheme of the normal Arabian system of the relative weights of gold and silver coins, gives us a curious approximation to the return obtained from the simple calculations just formulated. Whatever may have been the weight of the *miskál proper* in various localities, in many cases the *dinár* continued to be a *miskál* pure and simple; and theory was ordinarily consistent in recognising the weight of the silver *dirham* as 7-10ths of the gold piece. Under this aspect we have to examine a new scale of proportions: the latest and most exhaustive authority, M. Queipo, has fixed the actual weight of the representative Egyptian *miskál* at 4·600 grammes, or 72·007 grains. This return will make the *dirham* equal to 54·405 grains, the *sir* = 5174 grains, and the *man* = 206,983 grains, or over 29 lbs. avoirdupois. The estimate formed by the French editors of Ibn Batutah, in regard to that African traveller's independent comparisons of Delhi weights with those of the west, arrives at a closely approximate return. The *man* of Delhi is stated, on repeated occasions in the Arabic text, to be equivalent to 20 Barbary *ratls*, or 25 Egyptian *ratls*, and the former are fixed by the calculations of the modern commentators as corresponding to two-thirds of a French kilogramme of 15,432·35 grains troy, or 1½ *ratls* = 1 kilogramme, which makes the *man* equal to 28·78 lbs. avoirdupois.

I do not follow out in further detail these western comparisons, which are in a measure speculative, as I am satisfied to accept what may be termed the internal evidence as my test. Tried by this criterion, India at the present day furnishes a very complete series of *man* weights, which all the incidental changes of time and the imperfectly preserved units of scattered localities have but very slightly removed from the standard testified to by the intelligent travellers of the middle of the eighth century of the Hijrah.

Any attempt to determine with precision the authoritative weight of the *man* or other measures of grain, must be associated with the crucial test of corroborative coin equivalents. From time immemorial, in India, coins had been, to all intents and purposes, *weights*; pieces of money, in our sense of the term, having grown out of the archaic use of sections of metal of a fixed and determinate gravity, following the popular form of small square or oblong plates of silver, designated by the appropriate name of *Puranas* ("old"). But when these crude sections of metal, like the link of the knight's chain passed into the more advanced grade of "coined money," they were still scrupulously made to contribute to the double purpose of measure of metallic value and officially re-

* Institutes 305. † Page 359, Institutes. ‡ Ayeen Akbaree.
§ Institutes. §§ Ayeen Akbaree.

cognized weights. Their importance, in the latter capacity, consisting in their furnishing readily available tests of any disputed higher weights or measures, so liable to be tampered with by shop-keepers from all time and among all nations. So completely was this their second mission accepted in the land, that in later days, under Sikandar bin Buhlol (A.H. 854—894), the idea was conceived of extending the already mixed duties of the public coinage into a means of determining measures of length, so that the sufficiency of the cloth merchant's yard should be instantaneously checked by the very money of the customer in which he was to receive payment. The earlier phases of these imperfect schemes of exchange, when primitive people were first emancipating themselves from the inconveniences of crude barter, and replacing undefined handsful by specific measures of weight, may be traced back to the first contact of the Aryans and the Indigenes, when the pastoral tribes of the former impinged upon the urban communities of the latter, whose civilization partook so largely of the Turanian element. There is internal evidence in the composite table of weights preserved in "the Laws of Manu," of contributions from the independent resources of both races. Aryan thought, crudely developed at first, confined itself to the ever-ready standard of barely—a grain they held in high honour, and beyond the cultivation of which their herdsmen do not seem to have progressed in the Vedic age. As intelligence advanced, and the subtle faculties of the exotic mind were brought into play, the tendency was clearly towards infinitesimals, so that the checks and counter checks laid down are found to include every shade of variety of the produce of the soil that human ingenuity could set against each other. It was the duty of barley to testify against mustard-seed if the latter failed in its full maturity; mustard in its coloured varieties, had to qualify the poundage of poppy-seed, which again had to go through the severe trial of being pitted against impalpable dust. Encouraged by those tangible minutiæ, the Aryan Brahmins seem to have ventured upon the introduction of fanciful and purely imaginary quantities, so that measures of weight vanished into thin air (to an extent to defy the keenest modern Microscopist). But in all cases of the more clearly defined weights of Manu, there seems to have been a serious intent and supposed power of proof by the test of seeds, balanced against other varieties of seed. The altered conditions of culture, and the uncertainty of the exact locality which furnished the data for ancient calculations, may deny us the power of reconstructing the general scheme; but there is no doubt that the early tables were designed to supply a normal and ever-ready criterion by means of single or multiplied totals of indigenous grains, which from time immemorial had centered in the convenient goldsmith's *rati*, which, though not exclusively Indian, was of such universal acceptance throughout the continent as to be essentially traditional; and it is from this starting point, or unit in the ascending scale, that the purely Indian weights proceed, each, in its turn again, following some readily accessible product of nature peculiar to the soil.

'Ala-ud-din, as we have seen, was particular about his metric system, and probably the full force of ancient methods of reckoning still survived in the existing weights, so that some one description of current money ought so to fit in with and confirm the estimated amount of the *man* as to balance into even sums, or an approach thereto. Neither the 175 grain *tankahs* (the old *sataraktika*—100 *ratis*), nor the newly-devised *'adalis* of 140 grains (80 *ratis*), will divide into the equivalent number of grains now assigned to the *man*; but, strange to say, the ancient *puranas*, whose modern representatives abound in the coinage of the day, taken at the rate of 32 *ratis*, or 56 grains, fill in the exact sum of 201,600 grains, without even the break of a fraction, either in the totals of the *sir* or the *man*: 90 *puranas* represent the *sir*, and 3,600 give the measure of the *man*. The *ratis*, however, in either case are uneven, viz., 2880 and 115200; but this fact need not disturbe the result, as the *ratis* in the higher measures of produce, as in the Ghi table, I shall have occasion to quote hereafter from the *Jyotisha*, run into all sorts of irregular totals.

It may freely be conceded that this intervention of nines and twelves is opposed to the scale of multiples in the *quasi* Turanian division of the Tables of Manu, where the dominant idea among the tangible weights is confined to fours and tens, culminating in three hundred and twenties and three thousand two hundreds; but if another section of the evidence is examined, it will be found that these 56-grain coins do not themselves accord with the theoretical scheme of the associate currency of the first half of the eighth century A. H. This is a question which will have to be treated more at large later in our inquiry, but it is adverted to in this place as it has an important bearing upon the point immediately at issue. On the other hand, if we examine the Tables of Manu in their lower or fanciful divisions, the mystic threes and ordinary sixes are found to be sufficiently frequent, from which figures alone we might infer that the Aryans had originated this portion of the combined table of weights.

From whatever source derived, India is seen to have achieved, in very archaic periods, either out of her marked indigenous aptitudes, or her frequent chances of exotic inspiration, a very comprehensive system of weights and measures, extending to the elaboration of a binary Troy scheme, associated with all the essentials of an independent Avoirdupois theory, which, perhaps wisely, avoided any recognition of measures of capacity.

CURRENCY.

NEW GERMAN GOLD CURRENCY AND INTERNATIONAL COINAGE.

THE following letter from Mr. Frederick Hendriks, appeared in a recent number of the *Economist*:—

"A few memoranda on the present position of this question in North Germany may not perhaps be deemed out of place in the pages of your journal.

"It appears that, on the 13th June last, a committee of twenty-three deputies of the Reichstag presented to Prince Bismarck, as Chancellor of the Empire, a series of propositions, with the view of guiding the deliberations of the Parliamentary Session now assembled. They recommended:—

"1. A single monetary system for the German Empire, upon the basis of a single gold standard.

"2. To attain this end, transition period to be fixed, during which the gold coin, to be coined upon the basis of the plan finally adopted, shall be issued in sufficient quantity, and admitted as a means of discharging debts in a legal manner, in a fixed proportion to silver coins.

"3. It is anticipated that the admission of the gold coins referred to, upon a rate of exchange, comparatively with the silver coins, to be fixed by the Federal Council of the Empire, and which shall not be reduced thereafter for the payments to be made to the Empire or to particular States, may, having special regard to the existing economical condition to which such a monetary legislation will be applicable, prove very useful in shortening the *temporary rule* of the double standard, or even in dispensing with it altogether.

"4. The definitively adopted new gold coins *to be divided decimally*.

"The bill which it has finally been decided to submit to the Reichstag, provides for a gold standard and for a decimal subdivision—two highly important steps in the promotion of international coinage. Besides this the proposed gold coins for Germany bear an easily calculable ratio of weight in the metrical code. The 30-mark piece, as proposed, is to contain $\frac{1}{279}$rd of a kilogram of pure gold, the 20-mark piece $\frac{1}{418.5}$, and 15-mark piece $\frac{1}{558}$th part of a kilogram, so that the exact intrinsic value of any amount of such coins, as expressed in their weight of pure gold, can be easily ascertained by simple recollection of the ratio to the kilogram.

"The relations in which the intrinsic values of the proposed new coins will stand to the coins of the leading commercial nations, can only be understood by placing together a complete set of calculations, which shall embrace the whole facts. The annexed table has been arranged with the view of accomplishing that object:—

Comparative Table of the Weights, and of the Intrinsic Values in PURE GOLD *of the English, French, American, and German Gold Coins.*

Denomination of Coin.	*Pure* Gold Contents of each Coin.	Standard Fineness.	Gross, or Standard weight of each Coin.
	Grams.		Grams
Proposed 30-mark piece of German Empire	10·7527	·900	11·9474
German gold crown	10·0000	·900	11·1111
Half-eagle or 5-dollar piece	7·5232	·900	8·3590
Sovereign	7·3224	·916⅔	7·9882
25-franc piece (proposed)	7·2581	·900	8·0646
Proposed 20-mark piece	7·1885	·900	7·9850
20-franc piece	5·8065	·900	6·4516
Proposed 15-mark piece	5·3763	·900	5·9737
Half-German gold crown	5·0000	·900	5·5556
Half-sovereign	3·6612	·916⅔	3·9941
10-franc piece	2·9032	·900	3·2258
Gold dollar	1·5047	·900	1·6718
5-franc piece	1·4516	·900	1·6129

Weights and Values in GOLD *of English and Foreign Gold Coins —Contd.*

Denomination of Coin.	Value of *Pure* Gold Contents of each Coin.				
	In Pounds Sterling.	In Gold Francs.	In Half-Eagles.	In American Gold Dollars.	In German Silver Thalers and Groschen, taking the proportion of Silver to Gold, 15½ to 1.
	£	frs.		$	Thlr. Gro.
Proposed 30-mark piece of German Empire	1·4685	37·0374	1·4293	7·1465	10 ..
German gold crown	1·3657	34·4444	1·3292	6·6460	9 9
Half-eagle or 5-dollar piece	1·0274	25·9228	1·0000	5·0000	6 29½
Sovereign	1·0000	25·2213	0·9733	4·8665	6 24½
25-franc piece (proposed)	0·9912	25·0000	0·9648	4·8240	6 23½
Proposed 20-mark piece	0·9790	24·6917	0·9526	4·7640	6 20
20-franc piece	0·7930	20·0000	0·7718	3·8590	5 13
Proposed 15-mark piece	0·7342	18·5187	0·7146	3·5730	5 ..
Half-German gold crown	0·6828	17·2222	0·6646	3·3230	4 10½
Half-sovereign	0·5000	12·6106	0·4867	2·4335	3 13½
10-franc piece	0·3965	10·0000	0·3859	1·9295	2 22
Gold dollar	0·2055	5·1926	0·2000	1·0000	1 13
5-franc piece	0·1982	5·0000	0·1929	0·9645	1 10½

"The table shows that the true values of the proposed German gold coins are as follows, in English and French money respectively:—

	£	£	s.	d.	frs.	c.
30-mark piece.....	1·1685, say about	1	9	4	or 37	1
20 „	0·9790	„	0	19	7 „	24 69
15 „	0·7342	„	0	14	8¼ „	18 52

"The existence of such fractional differences between the proposed coins and the coins of England, France, &c., is a most unfortunate feature in the scheme. The 20-mark piece, as a coin of convenient size, will, in all likelihood, be the leading coin of circulation. It cannot yet be known if, in the common usage of the future, sums in German coin will continue to be expressed in thalers, of which 6⅔rds will go to the 20-mark piece, or whether they will be expressed in marks. If expressed in thalers, divisions by 6⅔rds will be necessarily employed, and these will present difficulty in calculating the equivalent gold coin of the country. If expressed in marks there will not be the same difficulty. But there the ease and convenience stop, for without the aid of some such table as is above given, the conversion of new German currency into corresponding English, French, or American coinage will be found tedious and confusing in any international comparisons or exchanges.

"Taken as a whole, the new German measure may be pronounced a movement in some respects in advance, but in others retrograde. This is the more to be regretted, as it will entail, with certainty, the necessity of the adjustment to a more international and simple relation of the coins of the German Empire to those of other continental nations at some future date, when the change will be attended with more inconvenience than were it accomplished boldly and at once. Far better would it be for the Reichstag to adopt the principles of the Paris Monetary Convention of December 1865, as have been attempted by Austria and Hungary. The powerful influence of Prince Bismarck might well have been exerted in that direction. The 20-mark assimilated with the 10 Austrian florin piece, the 25 peseta of Spain, the proposed 25-franc piece of France, Italy, Belgium, Switzerland, and Greece, would give one common homogeneous current coin from Calais to Brindisi, and would ultimately lead both England and the United States to enter such a monetary union. It would realise at least a part of the aspirations of a generous German prince of the olden Empire. The *Edinburg Review*, in an admirable article on international coinage, in October 1866, thus translated his words:—

> Had all men but a single creed,
> Faithful to God and just in deed,
> *One weight, one measure, coin, and gold,*
> 'Twere better for all an hundred fold.

"Let us hope that some of our German friends are not rejecting this lesson, and contemplating what has been referred to in certain English newspapers are probable to happen, and, in their anti-international-phobia, even desirable—namely, to look upon the 20-mark piece and the English sovereign as capable of natural interchange without compensation or tariff. True, we Britons are simple enough to allow our poor sovereign to be treated as 25 francs only in numberless transactions. But then the difference here is only $22\frac{13}{100}$ centimes per pound sterling against us. *That* we can, and do, swallow as a trifle only; but it would trouble our deglutition if we found in hotel bills, railway fares, &c., in Germany, to say nothing of in loans, and in railway and other commercial and State obligations, our sovereign estimated as equal to 20 marks only, worth, as it would be in intrinsic value, 5d., or 60 centimes, more than that German coin."

POSTSCRIPT, 1*st December* 1871.—The German Coinage Bill has undergone important amendments before finally passing through the Imperial Parliament. The pieces of 30-marks and 15-marks have been entirely eliminated from the original measure proposed by the Government. The 20-mark piece has been retained, and a 10-mark piece introduced. The 10-mark piece is equal to 0·4895 of a pound sterling or 9*s.* 9½*d.* very nearly. 279 of the 10-mark pieces will contain exactly 1 kilogram of pure gold, so that each coin will weigh $\frac{1}{279}$ part of a kilogram of gold nine-tenths fine. The tenth part, or 1 gold mark, is to be subdivided into 100 *pfennigs*. The further coinage of large silver coins, *i. e.*, of the full value silver thalers, is prohibited; and by Article 6 of the new law, it is contemplated that another law will by and bye be passed for the withdrawal of these large silver coins, which will complete the adoption of gold as the sole legal standard in the German Empire. Until such time, and as a transition measure, the double standard, or alternative use of gold or silver at the debtor's option, is introduced for all payments which, by existing law, are made in silver money of thaler currency, of South German currency, or of Lubeck or Hamburg customary currency. The weights and values of the new coins and of the decimal subdivisions or gold equivalents of the minor coins, may be usefully epitomised as follows:—

Denomination of Coin and Subdivisions	Pure Gold Contents.	Gross or Standard weight in Gold Nine-tenths Fine.
	Grams.	Grams.
20-MARK PIECE, or 2,000 *pfennigs*	7·168459	7·964954
10 „ 1,000 „	3·584229	3·982477
1 mark, or 100 *pfennigs*	·358423	·398248
⅒th mark, or 10 „	·035842	·039825
1/100th „ 1 *pfennig*	·003584	·003982

Denomination of Coin and Subdivisions.	Value of *Pure* Gold, contents of each Coin. In Pounds Sterling and Decimals.	In nearest Shillings, Pence, and Fractions of a Penny, omitting Decimals.	In Gold Francs of France, Italy, &c.	In American Gold. Dollars
	£	s. d.	frs. c.	$
20-MARK PIECE, or 2,000 *pfennigs*	0·9790	19 7	24 ·6917	4·7640
10 „ or 1,000 *pfennigs*...	0·4895	9 9½	12 ·3458	2·3820
1 mark, or 100 *pfennigs*	0·0489	0 11¾	1 ·2346	0·2382
⅒th mark, or 10 „	0·0049	0 1	0 ·1235	0·0238
1/100th „ 1 „	0·0005	0 0½	0 ·0123	0·0024

SILK CULTURE.

From the Commissioner of Pegu, to the Secretary to the Chief Commissioner; dated Rangoon, 1st November 1871.

YOUR letter of the 18th July having been circulated to the several Deputy Commissioners, I have the honour now to submit the reports on silk cultivation in this division. In Rangoon and the Lower parts of the Bassein district the soil is too wet to allow of silk cultivation. In the latter district silk is made in the Laymyethna township in three or four villages only. A report from Mr. A. C. Man accompanies Captain Pemberton's letter; both of these officers, as well as Captain Plant, refer pointedly to Lieutenant-Colonel Horace Browne's valuable paper on sericulture, which was published in the *British Burma Gazette* of the 24th September 1870. Captain Plant, Deputy Commissioner, Myanoung, sends up with his letter a report from Captain Forbes, in charge of the Tharrawaddy sub-division in the Tapoon, Mengyee, Monio and Tsanyuay township in which silk is manufactured. In Prome, silk culture is pursued in the east of the district under the Yoma hills in the townships of Mabathaman, Kyonzoang, Shoay-lay, Myodoung, Yabein, and Kalathenga, and in the Zeebinhla circle, Pounday township, and on the western side of the district in the Talokeben and Pyeemana circles of Padoung township. Lieutenant-Colonel Horace Browne (Thayetmyo) adds to his former paper a few supplementary remarks on the particulars of climate, and the quantity and price of the silk, and the attempts to extend cultivation. In a letter of Mr. Blechynden, which he quotes, it would appear that there is no market at Calcutta for Burmese raw silk such as sent him by Colonel Browne, but that it would be worth in London from 10 to 11 shillings per lb. As this is the local selling price there would be obviously no advantage in exporting it.

From the Deputy Commissioner, Rangoon, to the Commissioner of Pegu, Rangoon, dated Rangoon, 18th September 1871.

IN reply to your docket of 19th July last, on the subject of the production of silk and treatment of the silkworm in this district, I beg to state that throughout the delta of this district the worm is not reared: even towards the northern portions, as far as Pegu, I could find no trace; but I am informed that in the strip of Bawnee (transferred to the Toungoo district some time ago) a few Toungya cultivators rear the grub; on the borders of the Henzada township a few yanbains may be found about the Thonzai circle, but the great mass of this district is too wet to enable the worm to be reared with success.

From the Deputy Commissioner, Bassein, to the Commissioner of Pegu, Rangoon; dated Bassein, 18th September 1871.

IN continuation of this office Home Department, dated 21st ultimo, I have now the honour to submit herewith copy of a letter, dated 13th September 1871, from the Assistant Commissioner of Ngathaingyoung, regarding silk cultivation in his sub-division. The only other places in this district besides those mentioned in the Assistant Commissioner's letter where there is silk cultivation, are in some of the hilly parts of the Khyoungtha township. It is nowhere carried on by any person as an exclusive business, but merely on a small scale and in addition to other employments. The same method of culture as that described by Colonel Browne

in his note on sericulture—*vide Supplement to the British Burma Gazette* of the 24th September 1870—appears to be followed out in this district, except in the treatment of the worms, which Colonel Browne describes as sharing in common with "the family of the house-owner the smoke-begrimed and dirty accommodation," and to live and thrive in close proximity to the place where the culinary and other domestic operation of the household are carried on." This does not appear to agree with the treatment of the silkworms here, which are said to be extremely sensitive and delicate, and it is assigned as one reason why silk cultivation is not much followed. Another reason is the extreme care and unremitting attention the worms require, a separate apartment being required where no bad smells, especially such as emanate from cooking operations, can reach, and where even visitors are not admitted on account of a prejudice the Burmese have of what might be called the "evil eye." The tray in which the worms are, is kept covered over with a cloth to prevent them from accidental bad smells, tainted air and other enemies. Fresh leaves are given for food daily, they being strewed on the top of the remains of leaves of former days in order, apparently, to avoid the handling of the worms, which would necessarily follow were the tray to be cleaned out daily.

From the Officiating Assistant Commissioner, Bassein, to the Deputy Commissioner, Bassein; dated Bassein, 13th September 1871.

In reply to your letter I have the honour to forward the following report on the silk cultivation of this district:—The only part of this sub-division in which silk cultivation has ever been carried on is the Laymyethna township, and there only in three or four villages. It appears to be an unprofitable occupation, for by all accounts at present there is only one man in the whole sub-division who earns his livelihood by rearing silkworms. Climate mild, but humid. Four ticals of eggs will give about forty ticals of thread. Forty ticals of silk will realize the sum of Rs. 8.

There is only one kind reared here. The Burmese have named it "anowhloa." I don't know the scientific name for it. The eggs are hatched from 8 to 10 days after being laid; as soon as the worms appear they are brushed on to a large shallow basket and are fed with mulberry leaves. In about forty days' time the silk-worms being to spin their cocoons. These cocoons are placed in a pot of hot water; filaments of silk are then caught up and wound on to a cylinder. Very little, if any, of the silk is woven on the spot. It is mostly bought and taken to other places to be woven. The fabrics woven are strong and serviceable. A full and interesting account of the silk manufacture in Burma by Colonel Browne, Deputy Commissioner, Thayetmyo, was published in the *Supplement to the British Burma Gazette* of the 24th of September 1870.

From the Deputy Commissioner, Myanoung, to the Commissioner of Pegu, Rangoon; dated Henzada, 18th October 1871.

I HAVE the honour to acknowledge receipt of your docket No. 137-4, transmitting copy of Assistant Secretary's letter relative to the culture of silk; and in reply to state that this is not at all a favourable time of the year to gather full information on the subject; whereas in the cold weather the different localities could be visited and notes in full detail made, from which a useful and accurate report could be compiled. The report now submitted is made out from the statements of persons engaged in silk culture; but no doubt trivial things to them, but what might seem worthy of note to a European, have been left out. I beg to forward a copy of Captain Forbes' report on the subject, which he has drawn up from statements of some silk workers, whom he, at my desire, called in, and his report is as full as he could make it; and with it and Colonel Horace Browne's report there is little further for me to write upon, and the following seem to be all I need note. Formerly silk culture to a small extent was carried on at the foot of the Hills, Arakan Yoma, in Khyangin township, but of late years has been discontinued. It is at present carried on in the Tapoon, Mengyee, Monio, and Tsanyuay townships of Tharrawaddy sub division, and all in places situated at the base of the Pegu Yoma. The number of silk workers in this district is put down at 800, of whom 425 are men, and the area of land under mulberry cultivation is approximately taken at 636 acres. It is impossible to give the exact area, because vegetables, &c., are grown in the same "yah," with the "pozabin;" but the area stated may be accepted as pretty accurate. There are no statistics to show what quantity of silk is produced, but the average quantity of silk per worker is set down at 9 viss; so this rate would give the average annual product of the district of 7,200 viss. The worst quantity of silk produced will fetch Rs. 18 per viss, and last year the first quantity fetched Rs. 22-8; so the average rate is put down at Rs. 20 per viss; the out-turn value of the district therefore would be Rs. 1,44,000, £14,400. This would give an average annual income of Rs. 180 to each worker, but would not represent the net gain, as the value of their labour &c., &c., should be estimated and deducted. The quality of the silk is not very good, being coarse, and not as good as that produced in Prome district, which silk is excelled by that produced in Toungoo district. The silk workers, as a rule, depend entirely on their silk produce for their livelihood, and merely sow sufficient vegetables and rice for their daily food. There is great room for improvement in the culture of silk in Burma, and, if practicable, some feasible and simple measures might be introduced. In conclusion, I would invite your attention to the papers regarding the establishment of a Silk Supply Association in London, published at page 138, *British Burma Gazette* Supplementary, dated 12th June 1869. I think also the Agri-Horticultural Society will be able to give you some valuable information, and, as well as I remember, I think Captain Pemberton or Mr. Macrone sent that Society a paper on silk culture in Sandoway district.

Report on Silk Culture by the Assistant Commissioner, Tharrawaddy Sub-division.

SILK culture has been pursued from time immemorial along the base of Pegu Yoma or range of hills extending through the Tharrawaddy sub-division of the Mayanoung district. The silk cultivators, though principally, if not entirely, Burmese, are looked down on for the reason that their *professed* occupation necessitates the taking of animal life, and live chiefly in villages apart from others. The climate is that of what may be called the medium zone of Burma, between the extreme rainfall of the south and the very small one of the north, the rainfall as registered at the head-quarter station of the district last year (1870), being 35·78. It is impossible to obtain the extent of land under cultivation accurately unless a regular measurement be made, as the land under mulberry cultivation does not pay a tax by the acre, but "1 Rupee a dha," *i. e.*, really one a head for each cultivator. A "dha" is a heavy knife used in cutting jungle. An approximation may be arrived at by taking the number of silk cultivators and assuming that each man on the average has in his family four persons capable of assisting in various ways. Each silk-working family would cultivate about two acres of mulberry. Fresh trees are planted every year, last year's trees being cut down in July, and the cuttings planted out in fresh ground, and ready for the silk-worms in the end of September or beginning of October. Never having seen any silk except Burmese, I cannot compare it with others. The price in this sub-division varies according to quantity from Rs. 10 to 20 the viss. There only appears to be one species of worm reared, which Dr. Mason calls "phaleena." The natives say that silk-worms, of eggs obtained from the Karennees, east of the Toungoo range, are far superior; but state they are of the same species. I cannot say if it be so or not. These imported silk-worms deteriorate to the same standard as the local breed in a couple of years, owing to the warmer temperature of the lower locality. The silk produced in this locality is of two colours, pure white and bright yellow. The cultivators say there is no difference in the north, but that the caterpillars which spin white cocoons have white bellies, and those spinning yellow, have yellow bellies. In the Tharrawaddy sub-division, few of the silk cultivators keep up a breeding stock during the rains, but about September or October buy eggs from the Karens and Yebains of certain villages who principally devote themselves to breeding and selling stocks of eggs. These are sold by the "cloth" (explained afterwards) at 5 or 6 "cloths" a Rupee. But to begin from the first stage, the cocoons set apart for breeding after about 8 days open and the moth appears. Shallow baskets or trays, 3 to 3½ feet in diameter and 2 inches deep, made of bamboo strips are provided. In these a number of little bamboo circles, 3 inches in diameter, are placed, and about 20 moths placed in each, which begin laying and fill the circle, a piece of very open coarse cloth having been spread at the bottom of the basket to receive the eggs. One of these circles of eggs is called a "cloth." The eggs are left to hatch for 7 to 10 days, when the caterpillars appear. After 2 days they are fed with young tender mulberry leaves for 4 days. They then remain torpid for 2 days and are then again fed for 3 days with leaves "neither too young or too old;" then follows 2 days' torpidity and 4 day's feeding as below, followed by 2 days' torpidity and 4 days' feeding on full-grown leaves. After another 2 days' stage of torpidity, they are fed on full-grown leaves 7 to 10 days, when they cease to eat and are said to be "ripe." Of course the actual duration of these periods slightly varies with the temperature, but from 30 to 35 days elapses between the first feeding and the time the caterpillar ceases to eat.

The shallow trays before-mentioned are then prepared by arranging a long strip of bamboo two inches wide like a helix, the silk-worms being placed in the divisions and a cloth thrown over the whole, and in about 2 days the cocoons are formed. These are detached from the first trays, and left for 3 days more to spin, and are then complete and ready for reeling. This goes on from October to the end of February or middle of March, which is the silk season. During the hot months, the scarcity of good mulberry leaves, and during the rains, the moisture and rankness of the leaves which effects the insects, precludes the cultivation, at least to any extent, except for the mere purposes of breeding stock. The shallow trays are ranged in tiers in the houses with the silk-worms in different stages of progress. A common earthenware

pot with hot water is kept constantly on a slow fire from the time the reeling commences; 10 to 15 cocoons are thrown in (or 8 to 10 for fine silk), a thread of each is picked up, and they are reeled off together.

A woman works the reeling machine with one hand, and with the other holding a pair of small iron nipples from time to time nips together the several threads and keeps the cocoons from being drawn out of the pot. A cocoon yields a thread about 15 yards long. The small reel turns on a fixed spindle. The large one turns *with* the spindle and takes about 20 ticals of silk, when it is removed, and a fresh reel substituted. A woman can reel one tray of cocoons about 3,000 in a day. 250 cocoons will give 1½ to 2 ticals of silk. The average amount of silk produced from one house, that is, one working family, is stated to be about 6 viss a year. About 1855, Colonel David Brown, now Commissioner of Tenasserim, then Deputy Commissioner of Tharrawaddy, sent a Thoogyee, acquainted with silk-worm rearing over to Calcutta to procure eggs, I believe, from Bengal; but he did not succeed for some reason. The silk cultivators would gladly try any new or fresh stock if supplied by Government. Except here and there a coarse "putsoe" or "tahmine" (men and women's body cloths) for their own wear, none of the silks is woven on the spot, but is sold to hawkers and taken to the large towns, where it is either woven or sold again. I cannot find that any wild silk producing insect is specifically known to the natives; of course there are other cocoon-spinning insects of, I presume, the same genus as the silk-worm occasionally found on trees, but only one here and there. The cultivators would accept any eggs of a different stock to their own and try them, but unless they possessed the same amount of hardiness as the native silkworm, and could stand the same rough treatment, I doubt it would be of any use. Improvement in the manipulation would be still more difficult to obtain, as the present mode is the easiest, and produces a rough stony article that answers all their purposes.

Report on the Silk cultivation in the Prome District by the Deputy Commissioner, Prome; dated 23rd September 1871.

THE places where silk culture is pursued in this district:—

Mahathaman,	Kalathenga,	
Kyoonzoang,	Talokebeen,	Padoung
Shwelay,	Pyeemana,	
Myodoung,	Zeebinhla,	Poungday.
Yuabein,		

These are situated in hilly parts. The climate is much the same as in the other parts of the district; rainy season from May to October, average rainfall being about 40 inches. Cold weather lasts from November to February, when the thermometer goes down at times to 48 or 50 degrees; in the hot weather the heat is great. The area under cultivation in mulberry is estimated at 1,853 acres; the land is never measured; the cultivation is what is known as "toungya." The trees are not allowed to grow to any height; they are generally not more than six feet high, and after two years are cut down and the place abandoned. Portions of the trees when cut down are cut up into small pieces, and these are planted in fresh ground at the commencement of the rains; at the close of the rains the trees are 4 or 5 feet high, and the leaves are plucked. The quantity of silk produced in the year is estimated at 6,000 viss. The quality is not as good as Chinese silk; the highest price realized for silk produced here being Rs. 25, whereas Chinese silk is sold at Rs. 35 per viss. The silk produced here varies much in quality, and this is attributed entirely to the method of handling it; some of the poorest kind is sold as low as Rs. 10 per viss. The silk-worms are supposed to be all of one kind; their scientific names are not known. The moths when ready to lay are put upon pieces of white cotton cloth on which they lay their eggs, these are then placed in large shallow baskets, and when the worms come out they are fed on the tender leaves of the mulberry. When the worm changes into dark yellow colour, it is put into another large kind of basket which has been prepared with small receptacles for each worm, and in this the cocoons are formed. When about to take the silk, the cocoons are put into boiling water, and a very rough and simple kind of instrument is used for reeling; it is merely a smooth round bit of wood placed on two supports and turned with a handle. There has been no European enterprize in this part of the country. The silk when ready is brought into Prome and Shwedoung for sale, and the greater part of it is used in those towns for weaving the silk cloths which are worn by the natives of the country. The total number of persons engaged in silk weaving, that is, whose occupation is that of weaving, is about 802. The amount of silk used by them in the year is estimated at 5,150 viss, and the total value of the articles woven is estimated at Rs. 225,077. There is no way of discovering the quantity and value of silk exported. The only place to which silk produced here is taken, is to Upper Burma. The weavers in these parts do not only use the silk produced here; those who weave the finer and more expensive cloths use Chinese silk only; others use the two silks mixed, and others again used a still inferior kind of silk called "lan," and which is said to be brought here from Siam; this latter is much less in price than the others. I am not aware of any attempts that have been made by anyone to improve or extend the culture. When Colonel Ripley was Deputy Commissioner here, some one came, I believe, from Manchester to examine the methods of weaving and dyeing silk, but I do not know with what result; there is no one now in the district who was present at that time and can give any information regarding the enquiries made by the said person. Those who rear silk-worms live in such out-of-the-way parts that no qualified person has ever visited them so as to be able to point out the defects of the existing system or suggest improvements.

From the Deputy Commissioner, Thayetmyo, to the Commissioner of Pegu; dated Thayetmyo, 5th September 1871.

I HAVE the honour to acknowledge the receipt of your Home Department No. 137-6, dated 19th July last, forwarding copy of a demi-official letter, dated 22nd June 1871, from the Secretary to the Government of India, Department of Agriculture, Revenue and Commerce, regarding silk cultivation. In reply, I have the honour to remark that on the 16th August 1870, I submitted a memorandum on sericulture in British Burma, with reference especially to the districts of Prome and Thayetmyo, which was afterwards published in the *Supplement to the British Burma Gazette*, page 272, and that this memorandum answers nearly all the queries which are now put by the Secretary to Government. All that is necessary for me to do now, therefore, is to add a few supplementary notes on some points which are not fully explained in the memorandum. The climate of the localities where silk is grown in this district may be characterized, when compared with the climate of other portions of British Burma, as hot and dry for six months of the year and moderately moist during the wet season. Rain commences to fall in May and ceases generally in October. The rainfall may be estimated at between 50 and 60 inches. No register has been kept in the neighbourhood of the localities, but the fall is believed to be somewhat heavier than it is at Thayetmyo on the Irrawaddy, where the average may be set down at about 45 inches. The months of December, January, and February are excessively cold at night, the thermometer falling nearly to freezing point, though the sun is unpleasantly warm during the day. March and April are dry and hot, the thermometer in the shade going up to 105°.

The silk produce in Burma, though admirably adapted for the manufacture of the strong coarse silks, so universally worn by the natives of the country, is of a very rough and inferior description, and would, it is believed, be almost unsaleable in Europe. The European value of a specimen of it was in 1855 estimated by the Calcutta Chamber of Commerce at 5 shillings or 6 shillings a pound, or not much more than half the price which it fetches in the local market.

Since writing the above, however, I have forwarded a specimen of the raw silk to Mr. Blecynden, Calcutta, who has favoured me with the following remarks upon it:—"The thread is much thicker than Bengal silk, twice the number of cocoons being used. There is no market here for this sort of but it would be worth in London about 10 to 11 shillings per lb." Its London price therefore would be just about the same as it fetches here. The worms kept are all of one kind, but I regret that I am unacquainted with its scientific name.

Since my attention was drawn to the silk culture of this district I have attempted to introduce it into the Thayetmyo jail. A good many mulberry trees have been planted in the precincts of the jail, and if it is thought advisable several acres could be covered with the plant this year. The tree is one which shoots up rapidly from slips. Concerning its species there is some doubt. It has been said by some to be the *Morus Indica*, but the Secretary to the Rangoon Agricultural and Horticultural Society, to whom I forwarded a plant, believes that such is not the case. A few worms have been brought up in the jail as an experimental measure. As the mulberry trees are still small, much could not be done in this way. The worms were fed chiefly on the leaves of the *Broussonetia Papyrifera*, a creeper which grows wild in great abundance in the neighbourhood. On this plant the worms thrive though they do not reach so large a size as they do when fed on the mulberry. The experiment has shown that the worms can be successfully reared in the jail. Only one misadventure occurred, —a misadventure which showed that the Burma silk worm is extremely sensitive to smells to which he is not accustomed. The jail was being tarred, and as soon as the smell penetrated to where the worms were, they at once died off.

DISCOVERY OF PETROLEUM NEAR THAYETMYO.

From the Superintendent, Geological Survey, to the Officiating Assistant Secretary to the Chief Commissioner; dated Prome, 13th November 1871.

THE petroleum locality near this, is situated 11½ miles due west of Prome Pagoda, on a small stream falling into the Booyoo-choung, and 3 miles above the village of Town-bo-gyee on the same small

stream, which has no name on the map, but is locally known as Mahn-choung. The locality is best approached from the village of Yethian, 6 miles above Prome, on the opposite bank of the river, where a tolerable, fair-weather road, not however in its present state, practicable for carts, exists. The distance from Yethian, as the crow flies, is 9 miles, but the natives estimate the road as 12, which is near or a little under the truth. No permanent village exists, but about 35 houses of men solely engaged in the preparation of catechu are at present located there, the main drawback to permanent occupancy being want of water, At this spot (Mahn-choung-na) four square shafts, with six feet sides, have been sunk on or in the bed of the stream, in a line having an E. by N. bearing, and less than 100 yards in length. The highest shaft No. 1 is now obliterated by a land slip from the adjoining hill side. According to my information, it had been carried down to a depth of 20 cubits without yielding oil. Shaft No. 2 is situated some little way further down stream, and this is the only one that deserves our attention. Shafts No. 3 and 4 are again situated below No. 2, and though sunk to 25 cubits or so, have yielded no oil or next to none but strong indications nevertheless, of its presence. These shafts are full of water, but capable of being emptied and made use of, and the sides of all are supported by 2-inch planks of either that or pyeegado *(acacea catechu. Ingasylocarpa.)*

Shaft No. 2 is situated in the actual bed of the stream, which is here deflected round it through a short cutting. In it at 9 feet from the surface oil was reached, and to the lowest point attained, or 35 cubits, oil steadily trickled in, at the rate of from 2 to 2½ viss per diem, till the work was abandoned from the rain filling the shaft with water, in which condition it at present remains. From this shaft some 200 viss or thereabouts of oil has been obtained, thereby practically solving the question of its existence here in considerable quantity. The opinion of the men employed in the construction of this shaft, and who were men acquainted with the petroleum well of Yenan-kyoung, is, I believe highly favourable to the ultimate success of the undertaking, and their advice is to deepen the shaft to 80 cubits if the oil is not got copiously sooner. These men say (speaking probably from a well-grounded analogy) that the blue clay, in which the shaft at present lies does not itself yield the oil, but that no piercing it a yellowish sandy stratum will be found, from which a copious flow of water and oil will take place with considerable force, and accompanied by a simmering noise. They also state that at Yenan-kyoung oil is not commonly met with so near the surface as at this spot, and that all the most productive wells are sunk under deeper. I may here remark that the spot lies well within the area of the nummulitic formation, wherein I conceive the oil to originate, and the shafts have all been sunk in beds of blue clay or shale, compact and clunch (here and there exhibiting sign of induration), and containing small foraminifera, and seeming to correspond on geological position with some of the beds exposed on the bank of the Irrawaddy, above Ilton-bho (Akouk-toung), though their relations are not well seen near Mahn-choung in the undulating clay country stretching towards the river, and occupied along the line of junction of the nummulitic and newer group by tree forests wherein rocks are rarely visible. The lower beds of the newer group are also blue clays, and the result to the Physical Geography of the district is a belt of undulating clay country singularly devoid of water from the impermeable character of the soil, so much so as to necessitate the abandonment of many of these catechu villages in the hot season from the failure of water, not only for personal use, but which is required in moderate quantity for the process of manufacture of "kuth" (catechu). I have stated that up to the period of the abandonment of work from the shaft filling with water, a daily yield of 2½ viss of oil was obtained, which thereupon ceased. The cause of this is I think a very simple one. The oil which steadily trickled into the shaft as it was being excavated seems to have done so through the mere force of gravity, and by simple percolation from the cracks and fissures of the rocks on which it lay accumulated, and unaccompanied by either water or the peculiar simmering sound which the miners describe as indicating the flow of petroleum when a spring of that substance has been reached. Hence it follows that on the shaft becoming re-filled (with water) the pressure of a column of water, 80 cubits or more in height, could amply suffice to arrest any further flow of oil by the mere force of gravity, and no fresh flow or rather exudation of oil is likely to take place till the shaft is once more emptied and the pressure removed. Adverting now to the question regarding the steps I would propose being taken by Government for definitely ascertaining the practical value of the above discovery of oil, I would respectfully suggest the following course towards that end. Inasmuch as shaft No. 2 appears to have been very happily chosen, and to have been carried down with a fair amount of success (not to speak more encouragingly) it would seem to be a preferable plan to continue the deepening of this shaft, rather than at present to expend money with a similar object in any adjoining locality. From the letter of the Deputy Commissioner, dated 27th July 1871, I infer that during the present cold season, shaft No. 2 will be steadily continued, and in order that work may be pushed on as unfaltering as possible, I would suggest that an immediate grant of Rs. 1,000 be made to the owners in aid of the work, and even a promise passed of an additional amount at the discretion of the Deputy Commissioner should the work be well and satisfactorily carried down without result to 100 cubits. This grant, it should be explained, is made with the specific object of testing the capabilities of the locality and without prejudice to the owners' right to the shaft should the experiment prove successful; and the above course seems to me, not only as advantageous a mode as any of applying public money in the experiment which the Government seems willing to make, but a well-deserved recognition of the spirit of enterprise which the first promoters of the scheme havd displayed, and a perfectly legitimate aid, circumstances consideree towards the end in view. It may then be assumed that with the aid from Government of a few thousand Rupees shaft No. 2 will be carried down to a depth, if necessary, of 100 cubits; should, however, the comparatively unproductive blue clay have not been pierced at that depth, it will be time to consider if the work be still carried on or not, or if recourse be then had to bording, our argument in favour of the former course lying in the fact of this description of well-sinking being familiar to the natives, and requiring no skilled European superintendence, as would be the case in any experiment carried on with boring tools; and if it is the pressing desire of Government to settle once and for ever the question of profitably working the oil here, it might be, and I think would be the cheapest and best plan to that end, to carry down the shaft (if requisite) to the maximum depth at which the oil is anywhere worked in Upper Burma; and the present spot affords, in my opinion greater warrant for so doing with a prospect of success than any other with which I am acquainted. I am unable to state the greatest depth from which petroleum is obtained at Yenan-khyoung or elsewhere in Upper Burma; but the British Resident at Mandalay could doubtless without difficulty procure correct information on this head if requisite; but I do not think I need add more at present on the subject, as I have above endeavoured to state all the material facts at present bearing on the case, and the means which seem fittest and best to me, to practically settle the question at issue.

From the Superintendent, Geological Survey, to the Officiating Assistant Secretary to the Chief Commissioner; dated Thayetmyo, 24th November 1871.

The most important shaft (No. 1) whence petroleum has been obtained lately near the village of Ban-byin (Pan-pyeng in map) lies 12½ miles W. N. W. from the circuit house, Thayetmyo, and about a mile above the village of Ban-byin on the bank of the stream, falling into the Irrawaddy a little above Thayetmyo. A little below the above spot (shaft No. 1) a shaft was commenced in the river bank where indications of oil existed, but the whole has now been swept away by the river, or obliterated by the falling of the bank. A little further back from the bank of the stream a few excavations have been also made, but without result. About a mile or less north of the first shaft, two small excavations were made in the bed of a small stream, from one of which a little petroleum was procured, but beyond the indications afforded over a considerable tract of country of the presence of the oil in the rocks at a small depth below the surface, there is nothing of particular interest at any of these spots; neither are any of the wells systematically sunk and boarded, hence they are all now more or less fallen in and unserviceable, and shaft No. 1 is full of water as well. The beds in which the oil occurs are blue shales with some few intercolated beds of hard rather calcareous sandstone, and contain numerous fossils (ostrea, tellina, arca, solen, pecten 2 species, cytherea ?, conus, cyproa, turritella, crabs' claws, a small barnacle, one or two branching corals, and teeth of two species of the shark family) characteristic of the great miocene formation of the district, the distance from the nearest point of the numulitic formation being 4 miles. These beds are on about the same geological horizon as those wherein the now abandoned wells near Padoukben were sunk, and the entire intervening country seems to consist of these same beds dipping in different directions at usually low angles.

The geological position of the oil here is unquestionably curious, as on the presumption that it originates in the underlying numulitic group; a thickness of beds, speaking in round numbers, of some 2,000 feet and probably more, must intervene between the source of the oil and the beds wherein it here finds its way to the surface. It is not my opinion that the entire intervening thickness of beds is necessarily saturated with oil, but rather that it rises through these strata, along certain lines of pasture and permeability (such as a crushed anticlinal would afford) till meeting with such porous beds as the more arenaceous of these clays are, which here form the surface of the country, it becomes diffused among them in an irregular fashion. These soft, shaly, and arenaceous beds dip over all this country at low angles, as a rule, and from their yielding character give no indications of the condition or arrangement of the rocks far beneath them; but the above supposition of mine of the oil rising from a great depth to the surface along certain lines of disturbance is in accordance with what may be presumed to be the condition of the lower strata, and the result of these deeply-seated forces and movements, whose maximum effect we see in the

elevation of the Arakan Hills to the west. With the above diagnosis of the conditions under which the oil is here met with, it is obvious that no reliable opinion can be found beforehand of the success that would attend the sinking of a deep shaft, but that it all depends on the shaft being so sunk as to intercept the path (so to speak) along which the oil, here seen diffused through the strata, rises from below, in which case it is probable a fair amount of oil might be won.

It is the intention of the owner of the existing shaft, a Chittagonian Mussulman, to re-open it this cold season, and plank its sides, and deepen it, but I doubt its being done effectively from its faulty and dangerous position under an overhanging bank of tender materials, besides the risk it runs, if some rude groin is not thrown out to divert the river, of being swept away by the stream. I do not consider this man to be a proper person to whom the experiment should be entrusted; but as he has displayed considerable zeal, and incurred some expense in his exploration of this locality, a small grant of money might be made in aid of his future efforts. The boring need not be conducted to a greater depth than 150 feet, for which length I believe Major Twynam has now at Prome rods and the requisite gear, and also could depute a European of his department accustomed to their use. The road is unfortunately extremely bad, but the rods might, I presume, without much difficulty be transported on a rude sort of sledge drawn by bullocks, which would cost but little, and be more adapted to the work and roads to be traversed than a wheeled conveyance. In the event of a boring not revealing any sufficient source of oil, the question suggests itself to me, if the shales, saturated as they seem in places with the mineral, might not be made available for its production by a process of distillation in retorts, such as is in Europe adopted in the case of shales rich in oil. I merely however throw out this suggestion without giving any opinion or a question, respecting which I have no trustworthy means of judging.

NEW SETTLEMENT RULES.

THE PUNJAB.

To the Commissioners Peshawar, Dehrajat, Delhi, Settlement Commissioner and all Settlement Officers,—dated Lahore, 21st November 1871.

In compliance with the orders contained in the Secretary to Government Punjab's No. 772 of the 15th of December 1870, to the Secretary to Financial Commissioner, suggesting that in future Settlement Officers should be required to submit for the consideration and approval of the Financial Commissioner and the Government, a detailed statement of the principles and data on which they propose to frame their assessments, before announcing them; the following orders are issued for the guidance of all Settlement Officers in the Punjab:—

In framing these rules the Financial Commissioner has made use of a Circular of the Board of Revenue North-Western Provinces, No. 5, dated the 14th of June 1871. Before announcing the assessments of any tract of country, the Settlement Officer must submit a report, showing the revenue rates he proposes for adoption, the reasons which have led to the adoption of these rates, and the result on the land revenue which will follow if they are applied. It is not desired that these reports should be prepared according to one uniform model, or that one set of rules should be applied to all districts; the circumstances of districts vary so much, that such uniformity is impracticable, and any attempt to enforce it would be injurious; but there are certain headings which each report ought if possible to contain, and they should be arranged in the following parts:—

I.—Physical Geography.—First, an account of the physical geography of the Tahsil or tract under report. This should show the circles into which villages have been arranged for purposes of assessment, and the salient characteristics of each group of villages which have let to its being formed into a separate circle.

II.—Fiscal History.—A succinct and clear account of the history of the past assessments of each Tahsil, and so far as can be ascertained of the working of the several successive Settlements, whether summary or regular. This will include a description of the several classes of tenures, with the area held under each class, an account of the castes and numerical strength of the cultivating classes, whether landlords or tenants. A distinction should be drawn between those landlords who cultivate themselves and those who do not, and an account should be given of any alterations of demand made during the expired Settlement. The amount of coercion required to collect the land revenue; the extent to which proprietary rights have been affected by sale or mortgage; the average price of land per acre; the number of years' purchase, and the amount of purchase money per rupee of Government demand, should be shown, where this information can be obtained.

III.—Results of the last Settlement.—A comparative view of the statistics of the Tahsil at the last and present Settlement.

This should show, in a tabulated form, the amount and percentages of increase in cultivation and irrigation, with the proportion borne by the area actually cultivated and irrigated to the entire culturable area; and a detail of the different kinds of soil irrigated and unirrigated. The percentage of produce of each class should also be given here. The information above required will be contained in form No. I, attached to this Circular, but should be noticed here. The main causes which have led to alteration in the condition of each Tahsil should be stated. These will include:—

(*a.*) A statement showing the alteration in the value of produce during the last twenty years, or during the period for which such variations are ascertainable. This statement should be divided into quinquennial periods.

(*b.*) An account of improvements in communications, whether of lines of railway, metalled or ordinary roads, opening of markets, &c.

(*c.*) A notice of the increase or decrease of population, as exhibited in columns 30 and 31 of form No. I.

(*d.*) A classified statement of the holdings of tenants, showing separately the area held by tenants with rights of occupancy, and those without rights of occupancy, distributed according to the varying rates of rent in cash, or in kind, which are found to exist. This statement will be shown in form No. II, appended to this Circular.

IV.—Statistics as to produce.

(*a.*) An account should be given of experiments or enquiries made with the object of ascertaining the average yield of the principal staples in the districts under report; the mode in which such experiment or enquiry was conducted; and in the case of experiments, the area over which they extended. The result of these experiments should be reported in form No. III appended to this Circular.

(*b.*) The general abstract of area under crops showing the yield per acre of each description of crop, the assumed average price current, and the area under each crop, present and former, will be shown in form No. IV attached to this Circular.

V.—Proposed rates.—Heretofore under the orders of Government contained in the Secretary to Government Punjab's No. 594 of the 20th June 1864, the rule that one-half of the net assets should be the limit of the Government demand, has been followed in revised assessments. This rule was adopted from the North-Western Provinces, where tenant cultivation prevails more largely than in the Punjab. In this province a large proportion of the land is held by cultivating proprietors, and the reports of the province show that competitive rents were formerly completely unknown. Under the Sikh rule the Government either took revenue in kind or levied money rents based upon an estimate of the value of a share in the produce of land; and the value of the share taken from cultivators where payments are made in kind by tenants to landlords, rather than the amount of half-assets, should be taken as a guide for fixing the assessment. Where money rents are unusual or are fixed by custom without competition of any kind, the amount received by the landowners as proprietary dues, when added to the Government demand, must obviously form a fallacious basis for fixing the assessment; but this is what is adopted under the half-asset rule. With the sanction of the Local Government, the rule laid down in the letters marginally noted, is cancelled; and it is hereby declared that the basis of assessments shall in future be a share of the gross produce, the amount of which is to be fixed by the Local Government. For zabti crops, which it has not been customary to divide, but for which money rates were fixed under former Governments, the value of the Government share should be estimated according to the money rates formerly in force, or those which now regulate the rents of tenants. The revenue rates proposed for each circle should be given with a clear and concise account of the manner in which they have been arrived at. The proportion of gross produce assumed to represent the Government demand (which is to be one-sixth approximately, unless for special reasons a different rate has been adopted), and the value of grain and money rents as applied to the crop and area statements of the assessment circles, should be stated. The data on which conclusions on these points are based cannot be too carefully given.

VI.—Financial results.—The anticipated financial results of assessment, based on the proposed rates, as contrasted with those of the expiring settlement, and with the rates in adjoining Tahsils whether of the same or neighbouring districts.

The forms to be used in this report are four in number:—

Form No. I is the general abstract of area, resources, and rates.
Form No. II is a classified statement of tenant-holdings.
Form No. III is a new one, laid down for reporting the result of experiments made to ascertain the yield of crops.
From No. IV gives an abstract of area under crops, showing the productive capacity of the several assessment circles.

No Settlement Officer is at liberty to adopt any forms differing from those laid down, without the previous sanction of the Financial Commissioner.

With the assessment report a tabulated statement should be submitted, showing for each Tahsil the old demand without including cesses, the demand at assumed revenue rates, and the demand without cesses proposed for sanction. A statement should be drawn out to show the number of cesses payable in each Tahsil,

and the proportion borne by them to the Government demand. As soon as the proposed assessments have been sanctioned by Government, a corrected Towzi should be furnished to the Collector, in supersession of the Towzi of the expired settlement. The final settlement report of the district should be submitted when the operations subsidiary to and subsequent to assessment have been completed for the whole district.

FORM No. I.

GENERAL ABSTRACT OF AREA, RESOURCES, JAMA AND RATES IN THE SEVERAL ASSESSMENT CIRCLES OF TAHSIL DISTRICT OF

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
			Number of Mehals.				Section I.—(Area as Arranged for Assesement in Acres.)										Section II.—Resources and Capabilities considered in different Aspects.																
							Minhal or not assessed.				Malguzari or Assessed.						Area in Acres, and Percentage of total area.				Percentage of produce arranged in classes, See Form IV.				Ploughs and Cattle				Population.		Wells.		
														Cultivated.														*Average per*				*In use.*	
Serial Number.	Name of Chakla or Assessment Circle.	Former and present Statement compared.	Khalsa.	Khalsa and Shared.	Jagir.	Total.	Total Area.	Waste.	Math or Revenue Free.	Total unassessed.	Culturable.	Abandoned.	Irrigated.	Unirrigated.	Total.	Total of Cultivated and Abandoned.	Manured	Irrigated.	Zabti.	Paikasht.	I.	II.	III.	IV.	Number of head of plough cattle.	Entire number of head of cattle.	Plough.	Cultivator.	Number of	Per square mile of cultivation.	Old.	New.	Out of use.
	Name ..... { Former, Present,																																
	Grand Total ..... { Former, Present,																																

35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62
	Section II.—*Continued*						Section III.—Summary and last Settlement Jama, Compared.						Section IV.—Proposed Jama, Worked out from rates and Estimates.														
	Water Capacity.				Capacity for Expansion						Rates on Cultivation.		Rates adopted in Assessment.					Estimates Adopted.								
Average rain-fall in inches	*Water from wells.*						Summary Settlement—Jama of							*Irrigated.*												
	Average depth of wells in feet to the water.	Average cost of constructing a well.	No. of yoke of oxen required per well.	Area one well can irrigate in a year.	Total area uncultivated, and percentage of area uncultivated to total area (in red ink.)	Head of cattle per acre.	Revenue rate Jama of last Settlement.	Jama of last Settlement as in old No. II. Village Statement.	Jama of last Settlement as subsequently reduced A. D.—		Of Summary Settlement.	Of last Settlement Jama as per column 45.	On Ploughs.	Well.	Canal.	Unirrigated.	Abandoned.	On Ploughs	On Produce 1—8th of Gross Produce.	As per new revenue rate.	Present Jama of *Sunnud* with rate on culturable area.	Proposed Jama with rate on cultivated area.	Remarks.

Notes for the preparation of this Form :—

(1.) In columns 18 to 21, the number of acres is to be entered in black ink, and the percentage they bear to the total area in red ink.

(2). The head of cattle per acre should be calculated on the total area assessed as shown in column 17.

(3). In Section IV the blank columns 53, 54, 55, and 56, should be filled in according to the different estimates adopted in different settlements.

This form is slightly altered from Form No. V of the Forms introduced by Mr. Prinsep Settlement Commissioner, with the approval of the Financial Commissioner.

FORM NO. II.

CLASSIFIED STATEMENT OF TENANT-HOLDINGS.

1			2	3	4	5	6	7	8	9	10	11	12
Tenants with right of Occupancy.													
On ground I. Section XI. Chapter III, Act XXVIII of 1868.	On ground II. Section XI. Chapter III, Act XXVIII of 1868.	On ground III. Section XI. Chapter III, Act XXVIII of 1868.	Total area held by tenants with rights of occupancy.	Percentage of total cultivated area held by tenants with rights of occupancy.	No. of tenants-at-will paying rent in cash.	Average rent paid in cash.	Total area held by tenants paying rent in cash.	Percentage of total cultivated area held by tenants paying rent in cash.	No. of tenants paying rent in kind.	Share of produce paid by tenants holding at rents in kind.	Total area in acres held by tenants paying rent in kind.	Percentage of total cultivated area held by tenants paying rent in kind.	Remarks.

NOTE.—In column 9 one of the blank columns should be filled up, according to the different shares of the gross produce paid by tenants who pay in kind.

FORM NO. III.

FOR REPORTING EXPERIMENTS MADE TO ASCERTAIN THE AVERAGE GROSS OUT-TURN OF CROPS.

1	2	3	4	5		6			7	8
District	Tahsil.	Village.	Name of observer.	Area of land observed, irrigated or unirrigated.		Amount of Seed,			* Out-turn.	Remarks.
				Local measure.	Square yards.	Actually sown on observed area.			Rate of seed sown per acre.	
						M.	S.	C.	M. S. C.	

In this column it should be stated whether the land was manured or not, and whether if not manured, it was near the village site. Also whether the crops was considered a good one or not by the people.

* This column must be filled up according to the description of crop experimented on :—

EXEMPLAR.	
WHEAT.	
Grain m. s. c.	Straw. m. s. c.
COTTON.	
Cleaned m. s. c.	Uncleaned. m. s. c.
Cleaned Fibres. m. s. c.	
SUGAR.	
Gúr.	Rás.

And so on for each different crop.

FORM NO. IV.

GENERAL ABSTRACT OF AREA UNDER CROPS, SHOWING PRODUCTIVE CAPACITY IN THE SEVERAL ASSESSMENT CIRCLES OF

TAHSIL DISTRICT

Name of chakla or assessment circle.	Present Status.	Crops of the 1st order of value.		Total.	Crops of the 2nd order of value.		Total.	Crops of the 3rd order of value.		Total.	Crops of the 4th order of value.		Total.	Total area under crop.	Jama value of 4th gross produce.	Remarks.
Average price current for years.																
	Yield per acre															
	Area															NOTE.—This form is No. VI of the forms introduced by the Settlement Commissioner.
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															
	Yield per acre															
	Area															
	Value of gross produce ..															

MISCELLANEA.

WE learn from an American paper that there are found at Fungshao extensive wells of rock-oil. This oil, the writer informs us, does not in anything but its smell resemble petroleum, being more like a mineral resin-oil. It has the peculiar quality of expanding and contracting with the heat and cold much more than any other earth-oil. The natives use this article for various purposes, and large quantities are exported to China where it is considered a valuable medicine. The Chinese doctors have great faith in bad smelling compounds, and a patient treated with this oil smells like a kerosine-lamp. It is generally prescribed for diseases of the skin, but is also often given to women suffering from excessive grief. It is highly probable that the nauseating effect of this remedy distracts the attention of the troubled one, and causes her to forget her sorrows."

MR. CALDWELL, in the *Sugar-Cane*, gives the following graphic account of an invasion of locusts which he witnessed some time ago in New Caledonia :—

"About half-past seven in the morning the air became literally darkened for days and days, with countless myriads of winged insects about two inches long as close as rain in a shower, following each other in endless succession and devouring all verdure as they passed. I was that day at St. Louis, and from the Mission house, raised about 50 feet above the fields below, saw in the plain Mr. Denis's fields of eighteen acres of tall maize nearly ready for gathering, *eaten up in twenty-five minutes*, nothing being left but the hard portion of the stalk perfectly denuded, and the midribs of the leaves. They would soon have made equal havoc amongst the canes and rice; but the whole population of the Mission, adult and children, male and female turned out with horns, drums, tin cases, and everything capable of making a noise, which frequently scares them and prevents them from alighting in any numbers. For many days, the chief part of the labouring population was thus employed in watching, walking up and down among the growing crops. The confusion and disturbance is best compared to the scene a Mauritius estate presents when there is a fire in the cane fields. Yet this is but the first act of the tragedy. This early swarm lays eggs from which is born a new generation some five or six weeks afterwards, repeating the same devastation, and aided by constant accessions from behind, for the insects keep always moving onward. And so it goes on until the cold weather comes, or a storm drives them into the sea when they disappear as suddenly as they came and are seen no more for six or eight months, unless, as sometimes happens, their dead bodies are washed ashore in such quantities as to poison the air with their stench. The visitation I witnessed was the fifth in five successive years. In Nouméa the streets were so thickly covered with them that passengers in walking crushed them under foot, and in the neighbourhood they had left miles of grass land so utterly denuded of verdure, that the cattle had to be driven elsewhere to avoid starvation. In February 1870, they had attacked the young plantations of canes at St. Vincent, (Tamoa) Bulupari, and Poitoe, all of which they eat up, and had seriously damaged many of those at Conception, St. Louis, and the Dombea, so much so that many planters began to get disheartened, and one at least (a Mr. G.) was about to give up any further planting till he saw some likelihood of getting rid of them. They do not attack cotton, coffee, or manioc; but the first two have each their own special enemy which is not so fatal however as the locusts."

STATEMENT showing the Amount of each kind of CURRENCY NOTES of the BOMBAY CIRCLE in circulation on the 15th and 22nd December 1871 and 31st January 1872.

Date.	Denomination of Notes.						Total Value.
	10 Rs. Value.	20 Rs. Value.	50 Rs. Value.	100 Rs. Value.	500 Rs. Value.	1,000 Rs. Value.	
1871.							
15th Dec.	32,69,020	16,52,580	21,58,500	58,48,000	26,28,500	2,89,88,000	4,45,44,600
22nd „	33,02,510	16,31,020	21,64,600	58,28,100	23,46,000	2,89,79,000	4,42,51,230
1872.							
22nd Jan.	32,73,390	16,71,000	23,13,250	59,57,100	23,23,000	4,33,71,000	5,89,08,740
31st „	32,32,780	16,27,040	23,65,200	58,69,300	21,80,300	4,05,03,000	5,57,78,020

STATEMENT of the amount of INDIAN GOVERNMENT CURRENCY NOTES IN CIRCULATION, of the amount of COIN and BULLION RESERVE, and of the GOVERNMENT SECURITIES held by the Department of Issue of Indian Paper Currency.

Date.	Circles of Issue.	Balance of Issue Account.	Returned by other Offices of Issue.	Currency Notes in circulation.	Silver Coin Reserve.	Silver Bullion Reserve.	Gold Bullion Reserve.	Reserve in Government Securities.	Total Reserve.
		Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.
31st Jan. 1872 ...	Calcutta	5,17,09,750	6,35,750	5,10,74,000	1,44,31,666	78,08,488	72,[illegible]	2,75,11,631	4,98,24,280
Ditto ...	Madras	1,04,97,530	4,81,780	1,00,15,750	47,73,816	...	...	17,28,404	65,02,220
Ditto ...	Bombay	5,57,78,020	59,42,870	4,98,35,150	1,85,90,337	1,23,11,534	...	[illegible]25,35,209	5,34,37,080
Ditto ...	Allahabad	38,56,460	1,96,660	36,59,800	16,89,769	...	...	[illegible]03,291	27,93,060
Ditto ...	Lahore	81,44,030	12,10,650	69,33,880	49,93,683	...	...	27,[illegible]037	76,93,720
Ditto ...	Calicut	13,03,540	77,750	12,25,790	11,08,781	...	...	1,00,[illegible]	12,08,840
Ditto ...	Trichinopoly ...	8,05,830	2,42,930	5,62,900	5,14,561	...	...	1,00,0[illegible]	6,14,620
Ditto ...	Vizagapatam ...	3,79,010	12,420	3,66,590	1,75,111	...	...	1,00,059	2,75,170
Ditto ...	Nagpore	21,30,100	5,86,410	15,43,690	5,51,518	...	...	5,47,902	[illegible]99,420
Ditto ...	Kurrachee	68,95,020	24,00,630	44,94,390	41,13,704	..	...	27,00,106	[illegible]2,810
Ditto ...	Akola	12,98,190	1,89,250	10,99,940	5,49,160	...	...	...	5,[illegible]60
	Total ...	14,27,97,480	1,19,86,100	13,08,11,380	5,14,92,106	2,01,20,022	72,495	5,91,26,757	13,08,11,[illegible]

SILVER received and coined in the MINTS of CALCUTTA, MADRAS, and BOMBAY, 1871.

	CALCUTTA.			MADRAS.			BOMBAY.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rupees.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
July	2,497	15,832	...	...	...	...	...	46,973	...
August	33,651	62	...	...	...	...	...	19,257	...
September	12,489	...	...	...	...	...	...	27,736	...
October	25,938	...	...	...	...	...	73,092	80,319	...
November	1,887	13,19,754	...	...	...	...	...	10,94,183	...
December	...	15,62,128	7,71,167	...	...	...	...	23,02,735	...

CASH BALANCES in the GOVERNMENT TREASURIES in INDIA, 1870-71, contrasted with previous Years.

	July 1871.	Aug. 1871.	Sep. 1871.	Oct. 1871.	Nov. 1871.	Dec. 1871.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	3,81,91,334	3,92,77,872	3,89,72,852	3,59,15,905	3,98,51,466	4,02,70,407
Bengal	1,95,17,588	1,79,50,429	2,08,27,000	1,84,17,325	1,91,33,183	2,01,35,106
British Burmah	28,67,665	34,53,591	41,82,232	43,65,308	42,92,024	41,52,038
North-Western Provinces	2,82,88,228	2,54,18,247	2,26,47,816	1,96,63,189	2,31,89,522	2,58,55,243
Oudh	66,11,265	58,66,363	51,26,262	42,12,414	47,35,848	51,67,008
Punjab	1,34,38,354	1,26,99,032	1,30,89,900	1,13,10,001	1,05,36,066	1,25,11,134
Bombay	3,80,62,880	3,74,32,152	3,64,55,763	3,76,99,545	3,60,09,377	3,58,37,832
Central Provinces	86,49,613	82,36,688	79,07,239	76,69,327	85,95,053	77,05,555
Madras	2,87,96,862	2,71,84,195	2,34,57,269	2,07,68,534	1,79,66,827	2,10,46,575
	18,44,23,789	17,75,18,569	17,26,66,333	16,00,48,548	16,43,09,366	17,26,80,900
The same month 1868-69	10,94,54,805	10,02,49,204	9,04,93,920	7,89,69,348	8,14,11,652	9,77,02,951
Ditto 1869-70	14,00,50,689	12,29,02,765	11,28,90,937	10,73,15,338	11,75,13,672	12,84,73,346

THE BANK OF BENGAL.

Statement of Affairs.	6th Feb. 1872.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,40,869 7 0
General Treasury Balance at Head Office	3,28,43,782 11 9
Do. Do. at Branches	1,93,15,752 6 11
Other Deposits at Head Office and Branches	2,44,04,840 3 4
Bank Post Bills, &c.	13,44,991 2 8
Cash Credit undrawn	.....
Sundries	7,58,246 3 10
Total Rs.	10,22,08,482 3 6
Assets.	
Government Securities	93,77,060 12 0
Loans on Government Securities at Head Office and Branches	86,28,183 12 10
Accounts of Credit on do. do.	1,64,45,383 15 2
Mercantile Bills discounted at do.	2,00,87,845 4 5
Dead Stock	11,87,081 12 3
Stamps	14,012 9 0
Balances with other Banks.	3,82,513 7 11
Sundries	1,46,407 10 3
Cash and Currency Notes at Head Office.	1,62,11,164 0 0
Cash and Currency Notes at Branches	2,97,28,828 15 8
Total Rs.	10.22,08,482 3 6

THE NEW BANK OF BOMBAY.

Statement of Affairs.	10th Feb. 1872.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance at Head Office	8,86,337 0 0
Do. do. at Branches	86,929 0 0
Deposits at Branches	1,37,[illegible]692 0 0
Bank Post Bills outstanding	4[illegible] 0 0
Reserve	5,00,0[illegible] 0 0
Undrawn Cash Credits	9,52,160 [illegible] 0
Total Rs.	6.07.97,203 0
Assets.	
Government Securities	31,57,678 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	24,19,022 0 0
Credits Accounts do. do. on Gov. Sec.	97.12,716 0 0
Current accounts, overdrawn	5,590 0 0
Bills discounted and purchased at do.	1,36,11,148 0 0
Dead Stock and Less written off	4,37,943 0 0
Stamps.	6,936 0 0
Balance with Agents and Correspondents.	4,93,681 0 0
Government Reserve Cash.	.....
Cash and Currency Notes at Head Office.	2.97,99,078 0 0
Do. do. at Branches.	.....
Bullion at Head Office and Branches	11,53,411 0 0
Total Rs.	6.07,97,203 0 0

THE BANK OF MADRAS.

Statement of Affairs.	3rd Feb. 1872.
Liabilities.	Rs. A. P.
Capital.	56,25,000 0 0
Public Deposits at Head Office	43,38,679 13 11
Do. at Branches.	70,03,755 5 0
Other deposits at Head Office and Branches	90,74,253 1 10
Cash Credits undrawn at do	1,42,627 10 1
Post Bills	24,923 8 9
Reserve Fund.	5,50,000 0 0
Rest	52,563 4 10
Total Rs.	2,68,11,802 12 5
Assets.	
Silver and Notes at Head Office	40,65,564 3 4
Silver and Notes at Branches	75,09,456 4 8
Government Securities	10,15,785 9 1
Government Reserve—Cash	18,38,679 13 11
Securities	.....
Loans at Head Office and Branches	32,50,209 3 3
Accounts of Credit at Head Office and Branches	3,57,710 0 0
Mercantile Bills discounted at Head Office and Branches	54,68,536 14 7
Dead Stock at Head Office and Branches.	2,34,819 8 0
Bills of Exchange do	23,69,253 3 7
Due by other Banks.	7,01,788 0 0
Total Rs.	2,68,11,802 12 5

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54	4 per cent Loans.						4½ per cent.		5 per cent.		5½ per cent Loan of 1859-60.	5 per cent. Debentures for						Total Amount.
		[illegible] of [illegible]-39.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1865.	of 1856-57.	Transfer Loan dated 15th July 1870.	P. W. of 1854-55.	of 1856-57.		2 years.		3 years.		5 years.	10 years.	15 years.	
													Repayable Jan. 1869.	4½ per cent Transfer Loan.	Repayable Jan. 1870.	4½ per cent Transfer Loan.	Repayable June 1872.	Repayable June 1877.	Repayable June 1888.	
15th June 1871...	53,100	[illegible]	[illegible]	19,62,027	40,56,200	1,50,93,200	1,20,75,700	1,46,69,900	14,500	47,09,000	68,700	5,40,90,900	4,43,50,100	.....	.....	1,65,000	18,60,000	31,81,000	33,46,000	37,11,000	16,23,42,314
31st July 1871 ...	53,100	[illegible]	[illegible]	19,57,653	40,95,300	1,49,21,600	1,23,24,700	1,42,85,600	14,500	39,43,700	67,700	5,30,05,900	4,36,00,100	.....	55,000	1,65,000	18,96,000	31,70,000	33,46,000	36,66,000	15,98,70,106
15th Aug. 1871 ...	53,100	[illegible]	2,347	19,52,213	40,87,200	1,49,36,900	1,23,50,000	1,42,71,000	14,500	39,24,200	67,700	5,23,95,600	4,30,37,100	.....	55,000	1,65,000	18,60,000	33,46,000	36,76,000	8,72,000	15,82,39,066
15th Sept. 1871...	53,100	[illegible]	2,347	19,52,213	40,88,700	1,49,79,900	1,22,53,300	1,41,22,000	14,500	33,32,800	10,700	5,09,77,100	4,32,52,800	.....	26,600	1,65,000	10,61,000	27,03,000	33,46,000	36,76,000	15,56,91,366
31st October 1871.	53,100	[illegible]	2,347	19,52,213	40,75,300	1,49,85,200	1,22,15,400	1,38,53,400	14,500	32,98,900	10,200	5,02,41,200	4,23,44,300	.....	.....	.....	.....	27,03,000	33,46,000	36,65,000	15,36,60,966
15th Nov. 1871...	53,100	28,[illegible]96	2,347	19,51,893	40,76,400	1,51,33,300	1,21,36,000	1,37,38,500	14,500	33,24,200	10,200	5,02,95,100	4,16,01,200	.....	.....	.....	.....	27,02,000	33,46,000	36,48,000	15,29,47,146
15th Dec. 1871...	53,100	20,374	2,347	19,98,615	40,59,700	1,49,51,400	1,22,56,700	1,33,86,400	14,500	33,36,200	.....	2,42,42,600	4,14,43,400	.....	.....	.....	.....	22,82,000	33,14,000	36,50,000	13,80,33,636
31st Jan. 1872 ...	53,100	20,374	2,880	19,83,680	39,97,300	1,48,79,400	1,21,73,500	1,30,34,000	14,500	33,78,300	.....	1,09,57,100	4,04,93,000	.....	.....	.....	.....	22,81,000	33,11,000	36,50,000	11,02,29,134

PRICES OF FOOD THROUGHOUT INDIA.—JANUARY 1872—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

BENGAL. (*Rice, the staple food.*)

		Rice.	*Wheat.*
Burdwan Division.	Burdwan	27½	22
	Bancoorah	27½	19
	Beerbhoom	32	16
	Hooghly	20	20
	Howrah	19	15
	Midnapore	28	10
Orissa ,,	Balasore	34	16
	Cuttack	21	12
	Pooree	31½	10½
Assam ,,	Durrung	21	8½
	Goalparah	17	30
	Kamroop	30	20
	Luckimpore	13	10
	Nowgong	16	...
	Seebsaugor	16	10
Dacca ,,	Dacca	23	11
	Backergunge	24	13
	Furreedpore	23	16
	Mymensing	23½	16
	Sylhet	24½	16
	Cachar	19	15-16
Patna ,,	Patna	24½	24
	Gya	23	24
	Chumparun	24	23
	Sarun	22	20½
	Shahabad	24	22
	Tirhoot	23	21
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½
	Monghyr	27	27
	Purneah	29	27
Sonthal Pergunnah.	Godda	..	..
	Nya Doomkah	30	16
	Rajmehal	30	32
	Deoghur	29	21
Presidency Division.	Calcutta	...	..
	Nuddea	..	..
	Jessore	25½	15
	24 Pergunnahs	21½	19
Rajshahye ,,	Rajshahye	27 3-16	21 9-16
	Bograh	33½	15½
	Dinapore	35	17½
	Maldah	30	28
	Moorshedabad	28	25
	Pubna	23	20
	Rungpore	25 11-16	18
Chota Nagpore ,,	Lohardugga	26	14
	Hazareebagh	25	20
	Manbhoom	32	16
	Singhbhoom	86	18
Chittagong ,,	Chittagong	21	11¼
	Bullooah	25	
	Tipperah	26½	15

NORTH WESTERN PROVINCES. (*Wheat and Joaree, the staple food.*)

		Rice.	*Wheat.*	*Joaree.*	*Bajra*
Meerut Division	Dehra Dhoon				
	Saharunpore				
	Moozuffurnugger	14	22	23	23
	Meerut				
	Boolundshuhur				
Kumaon ,,	Kumaon	12	15	20	20
	Gurhwal				
Rohilkund ,,	Bijnour				
	Moradabad				
	Budaon	18	22	26	25
	Bareilly				
	Shahjehanpore				
	Terai Pergunnahs	20	34	..	25
Agra ,,	Muttra				
	Agra				
	Furruckabad	15	19	19	20
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun				
	Jhansie	12	23	27	25
	Lullutpore				
Allahabad ,,	Cawnpore				
	Futtehpore				
	Banda	17	21	24	23
	Allahabad				
	Humeerpore				
	Jounpore				
Benares ,,	Gorucknpore	22	21	26	..
	Bustee				
	Azimgurh				
	Mirzapore	14	17	20	21
	Benares				
	Ghazeepore				
Ajmeer ,,	Ajmere	17	22	26	25

OUDH. (*Wheat and Joaree, the staple food.*)

		Rice.	*Wheat.*	*Joaree.*	*Bajra.*
Lucknow Division	Lucknow				
	Oonao	19	22	22	
	Baraitch				
Seetapoor ,,	Seetapoor				
	Hurdui	18	26	31	31
	Kheree				
Fyzabad ,,	Fyzabad				
	Baraick	19	23	26	18
	Gondah				
Roy Bareilly ,,	Roy Bareilly				
	Saltanpoor	18	20	24	22
	Pertabghur				

PUNJAB. (*Wheat and Joaree, the staples*).

		Rice.	*Wheat.*	*Joaree*	*Bajra.*
Delhi Division.	Delhi				
	Gurgaon	9	30	23	26
	Kurnal				
Hissar	Hissar				
	Rohtuk	10	18	22	20
	Sirsa				
Umballa	Umballa				
	Ludiannh	9	19	23	22
	Simla				
Jullundhur.	Jullundhur				
	Hoshurpore	13	23	30	25
	Kangra				
Amritsar.	Amritsar				
	Sealkote	10	20	26	22
	Gurdaspore				
Lahore.	Lahore				
	Ferozepore	10	19	22	21
	Gujeranwalla				
Gujerat.	Rawul Pindi				
	Jhelum	8	18	26	22
	Gujerat				
	Shahpore				
Mooltan.	Mooltan				
	Jhung	8	10	25	24
	Montgomery				
	Mozuffurnuggur				
Dera I. Khan.	Deera I. Khan	7	22	31	29
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar				
	Kohat	6	15	21	21
	Hazara				

CENTRAL PROVINCES. (*Wheat and Joaree, the staple food.*)

		Rice.	*Wheat.*	*Joaree.*
Nagpore.	Nagpore			
	Bhundara			
	Chanda	16	19	22
	Wurdah			
	Balaghat			
Jubbulpore.	Jubbulpore			
	Saugor			
	Dumoh		27	32
	Mundla			
	Seonee			
Nerbudda.	Baitool			
	Hoshungabad			
	Chindwara	12	19	19
	Nursingpore			
	Nimar			
Chutteesghur.	Raepore			
	Belaspore	35	37	...
	Sumbulpore			
Upper Godavery.	Seroncha	7	11	20

MADRAS (*Rice and Cholum (Joaree) the staple food.*)

		Rice.	*Joaree.*
Northern Section.	Ganjam	246	125
	Vizagapatam	311	166
	Godavery	194	107
	Kistna	272	180
	Nellore	235	133
Ceded Districts.	Cuddapah	294	157
	Bellary	286	131
	Kurnool	344	154
East Centre	Madras	260	184
	North Arcot	221	114
	South Arcot	207	91
Cauvery.	Tanjore	229	124
	Trichinopoly	232	127
Southern Section.	Madura	315	146
	Tinnevelly	340	152
West Centre.	Combatore	291	137
	Neilgherries	427	213
	Salem	243	110
West.	South Canara	272	...
	Malabar	300	...

Quotations are—so many Rupees per Garce = 8,960 lbs.

2nd sort Rice quoted.

BOMBAY PRESIDENCY (*Rice, Bajra, and Joaree, the staples.*)

		Rice.	*Joaree.*
Northern Division.	Ahmedabad	Rs. 4	Rs. 2½
	Kaira	3½	2½
	Surat	3½	3½
	Tannah	..	..
Southern Division.	Poonah	3½	2½
	Ahmednuggur	..	..
	Kulladghee	3½	1½
	Rutnagherry	3	..
	Belgaum	3	1½
	Dharwar	3	1½
	Sattara	4	2½
	Canara	..	2½
Sindh	Kurrachee	..	2½
	Hyderabad	..	2½
	Sukkur	3	2½

No Returns since January 1870.

Rupees per maund of 82 lbs.

BURMAH (*Rice, the staple.*)

		Rice	
Arakan.	Arakan		
	Ramree	2 4 0	
	Sandoway		
	Northern Arakan		
Pegu	Rangoon		
	Bassein		
	Myanoung	2 7 0	
	Prome		
	Toungboo		
Tenasserim	Amherst		
	Tavoy	2 0 0	
	Mergui		
	Shevegyeen		

Per maund of 82 lbs.

No Returns since April 1870.

2nd sort Rice quoted.

Advertisements.

NEW BANK OF BOMBAY, LIMITED.

CAPITAL Rs. 1,00,00,000, DIVIDED INTO 20,000 SHARES OF Rs. 500 EACH.

FIRST ISSUE 10,000 SHARES OF Rs 500 EACH Rs. 50,00,000 PAID UP.

RESERVED ISSUE 10,000 SHARES OF Rs. 500 EACH, ON WHICH Rs. 100 PER SHARE HAVE BEEN PAID.

Directors.

A. J. MACDONALD, Esq., (of Sir Charles Forbes & Co.)
CAPTAIN G. F. HENRY.
R. VALENTINE REID, Esq., (of Messrs. Finlay, Scott & Co.)
DINSHAW MANOCKJEE PETIT, Esq.
AHMEDBHOY HUBIBBHOY, Esq
KESSOWJEE NAIK, Esq.
E. D. SASSOON, Esq

EIGHTH REPORT.

THE Directors beg to submit to the Proprietors the Audited Accounts of the Bank for the Half-Year ended 31st December last

There was a fair and steady employment for money during the six months, and partly from this circumstance, partly from exceptional causes, the Funds of the Bank have been well employed.

The Government Securities held by the Bank have been brought down at rates under the ruling market values. The whole of the Five per cent. Paper in the Bank's hands was sold, after due consideration, prior to the conversion of that Loan.

The result of the working, inclusive of the sum brought forward from last half-year, is a net profit of Rs. 4,26,936-5-6, and out of this amount the Directors, in accordance with, and as limited by the Articles of Association, have declared an *ad interim* dividend at the rate of five per cent. per annum. This will absorb Rs. 150,000, and leave a balance of Rs. 2,76,936-5-6 to be carried forward.

The unadjusted overdues at the close of the half-year amounted to Rs 6,000, and full provision has been made for them.

The Directors are pleased to be able to acquaint the Shareholders that the Right Hon'ble the Viceroy and Governor-General-in-Council, with the consent of His Grace the Secretary of State, has now authorised the Right Hon'ble the Governor-in-Council of Bombay to pass an Act for the incorporation for the New Bank of Bombay, in the same form as the Act for regulating the Bank of Bengal. The Act is in course of preparation, and after approval by Government, shall be submitted to a Special Meeting of the Shareholders.

The Report of the Auditors is annexed

By order of the Board of Directors,

M. BALFOUR.

Secretary and Treasurer.

AUDITORS' REPORT

FOR THE HALF-YEAR ENDED 31ST DECEMBER 1871.

THE following is our Report of the Audit of the Bank's Books and Accounts for half-year ended the 30th of December 1871.

We have compared the Securities deposited with the Bank and in the Treasury for safe custody, with the Bank Registers, and have found them correct.

We have also found the Government Securities and Specie belonging to the Bank in order, and of the value stated in the Accounts.

We have carefully examined the Securities held by the Bank against Fixed Loans and Cash Credits, consisting of Government Paper, Guaranteed Railway Shares, and Goods, and have found them in order.

We have counted the Cash and Currency Notes at the Head Office; their amount is correctly stated in the Balance Sheet

The Cash, Bills, Cash Credits, Fixed Loans, &c., at the Branches, are vouched for by their respective Agents, whose Statements we have examined, and they are correctly stated in the Balance Sheet.

We have compared the General Ledger Balances with those in the Balance Sheet, and have found them to agree.

We have also examined the Stock Ledgers, the Branch Ledgers, and Security Ledgers, the Balances in which we found correct and in accordance with the Statement in the Balance Sheet

We also examined the Overdraft Account, and are perfectly satisfied with the result. The Property against these Accounts in the Bank's possession seems to us ample.

The Abstract of the Balance Sheet prepared for publication is correct, and the Profit and Loss Abstract shows the actual result of the half-year's operations.

(Signed) THOMAS LIDBETTER,
" BYRAMJEE CURSETJEE GHANDEE, } Auditors.

Bombay, 18th January 1872.

STATEMENT OF AFFAIRS ON 31ST DEC. 1871.

Dr.

	Rs. a. p.	Rs. a. p.
To CAPITAL:-		
10,000 Shares of Rs. 500 each paid up	50,00,000 0 0	
10,000 Shares of Rs. 500, on which Rs. 100 per share have been paid up	10,00,000 0 0	
		60,00,000 0 0
„ Reserve Fund		500,000 0 0
„ Current Deposits at Head Office and Branches		97,07,756 11 3
„ Fixed do. do. do.		16,67,114 7 5
„ Government do., Treasury General Balance		2,50,71,910 13 10
„ Do. do. Branches		16,81,035 13 6
„ Bank Post Bills Outstanding		31,277 4 11
„ Other Liabilities		4,26,250 10 6
„ Balance of Profit and Loss Account		4,26,936 5 6
		Rs. 4,55,12,282 2 1

Cr.

	Rs. a. p.	Rs. a. p.
By Government Securities	....	42,97,733 0 0
„ Fixed Loans on Government Securities, Bullion, and Merchandise	....	17,54,287 8 2
„ Cash Credits do. do. do.	....	84,07,510 10 9
„ Overdrawn Current Accounts	....	39,889 9 11
„ Bills discounted and purchased	....	87,74,236 4 4
„ Balances with Correspondents	....	336,783 9 2
„ Freehold premises situated in Elphinstone Circle, Bombay, and Furniture therein at cost price Rs.	450,000 0 0	
„ Do. do. at Oomrawuttee, at cost price	5,854 0 0	
„ Do. do. Ahmedabad	9,150 13 8	
	4,65,004 13 8	
„ Furniture at the different Branches at cost price	26,453 4 0	
	4,91,458 1 8	
Less written off	55,000 0 0	
		4,36,458 1 8
„ Stamps	....	7,327 13 0
„ Stationery value on hand	....	2,471 10 6
„ Adjusting account for interest due the Bank to date on Loans, Cash Credits, and on Government Securities, also amount by Government for conducting Public Debt Office, Treasury and Saving's Bank, less rebate of Interest, Discount, and Exchange	....	72,140 0 10
Cash and Currency Notes & Bullion at Head Office and Branches	....	2,13,83,443 14 7
		Rs. 4,55,12,282 2 11

ABSTRACT OF PROFIT AND LOSS ON 31ST DECEMBER 1871.

Dr.

	Rs. a. p.	Rs. a. p.
To Salaries at Head Office	80,473 15 9	
„ Auditors' Fees	1,000 0 0	
„ Directors' Fees	8,385 0 0	
„ Rent, Taxes, and Insurance	5,627 13 1	
„ Miscellaneous Charges, including cost of transit of Specie	23,909 15 5	
		1,19,396 12 3
„ Salaries at Branches	55,506 7 11	
„ Other Charges at Branches, including cost of transit of Specie	14,418 8 3	
		69,925 0 2
„ Brokerage Account	....	5,854 5 7
„ Interest paid at Head Office and Branches	....	56,805 12 0
„ Amount carried to Credit of Stationery Account	....	10,000 0 0
„ Net Profit to 31st December 1871	....	4,06,443 11 4
		Rs. 6,68,425 9 4

Cr.

	Rs. a. p.
By Interest received at Head Office and Branches	2,44,274 1 9
„ Exchange Do. do. do.	2,18,807 4 10
„ Commission Do. do. do.	48,595 3 8
„ Discount Do. do. do.	33,765 7 6
„ Interest on Government Securities	1,20,263 14 8
„ Profit on Bullion operations	2,719 8 11
	Rs. 6,68,425 9 4

PROFIT AND LOSS ACCOUNT FROM 1ST JULY TO 31ST DECEMBER 1871.

	Rs. a. p.
To Dividend for Half-Year ended 30th June 1871	1,80,000 0 0
Amount applied in reduction of Premises and Furniture Account.,	15,000 0 0
Amount carried to credit of Reserve Fund	85,000 0 0
Balance at credit of this Account	4,26,936 5 6
	Rs. 7,06,936 5 6

	Rs. a. p.
By Balance of this account on 1st July 1871	3,00,492 10 2
„ Net Profit for Half Year ending 31st December 1871	4,06,443 11 4
	Rs. 7,06,936 5 6

Examined and found E. & O. E.,

18th January 1872.

THOMAS LIDBETTER, } Auditors.
BYRAMJEE CURSETJEE GHANDEE, }

M. BALFOUR, Secretary and Treasurer.
ROBERT CLARK, Chief Accountant.

A. J. MACDONALD,
G. F. HENRY,
R. VALENTINE REID,
KESSOWJEE NAIK,
E. D. SASSOON,
AHMEDBHOY HUBIBBHOY, } Directors.

THE INDIAN LIFE ASSURANCE COMPANY (*Limited.*)

REGISTERED UNDER ACT X. OF 1866.

Head Office—MEERUT.

DIRECTORS.

Chairman, W. McLeavy, Esq. .. *Manager, Bank of Upper India, (Limited)*
C J Collins, Esq.
R. R Dean, Esq. . . . *Manager, Allahabad Bank.*
W Hobson, Esq. ... . .. ,, *Mussoorie Savings' Bank*
J C Parry, Esq. . *Late Genl Manager, Delhi & London Bank*
F Peterson, Esq . .. *Manager, Simla Bank Corporation*
C W. Stowell, Esq. . ,, *Uncovenanted Service Bank*
F. Warner, Esq .. . *Barrister-at-Law.*
Sheikh Ellahee Bux

MEDICAL ADVISER.

William Moir, Esq, M B., Civil Surgeon, Meerut.

SECRETARY.

D Lancaster, Esq.

AGENTS.

Hill, B llman, & Co, Calcutta.

This Company was formed towards the end of 1869, and has already received substantial patronage from the public

The object for which it was established with a full c tion in India was to secure the Indian public against a repetition of such y losses as have recently been sustained by the collapse of certain Assuran England where the entire management of those institutions was located.

Security—To ensure absolute security, the funds of the company are invested *only* in Government securities The company is strictly prohibited from making advances on house or landed property or n stocks, shares or obligati ns of any company whatever, though such advances are usually extensively made by other Assurance Companies

Policies are granted for whole life either with or without participation in the profits of the company according to the scale of premium selected by the as sured Policies are also granted for short terms from one to ten years at moderate rates

The Proposal Form is simple in its terms and the *conditions* of the *policies* are liberal, all *unnecessary restrictions having b en removed*

The rates of premium are made as moderate as is consistent with *complete security* of the assured

Advantages of Assurance—It secures by a small monthly, quarterly, half yearly or yearly saving a provision for widows and children. It affords opportunity of making a settlement prior to marriage It enables persons to raise money on life interests. It secures sums of money contingent on parties coming of age. It enables debtors in event of death to satisfy their creditors thus saving the bor r vers property from claims and suits from loss

Assurance in a sound company is far superior to connexion with a Pension Fund, for in the latter case if the nominee dies all contributions are forfeited and the subscribor loses the benefit of all he has paid, whereas in the case of a policy it still ensures and may be made available for any other purpose

Forms of Proposal, tables of rates and all further information may be obtained by letter or on application to the Agents or to the Secretary.

ANNUAL PREMIUMS

Required for an assurance of Rs 1,000 for the whole term of life.

Age	Civilians				Military and Naval			
	Without Profits		With Profits.		Without Profits		With Profits.	
	Rs	As.	Rs.	As	Rs	As.	Rs	As
20	31	0	35	13	35	11	40	8
30	37	9	42	11	41	11	47	7
40	46	13	53	3	50	15	57	14
50	61	4	69	10	65	7	74	5
60	88	0	103	0	90	0	105	0

D. [illegible] ASTLE
Secretary.

Meerut, 12th November 1870.

PHŒNIX FIRE OFFICE.—ESTABLISHED IN 1782

UNLIMITED.

The importance of this company's transactions with the public may be judged from the fact that since its commencement it has been able to pay 9 000 000/ sterling as losses under insured risks, and without a single call on its proprietors whose liability is unlimited.

The undersigned are authorised to issue policies in Bombay and the Mofussil at the tariff rates of all the old established company, which are as low as the nature of the risks can justify.

The rates on bungalows in the Mofussil, and residences, offices, and godowns in Elphinstone Circle, have been lately much reduced. Particulars on application at the Agency office.

A. C. BRICE & Co.,
Agents.

No. 6, Rampart Row, Bombay, 1870.

THE QUEEN INSURANCE COMPANY

FIRE AND LIFE.

HEAD OFFICE.- Queen Insurance Buildings, Liverpool.

CAPITAL.—(£3,000,000) Two Millions.

Trustees.—Sir Thomas Edwards Moss, Bart., Christopher Bushell, Esq and Edward [illegible], Esq.

DIRECTORS,

Chairman—Bethell [illegible]
Deputy Chairman—R. W. [illegible]

John Bateson, Esq,
John Bingham, Esq
T Ridgway Bridson, Esq.
William Forbes, Esq.
Andrew Galbraith, Esq.
Charlton R. Hall, Esq.
William Hind, Esq.
Patrick Hunter, Esq.
Actuary and Secretary—[illegible]
Sub-Manager—[illegible]
Bankers—[illegible] Provincial Bank of Ireland; London; [illegible]

[illegible] M P.
[illegible] P.

[illegible] for Fire [illegible] moderate as those of other first-class offices. [illegible] branch of this Company recently established [illegible] military lives in civil employ

For further information and particulars, [illegible] &c., regarding Fire and Life Insurances apply to

[illegible] & Co.,
Agents in Bombay.

Bombay, 1st January 1872

ALLIANCE BRITISH AND FOREIGN LIFE AND FIRE ASSURANCE COMPANY.

ESTABLISHED 1824.

CHIEF OFFICE:

Bartholomew Lane, Bank, London, E. C.

BOARD OF DIRECTION.

PRESIDENT—Sir Moses Montefiore, Bart., F.R S.

DIRECTORS.

James Alexander, Esq (Alexander, Fletcher & Co)
Charles George Barnett, Esq. (Barnett, Hoare, Hanbury, and Lloyd)
George Henry Barnett, Esq. Glympton Park
James Fletcher, Esq (Alexander, Fletcher & Co)
William Gladstone, Esq (Thomson, Bonar & Co).
Right Hon George Joachim Goschen, M P.
Samuel Gurney, Esq
James Holme, Esq, (Director of the Provincial Bank of Ireland)
Sir Curtis Miranda Lampson, Bart
Sampson Lucas, Esq (Lucas, Micholls & Co)
Elliott Macnaghten, Esq., (Member of the Indian Council)
Thomas Masterman, Esq (Director of the Bank of England)
Joseph Mayer Montefiore, (Director of the Provincial Bank of Ireland)
Sir Anthony De Rothschild, Bart, New Court
Baron Lionel Nathan De Rothschild M P
Thomas Charles Smith, Esq Oxford Square, Hyde Park.,

AUDITORS.

Lord Richard Grosvenor, M. P.
Hugh Colin Smith, Esq
Richard Hoare, Esq

FIRE RISKS

of an eligible character are accepted at minimum current rates

LIFE DEPARTMENT

The non-participating rates of premium for European lives resident in India have been very materially reduced, and the undermentioned Agents are authorised to decide upon Proposals submitted, to issue Policies, and to settle claims

The Reserve Fund is over

NINETY-FOUR [illegible]S OF RUPEES

which is irrespective of and in addition to the paid-up capital and the Fire Reserve Fund) being about 30 per cent on the sum assured under the Company's Life Policies, and besides this there is the guarantee of a subscribed Capital of not less than

FIVE CRORES OF RUPEES

coupled with the personal responsibility of a numerous body of wealthy Proprietors. For detailed Prospectuses, Forms of Proposal, &c., apply to

RIMINGTON & Co.,
Agents for the Presidency of Bombay.

CHURCH OF ENGLAND ASSURANCE INSTITUTION.

ESTABLISHED 1840.

Empowered by special Act of Parliament 4 & 5 Vic, Cap. XCII.

CAPITAL—One Million Sterling

Life Assurances of every description granted
Returning provision combined with Life Assurance.
Free Policies issued which can never altogether lapse through non payment of Premium
No extra charge for sea passage
Reduction to European rates without Medical examination.
Premium may be paid annually, half yearly, quarterly, or monthly, as desired.
Parsee and Armenian lives insured.
For detailed Prospectus, &c, apply to

RIMINGTON & Co., Agents.

Bombay, 12th July 1870.

LIVERPOOL, LONDON AND GLOBE INSURANCE COMPANY.

Liability of Shareholders Unlimited

Capital £2,000,000 Accumulated Funds £3,301,005

Revenue		*Invested Funds.*	
Fire Premiums	£ 836 816	Capital	£ 391,753
Life Premiums	,, 250 049	Life Reserve ..	,, 1,873,020
Interest	,, 102,680	Reserve Fund ..	,, 971,410
		Undivided Profit	,, 64 8..3
	£1 189,545		£3 301 005

Fire Department.

Policies of Insurance against fire upon dwelling houses and other buildings in both the European and Native parts of the Island of Bombay, are issued by the undersigned on behalf of the Company.

The rate on pucka built bungalows situated out-side the Fort of Bombay, or in any part of the Bombay Presidency, is now reduced to (6) six annas per cent. per annum

Life Department.

This Company offers the advantage of Fixed Bonuses accruing after five years annual payment of premium, *uncontingent* on profits. Policies are indisputable after five years Claims are payable thirty days after admission. Annuities are granted on very favorable terms The undersigned will issue Policies on behalf of the Company

Agents in Bombay—RITCHIE STEUART & Co
Agents in Calcutta—GILLANDERS, ARBUTHNOT & Co.

NORTH BRITISH AND MERCANTILE INSURANCE COMPANY.

Incorporated by Royal Charter and Special Acts of Parliament.

Paid up Capital		..£250,000
Fire Reserve Fund	297,153 10 10	
Fire Premium Reserve	138,514 15 1	
		435,668 5 11
Total Accumulated Funds		2,839,118 18 11
Annual Income from Fire, Life and Investments.		801,801 12 9

Agents in Bombay.

W. NICOL & Co.

THE SOUTHERN INSURANCE COMPANY, (LIMITED.)

REGISTERED CAPITAL—ONE MILLION STERLING.

Paid-up Capital .....£ 100,000
Reserved Fund .....£ 40,000

HEAD OFFICE—MELBOURNE.

The undersigned having been appointed Agents, are prepared to grant Policies by Marine Insurance.

Bombay, 19th June 1869. J. N. WADIA, SONS & Co.

GEORGE W. WHEATLEY & Co.,

Established 1836.

ARMY, BANKING, TRANSIT, AND GENERAL AGENTS.

Offices .. LONDON { 156 Leadenhall St. 33 Regent St. W.
.. BOMBAY. 20 Sassoon's Buildings.

AGENTS IN ALL PARTS OF THE GLOBE.

ARMY DEPARTMENT.—Military, Regimental, and Mess Indents of all kinds promptly and economically executed.

BANKING DEPARTMENT.—Pay, Allowances, and dividends drawn, and remittances and investments effected upon favorable terms. Interest allowed on Current as well as Deposit accounts.

GENERAL DEPARTMENT.—Indents for goods of every description executed. The Bombay Agency undertakes the indents of all kinds, and executes through the Morsom House all orders for European or American goods.

N. B.—Constituents are requested that time, trouble, and frequently expense are saved by instructions being made full and complete in the first instance. Where a margin is intended to be given, its limit should be stated.

TRANSIT DEPARTMENT.—THE GREEN SPECIE EXPRESS undertakes the forwarding of goods, parcels by the quickest, safest, and most economical routes throughout India, Europe, and the World, and the necessary shipping.

SPECIAL AGENCIES.

GEORGE W. WHEATLEY & Co. are Sole Agents in Western India for the following firms:—

Hilliards (Billiard Tables)	ABBOTT & NICHOLL, Birmingham
General Stationery	SAML. WORSNAM & Co, London
Haberdashery	D. NICHOLSON & Co, London
Hardware	DAVID JONES, Birmingham
Inks, Printing	SHACKELL & EDWARDS, London
Jewellery	HARRISON & Co, London & Birmingham.
	FORTUNY & DAVEY, London
Pens, Pinkahs,	MADDEN & Son, London
Lithographic Presses	MACFARLANE, MACDONALD, MACGREGOR
Marine Engines	JACKSON & WATKINS, London
Machinery, Saw Mills, &c	SAML. WORSNAM & Co. London
Needles	ABEL MORALL, London
Printing Presses	HOPKINSON & COPE, London
Type	V. & J. FIGGINS, London
Sewing Machines	J. WEIR, London
Shoe Thread	ULLATHORNE & Co, London
Watches	DENT & Co, London
Wines	LOWENTHAL & SOLMS, Frankfort.
	STANDRIDGE & TURNER, London.

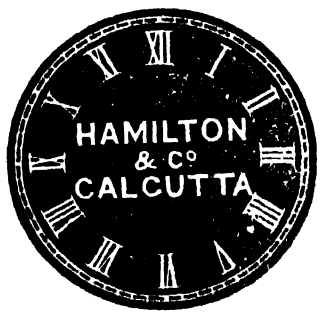
Select parcels of Watches, Jewellery, &c., are now on hand. Consignments of choice Wines, Printing Presses, and Inks, Printing Paper, Sewing Machines, &c., are daily expected.

Bombay, 1st August 1870. J. L. MADDEN, Agent.

THE EXHIBITION ENGLISH LEVER WATCH.

IN FINE SILVER, double-bottomed, engine-turned hunting case, of medium size, and with a first-class full plate Lever movement.

Rs. 50 Cash.



Rs. 50 Cash.

HAMILTON & Co.

Begs to state that for some years past, their endeavour has been to introduce to their Constituents a good, reliable, English Silver Watch, at a really moderate price. Owing to recent valuable improvements in the Watch-maker's art, by which the aid of machinery has been brought to bear with marvellous success, they are now enabled to offer the above Watch, which they guarantee to be entirely English-made throughout, at the hitherto unprecedented price of Rs. 50 cash, and the same Watch in Gold Engine-turned hunting case, at Rs. 160 cash.

NOTE.—*Our new Illustrated Watch Pamphlet can be had free on application.* Orders respectfully solicited.

HAMILTON & Co.,
Watch and Clock Manufacturers,
Jewellers and Silversmiths in ordinary to His Excellency Earl Mayo, K. P.
8, Old Court House Street, Calcutta.

ESTABLISHED IN 1820.

C. LAZARUS & Co.,

Incorporated with Shearwood & Co.,

CABINET MAKERS, UPHOLSTERERS, BILLIARD AND BAGATELLE TABLE MANUFACTURERS.

BY APPOINTMENT TO
His Excellency the Viceroy, Governor-General of India,
AND TO
His Royal Highness the Duke of Edinburgh,
CALCUTTA.

C. LAZARUS & Co., while thanking their numerous constituents for the solid support extended to the Firm since 1820, attribute their success to the following maxims which continue to guide their business transactions, *viz*:—

Good work with unadulterated materials.
Skilful and trustworthy Workmen.
Uniform Scale of Charges.
Strict and competent Supervision.

NEW ILLUSTRATED CATALOGUE.

There are a few special features in connection with the expensively executed Catalogue, to which C. L. & Co. would ask their constituents' attention:—

1. The *newest* and *most elegant* designs only find a place in the volume. Many of these designs, it should be mentioned, represent an original result; that is to say, they have been elaborated with special reference to the household requirements of this country. In working to this end, reference has been had to the latest models of the first Cabinet Manufacturers of Europe. All that was recherche in style, or chaste in pattern, has been taken advantage of in the production of C. L. & Co.'s special designs for India, these designs, however, being combined with others which C. L. & Co.'s long experience has shown to be of the utmost importance. These it is scarcely necessary to detail, yet it may be observed, as a general principle, in modifying home designs to suit Indian requirements, that substantiality should never be sacrificed to a too slender elegance, and this principle has been steadily kept in view. Indeed, in the manufacture of Cabinet Ware in India this is a prime consideration, as climatic effects, not to speak of other agencies, have a most marked action in deteriorating such articles. It remains only to add, therefore, that, while all that is chaste, tasteful, and elegant has been freely appropriated from the sources indicated in the production of C. L. & Co.'s designs, regard has been had, at the same time, to the requirements of strength and substantiality, a judicious blending of both, in fact, has been aimed at, as C. L. & Co. humbly believe, has been most successfully accomplished.
2. C. L. & Co. have had each article of their stock photographed. The diagrams have been engraved at considerable expense in England from these photographs, and represent, therefore, each article with artistic fidelity.

PRICES.

C. L. and Co. are alive to the necessity that exists in these altered times for reasonable prices. The supplying, however, of a *bonâ fide* reliable article is the first consideration with a respectable and old established firm. Regard being had to this, and also to the fact that C. L. & Co. warrant every article that issued from their manufactory; they can confidently state that their charges represent only a slender margin of profit over and above actual cost of production.

IMPORTANT TO MESSES AND BILLIARD CLUBS.

THROUGHOUT INDIA, BURMAH, CEYLON, AND THE STRAITS.

Consequent on the numerous applications that C. LAZARUS & Co. have lately had from parties residing at a distance from Calcutta, to have their Billiard Tables re-cushioned on C. L. & Co.'s new principle, and as sending the Tables to Calcutta for that purpose is attended with great delay, thereby occasioning much inconvenience, C. L. & Co. have been induced to keep a stock of Cushions on their new principle always on hand, which can be fitted to any Table, the accurate length and width of the slate-bed only being required.

Up-country Messes and Clubs can, by thus securing a spare set of Cushions, ensure the constant use of the Table—a desideratum C. L. and Co. are satisfied they will not be slow to appreciate, as the inconvenience hitherto felt by the Table being unavailable for play during such time as the old Cushions are under repair, has been admittedly very great.

BILLIARD AND POOL BALLS.

Billiard cloths, Cues, Billiard and Pool Marking boards, Tips, Chalks, and every requisite for the Billiard Table. Billiard Cushions renovated. Billiard Table repaired and re-cushioned on their new principle, thereby making an old Table as good as new.

B. B. B.

In accordance with their established practice of introducing novelties to the Indian public, C. LAZARUS & Co. have pleasure in announcing that they have made arrangements to supply the latest [illegible] and family amusement, by importing the popular B. B. B. Table. The peculiarity of these is that on the one Table the three favourite games of BILLIARD, BATTUE, and BAGATELLE may be played, thus affording a pleasing variety of amusements, concentrated on a single board at little [illegible] the cost of one. Anticipating that the demand for these Tables will be [illegible] are prepared to supply them on very favourable terms, it being [illegible] business to furnish the best and most approved articles of every [illegible] consistent with excellence of quality and a fair [illegible]

[illegible]LIARD TABLE.

C. LAZ[illegible] view to procure for India one of the [illegible] on their own premises, a number [illegible] commonly patronised in Fashion[illegible]

It is now [illegible] part in a game where their [illegible] simulation contributes, [illegible] to one pete for. [illegible]

The "[illegible] of the "[illegible] adapted to [illegible] game. The size of the Tables is six feet by [illegible] and the Cues and other requisites so specially [illegible] and graceful manipulation by a lady.

C. LAZARUS & Co.,
Calcutta.

BOMBAY:—Printed and Published for the Proprietor at the *Economist Steam Press*, by G. L. F. CONNELL, Manager.—21st February 1872.

THE

Indian Economist,

A Monthly Journal Devoted to Economic and Statistical Inquiries concerning India.

VOL. III.] BOMBAY, MONDAY, 22ND APRIL 1872. [No. 9.

Advertisements.

OVERLAND ROUTE.

THE Peninsular and Oriental Company book passengers and receive Cargo and Parcels by their Steamers [illegible]—

Aden, Suez, Brindisi, Malta, Gibraltar, Southampton	From Bombay every Monday [illegible], from Mazagon.
Galle, Madras, Calcutta, Penang, Singapore, Batavia, Hong Kong, Shanghai, Japan	Tuesday, the 30th January, 13th, 27th February, 12th, 26th March; 9th, 23rd April.
King George's Sound, Melbourne, Sydney	Tuesday, the 13th February, 12th March, 9th April and 6th May.

Cargo can also be booked through to Trieste, Odessa, Naples, Venice, Genoa, Barcelona, Havre, London, Liverpool, and New York.

A considerable reduction has been made in the rates of passage money. For further particulars apply to

GEORGE F. HENRY,
Superintendent.

Bombay, January 1872.

AUSTRIAN LLOYD'S STEAM NAVIGATION CO.

MONTHLY LINE OF STEAMERS BETWEEN BOMBAY AND TRIESTE, VIA SUEZ CANAL.

THE Company intends to despatch every month a Steamer from TRIESTE to BOMBAY, and *vice versâ*. The Steamers "APIS" and "SPHINX" have only limited accommodation for a small number of Passengers. The rates for Cabin Passengers include food and table wine, transit through Egypt, and free conveyance of 3 cwt. of Luggage. For baggage in excess £4 per ton is charged.

The "SPHINX," 1,400 tons, will be despatched from Bombay on or about the 10TH FEBRUARY, and the "MINERVA," 3,124 tons, on or about the 10TH MARCH.

PASSENGER RATES FROM BOMBAY PER "APIS" AND "SPHINX."

	Cabin.	Deck with food.
To Trieste	£ 40	£ 19-0
To Port Said	„ 30	„ 14-6
To Suez	„ 28	„ 13-7
To Aden	„ 16	„ 7-13

The Imperial Mail Steamer "MINERVA," 3,124 tons, 430 H. P., which has excellent accommodation for a large number of Passengers, and carries a Doctor and a Stewardess, will leave Bombay on or about the 10TH MARCH.

RATES OF PASSAGE PER "MINERVA."

	1st Class.	2nd Class.	Deck.
To Trieste	£50 0	£45 0	£19 0
To Port Said	37 0	23 0	11 6
To Suez	36 0	22 0	13 7

Children under 3 years of age, FREE; above 3 and under 10 years, HALF FARE. Cargo taken for Trieste, Venice, Constantinople, Odessa, Aden, Egypt, England and the Continent generally.

There is also a weekly service by Mail Steamers between Alexandria and *vice versa*, in conjunction with the P. & O. Co.'s mail steamer to and from Suez. The Austrian Lloyd's mail steamers leave Alexandria direct for Trieste immediately after the arrival of the Bombay and Calcutta Mails from Suez. The distance between Alexandria and Trieste is 200 miles shorter than that between Alexandria and Marseilles, and the voyage to Trieste is much more agreeable, it being a coasting trip, full of variety of beautiful scenery from the Island of Candia to the port of Trieste. The passage occupies only 4½ to 5 days, and the Company's best steamers are employed on this line, which are built expressly for this service, with especial regard to the accommodation and comfort of passengers, and have each an experienced surgeon on board. At Trieste the traveller to England has an extensive choice of picturesque and interesting routes, occupying from three days six hours to five days to London, at an expense varying from £7 to £13.

Passengers by the P. & O. Co.'s steamers to Suez can have their baggage forwarded by that Company's steamers from Alexandria to Southampton, at a charge of 10s. per cwt. for the regulated allowance of 3 cwt. and of 20s. per cwt. for excess weight (both exclusive of Transit through Egypt), to which the Austrian Lloyd's Agent at Suez will attend.

The undersigned grants also passage tickets for the steamers plying between Alexandria and Trieste, and for the railway between Suez and Alexandria.

PASSENGER RATES FROM ALEXANDRIA TO TRIESTE.

FIRST CLASS .....£13. | SECOND CLASS.....£9

Children under 10 years at HALF FARE; under 2 years, FREE.

REDUCED FARES FOR FAMILIES, consisting of not less than 3 adult members travelling together:—FIRST CLASS, £8 10s. per head. SECOND CLASS, £7-10 per head.

Personal Baggage allowed free: 1st Class 200 lbs., 2nd Class 150 lbs., overweight 10s. per 100 lbs.

Railway Tickets from SUEZ to ALEXANDRIA, with all the privileges of passengers by the P. & O. Co.—FIRST CLASS, £3; SECOND CLASS, £2; CHILDREN over 3 and under 10 years at HALF FARE. Free Baggage: 1st Class, 3 cwt., 2nd Class 200 lbs. overweight, 7s. per cwt.

For further particulars, and for freight and passage apply to the Agency of the Austrian Lloyd's Steam Navigation Company.

A. C. GUMPERT,
Manager.

Bombay, 12, Medows Street, 15th January 1872

STEAM COMMUNICATION WITH ITALY, VIA SUEZ CANAL.

ITALIAN STEAM NAVIGATION COMPANY of MESSRS. R. RUBATTINO & Co., GENOA.

THE REGULAR STEAMERS LEAVE

GENOA on the 24th, and BOMBAY on the 1st
of each month.

PASSENGER RATES,

INCLUSIVE OF ALL TRANSIT FEES THROUGH THE SUEZ CANAL.

		Including Wines.	Without food
To Aden	£22	£15	£4
„ Suez	36	22	8
„ Port Said	38	24	9
„ Alexandria	39	25	9-10
„ Cassaua	50	31	14
„ Naples	50	31	14
„ Leghorn	50	31	14
„ Genoa	50	34	14
„ Marseilles (for shipment at Genoa)	52	35	14-10

Children under 3 years, free of charge. Children not above 10 years, half fare.

NEXT STEAMER FROM BOMBAY—

"PERSIA" on THURSDAY, 1ST FEBRUARY 1872.
"INDIA" on FRIDAY, 1ST MARCH 1872.

The exact hour of departure will be fixed and published a day or two previous to sailing.

For hand-books of information, rates of freight, &c., apply to

VOGHART BROTHERS,
Agents, Rubattino Steam Navigation Company.

Bombay, January 1872.

STEAM COMMUNICATION WITH THE MALABAR COAST, CEYLON, MADRAS, AND CALCUTTA.

THE British India Steam Navigation Company (Limited), UNDER CONTRACT WITH GOVERNMENT, despatch steamers as above with Mails, Passengers, and Cargo, every fourteen days.

This route is the most expeditious and economical for passengers for the Neilgherry district, Bangalore and Madras, who can land at Calicut for Beypore, and proceed from thence by rail.

Passengers for Calcutta can take the same route, picking up the steamer at Madras.

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH THE PERSIAN GULF, VIA KURRACHEE.

Interchanging Cargo and Passengers at Bussora, to and from Bagdad, with the Euphrates and Tigris Steam Navigation Company.

THE British India Steam Navigation Company (Limited), UNDER MAIL CONTRACT WITH GOVERNMENT, will despatch a steamer every 14 days to the PERSIAN GULF, touching at KURRACHEE, GUADUR, MUSCAT, BUNDER ABBAS, LINGA, BUSHIRE, FAO, MAHOMERAH and BUSSORAH.

Bombay, January 1870. W. NICOL & Co., Agents.

STEAM COMMUNICATION WITH KURRACHEE.

THE British India Steam Navigation Company (Limited) UNDER MAIL CONTRACT WITH GOVERNMENT, and in connection with the weekly service from England, despatch a steamer to Kurrachee every Monday at noon.

Bombay, 1870. W. NICOL & Co., Agents.

THE STANDARD LIFE ASSURANCE COMPANY.—Established 1825,

WITH WHICH IS NOW UNITED

The Colonial Life Assurance Company.

COLONIAL AND FOREIGN ASSURANCES.

An amalgamation having been formed between the *Standard Life Assurance Company* and the *Colonial Life Assurance Company*, the business of the united companies will henceforth be conducted under the title of

THE STANDARD LIFE ASSURANCE COMPANY.

The annual income of the Standard Company is now upwards of £650,000, and the accumulated funds amount to upwards of £3,500,000 sterling. The new business transacted during the past year amounted to the large sum of £1,375,000 sterling, the corresponding premium amounting to £45,337 per annum.

Moderate rates charged for residence in the Colonies, India, and other places abroad.

Local Boards and *Agencies* in India, and in all the British Colonies where every facility will be afforded in the transaction of business, and where premiums may be received and claims paid.

Immediate reduction of premium on return to Europe, or other temperate climate, without medical certificate.

Profits divided every five years.

The new Colonial and Foreign Prospectus may be had on application at the chief offices of the Company, or to the Agents at home or abroad.

WILL. THOS. THOMSON, Manager and Actuary.
D. CLUNIE GREGOR, Colonial and Foreign Secretary.

BOMBAY BOARD.

H. Prentis, Esq. | W. Nixon, Esq.
A. R. Scoble, Esq. | A. E. Ashley, Esq.

Agents at Bombay.
The London, Asiatic and American Company, (Limited).

COMMERCIAL UNION ASSURANCE COMPANY.

HEAD OFFICE: 19 & 20, CORNHILL, LONDON.

Capital fully subscribed ..... £2,500,000.
Amount paid up..... £250,000.

LONDON BOARD OF DIRECTORS.

JOHN BOUSTEAD, Esq., (Price and Boustead)
JEREMIAH COLMAN, Esq., (J. & J. Colman)
ALFRED GILLS, Esq., 9, Adelphi Terrace, W. C.
NEHEMIAH GRIFFITHS, Esq., Lee, Kent
SAMUEL HANSON, Esq., (Samuel Hanson & Son)
FREDERICK W. HARRIS, Esq., (Dixon & Harris.)
FRANCIS HICKS, Esq., (Thomas & Francis Hicks.)
JOHN HODGSON, Esq., (Grant, Hodgson & Co.)
F. LARKWORTHY, Esq., (Bank of New Zealand.)
CHARLES J. LEAF, Esq., (Leaf, Sons & Co.)
WILLIAM LEASK, Esq., 14, Eastcheap, E. C.
A. J. MUNDELLA, Esq., M. P., 116, Wood Street, and Nottingham.
HENRY W. PEEK, Esq., M. P., (Peek Brothers & Co.)
ALEX. ROBERTSON, Esq., 29, Grafton Street, W. C.
D. COOPER SCOTT, Esq., London and Brazil.
ALEXANDER SIM, Esq., (Churchill & Sim.)
HENRY TROWER, Esq., (Trower & Lawson.)
JAMES P. WOODHOUSE, Esq., (J. C. & M. Woodhouse)

INDIAN BRANCH—CALCUTTA.

No. 1, HARE STREET.

DIRECTORS OF THE INDIAN BRANCH.

T. A. APCAR, Esq., (Messrs. Apcar & Co.,) Merchant.
G. M. BRACKEN, Esq., Merchant
J. C. MURRAY, Esq., (Messrs. Kettlewell, Bullen & Co.,) Merchant.
The Hon'ble G. C. PAUL, Officiating Judge of the High Court.
C. SANDERSON, Esq., (Messrs. Berners, Sanderson and Upton,) Solicitor and Registrar of the Diocese of Calcutta.
A. THOMSON, Esq., (Messrs. Atkinson, Tolton & Co.,) Merchant.

MEDICAL OFFICERS.

DR. N. C. MACNAMARA, 6, Russell Street. [illegible] 10½ to 12 A.M., Saturdays 3 to 4 P.M.
DR. W. PALMER, General Hospital. [illegible] 12½ to 2 P.M.

BANKERS.

The Oriental Bank Corporation.
The Chartered Mercantile Bank of India, London and China.

SOLICITORS.

Messrs. Berners, Sanderson, and Upton.

LIFE DEPARTMENT.

THIS company, having a subscribed Capital of Two Millions and a half sterling, of which £250,000 is paid up, effectually guarantees the fulfilment of its engagements with the Assured, who are entirely relieved from the personal liability of Shareholders and Officers. The importance of these considerations will be evident to those who reflect on the duration of Life Assurance contracts. The Funds of the Life Department are kept perfectly distinct from those of the other Departments, and are invested in the names of separate Trustees. The prospect of Bonus to the participating policy-holders is unusually good, as the expenses to be borne by the Life Branch have been limited by resolutions embodied in the Deed of Settlement to a small percentage on the Annual Premium Income.

The first life policy was issued in May 1862. On the 21st December 1870, the Life Premium Income, exclusive of re-assured risks, was upwards of 58,000*l*. and at the same date the Life Trust Funds *for the primary security of life policies* exceeded 226,000*l* being about sixty per cent. of the amount received upon whole life policies then in force, *after providing for all special policies, and for the reversionary Bonuses declared upon existing policies.*

In addition to the security thus afforded there is the *General Investments* of the Company, which exceed 500,000*l*, and the uncalled Capital of 2,250,000*l*.

Four-fifths of the *entire* profits of the Life Branch are divisible among the participating policy-holders.

IMPORTANT CONCESSION TO THE ARMY.

The Directors of this company have decided upon accepting the lives of military men who are not on active service *at the same rates as civilians*, provided that before proceeding on active service due notice is given to the Manager, and a commensurate extra premium paid. Subject to this stipulation, the following rates of premium *will in future apply equally to military men and civilians*, and the former will be enabled to effect assurances with this company *upon more favourable terms than can be obtained from any other office.*

Yearly premium for the Assurance of Rs. 1,000.

Age next Birthday.	For the whole term of Life. without Profits.	For the whole term of Life. With Profits.	Age next Birthday.	For short periods, &c. For One Year.	For Three Years.	For Seven Years.	
	Rs. a. p.	Rs. a. p.					
30	35 0 0	39 0 0	30				
31	35 0 0	39 0 0	31	Rs. a. p.	Rs. a. p.	Rs. a. p.	
32	36 0 0	40 0 0	32				
33	36 0 0	41 0 0	33	35			
34	37 0 0	41 0 0	34	& 28 0 0	38 0 0	20 0 0	&
35	38 0 0	42 0 0	35	under			under
36	38 0 0	43 0 0	36	36 28 0 0	29 0 0	20 0 0	36
37	39 0 0	44 0 0	37	37 29 0 0	29 0 0	30 0 0	37
38	40 0 0	45 0 0	38	38 29 0 0	29 0 0	30 0 0	38
39	41 0 0	46 0 0	39	39 29 0 0	29 0 0	30 0 0	39
40	42 0 0	47 0 0	40	40 29 0 0	30 0 0	31 0 0	40
41	43 0 0	49 0 0	41	41 30 0 0	30 0 0	32 0 0	41
42	44 0 0	50 0 0	42	42 30 0 0	31 0 0	33 0 0	42
43	46 0 0	51 0 0	43	43 31 0 0	32 0 0	34 0 0	43
44	47 0 0	53 0 0	44	44 32 0 0	33 0 0	35 0 0	44
45	48 0 0	54 0 0	45	45 33 0 0	34 0 0	36 0 0	45
46	50 0 0	56 0 0	46	46 34 0 0	35 0 0	37 0 0	46
47	51 0 0	57 0 0	47	47 35 0 0	36 0 0	38 0 0	47
48	53 0 0	59 0 0	48	48 36 0 0	37 0 0	39 0 0	48
49	54 0 0	60 0 0	49	49 37 0 0	38 0 0	40 0 0	49
50	56 6 0	62 0 0	50	50 38 0 0	39 0 0	42 0 0	50

The above rates will compare favourably with the *civil rates* of any other company transacting life business in India.

Examples of Bonus declared on Policies effected in 1863, *at the Division of Profits,* 31*st December,* 1867.

Age at entry.	Sum Assured.	Bonus Added.	Yearly Rate of Bonus per cent. on Sum Assured.
	£. s. d.	£. s. d.	£. s. d.
20	1,000 0 0	100 0 0	2 0 0
30	1,000 0 0	106 0 0	2 2 5
40	1,000 0 0	106 0 0	2 2 5
50	1,000 0 0	110 0 0	2 4 0

SPECIAL FEATURES OF THE LIFE DEPARTMENT.

Premia are received in yearly, half-yearly, quarterly, or *monthly instalments.* Medical fees are paid by the company.

Claims are paid *one month* after satisfactory proof of death.

Lives assured at Indian rates (not being sea-faring persons) are permitted to reside *in any part of the world* in time of peace.

The office is a comparatively young one (first policy issued in 1862), and *is therefore free from old liabilities.*

It possesses a very large capital, *the whole of which is fully subscribed.*

Its investments are all *of a first-class character.*

The life funds are allowed to accumulate *in special trust* for the primary security of life policies.

The expenses of management are guaranteed by the deed of settlement *not to exceed* 15 *per cent of the premium income.*

The London Directorate consists *of first class city merchants, who look after the business themselves, and are all shareholders in the company, and nearly all of whom have served from the commencement.*

The *large Bonus* declared to policy-holders at the declaration of profits up to December 1867.

The first-class position which the office holds at home, *as shown by the price of its shares on the London Stock Exchange.*

The following Agents have been appointed in connection with the Life Department:—

Agra	Uncovenanted Service Bank,
Allahabad	C. J. Cooke, Esq., Bank of Bengal.
Akyab	Messrs Bulloch Brothers
Backergunge	W. Fraser, Esq., Bank of Bengal.
Behar Districts	J. Almeida, Esq.
Benares Districts	H. T. Balfour, Esq., Bank of Bengal.
Bangalore	N. R. Bain, Esq.
Bombay	Messrs. G. W. Wheatley & Co.
Cawnpore	W. Neill, Esq., Bank of Bengal.
Ditto	Bank of Upper India
Ditto	T. Lucas & Co.
Chittagong	Messrs Bulloch Brothers.
Chowparan	James Begg, Esq.
Chumparan Districts	E. C. Lamb, Esq.
Cochin	Pierce, Leslie, & Co.
Coconada	W. M. Abell, & Co.
Dalhousie	Walter Adlard, Esq.
Delhi	Delhi and London Bank Corporation.
Ditto	H. B. Sterndale, Esq., Bank of Bengal.
Dinapore	Messrs. Kelly & Co.
Dacca	N. P. Pogose, Esq.
Dhaneo	Bazeujee Furdoonjee, Esq.
Kurseong	C. Graham, Esq.
Lahore	Hector Gunn, Esq., Agra Bank.
Ditto	J. D. Watters, Esq., Bank of Bengal.
Lucknow	W. Dickson, Esq., Bank of Bengal.
Ditto	W. A. N. Langdon, Esq.
Madras	C. L. O'Brien, Esq., Secretary to the Local Board
Maulmain	Messrs. Bulloch Brothers.
Meean Meer	W. Adlard, Esq.
Meerut	Greetham and White.
Mirzapore	T. Lucas & Co.
Monghyr	Thomas & Co.
Mussoorie	Delhi and London Bank.
Nagpore	T. A. Clarke, Esq.
Patna	Messrs. Kelly & Co.
Ditto	W. Fraser, Esq., Bank of Bengal.
Pyrmah	P. H. D. de Dombal, Esq.
Rangoon	Messrs. Bulloch Brothers.
Rohilkund Districts	H. Costley, Esq.
Sylhet	E. G. Foley, Esq.
Saugor	J. A. Withall, Esq.
Simla	Simla Bank Corporation.
Ditto	United Bank of India.
Tirhoot	E. Dalgleish, Esq.
Umballa	Simla Bank Corporation.
Ditto	United Bank of India.
Ditto	Greetham & White.

FIRE DEPARTMENT.

The Fire Premium income of the company, as at 31st December 1870, exceeded £127,000

Fire Insurances are granted at favourable rates throughout Bengal, the North-West Provinces, and the Punjab, on merchandize, warehouses, screw-houses, mills, dwelling-houses, shipping, &c.

Rates for Fire Risks in Calcutta.

The Buildings being brick or stone, built and tiled, or roofed with metal, slate, or chunam.	Per Rs. 100. 12 months	6 months	3 months	2 months	1 month.
	as.	as.	as.	as.	as.
Private Dwelling Houses	4	3	2	1½	1
Shops and Warehouses—					
No hazardous Goods or Trade	8	6	4	3½	2
Hazardous Goods or Trade (Warranted that no jute or cotton in a loose state be deposited in the building.) from to	10	7½	5	4	2½
	12	9	6	5	3
Bonded warehouse, no hazardous goods	8	6	4	3½	2
Jute and loose cotton	16	12	8	7	4
Presses or screw-houses cotton or jute (warranted no artificial light used.)	20	15	10	8	5
Without such warranty	24	18	12	9	6

The rates for Mofussil risks may be ascertained from the Manager.
For list of Fire Agents vide advertisements in *Englishman* and *Pioneer.*
Claims settled without reference to England.
Copies of the last Report and Balance Sheet of the company together with Forms of Proposals and all further information, may be obtained by letter or on application at the Calcutta Office between 10 and 5; or on Saturdays between 10 and 2.

By order of the Directors of the Indian Branch,

No. 1, Hare Street, Calcutta, 31st March 1871. } C. H. OGBOURNE, Manager in India.

Applications for Agencies will be received from influential Mofussil residents.

THE

Indian Economist.

A Monthly Journal devoted to Economic and Statistical Inquiries concerning India.

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SETTLEMENT OF BHURTNA.

PROFITS ON CULTIVATION.

ACCORDING to the promise of our last issue, we now proceed to notice the very able defence of Mr. Neale's Settlement of Bhurtna, which appeared in a recent number of the *Indian Observer*, and in connection therewith, the letter upon "Prices in the North-West Provinces" which appeared in our February's issue. In reviewing Mr. Neale's Report we said that:—

"The principle formally laid down for his (the Settlement officer's) guidance is that he is to assess the land at half the rental or 50 per cent. of the net assets, as it is technically called in the Settlement Rules." And again—"The Settlement of Mr. Bird was framed upon the principle of taking 66 per cent. of the net profits of cultivation. In 1854 the Department was directed by Circular Order to reduce the assessment in all cases from 66 to 50 per cent.' But in recent Settlement proceedings in the provinces, it seems to be the rule to waive all close inquiry into the profits of cultivation, and to assess the land at half the rental supposed to be exacted by the zemindar."

Our contemporary comments upon this statement as follows:—

Whatever doubt may envelope the proceedings of other departments, no uncertainty can exist regarding the rules under which Settlement officers act. "Directions for Settlement officers" and the Board's Circulars are explicit enough, and easily to be understood of the people. Everything that a Settlement officer does or says is published in the Revenue Reporter. And if the public is not compelled to read, still it has to pay for printing the lucubrations of every youngster attached to the Department. Let us turn then to the *Directions for Settlement Officers*." There we find the principle thus stated—"It is desirable that the Government should not demand more than "two-thirds of what may be expected to be the net produce to the "proprietor during the period of Settlement, leaving to the proprietor "one-third as his profits and to cover expenses of collection. By net "produce is meant the surplus which the estate may yield after deducting the expenses of cultivation, including the profits of stock and "wages of labour, and this, in an estate held entirely by cultivating "proprietors, will be the profit on their seer cultivation, but in an "estate held by a non-cultivating proprietor, and leased out to cultivators or assamees paying at a known rate, will be the gross rental." Now this is the principle upon which the Settlement of Mr. Bird, that is, the settlement now expiring, was made. Except in those more rare cases where the estate is entirely cultivated by the proprietors themselves, the net produce is defined to be the 'gross rental.' By the Saharunpore rules, the Government share of the net produce was reduced to one-half; but the definition of the net produce was not touched. It is therefore a mistake to suppose that the principle of Mr. Bird's Settlement was in any way different from that now acted on. We have only to read the old Settlement reports to see that the attention of Settlement officers was directed to the discovery of the rent quite as much then as it is now. There is therefore no ground for accusing the Department of a departure from an established principle.

The general reader will probably find it difficult to discover any difference between this account of the rule under which the Settlement officer acts, and our own version of it above. But there is a real difference between them at bottom, and we are glad that the *Observer* has so clearly taken our meaning. Thus he adds:—

It is open to anyone to say that the net produce ought not to be taken as equivalent to the gross rental. We ought, it may be urged, to make searching inquiries into the produce of land and the cost of cultivation; and to found our assessment, not on what the land does pay, but on what it ought in our opinion to pay. This is Mr. Knight's view.

Upon the whole that *is* Mr. Knight's view. We complain that in these North-West Settlement proceedings there has been too little exact enquiry into the profits of cultivation, and too great a readiness to accept the statements of the zemindar upon the subject, and to regard the rentals which he levies or says he levies as identical with, the same thing as, the net profits of cultivation. It may be quite true as the *Observer* says:—That "it would take "years of enquiry, and a long series of experiments to arrive at "anything like an accurate knowledge of the average profits of "cultivation," but our contemporary seems to forget that our contention has all along been that this enquiry ought long since to have been made. The very Settlement rule which he quotes (Mr. Bird's) presupposes that such an enquiry has been made, and that neither the zemindar's statements upon the point, nor his rent roll, but "two-thirds of what *may be expected* to be the net produce," should be taken. We complain that the rule has been set aside, and that it is practically made to run thus:—

It is desirable that Government should not demand more than two-thirds (now one-half) of the rental which the zemindar levies.

We complain that, practically, this rule has determined the assessments, and that it is *not* the principle that *ought* to determine them. The *Observer* seems to repudiate the original rule as impossible. He says:—

It is clear that, if by any process we could ascertain exactly what the cultivator makes, we could pitch our assessment so as to leave him just sufficient to pay him for his labour and expenditure. All the rest might be swept into the coffers of the State. But in order to do this, we must, to use the *Economist's* phrase, 'make short work with these zemindars' rights.' We must also sweep away a good deal of legislation that foolish people have at various times been at the pains to make for the protection of the tenant. Every tenant must be, so to speak, whipped up to the collar, and made to take his full share of the draught.

Why, we demand, must exact enquiry into the profits of the cultivator, be followed by anything of the kind? These *ad captandum* efforts to cast odium upon the course we recommend, are unworthy of the *Observer*. We have just as much consideration for the cultivator as he himself has, and his constant efforts to excite popular passion against us for merely fulfilling our duty as a publicist, inspire us with a good deal of contempt, and some resentment. Such tactics are unworthy of a journal in the position of our contemporary, while they are constantly resorted to thereby. We say that exact enquiry ought to be made into the profits of cultivation, when we are accused of wishing to play the

oppressor, and to extort the last pie from the cultivator that we can make him pay. Mr. Hume's department will no doubt institute the enquiry which we demand, and we shall now shew the necessity of doing so from a recent memo. upon the profits of cultivation in the Cawnpore district submitted very lately by Mr. Halsey to the Board of Revenue.

Mr. Halsey's account of the profits of cultivation in the district it will be seen, as we go on, refute themselves, and one hardly knows what to say to a writer who insists that nearly all cultivation is carried on at a loss, and that with well irrigation for instance, no crop yields a profit except barley, and that a very small one. If we are to accept Mr. Halsey's conclusions, bajra and joaree are never cultivated at all, but at a loss of Rs 1-11-4 per acre in the one case, and Rs. 1-3-8 in the other. Barley and wheat under well irrigation can only be cultivated at a loss of Rs 1-12-5 in the one case, and Rs. 7-11-0 per acre in the other. Barley irrigated by 'canal lift however yields a profit of Rs. 1-5-7 per acre, but wheat irrigated in the same way, a loss of Rs. 2-4-0. In the case of sugar-cane we are told, that if dependent upon either water irrigation or canal lift for its cultivation, there is a loss in the case of Rs. 23-1-8 per acre, and in the other of Rs. 9-11-4 and that it is only where water is obtainable by canal *flow* that any profit is to be obtained at all. Statements like these plainly refute themselves. They remind one of the Indian bagman who insisted that his firm lost money upon every thing they sold, and that "if it was not for the large business they did, they could not make it answer at all." Mr. Halsey's statements are their own refutation we say, and throw discredit on his judgment generally, and on his conclusions as to prices. He gives us three separate estimates, his own, Mr. Hume's, and Sir R. Montgomery's, of the cost of cultivating the staple products of the Cawnpore district, bajra, jowar, barley, sugar-cane, wheat, and gram. The discrepancies between these estimates are so large, that it is simply impossible to believe any of them. Here is the account which they severally give of the cost of cultivating an acre of bajra :—

	Hume.	*Montgomery.*	*Halsey.*
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Seed	.. 0 13 1	0 8 0	0 2 0
Ploughing, Sowing, and manure	.. 3 4 6	4 0 0	3 0 0
Weeding	.. 1 7 7	2 0 0	0 12 0
Bird scaring	.. 1 5 3	nil	1 5 1
Reaping ..	.. 1 15 6	nil	0 6 0
Thrashing and cleaning	.. nil	nil	1 2 0
Rent	.. 3 13 0	3 0 0	3 0 0
	Rs. 12 13 9	Rs. 9 8 0	Rs. 9 11 4

Thus while Mr. Hume affirms the cost of cultivating an acre of bajra to be Rs. 12-13-9, Sir R. Montgomery makes it but Rs. 9-8-0, and Mr Halsey believes that both are wrong, and that the right amount is Rs. 9-11-4. They agree almost as little about the produce per acre as about the cost of cultivating it, for while Mr. Hume declares it to be 12½ maunds, Mr. Halsey says with Sir Robert Montgomery, that it is only 9 maunds. The accounts agree in nothing but the price at which the gram sells, which they all estimate at 30 seers per rupee. The net result of the cultivation stands thus :—

	Mr. Hume.	*Sir R. Montgomery*	*Mr. Halsey.*
Value of Produce .	Rs. 16 10 8	Rs. 8 0 0	Rs. 8 0 0
Cost of cultivation .	12 13 9	6 8 0	9 11 4
Profit	Rs. 3 12 11	Rs. 1 8 0	..
			Rs. 1 11 4

With such estimates before us, it is impossible to arrive at any conclusion whatever, but that they are nearly all guess-work from beginning to end. Mr. Halsey's figures must, we think, be held to answer themselves, as it is impossible that one of the great staples of the district should be steadily cultivated at a loss of Rs. 1-11-4 per acre, which is what he asks us to believe. As these estimates have been drawn up by officers of distinction, and may be useful for purposes of comparison to some of our readers, it may be as well for us to give Mr. Halsey's account of the cultivation of the other staples of the district recast in the same shape as above. The estimates of the cost of cultivating joaree are as follows :—

	Hume.	*Montgomery.*	*Halsey.*
Seed ..	Rs. 0 13 1	Rs. 1 8 0	Rs. 0 2 0
Ploughing, sowing, and manure ..	.. 3 4 6	.. 3 0 0	.. 3 12 0
Weeding	.. 1 7 7	.. 4 8 0	.. 3 0 0
Bird scaring ..	.. 1 5 3	.. nil	.. 2 0 0
Reaping ..	.. 1 15 6	.. nil	.. 0 8 0
Thrashing and cleaning	.. nil	.. nil	.. 1 3 0
Rent	.. 7 13 0	.. 10 8 0	.. 6 0 0
Total expenses.	Rs. 16 10 11	Rs. 19 8 0	Rs. 16 9 0
Value of Produce	Rs. 16 10 8	Rs. 18 10 8	Rs. 15 5 4

Let the reader observe the frightful discrepancies in this table in the one item of rent. While Sir Robert Montgomery makes out that the average rent of joaree land in the Cawnpore district is Rs. 10½ per acre, it is only Rs. 6 according to Mr. Halsey, and Rs. 7-13-0 according to Mr. Hume. Is it really then impossible for our Settlement officers to tell us even at this day, what the average rental of dry crop soil is in the North-West, within four Rupees [illegible], look at the three estimates of the produce per acre :—

Mr Hume	12½ maunds per acre.
Sir R. Montgomery	14 "
Mr Halsey	10 "

But joaree is largely grown for the sake of its straw, of which neither Mr. Hume nor Sir R. Montgomery take any notice whatever, while Mr Halsey, whose attention was probably directed to the point by our articles of last year, tells us that in addition to 10 maunds of grain, an acre of joaree yields on the average Rs. 2 worth of straw, which, added to the estimates of the two former gentlemen, would show the cultivation of joaree to be profitable; while Mr. Halsey, although including the amount in *his* estimates, gives the impossible result of an average loss per acre of Rs. 1-3-8 on the cultivation. The estimates for the cultivation of gram are as follows :—

	Montgomery	*Halsey.*
Seed	Rs 1 8 0	Rs. 2 0 0
Ploughing, sowing, and manure.	1 8 0	8 12 0
Reaping	nil	1 0 0
Thrashing and cleaning	nil	1 2 0
Rent	4 0 0	4 0 0
Total expenses .	Rs 7 0 0	Rs. 16 14 0

Mark the astounding discrepancy here between the two estimates as to the cost of ploughing and manure. According to Sir R Montgomery, the average produce of gram in Cawnpore is 9 maunds per acre, while Mr. Halsey declares it to be 12. The value of the straw according to the former, is but Rs. 1-4-0 per acre, while according to the latter, it is more than three times that amount, or Rs. 4 per acre. Turning from the dry crop cultivation of the district to the irrigated crops of barley, wheat, and sugar-cane, we find the same perplexing discrepancies marking them all. Irrigation is carried on extensively in the district, partly from wells, and partly by canal lift, and by canal flow. It is necessary for the reader to keep this distinctly in mind. Barley, wheat, and sugar-cane, are all staples of the district, and are all irrigated partly by canal flow, partly by canal lift, and partly from wells. Let us take sugar-cane irrigated by well water first, and compare the three estimates :—

Sugar Cane irrigated from Wells.

	Hume.	*Montgomery*	*Halsey.*
Seed	Rs. nil	Rs. 6 0 0	Rs. 6 0 0
Ploughing, sowing and manure	9 0 4	6 0 0	12 2 0
Weeding	nil	6 0 0	3 0 0
Watering	78 12 0	12 0 0	41 4 0
Reaping	18 6 0	13 0 0	18 6 0
Rent	7 14 0	10 0 0	20 0 0
	Rs. 114 0 4	Rs. 53 0 0	Rs. 100 12 0

Comment upon these discrepancies is needless, but let the reader observe the fact that while according to one estimate the average rent of an acre of cane-land in the North-West is but Rs. 7-14-0, another makes it Rs. 10, and Mr. Halsey Rs. 20. With these figures before it, the *Indian Observer* itself will perhaps begin to see the necessity of some attempt being made in Settlement proceedings in the North-West, to check the interested statements which are made concerning the rental of the zemindar by close enquiry into the profits of cultivation. And now with reference to the produce of this acre of cane the

estimates agree in nothing but the price paid for it. They stand thus:—

Mr. Hume's Estimate ..	21 Maunds @	Rs.	49 11 0
Sir R. Montgomery's ...	32 ,, @		75 4 0
Mr. Halsey's ...	33 ,, @		77 10 9

Thus according to Mr. Hume, the cultivation of sugar-cane irrigated from wells in the district, entails a loss upon the cultivator of Rs. 64-4-6 per acre; Mr. Halsey makes out the loss to be only Rs. 23-1-8, while Sir Robert Montgomery declares it to yield a profit of Rs. 22-4-8. Is not all this very discreditable? How can any of our officers believe in cultivation with such results as they shew, being carried on at all? In the case of sugar cultivated by canal *lift*, they come to the same conclusion that it is carried on at a loss, but while Mr. Hume makes the loss to be Rs. 24-14-6 per acre, Mr. Halsey declares it to be Rs. 9-15-0. The only profitable cultivation of cane in the district according to Mr. Halsey, arises in cases where the water is supplied by canal *flow*, where Mr. Hume still makes the loss to be Rs. 6-[illegible] Mr. Halsey shew Rs. 12-1-2 profit. Here again moreover we have the same startling discrepancies, in the processes by which they reach these results:—

Cane irrigated by Canal flow.

	Mr. Hume.	*Mr. Halsey.*
Seed	nil	Rs 6 0 0
Ploughing	Rs 9 0 1	,, 12 2 0
Weeding ..	,, nil.	,, 3 0 0
Watering . .	,, 21 0 0	,, 6 0 6
Reaping .. .	,, 18 6 0	,, 18 6 0
Rent .. .	,, 7 11 0	,, 23 0 0
	Rs 56 1 1	Rs. 65 8 6
Value of Produce	Rs 19 11 0	Rs 77 10 1

As it is impossible for us to decide which of these estimates is the more reliable, we are obliged to dismiss both, again expressing our astonishment at the discrepancies between them. According to Mr. Halsey, sugar-cane is a staple cultivation of the Cawnpore district, and yet according to Mr. Hume, not an acre of it is grown, but at the following loss:—

Under well irrigation	Rs	64 4 6 per acre Loss.
,, Canal lift	,,	24 14 6 ,,
,, Canal flow	,,	6 8 6 ,,

As we are entirely dependent upon Mr. Halsey for these estimates, the suspicion unavoidably arises in our minds that he must have unintentionally misrepresented Mr. Hume in some way or other, for who could believe in a staple cultivation carried on for 20 years at a loss of from 13s. to 128s. per acre! Now what do these estimates prove, but the absolute necessity of that 'exact enquiry' into the profits of cultivation which the *Indian Observer* would waive us away from, by telling us that it would take years to make it. Let it be so, we have a vast estate in the land, an interest for all time therein, and can afford any number of years that may be required for the purpose. Let us now turn to the cultivation of wheat in the district, which also is irrigated in the three ways already described. Here again Mr. Halsey startles us with the statement, that although wheat occupies more than half the acreage under cultivation, the cultivation is carried on at a heavy loss except where the land is irrigated by canal *flow*. The grain cannot be cultivated without irrigation, while we are to understand that every acre of wheat irrigated by well water, involves the farmer in a loss of Rs. 7-11-0; every acre irrigated by canal lift, entails upon him a loss of Rs. 2-4-0; and it is only where the wheat lands are irrigated by canal *flow*, that the cultivator gets the trifling profit of Rs. 3-4-6 per acre. The two estimates in this last case compare thus:—

	Mr. Hume.	*Mr. Halsey.*
Seed	Rs. 3 4 0	Rs. 2 0 0
Ploughing, sowing, & manure .	,, 9 5 1	,, 10 8 0
Weeding	nil.	,, 1 14 0
Watering	,, 5 4 0	,, 2 8 6
Reaping	,, 1 7 7	,, 1 11 0
Thrashing and cleaning	,, nil.	,, 6 15 0
Rent	,, 8 0 0	,, 8 0 0
	Rs. 27 5 2	Rs. 33 11 6

The estimates, it will be seen, are totally irreconcileable, agreeing in nothing but the rental, which we are to understand averages Rs. 8 per acre throughout the district. The two gentlemen agree however, or nearly agree, as to the average produce being 16 or 16½ maunds per acre, but while Mr. Hume takes no account whatever of the *straw*, Mr. Halsey says it is worth, and that it realizes, Rs. 5 per acre. Our readers will not have forgotten our remarks some months ago upon the fact, that no account was taken of the value of *fodder* in the Settlement Reports that had come under our notice. Our remarks were somewhat severely criticized at the time, and an effort made to show that fodder was really worth nothing in the North-West Provinces, while we have here Mr. Halsey—profiting we may fairly presume by our hint—discovering that the straw of wheat lands *alone* in his district realizes Rs. 5 per acre. We commend this fact to the Board of Revenue at Allahabad, and to our old opponent Mr. Elliot. If all the wheat lands of the North-West Provinces yield Rs. 5 worth of *straw* per acre, or even half that value, what becomes of the assessment question? However, we may as well say frankly that we distrust Mr. Halsey's figures, not from the least suspicion of bad faith in them, but that he seems to us wanting in judgment, and to be so thoroughly under the influence of foregone conclusions, as not to be able to enquire with patience and caution into the questions he would fain elucidate honestly. It is not worth while for us to give the estimates of wheat cultivation under water from canal *lift* or from wells. We simply notice therein again the following discrepancies:—

Cost of water.	*Mr. Hume.*	*Mr. Halsey.*
By Canal lift	Rs. 13 13 0	Rs. 8 1 0
,, Wells	25 10 0	14 8 0

These discrepancies are so vast as to destroy the estimates altogether, for who is to decide whether Mr. Hume or Mr. Halsey is right?

The cultivation of barley only remains to be dealt, where the differences are as irreconcileable as ever. By way of digression for a moment, and to shew how unreliable Mr. Halsey's statements throughout, we notice that in Appendix [illegible] which professes to give a comparative statement of the average produce of wheat and barley per acre, the belief has been imposed upon him that wheat yields a larger produce than barley! Mr. Halsey surely knows that the average produce of barley per acre is everywhere greater than that of wheat. The figures which have been imposed upon him, by his subordinates, we suppose, reverse the fact. Can Mr. Halsey wonder that we distrust his conclusions generally?

To return however to the estimates before us, let us see what they reveal as to the cost of cultivating barley in Cawnpore upon land watered from wells:—

	Mr. Hume.	*Sir. R. Montgomery.*	*Mr. Halsey.*
Seed	Rs. 1 10 1	Rs. 1 8 0	Rs. 2 0 0
Ploughing, sowing, and manure .. .	6 9 0	4 0 0	7 2 0
Weeding	1 7 7	nil	1 14 0
Watering	10 8 0	3 8 0	9 0 0
Reaping	1 8 0	nil	1 8 0
Thrashing & cleaning.	nil	nil	4 14 0
Rent ..	7 11 0	7 0 0	6 0 0
	Rs 29 8 10	Rs. 16 0 0	Rs 32 6 0

We have here the same story repeated once more, while the produce varies as follows:—

According to Mr. Hume	15½ maunds per acre.
,, ,, Sir R. Montgomery	18 ,, ,,
,, ,, Mr. Halsey	16 ,, ,,

The produce is priced by all alike at 25 seers per Rupee, but neither Mr. Hume nor Sir R. Montgomery allow anything for the *straw*, while Mr. Halsey declares its value to be, as in the case of wheat, Rs. 5 per acre; and the general result is, that while Mr. Hume declares the cultivation of barley to entail a loss upon the cultivator of Rs. 4-12-1, and Mr. Hume of Rs. 1-12-5, Sir R. Montgomery shews a profit of Rs. 12-12-9 per acre thereon. We need not carry the story any further. Putting the discrepancies in these estimates aside altogether, we look upon them as made out upon a wrong principle from beginning to end. The profits of peasant farming are not to be ascertained in this way at all. What do the ploughing, and the sowing, and the watering, and the reaping, and the threshing all mean, in the main, but the peasant's own labour, and that of his family upon the little

holding. The labour is a fixed condition of the peasant life. He eats his bread in the sweat of his brow, and the important question really is, what remains to the man after reimbursing all the *money outlay* he has had to make upon the year's cultivation, for the maintenance of himself and family. According as that remainder is great or little, will the man be prosperous or the reverse, will his cultivation be profitable or not. This *money outlay* consists simply of seed, rent, water, and the interest upon and renewal of the capital stock he may have in his holding. These are, we say, his real outlay. The other items mean his own labour, and if they are to be taken into account at all, would it not be wiser to estimate his labour at so many rupees per month for the whole year, as though he were a day labourer.

PRICES IN THE NORTH-WEST.

And now as to the course of prices in the North-West. The correspondent, whose letter appeared in our issue of February, appended thereto a statement of the prices prevailing in several of the great cities of the North-West from the commencement of the century, and sent us a diagram of their course which we were unable at the moment to produce. Instead of going back so far as our correspondent carries us, we had better perhaps confine our enquiries to the last 50 years, dating from about the period when, with the overthrow of the Pindarrees and Mahrattas, settled and peaceful rule began to prevail all over the Continent. We have frequently expressed our conviction, that the course of prices was steadily downwards from 1820 to about the period of the Crimean war: that the direction was then reversed, and that the rise from that period has been continuous and unprecedented throughout the country. It is necessary however to bear in mind that our remarks upon this subject applied, in the first instance, almost exclusive reference to Western India and the Central Provinces, where the phenomena have been more strikingly apparent than in other parts of India. Taking however our correspondent's own quotations for the three markets of Allahabad, Agra, and Meerut, and grouping them in two periods of 20 years each (1831 to 1850 and 1851 to 1870), the average prices in periods of five years each, are we find as follows:—

Wheat at Allahabad, (periods of 5 years).

20 Years.	1831 to 1835	30	Seers per Rupee
	1836 to 1840	22	" (famine)
	1841 to 1845	26	"
	1846 to 1850	31	"
20 Years.	1851 to 1855	21	"
	1856 to 1860	21	"
	1861 to 1865	19	"
	1866 to 1870	16½	"

Agra.

20 Years.	1831 to 1835	30	Seers per Rupee.
	1836 to 1840	22½	" (famine.)
	1841 to 1845	20	"
	1846 to 1850	41	"
20 Years.	1851 to 1855	31	"
	1856 to 1860	28½	"
	1861 to 1865	22½	"
	1866 to 1870	17½	"

Meerut (Ghazeebad.)

20 Years.	1831 to 1835	24	Seers per Rupee
	1836 to 1840	24	" (famine)
	1841 to 1845	37	"
	1846 to 1850	33	"
20 Years.	1851 to 1855	37	"
	1856 to 1860	31	"
	1861 to 1865	24	"
	1866 to 1870	18	"

Now these markets may be fairly taken to represent the whole of the North-West Provinces, and what do the quotations show, but that the price of wheat has risen continuously throughout the whole of the last 20 years, and that the price of grain in the last five years of the period, was just double what it was in the first five:—

	Allahabad.	*Agra.*	*Meerut.*
1851 to 1855	30 seers.	34½ seers.	37 seers.
1866 to 1870	15 "	17½ "	18 "

Prices fluctuated throughout the period as the price of food ever does, according to the character of each harvest, but the *tendency* throughout was steadily upwards, until at last the quotations are twice what they were at the commencement of the period. In other words, the price of wheat doubled itself in the 20 years 1851 to 1870. Whether the rise will be permanent or not, there is the fact, from our correspondent's own figures, that corn rose 100 per cent. in the provinces during the 20 years 1850 to 1870. Our correspondent will himself admit this fact, for it is he himself who adduces it. He says however:—

> I by no means deny, as you seem to infer, that there has been a large and permanent rise in prices. If you will look again at what I wrote, you will see that I estimated the permanent rise at no less than 30 or 35 per cent., and that I attributed the greater part of it, as you do, to the fall in the value of silver. My object was not to prove that prices had not risen, but to show that temporary causes had far more influence on their rise and fall than is commonly supposed.

On the other hand, we think there is room to believe from the steady tendency of the quotations, that he has (1) under-estimated the change that has taken place in the value of money; and (2) overlooked the effect of the opening up the Provinces to the rest of India by the railway system. No one of course can foretell the future, but that there is a manifest tendency in Settlement officers of the North-West Provinces to under-estimate the permanent rise, we think there can be no doubt. A Register of prices in the Cawnpore district for the last 30 years, is now before us, where we find the averages to be:—

	Wheat.	*Joaree.*	*Bajra.*
1840 to 1850	20·1	17·0	13·8
1850 to 1860	21·3	24·1	17·10
1861 to 1871	22·5	27·5	21·1

If we recast the averages however, the prices for wheat from 1848 to 1871 in this district were.—

1848-1859	31·2	Seers per Rupee
1860-1871	21·9	" "

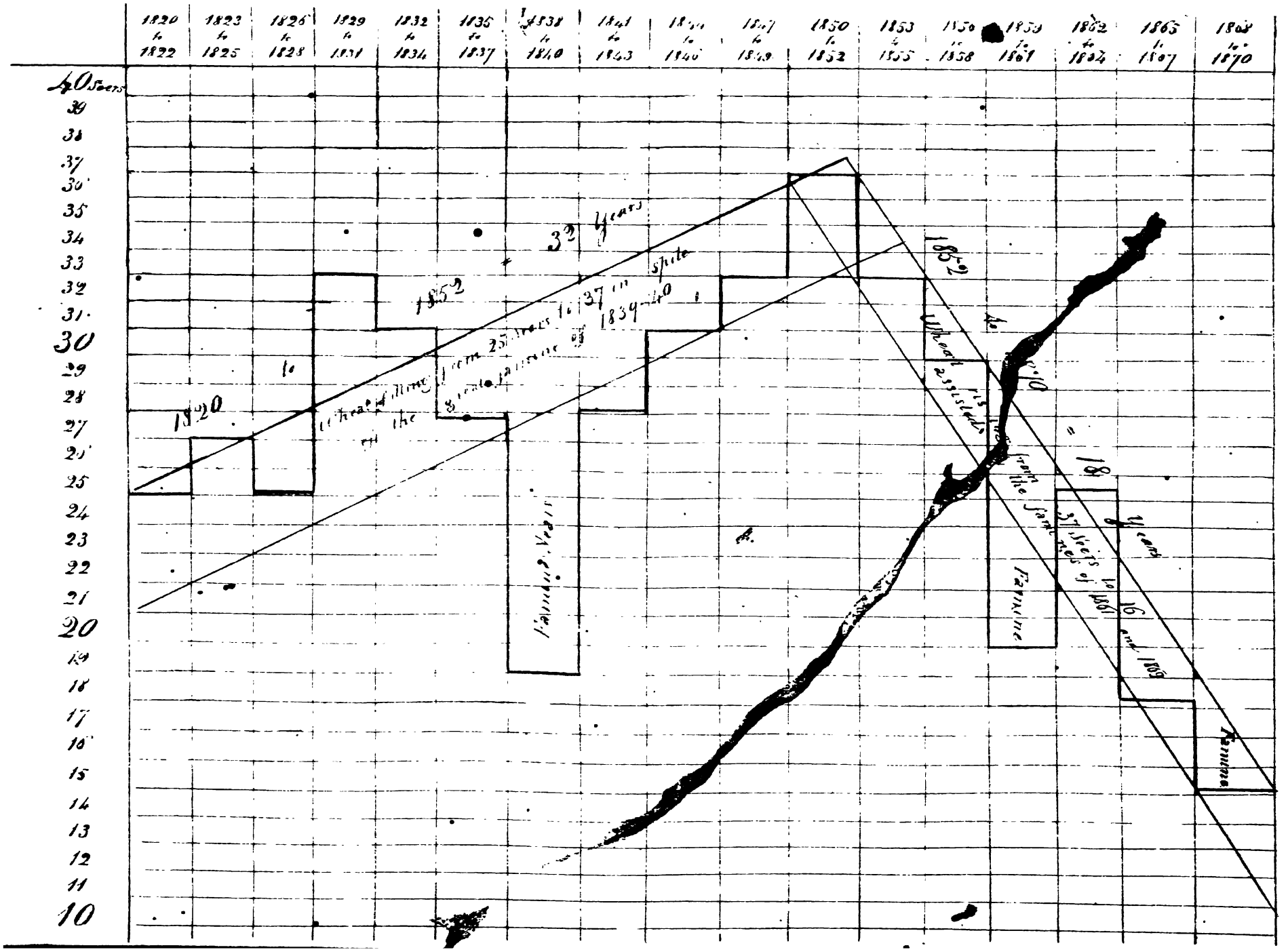
We cannot say that we place implicit reliance upon these statistics, as we see evidences of carelessness therein, and yet the Settlement officer, from whom we get them, is positive that there has been no rise in prices in the last 50 years. Let him look at the accompanying diagram for which we are indebted to the correspondent, whose letter we have been noticing. What could show more clearly than this diagram that from 1820 to about 1850, prices were steadily falling in the North-West in spite of the severe famine of 1839, and that in the last twenty years the current, *assisted* by the famines of 1861 and 1869, has set steadily in the other direction. That the causes while partly ephemeral, are in a large measure permanent, we think, there can be no doubt, and our correspondent somewhat exaggerates, we think, the effects of the cyclical disturbances he speaks of.

The diagonal lines across the diagram have been inserted by ourselves, to shew more clearly the steady tendency of the movement in each direction: downwards from 1820 to 1850, *in spite* of the famine of 1839: upwards from 1851 to 1870, by the assistance of the drought in 1861 and 1869. Since this diagram was prepared, we have received Mr. Plowden's report upon prices and wages in the North-West, into which we have had time only to glance. It seems however to corroborate fully the teachings of the diagram, and we shall probably return to the subject in our next issue.

AGRICULTURAL STATISTICS.—Bombay.

We are indebted to Lt.-Colonel Merriman, Acting Chief Engineer for Irrigation in Bombay, for some very interesting statistics concerning the land and agriculture of the Western Presidency. Excluding Sind from the account, the total area of the Presidency comprises 40,717,229 acres, of which 11,060,014 acres, or about 27 per cent., is shown as barren, but it is not known whether land kept for grazing purposes is included in this. Excluding jagheer or alienated land, the area of cultivable land is made up as follows:—

Cultivable, not cultivated		12·6 per cent.
Fallows of one year		8·1 "
Crops of one year:—		
Rubbee	31·8	
Khurreef	68·0	79·3
Two fusl	0·2	
	100·0	
		100·0


1820 to 1822
1823 to 1825
1826 to 1828
1829 to 1831
1832 to 1834
1835 to 1837
1838 to 1840
1841 to 1843
1844 to 1846
1847 to 1849
1850 to 1852
1853 to 1855
1856 to 1858
1859 to 1861
1862 to 1864
1865 to 1867
1868 to 1870
40 Years
39
38
37
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
1820
1852
32 years
1834-40
Wheat
Famine
1861
16 years
1869
Famine

The proportion between the rubbee and khurreef harvests is thus 32 per cent. of the former, to 68 of latter. In the Konkun, where the heavy rain is confined to the monsoon months, the proportion of rubbee is very small. In Sholapoor, where showers in October are generally to be relied on, the area of the rubbee is greater than that of khurreef, and in Dharwar, on the borders of Mysore, the areas are nearly equal. Accompanying Colonel Merriman's memorandum, we have a table showing the distribution of the chief crops in acres. The return is not quite complete however, returns from Canara not being obtain[illegible]. The figures given in the table shew the following results :—

Jowar and Bajree ..	51·9 per cent
Cotton ..	10·6 ,,
Wheat and Barley .	5·3 ,,
Rice ..	5·1 ,,
Oil seeds	3·2 ,,
Pulse ..	1·9 ,,
Sugar ..	0·21 ,,
Vegetables	0·20 ,,
Others...	21·56 ,,

When comparing the land revenue of Bombay with that of other provinces, it is of importance to keep these figures in mind: for there is certainly no other Presidency in India, the produce of which upon the whole is of so poor a character, jowar and bajree occupying more than half the cultivated area of land. Comparing the rubbee and khurreef crops of Bombay with those of other provinces, the figures are :—

	Rubbee.	Khurreef.
Sind	26 per cent.	74 per cent
Punjab	51 ,,	49 ,,
Oudh	54 ,,	46 ,,
Central Provinces	47 ,,	53 ,,
Bombay	32 ,,	68 ,,

Bombay and Sind would thus seem at first sight to have the poorest cultivation in the country, but the latter is enriched by the immense extent of its irrigated area. The percentage of land cultivated by means of irrigation therein, contrasts with that of other provinces as follows :—

Sind	91 per cent
Punjab	31 ,,
Mysore	18 ,,
Oudh	nearly 40 ,,
Central Provinces	1·6 ,,
Bombay	2·1 ,,

Upon the whole, it would seem certain, that the produce of Western India is poorer than that of any other part of India, a fact that should be kept in mind when dealing with the revenue which the land yields. On the other hand, it is necessary to remember that the price of produce is very much higher in Western India that in any other part, and that nothing is easier for us than to be betrayed by hasty generalizations upon the subject, into error. Still another element in the economic condition of the country is the pressure of population upon the soil, in which the most striking discrepancies exist in the several provinces of India. The following table furnishes a comparison of the population, cultivated area, the fallows, and cultivable but *not* cultivated lands of Bombay and several other provinces :—

Province.	Cultivable but not cultivated.	Fallow.	Under Crops	Population (rural) per square mile.
Sind	60	20	20	28
Punjab	42	..	58	157
Mysore	30	3	67	132
Oudh	28	5	67	134
Central Provinces	48	.	52	139
Bombay	13	8	79	129

The cultivable waste of Bombay is thus almost nominal : indeed there is no such waste except in Khandeish. On the other hand, the population is very sparse, 129 to the square mile, but this estimate includes the city of Bombay itself, if we are not mistaken, and the real pressure of the agricultural population does not probably exceed 70 or 80 per square mile. Bombay owes all its well-being to the great commercial cities which it contains, and the demand of those cities upon the produce of its fields it is, that makes the price of produce so abnormally high, and the sale value of the land so large. The *Indu Prukash*, a few months ago, gave us the following account of the distribution of the bagayet, rice, and dry crop cultivation in the several districts of the Presidency :—

	Irrigated	Dry crops.	Rice land.	Total.
Poona	acres 50,499	35½ lacs.	26,605	36 lacs.
Nugger	,, 61,603	33½ ,,	18,090	84½ ,,
Khandeish	,, 27,099	22½ ,,	89	22½ ,,
Sattara	,, 48,817	16 ,,	15,000	16½ ,,
Tanna	,, 62,892	9 ,,	4½ lacs.	14 ,,
Ratnagiri	,, 12,875	1½ ,,	5½ ,,	9 ,,
	2,60,685	118 ,,	10½ ,,	130 ,,
Carnatic	,, 16,310	44 ,,	1½ ,,	45½ ,,
Guzerat	,, 57,815	21½ ,,	1½ ,,	22½ ,,
Total	acres 3,49,814	182½ lacs	13½ lacs.	198 lacs.

These figures are taken from official returns and supply, we are told, the most reliable statement that can be furnished on this important point. The dry crops are the backbone of the harvests of the country, the irrigated land being hardly two per cent. of the cultivated area. The rice lands, excluding Tannah and Ratnagiri, where rice is the only staple crop, also make but a poor figure. The statistics of dry crop cultivation to a great extent may be taken to represent the entire agricultural statistics of the country. The distribution of crops throughout the country will be seen from the following statement :—

	Maharashtra.	Guzerat.	Carnatic.	Total acres.
Jowaree	51½ lacs	1 lacs	20 lacs.	55½ lacs.
Bajree	31 ,,	3¼ ,,	3½ ,,	37½ ,,
Wheat	7 ,,	1 ,,	2½ ,,	13½ ,,
Rice	11½ ,,	2 ,,	1½ ,,	15 ,,
Gram	5½	not given	1 ,,	6½ ,,
Cotton	8 ,,	5 ,,	14½ ,,	27 ,,
Naglee	3½ ,,	[illegible]	[illegible]	4 ,,
Toor, Mut, Sa[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Hoolgi, and Oonee	[illegible]	[illegible]	[illegible]	[illegible]
Teel	not [illegible]	[illegible]	not given.	3½ ,,
Linseed, Hemp	[illegible]	[illegible]	[illegible]	1½ ,,
Kardee, Castor Oil	[illegible]	[illegible]	[illegible]	[illegible]
Tobacco	[illegible]	[illegible]	[illegible]	[illegible]
Sugarcane	[illegible]	[illegible]	[illegible]	[illegible]
Grass land	[illegible]	[illegible]	[illegible]	7½ ,,
Pulse and other miscellaneous product, vegetable garden produce, &c	[illegible]	[illegible]	[illegible]	25 ,,
				206 lacs.

"This completes the tale of the products of agricultural industry in Bombay. Jowaree and bajree are the staple food of Maharashtra, jowaree of the Carnatic, while in Guzerat, jowaree, bajree, and wheat, occupy very nearly equal areas of cultivation. The influence of cotton cultivation upon the food supply of the country will be apparent from the fact that it occupies an absolutely larger area in Guzerat than is covered by any other crop, and in the Carnatic, it is second only to the jowaree, the staple food of the country."

ELECTED BY THE PEOPLE.

In a late issue of the *Friend of India*, Mr. Marshman demands whether "our rulers" are bent on trying the experiment of how long a government of aliens can last amidst a national feeling of universal disaffection. This is somewhat strong language from the lips of Father John. He proceeds :—

> The fact is, that like Mr. Gladstone's government you are going too fast. Cannot you be content to allow European civilization to advance at a more moderate pace, suited to the character of the people, instead of prematurely forcing on them institutions at express speed and rousing the people to a flood of mutiny by the constant multiplication of taxes to provide for progress?

That we are moving very dangerously fast in some directions, we think there can be no doubt whatever. But it is far from being exclusively the fault of the Government. At this moment, a demand is being preferred with the utmost passion, by a part of the English press in Bombay, for the complete transfer of the Municipal rule of that city from the Government to a body that is to be *elected by the people*. And the fiercest indignation is being expressed at what the Advocate General of Bombay calls "the homeopathic dose of the representative principle" conceded by the Government in the new Municipal Bill it has brought forward. Under the leadership of the English Press "the incompetent Government of Bombay and its dummy Council"—such are the expressions used—are being assailed with the utmost virulence for refusing to abdicate its functions in favour of a Corporation and Town Council to be elected by the people. Elected by the people! Now this people consist of about 130,000 ignorant Mus-

submen, 100,000 Arabs, Caffres, Malays, and *Bad mashes* of all kinds; 400,000 dark and [illegible] (Hindoo); and the merest handful of men, fit either from their education or position to be entrusted with political power. Every fact in the circumstances of the city, demands that its Government should be as strong and simple a Government as it is possible to form, while a demand is made with the utmost pressure that we should give this city purely representative Institutions and introduce voting and electioneering, with all their attendant dangers and evils into it. That the village communities of India should, as far as possible, be left to manage their affairs in the way they have done from time immemorial is proper enough, but the proposal to introduce purely "British Institutions" which is what is demanded, into a city like Bombay, seems little short of a [illegible]. Everyone of course sees that no *real* representation of our native population can be permitted, but they *will* have the sham thing for all that. In view of the temper into which the people have been written, we think the Government would do well to withdraw the new Bill altogether, and instead of introducing any [illegible], submit the position of affairs to H. M.'s Secretary of State. It is [illegible] the Government in this case, at all events, that is "prematurely forcing institutions on the people," but the non-official body that is making loud [illegible] impossible. It was [illegible] the other day that the Bench of Justices in Bombay [illegible] to stop the payment of the police of the city, while dealing with the local Government as to some contribution [illegible] to which it had withdrawn. We are moving very fast in India, as Mr. Marshman says, beyond doubt.

THE MOGUL REVENUES.

SOME doubt was cast, in a [illegible] of the *Indian Observer*, upon the conclusions of Mr. Thomas as to the revenues of the Mogul Empire, on the ground of "the all-pervading Persian style and spirit of exaggeration" that pervade the statements of Abul Fazl and other authorities upon whom Mr. Thomas relies. Mr. Thomas has ignored, we are told, the tendency of oriental historians so to dress out every petty event and chief's principality "in magnificent hyperboles that Solomon is reduced by the comparison into a pauper, not able to maintain a stud or rebel." The *Englishman* replies to these criticisms, that the best writers of Abul Fazl's stamp are very exact in their accounts, and expresses his wish that we had even more of them than the Ain for us to consult, either before or after the introduction of our rule.

> There could not be a more sober writer than Abul Fazl Allami. His accounts of the Court and administration of Akbar go into the minutest details with a simplicity not [illegible] with the spirit of hyperbole. He writes rather as a statistician would do. The middle ages would have written a scientific treatise from a specimen of the type referred to by the *Observer*. A writer that goes into such details as classified lists of the precious stones in the royal treasury with their weights and values, who records the exact cost of the royal kitchen down even to the recipes for the different dishes and the quantities used in the most matter-of-fact language and obviously without exaggeration, who furnishes long lists of bazar prices, being careful to introduce them with a warning that "as prices vary as on marches, or during the rains, and for other reasons," he gives average prices only "for the information of future enquirers," who is almost laughably minute in all he writes, and who thinks nothing too much or homely for observation and comment, is hardly the man to assimilate his history to a heroic poem."

The *Englishman* has, we think, the best of the controversy, and we must make room for some remarks of the same journal upon the true amount of the Mogul revenues:—

> When we compare the extent of territory under Dutch sway with that which obeyed the sceptre of Aurungzebe, when we recollect what vast tracts of waste and jungle have since his time been brought under the plough, when we take into consideration the vast diminution which during the interval has taken place in the purchasing power of silver, it seems almost incredible that the land revenue collected by that monarch was some fifty per cent greater than we realise at the present day. Yet official documents the authenticity of which is above suspicion, show that the net collections of this branch of Aurungzebe's revenue were, towards the close of the seventeenth century, £34,506,640, while at the commencement of his reign they were £24,056,114. In the reign of Akbar, in the year 1594, the land revenue was £16,574,388; between that period and 1628 it rose slowly but steadily to £17,500,000. In the next twenty years it increased to £22,000,000 at which figure it stood in 1656, during the reign of Shah Jehan: while official documents show that in 1655 it was £24,056,114 after allowing ten per cent. for collection and some years later £34,506,640. But we give the whole of the figures as recapitulated by Mr. Thomas:—

RECAPITULATION OF THE AMOUNT OF THE REVENUES OF THE MOGUL EMPIRE AT VARIOUS PERIODS REJECTING ALL IMPERFECT RETURNS.

Mogul Emperors.		*Authority.*	*Land Revenue.*	*Revenue, from all sources.*
1 Akbar,	A.D. 1594	Nizam ud-din Ahmad	....	32,000,000
2 ,,	,, 1594	Abul Fazl, MS	16,574,388	
3 ,,	,, ,,	Official documents	16,582,440	
4 ,,	,, 1605	[illegible] quoted by [illegible]	17,450,000	
5 Jehangir,	,, 1609	Captain [illegible]	..	50,000,000
6 ,,	,, 1628	Abdul [illegible] and Lahori	17,500,000	
7 Shah Jehan,	1648-9	Official documents	Gross .. 22,000,000 Nett .. 20,743,970	
8 Aurungzebe,	1655	Official documents	Nett .. 24,056,114	
9 ,,		Later Official documents	34,506,640	
10 ,,		Gemelli Careri	....	80,000,000
,,	,, 1697	Manucchi (Catrou) ..	38,719,100	77,130,800
,,	,, 1707	Ramusio	30,179,692	
		Difference 10 per cent. for collection		
		Double the land revenue.		

In the figures of Manucchi and Ramusio we do not place much faith. Nor is it probable that the sum of £80,000,000 given by Gemelli Careri as the total of Aurungzebe's revenue from all sources in 1695 can be strictly depended on. But the amount of the land revenue under Akbar in 1594 viz., £16,582,440, is based on official documents, so is that of £24,056,114 under Aurungzebe in 1655, and that of £34,506,640, forty years later, and thus rate of increase being established by unquestionable evidence, no reasonable doubt attaches to the figures for the intermediate years given by competent native authorities. The total revenue under Akbar was £32,000,000, of which £16,582,440 was from land, £15,417,560 from other sources. If the latter sum increased only in the same proportion as the land revenue, the total revenue under Aurungzebe would have been about sixty-seven millions sterling.

We have not much difficulty in accompanying our contemporary thus far, but are not quite sure that he is right when he proceeds as follows:—

> In the reign of Akbar, about four times as much grain could be obtained for the same weight of silver as now. Depreciation of precious metals had however then already set in, and probably went on progressing in the interval between Akbar and Aurungzebe. We have not at hand the data which would enable us to make a strict comparison of the prices of the latter reign with those of the present day, but we shall probably be on the safe side if we take the value of silver, as then tested, to have been at least three times as great then as now. On this assumption then the land revenue of Aurungzebe was equal to rather more than a hundred millions sterling of our own money, and we know that of Akbar to have been equal to more than sixty-six millions. We must say a doubt suggests itself to our minds, whether it would now be physically possible to collect a hundred or even sixty-six millions as revenue from the same area of cultivated land that gave these amounts to Akbar and Aurungzebe respectively, and the fact might lend some support to the notion universally current in India, that the land is less productive now than it was in the time of the Muhammadan Emperors. It is quite out of the question however to suppose that it could have been five or even three times more productive then, nor is there any need for such a supposition. We believe there would be very little difficulty in showing on independent evidence, that if we took the same proportion of the produce throughout India, including Bengal, as Akbar took, we should realise fully as much as sixty millions sterling.

We should be very glad to see our contemporary return to this subject, and state at length the full change which he thinks has taken place in the value of silver, with the grounds on which he bases his belief.

REVISION OF ASSESSMENTS BOMBAY.

Papers relating to the Revision of Assessment in six talookas of the Ahmednuggur Collectorate. Selections, Bombay Government, No. CXXIII.

THE districts to which these selections and papers refer, are in point of natural advantages below the average of Bombay districts. They are certainly inferior to Guzerat, Khandeish, Dharwar, and the Concan Districts. Perhaps however if we except Kortee and part of Kurdeh, which have a very bad climate, in which respect they are like the adjoining district of Indapoor in the Poona Collectorate,—they may be considered average specimens of the Deccan districts. There was very little capital in them at the time of the revision (1854). Prices were low, with no certain

prospect of a rise, and the previous settlement had had a demoralizing effect, and a majority of the ryots were the slaves of the Marwarees. Notwithstanding these disadvantages, the amount realizable under the revised rates will, before the termination of the settlement, exceed the collections under the old system by about 46 per cent. Should present prices continue, the assessment might, with safety, be doubled at the next revision, yielding an increase of 193 per cent. But even on the supposition that prices fall, the assessment if only raised 50 to 75 per cent. (the Indapoor assessment raised 53 and that of Madeh 77) would yield an increase of 119½ to 156½ per cent. on the average collections of the former system. It may further be noticed that the collections in the years immediately preceding the settlements, were somewhat below the average. The attempt to levy too much revenue in 1847-48 in the depressed and impoverished condition of the districts, did so much injury that heavier rates than those adopted could not have been imposed with safety *at the time*; although of course the rise in prices that has since taken place, and the improved condition of the districts, would now warrant the imposition of a higher assessment. In districts with such an uncertain rainfall moreover, it is always expedient to make a low assessment.

Results quite as favourable appear to have been reached under the new Survey in many other Deccan districts, and it is to be remarked that they were generally advancing in prosperity even before 1862, when the modern period of high prices commenced. The arguments of Sir George Wingate, in support of the Bombay system, have been fully confirmed by the results attained in all the collectorates. Viewed simply as a measure of administrative reform, no revenue system in India has proved so successful as that introduced by the late Mr. Goldsmid and Sir George Wingate. One main cause of the Bombay Settlements having hitherto proved more successful, financially, than those of other parts of India, is the method adopted of applying the assessment to the arable waste lands, as they are brought under cultivation.

Districts.	Average former collections	Survey rentals.	Increase on average of former collections (of old system)
	Rs.	Rs	
1. Rahoorie	59,952	127,848	
2. Newasseh	101,528	150,945	
3. Kurdeh	121,618	144,332	
4. Nuggur	80,260	94,788	
5. Kortee	69,257	95,068	
6 Sheogaum	12,354	61,146	
7. Jamkheir	55,504	65,143	
(1) 7 Districts	531,503	739,560	
(2) Deduct 1 per cent for assessment of land remaining uncultivated		7,395	
		732,165	
(3) Add for local fund cess at 1 anna in rupee or 6¼ per cent		45,751	
Amount realizable under present settlements		777,921	247,418, or 46½ per cent
Revised assessment at end at present term of settlement, at 50 per cent. increase with a local cess of 6¼ per cent.		1,166,881	636,381, or 119½ per cent.
Ditto. at 75 per cent. with ditto		1,361,361	830,861, or 156½ per cent.
Ditto. at 100 per cent. with ditto.		1,555,849	1,025,346, or 193 per cent

Notes.

(1) The aggregate collections in the years immediately preceding settlements were somewhat below the averages shown.
(2) In all the districts the cultivation has reached, or is rapidly approaching its maximum limit.
(3) A local cess of 1 anna in the rupee was imposed subsequently to the settlements, and in reality forms an addition to the Government share of the rent.

THE TICHBORNE CASE.

It is surely a striking illustration of the incapacity of the public mind to deal with questions of evidence, that five men out of every six you meet, seem to have arrived at the belief that the claimant in the Tichborne case, is the butcher of Wapping. But the Counsel in the case certainly have no such belief: they know well that the man is not Arthur Orton, and the fact stamps their course, we think, with real immorality. For while knowing that the claimant is not 'the butcher,' their whole strength was used to fill the minds of the jury and the public with the belief that the man really is he. From beginning to end, the defence has been an elaborate and conscious *suggestio falsi*, and so completely has it succeeded, that although a hundred persons have sworn that the man is Roger Tichborne, and not one single witness can identify him as Arthur Orton, he is still believed to be the latter, Thus we are to accept it as a fact, that while a hundred men identify him as Sir Roger and not one can challenge him as Orton. he really is Orton and not Sir Roger. No one can discern Arthur Orton in the man although he is really he, while a hundred discern him to be the man he really is *not*. The defence proved, what was not denied, that the claimant adopted the name of Orton in Australia; when although they *know* that he is not Orton, they persistently *suggest* that he is, and with such success that five out of every six persons you meet, tell you unhesitatingly that beyond doubt he is "the butcher." The defence was an elaborate attempt to obtain a verdict, by filling the minds of the jury with what Counsel knew to be a *suggestio falsi*; and Sir John Coleridge, uneasy apparently at his own success, has tried to satisfy his conscience as to the course taken by reminding the Court that he did not "affirm the man to be Orton." No: he only suggested it, knowing well that he was not; but so suggested it, and so worked the suggestion, that he has filled men's minds with the belief that he is. The case is a most unpleasant one throughout. As it now stands, the public undoubtedly believe the claimant to be the butcher, although no one can identify him, and that he is not Sir Roger, although a hundred people swear that he is. What does Sir John Coleridge himself believe? He knows that he is not Arthur Orton: he assures the jury in unmistakable terms that he is *not* Roger Tichborne: whom then does Sir John Coleridge really believe him to be? Ask the next person you meet, his grounds for believing the claimant to be 'the butcher,' and you will find that they consist of the *suggestions* made by Counsel, while those suggestions have been so false throughout, that they themselves *know* that the claimant is *not* the butcher, let him be whom else he may. Let the reader imagine for a moment his own return to England, after fifteen years absence, and finding a hundred persons identifying him as someone else in the most positive manner, a strange lady claiming him for her son, while not a single member of his own family, friends, or acquaintances, can remember him or identify him in the least. Such is the exact position of this man. A multitude of persons swear him to be the man he is not, while not one single person can identify in him the man he really is. And the public mind generally seems satisfied with the issue of the trial. English procedure is undoubtedly largely to blame for so impotent and unsatisfactory a conclusion of the case.

THE DEBT OF INDIA:

A DISCLOSURE.

In his late work on the National debts of the world, Mr. Dudley Baxter furnishes us with a mass of interesting and important figures concerning the economic position of the civilized nations of the world. Under the head of the 'civilized world,' he includes the whole of Europe, America, and Australasia, and part of Asia and Africa. The statistics of the people are:—

	Population.
The European Nations	309,900,000
Anglo-Saxon & Latin America	84,600,000
Australasia	1,833,000
Asia (British India, Ceylon, Japan & Hongkong)	192,200,000
Africa (Egypt, Cape, Mauritius)	17,385,000

According to this grouping, the population of what may be regarded as the civilized world, excluding China and the Native States of India but including Japan, is about 600 millions, whose financial position is declared to be as follows:—

Their annual income on an average of	£11-0-0 per head		£ 6,600,000,000
„ annual taxation	£ 1-0-0	„	„ 596,000,000
„ debts in the aggregate		„	„ 3,900,000,000
The annual interest on their debts		„	„ 157,000,000

That these figures represent a fair approximation to the facts, there need be no doubt, and they shew the total indebtedness of

the civilized world, to amount to about eight months of its total annual income or earnings. The position of British India in this comparison must therefore be regarded as very favourable, since it would stand somewhat as follows :—

THE CIVILIZED WORLD .....Estimating its average income at £11 per head, has anticipated and spent, on the average, about 8 months of that income.

BRITISH INDIA .....Estimating its income at £6 per head only, and its debt at £90,000,000, has anticipated and spent 5 weeks of its income only.

When we bear in mind moreover, that in equity this so-called Indian debt is more an English than Indian liability, the fact we have so frequently insisted upon, stands out prominently, that the credit of British India should stand higher in the money markets of Europe, than that of almost any other nation. For practical purposes, British India may be said to be the one civilized country of the world that is not in debt : and yet while other nations borrow in the most reckless manner merely for purposes of war, or war preparations, India is forbidden to borrow even for purposes so vital to her well-being as 'communications.'

Our total debt according to the latest Returns is made up of the following liabilities :—

In England.—

East India Bonds	3,017,617
„ „ Debentures	4,995,000
India 5 per cent. Stock	17,200,000
„ 4 „ „	12,800,000
Debentures issued in exchange to holders of Debentures of the Calcutta and S. E. Railway Co ..	£ 88,050
Owing for Stores purchased for India . ..	195,000
Admiralty and War Office claims	185,000
Capital of Indian Railway and other guaranteed Companies remaining in the Home Treasury after deducting sums (partly estimated) drawn by them in India	£6,771,511
Miscellaneous	19,711
Total to 31st Dec 1871	£48,272,152

In India.—

Total Interest bearing debt .. .	£70,681,568
Debt not bearing Interest	9,192,242
Total to 30th Sept. 1871 ..	£79,873,810

Thus the total liabilities of the Government of India in both countries amount to about £129,000,000 sterling, against which however there are the Cash Balances in the two countries, amounting to £24,000,000 to £25,000,000. For all practical purposes, the debt of India may be held to be £90 to £100,000,000 sterling. This sum is exclusive however of the charge upon the revenues of India, for the capital stock of the East India Company, £6,000,000 which is subject to redemption by Parliament on payment to the Company of 200*l.* sterling for 100*l.* stock. There are also contingent liabilities in respect of interest, guaranteed Indian Railway and other Companies, and of repayments to them of capital expended

ALCOHOL:

FOOD OR POISON?

Is ALCOHOL food, medicine, or poison? The answer we suppose must be the common place one that by turns it is all three. The medical manifesto recently issued in London upon the injurious extent to which alcohol has of late years been prescribed by the profession, has led to an attempt to determine by experiment the maximum quantity which can be taken "without producing its slighter poisonous effects." Mr. F. E. Anstie's experiments lead him to conclude that two glasses of sherry per diem representing about ¾ of an ounce of absolute alcohol, are about half the quantity which a strong and fairly active, but not too hard-worked, adult *male* can consume daily, without any evidence (from the appearence of alcohol in the excretions) that the body suffers from a surfeit. *Women*, those at least who lead an ordinary life, on account of their inferior bulk, the smaller amount of organic, muscular, and intellectual work which they perform, and the greater danger to which their nervous system exposes them when dealing with "nervine" agents, ought to be limited to half the allowance assigned to men, or two glasses instead of four per day We have the smallest possible respect, we confess, for such conclusions. Our own belief in the matter is a very simple one. The man or woman who enjoys perfect health without stimulant of any kind, should never touch any. But the many do *not* enjoy perfect health, and it can only be matter of personal observation in these circumstances, how much or how little stimulant assists the assimilative, or (healthfully) retards the destructive, processes constantly at work in the [illegible] Thus Mr. Anstie himself says he is acquainted with a good many hard-worked professional and literary men, who [illegible] physical good health and efficiency both of body and mind, and whose daily allowance is the equivalent of 2¼ ounces absolute alcohol. This would represent about six glasses of sherry or a whole bottle of light wine. The German army was rationed on this scale during the late war. Until the action of alcohol upon the system is more exactly known than it now [illegible] impossible to prescribe it *quantitatively* except by rule of thumb. For the very same quantity is at times poison at others medicine, and at others food, to the very same person. We were very much struck with a statement we met with recently in one of the Jail Reports of the country, we forget which of them. It was to the effect that the writer, a medical man in charge of the jail, had never in the course of a somewhat long experience once known an instance in which a prisoner had suffered in health from being deprived under the jail rule of the stimulants to which he had been accustomed outside. We should certainly like to know whether this experience can be corroborated by other medical men similarly placed.

SETTLEMENTS IN THE NORTH-WEST.

A CORRESPONDENT in the North-West Provinces, a Settlement officer, wrote to us some months ago concerning our strictures on some recent proceedings of the department :—

> Now that I have written all this to oppose you, I must in fairness admit that there have been many instances to establish your view; only I would say that these instances have probably affected single towns or villages, and not wide tracts of country. The town of J——pays, I believe, about Rs. 7,000 land revenue. The cultivated area is about 8,000 acres; its land enriched with the most fertilizing of all manures; and part of the land is irrigated from ponds and more from wells. The history of this absurd assessment need not be made public; only it must be conceded that in that one town the Government has unnecessarily lost at least £3,000 a year, or say £90,000 in the 30 years, for which the assessment is to run. There is another town not far from it named G——, whose assessment is Rs. 4,000 a year. Its tobacco crop in one year sold for Rs. 30,000; that is to say, 7½ times its entire assessment for the whole year was raised from a crop which occupied part of the ground for 3 months. It is true that this crop is very liable to destruction by hail; and in the very next year to that whose profits I have related, the owners lost some Rs. 6,000 worth in half-an-hour; but allowing for that risk, the town is manifestly under-assessed at least 50 per cent.: that it to say, a fair assessment would in the 30 years of the currency of the Settlement have yielded to the State about £12,000 more than will be yielded as the assessment stands. And this sum represents considerably more money than has been gained to the Empire by the Income-tax and Certificate-tax during the past 11 years in the whole district where that town is situated.

We quote this extract by way of introduction to a request that the Government of the North-West-Provinces would frankly make public certain disclosures which have reached it within the last twelve months, as to the astounding errors that have been made in some of the Settlement proceedings of late years. It is not quite candid, we think, to lay before the public such of these proceedings only as upon the whole can be submitted to public criticism, without fear of much damage being done to them; and to suppress such reports, or revision of reports, as prove the necessity there was for our strictures. We hear on unexceptionable authority of the existence of reports which assert in the strongest manner the general accuracy of our complaints on the subject, and we do not think it is quite fair to suppress these reports, and to publish such only as seem to show that our strictures were not called for. We do not question the good faith of Sir William Muir's Government for a moment. It is beyond suspicion; but we think its discretion is not quite fairly asserted. Why the reports we refer to should be kept back, we cannot tell, unless it be to screen the officers whose proceedings are impeached, and we appeal to Sir William Muir or the Board of Revenue to publish them.

EDITORIAL NOTES.

THE Government of India we see have resolved that—

Experiments on a larger scale will be necessary to enable it to determine how far Mr. Login's plan of Egyptian culture is likely to prove generally successful, and how far the favourable results which he has obtained have been due to the extreme care bestowed by him and his subordinates on the undertaking. Under any circumstances however Mr. Login is entitled to the thanks of Government for the attention which he has paid and the labour he has devoted to this most important national object, the improvement of the cotton culture of India. The Lieutenant-Governor of the Punjab will arrange for the further prosecution of the experiments suggested by the Commissioner of Cotton and Commerce.

IT is a satisfactory feature of the Budget that although Sir Richard Temple takes credit there for opium at Rs. 1,200 per chest only, it still shews a surplus of nearly a quarter of a million sterling. The prices obtained for the drug at the last sale in Calcutta (3rd inst.), realized Rs. 1,424 to 1,46[illegible] per chest.

Description of Opium.	Chests.	Highest.	Lowest.	Average.	Proceeds
Behar	2,000	1,470	1,460	1,463 1 7	29,26,260
Benares	1,575	1,435	1,120	1,421 12 8	22,41,059

Should these prices be maintained, and in presence of the short supply in Bengal they are not likely to fall, the surplus which the regular estimates will shew at the end of the year, will have swollen from £237,000 to nearly £1,500,000.

Year by year says the Finance Minister, experience brings home to us the conviction that there are few points of greater consequence to the prosperity of Indian Finance than a safe and moderate estimate of the opium revenue.

The estimate made is, we believe, a safe and proper one; but it is a question, as some of our Calcutta contemporaries point out, whether a surplus obtained in any year purely from opium, should not be carried to the credit of a Reserve Account for contingencies. The question has moreover a very direct bearing upon the strength of the Cash Balances.

A LATE issue of the *Indian Observer* contains an elaborate and we think a very unworthy attack upon the editor of this journal. Not only it seems have we travestied the Scriptures, and made passages of them 'intensely ludicrous' by the references we have made to the history of the Egyptian famine and the measures taken by the Hebrew Minister to surmount it, but we are declared to be dishonest, and to make statements that we know to be untrue. And all this simply because we have frankly avowed that "were "we ourselves engaged in Settlement operations, we should not "dream of giving practical expression to the doctrine which we "nevertheless hold to be true, and necessary to be remembered."

Now that doctrine is, that from time immemorial the State has ever had the right of appropriating a share of the produce of the land, a share that might amount to one-half thereof under Mahommedan law, and that under any native rule was regarded as moderately asserted when one-third only was taken. And because we add frankly that were we ourselves engaged in Settlement operations, we should not dream of exacting so high a proportion, it is dishonest it seems for us to object to the very low rates which have been the rule of late years. Because we would not ourselves take one-third or one-half, it is dishonest to object to only a fifteenth or twentieth being taken! And our course is supposed to be honestly pourtrayed as follows:—

Do you think that in India Settlement officers have made their assessments too low? Avoid all discussion of the facts on which these assessments are based; insist loudly on the absolute right of the State to a mathematical share of the gross produce; value this share at a sum greatly in excess of all existing taxation. The non-agricultural classes will believe that, by adopting your views, all taxes affecting them will be abolished, and the resources of the country developed to an unlimited extent without the slightest financial difficulty. Never mind what means you use; once succeed in exciting an unreasoning clamour, or, as Mr. Knight would say, in "thoroughly awakening the public mind," and the victory is won. Do not fear that you will be embarrassed by former promises and assertions; you have frankly admitted you would not dream of carrying them out; you must make a pretence of doing so, but you may safely give it up, and boast about your own good sense and moderation. No doubt this policy is often successful. Will Mr. Knight venture to say that it is an honest one?

Mr. Knight "ventures to say" that every one who has read his writings upon the subject with candour, will wonder as he himself does, at the perversity with which the *Indian Observer* has tortured them for months past.

5 APRIL.

THE *Economist* warns the Radical party at home, that their political aspirations after a much greater equality of condition than at present exists in Great Britain, and for legislation to defeat the tendency of property to accumulate in few hands, with their proposals about intestacy, primogeniture, the tenure of land, and the liberty of bequest, are inconsistent with any hope of seeing direct taxes tolerated in the country. It is well for them to take note, it says, of the fact that an increasing dislike of direct taxation and an increased impatience of it, will be the direct result of carrying the reforms which they demand.

THE Government of India, says the *Economist*, "possesses two sources of revenue unknown in England—one under a name either of land-tax or of rent, as we may think it best to name it. It derives a great revenue from the soil of the country, and this revenue, from the great improvement of the people, and from another cause, we shall mention directly, (Public Works), has rapidly increased.—

In 1858 it was	15,317,000
In 1867	19,136,000

"showing an increase of nearly four millions in ten years."

Our contemporary is wrong in supposing the increase of the land revenue to have been anything like what his figures show. We are now however entering upon a period of revision of leases and re-assessments, and the next decade will shew a very marked improvement upon the last.

THE actual revenue of the Madras Presidency in the year 1870-71, and the estimated revenue of the present year compare as follows:—

		1870-71.	Estimate 1872-73.
Land-revenue	Rs.	130,33,269	445,00,000
Abkari	"	58,92,857	57,00,000
Assessed taxes	"	23,34,850	6,90,000
Customs	"	30,48,784	30,30,000
Salt	"	126,42,303	130,00,000
Stamps (General)	"	16,22,080	16,00,000
Do Court Fee	"	24,10,134	24,00,000
Total....	Rs.	717,84,057	709,20,000

The diminished total for 1872-73, it will be seen, is attributable to a falling off under the head of Assessed Taxes, the Income-tax having been 3½ per cent. in 1870-71, and now one per cent. only.

IN noticing the fact that a revision of Settlements is going on in Mysore upon the Bombay system of Survey and Assessment, *Allen's Indian Mail* quotes the testimony of the late Commissioner, Mr. Bowring, that the Bombay system is "the only "Settlement in India, of which it can be said that the Government "revenue always increases under it, that the waste land is invariably taken up for cultivation, and that the assessments never "break down." That is high praise, says the *Mail*, from a Bengal Civilian, but our contemporary adds, "the Bombay system, be it remembered, assesses the land revenue mainly on the heads of villages, and the assessment runs for thirty years."

Our contemporary is here at fault. The distinctive feature of the Bombay system is that the Settlement is made with each individual cultivator, and not with the "heads of villages." The plan of dealing with the patel or malgoozar, head of the village, is the system on which the Central Provinces were settled, and is not the Bombay plan at all.

THE most important practical step perhaps that could be taken for bettering the condition of the working classes in our own land, would be the providing them with improved dwellings. Few persons have any true idea of the horrible condition in which the proletariat of European cities generally are housed, as shewn a few years ago by Pere Haycinthe at Brussels.

The wildest and most extravagant statements are sometimes made as to the amount that would be required to re-house the artizan class of England, no less a sum than £800,000,000

having been recently declared necessary for the purpose. It is asserted on the other hand, that less than one-twentieth of that sum spread over many years and a not very large area, would be a considerable over-provision. "Take the metropolis for instance, and say that it contains a million of working-men, who need to be better housed. House two hundred thousand of them only on the Peabody plan, and you give the remainder a choice of dwellings, a power of selecting the best, and rejecting and deserting the worst, which would force upon proprietors the immediate improvement of their cottages. Now 200,000 persons mean 40,000 families; and at the high estimate of £200 per family, which is certainly excessive, £8,000,000 might be required in the metropolis. But even this would not in all likelihood be required. Probably £2,000,000 judiciously spent in new buildings, and two more in purchasing existing ones (as Lord Shaftesbury's Society has done with some courts and alleys in Holborn), and cleansing them and supplying them with all needful appliances, would suffice to produce a complete change in quarters, where the people are now housed in hovels of the worst description."

The question of "improved dwellings for the poor" lies at the root of all efforts to raise the condition of the proletariat. When will the Governments of the world wake up to an understanding of the fact that *this* also is a question to which the doctrines of *Laissez faire* have but too fatally been applied.

THE *Indian Observer* has become the property, we understand, of Mr. J. W. O'Sullivan, who also will edit the journal in future. We congratulate both the late and present proprietors upon this arrangement, Mr. O'Sullivan being one of the ablest and best-informed writers we have in India.

In one of the latest issues of the *Observer*, under its late proprietors, its editor sums up the difference of views between the *Observer* and the *Economist* as follows:—

Mr. Knight believes "that the Commonwealth has a divinely appointed right to at least one-fifth of the gross produce, and that up to this limit it may fix its rents precisely like any other landlord, whose cultivators are the merest tenants-at will." We hold:—

1.—That India is not a commonwealth.
2.—That the Government does not stand towards the agriculturists as a landlord to his tenants-at-will.
3.—That the Government is not entitled to an arithmetical share of the gross produce of the whole of India; it is entitled to levy the land revenue like any other tax, but the amount to which it is entitled is fixed at no uniform rate; it must be determined by the actual condition of each district assessed.

The statement concerning ourselves in this extract, is most untrue; and the use of quotation marks, suggesting that the statement expresses our *ipsissima verba* was, we hope, an accident. To invite us to establish the fact that India is a commonwealth in the narrow sense of the term attached thereto by the *Observer*; or the Indian Government a landlord in the English sense of the word; or the Government entitled to an exact arithmetical share of the produce of the whole of India, is to invite us to establish what we have never affirmed. We cannot honestly compliment our contemporary upon his conduct of this important controversy. There have been some admirable articles thereon in his columns, and a good deal of what has been anything but that. We trust Mr. O'Sullivan will be fortunate enough to retain the one class of contributions: the others he may drop with nothing but advantage.

MR. LOGIN sends us from Umballa some very pertinent and just remarks on the subject of 'Communications.' He says:—

In a country like India, covering so large an area, we should be prepared for scarcity in some tracts of the country at all times, which renders it the more necessary that we should have good lines of communication, for if they are provided, what might be an appalling famine, will be only a partial scarcity. The question is therefore how to provide cheap transport.

Navigable canals are no doubt the cheapest; railways come next, and roads last of all, the cost of freight increasing in an arithmetic progression, in about the ratio of 2, 4, and 6. Hence it is evident that where there are only roads, we may have a super-abundance of grain in one district, and a few hundred miles off, a raging famine.

Unfortunately, water transport can only be made available in peculiar localities, and water is often too valuable to be used in canals, and can be more profitably expended on irrigation, so as to produce food and save the necessity for any transport of grain. The question thus becomes very complicated, and the conclusion I have come to is, that all are necessary, and that there should be a combination of all, one aiding the other. Roads for short distances, railways where time is an important element, and navigable canals where it is not so.

We venture to remark upon this extract, that we think Mr. Legin's arithmetical progression of comparative cost, doubtfully correct. Surely transport by water costs less than half what it does by railway, even taking the element of time into full account. Mr. Login proceeds as follows:—

To arrive at a just conclusion as to the relative value of each mode of communication to protect the country from famine, where outlay of capital is an important element, a few facts are necessary to be known. To begin with cheap, earthen roads, and expensive metalled and bridged ones. Many of your readers will be surprised to learn, that the cost of carriage over a "kutcha" road is barely 25 per cent. greater than over a pucka one; while the saving by rail compared with a metalled road, is 200 per cent. for transport alone. The tear and wear of macadamized roads far exceeds the cost of the tear and wear of iron [illegible], so much so that the former nearly equals the railway freight, were [illegible] goods sent by rail instead of over a metalled road. Hence *for traffic* [illegible] kutcha roads are more economical than metalled roads, and [illegible] ways are cheaper than either, wherever the traffic anything like pays the guaranteed interest. It is nonsense to say that because a railway does not clear the whole guaranteed interest, the difference is a dead loss to the country to that amount; for every maund sent by rail is a gain to Government and the tax-payer by an amount almost equal to the [illegible] 3rd class goods.

We are not sure that we quite understand Mr. Login's meaning. Are we to understand that taking all things into account, (1) transport by *kutcha* roads is cheaper, *upon the whole*, than by *pucka* ones; and (2) that transport by railway is cheaper by 200 per cent. than by either? We should be glad to hear from Mr. Login at greater length upon the subject, the more so as he is no partizan of any interest whatever.

AFTER misrepresenting with the utmost perversity for months, what we have written upon the subject of re-assessing the land, the *Indu Prakash* sums up "the plan *it* would like to see adopted" in the following paragraph:—

To sum up in a few words the plan we should like to see followed:—We would recommend that the new assessments be as liberal as possible, the increased cost of administration and necessities of Government being the basis to go on in reckoning the necessary increase, rather than calculations either as to the relative value of the present and former assessment when reckoned in produce, or as to the real amount of rent the land would bear; and the assessment should be fixed if possible at such a rate as to provide for local wants without further vexatious taxation of cultivation in the shape of Income-tax, local fund, or other cesses.

But this is simply a reproduction, almost in our own words, of the two principles for which we have so earnestly contended from first to last: (1.) That the assessment should in all cases be as liberal as the exigencies of the State allow: (2.) That instead of supplementing an unduly low assessment by such devices as the Income-tax, we should take, once for all, in the shape of land revenue, the amount we are compelled to levy upon the people. Our readers will bear testimony how earnestly we have laboured to get these principles fixed in the public mind. And now, this native journal which has done nothing but abuse us in the most virulent manner for months, coolly puts forward these principles as its own, the principles for which it has been contending throughout. We forgive him: but let him not criticize our writings again, until he has been at the pains to understand them. The principles he now lays down are *our* principles, for which so much abuse has been heaped upon us by this very writer.

THE Select Committee of the Commons are subjecting the Home Charges to a thorough scrutiny, we are glad to see. It is a breach of the privileges of the House to publish the evidence taken by the Committee before its Report is issued, but the press defies the rule, and does the public the service of reporting the evidence *in extenso*. From the examination of General Pears, as to the cost of the depôts, we make the following excerpt:—

Sir C. Wingfield: Does the War Office charge you with sums which rather belong to England than to India?

General Pears: I do not think they charge us with sums for which they have not some ground for charging: the fact is, the War Office and the India Office view the matter from two distinct points. It is a difficult thing to find some general principle on which to make these charges. The War Office seem to think we ought to pay a share of expenses of military organization in this country. On the other hand, the Indian Government may argue that they have to pay more for a soldier trained by the War Office than one would cost if he were trained and paid by the Government of India. Some middle course between those two courses is desirable. The War Office have the monopoly of the supply of soldiers, and their arrangements being dependent on considerations of Imperial policy, they came to

the Government of India and said:—"the soldier costs us so much, and you must pay it." We say if we were left to ourselves, we should get soldiers at a much cheaper rate; but we cannot hope to combat their arrangements or their policy. We say, if we had a depôt for India, we could get recruits at a much lower cost; but they reply—"It does not suit our military organization; and a large proportion of the expenses must be borne by India."

Sir C. Wingfield: So that you are obliged to pay for a dearer article than you require?

General Pears: That is the case.

Sir J. Elphinstone next [illegible]ned General Pears with reference to the quality of the recruits [illegible]ed by the East India Company, and those now sent [illegible]

General Pears: The recruits are [illegible]tai[illegible]in the Presidency as they used to be in the time of the East India [illegible]. They are now moved at once into the interior. I consider that the raw material of the recruits is better than it was under the East India Company. They become good soldiers, or fit for service, in six months after their arriv[illegible]

Mr. Fawcett: Do you think it is honest to tell the Eng[illegible]h people that they have so many effective soldiers, and that they are pa[illegible]certain amount towards them, whereas a portion of the expense, and not a very inconsiderable expense, is paid by the Indian people? Is this what was told in Parliament?

General Pears: There must be some peculiar mode of exhibiting the army estimates, with which the House of Commons should be bettter acquainted than I am. I think that £100 for training an infantry recruit is too much.

We shall look by and bye for the Report of this Committee with very great interest. If the Report fail to remedy the present abuses, we shall almost despair of their reform.

THE *Indian Examiner*, in noticing our statement that the Government of India would have "no vested interests to consult" in itself undertaking the business of Life Insurance, thinks we have made a mistake upon the point:—

> The number of holders of shares in Insurance Companies is greater in India than many people think. This might not be an insuperable objection to the carrying out of the proposition, but it shadows forth the probability of a powerful opposition. The collapse of so many Insurance Societies of late has shaken public confidence, we admit. But a short time has only to elapse during which things go smoothly, that confidence will be revived and, as it is generally found in such cases, there will be a reaction in favour of the Companies stronger than before existed.

Mere Indian shareholders in such Companies, however numerous they might be, could hardly raise an opposition worth considering. The *Examiner* proceeds to remark that:—

> "The *Economist* could not have chosen a better time for agitating this question, which but for its novelty, would commend itself to the approbation of all those and their name is, nearly legion—who are now dubious of the stability of private Insurance Companies."

It is not so much, we confess, any fear of the stability of the present Companies that moves us in the matter, as the conviction (1) that Life Insurance is the proper business of the State; (2) that the rates might be indefinitely lowered by the State; (3) that the profits would be a sure and prolific source of revenue; and (4) that the extension of the system in this country, would be a powerful guarantee for the loyalty of the people. It seems to us that the organization of a department of Life Insurance by the State, just as we have Governmental Savings Banks, would be a great boon to the people, and a certain source of profit to the State, and that as the field is not occupied by private Companies in India, its government might create such a department with nothing but advantage, there being no risk whatever in the business of Insurance. Novel as suggestions of this order at first seem, a little reflection will frequently suffice to shew that, they are sound, and practicable, and wise. The State should undertake the Life insurance of its subjects: the Municipalities, the Insurance of property against fire.

IN a late number of the *Indian Observer*, the Government is urged to ascertain the precise position of the opium trade in China. Our contemporary approves Mr. Maitland's suggestion to the Select Committee, that Government should send to China two or three gentlemen of Chinese experience, and a knowledge of the language and habits of the people, who should go into all the districts where opium is grown, live among the people, and ascertain by personal observation, what are the actual facts. Our contemporary believes that this plan was once suggested by the Board of Revenue and the Lieut.-Governor of Bengal, but negatived by the Supreme Government:—

> Whether the reports be pleasant or not, let us know the worst. The great point is as to the quality produced in China. Unless the quality is brought to equal the Indian drug, we have no fear, for the wealthier Chinamen will not cease to buy ours. On the other hand, if the quality is brought up to a level with the Indian, which, for our own part, we are loath to believe is likely, then all the reduction of price we may make will not avail. We must look the deficit in the face, great and serious though it be.

Mr. Maitland's suggestion is so simple and practical, that we would join with the *Indian Observer* in urging it upon Sir Richard Temple, with whom we suppose it chiefly lies to decide upon it. Now is the time to institute these enquiries, when panic has nothing to do with our counsels, and the trade seems to have gone into its normal state. The enquiry to be thorough must of necessity be somewhat protracted, and there will no doubt be difficulty in selecting the right agents for prosecuting it; but it ought to be made beyond doubt, while the expense attending it is hardly worth taking into account, when we remember the interests that are at stake. It will be hard if Calcutta, Bombay, and China, between them cannot furnish the men we shall [illegible]. Foreign Governments shew far more decision and promptness than our own in dealing with questions in which their industries are involved. We are too ready to stumble at the threshold, over the expense. Surely it is a great reproach to us, when we remember the interests we have at stake, that the Indian Government should be depending to this hour upon what is little better than 'hearsay' as to the growth and manufacture of opium in China itself.

A Home contemporary has an interesting note upon the condition of the cultivator, and the famous tanks of Mysore, being substantially however we imagine, a quotation from Mr. Bowring. He tells us that:—

> Owing to the extinction of its landed aristocracy and the absence of very rich and powerful merchants, the social leadership in Mysore belonging to the official classes, that is in effect to the Brahmans who hold nearly all the Government places and a good deal of the land of the country. In the Bangalore district the soil, as red as that of Devonshire, is very fruitful and the ryots are skilful husbandmen in their own way, however strange to our ideas may be their habit of growing several kinds of crop at one time in the same field. Most of them are well-to-do, making a brave show of jewelry and bangles on fair-days; and this may partly account for the independence of their manners as compared with those of the "cringing Bengáli." The old village community, once prevalent all over India, still retains many of its primitive features in Mysore. One of the village officers is the *Nyaputi*, who works the sluices and distributes the water of the tanks. Some of these are 300 years old, and ten miles round. A tank when full, is reckoned to hold six months' supply of water. These tanks often occur in regular chains, so as to ensure the storage of every available drop of water. They are solidly built as a rule, with embankments fifty feet wide, sluices at either end, and immense escape-weirs made of large stones.

It is a terrible reproach to British rule that we are allowing the works of our predecessors to go to ruin over wide districts of the country, while doing next to nothing ourselves in the construction of new ones. Our total outlay upon Canals and State Railways averages less than £1,500,000 a year.

THE BUDGET—1872-73.

THE present financial statement gives us (1) the final results (actuals) of the year 1870-71; (2) the Regular Estimates of 1871-72; and (3) the anticipatory or Budget Estimates for the new official year 1872-73, which began on the 1st instant. Beginning with 1870-71 the accounts of the year now finally closed shew an actual surplus of £1,482,000 of income over expenditure. The Budget Estimate laid before Council two years ago, shewed a deficit: the Regular Estimate put forward twelve months afterwards promised a surplus of £997,100; while it is now ascertained that there was an *actual* surplus upon the year of £1,482,000. For the actuals of 1871-72, the year just ended, we must wait till April 1873, but it is satisfactory to know, that the Regular Estimates—which are largely based upon actual figures—shew a surplus over the anticipations of last year of about 2½ millions. The Budget Estimates for the year upon which we have just entered, shew a small surplus of £237,000. The accounts stand thus:—

1870-71—Budget Estimates showed	£	(a deficit.)	
[illegible]ar Estimates ,, ...	,,	997,100	surplus
Actual Results ,, ...	,,	1,482,000	,,
1871-72—Budget Estimates ,, ...	,,	93,400	,,
Regular Estimates ,, ...	,,	2,700,000	,,
Actual results (not yet ascertained).			
1872-73—Budget Estimates shew	,,	237,000	,,

THE SURPLUS.

The surplus of 1871 consists of £1,845,100 from opium, and of £761,500 from other causes. "Disclaiming" says the Finance Minister "any credit for the opium surplus, we may perhaps in some degree, claim credit for the remainder, as tending to show that the original estimates were cautiously made, and that economy has been so enforced, that the various departments have worked within the estimates of expenditure." The claim is we think just, and must be allowed; the more so as a great part of the saving has been made in the military department, the expenditure upon the army being considerably below the Budget Estimates in spite of the expeditions against the frontier tribes of Cachar.

OPIUM ESTIMATE.

The receipts from opium for the coming year, based upon the expectation of an average price of Rs. 1,200 per chest, are estimated at £7,700,000.

"The amount set down for opium, £7,700,000, or 7¼ millions, though but little below a normal estimate, is considerably less than that which we are receiving for the current year. This decrease arises, as respects Bengal, from the circumstances I have mentioned to-day, namely, the short crop of last season. That failure of supply affected only one-quarter of the financial year just closed. But it will affect three-quarters of the present year, when the quantities are known and have already been notified. The Government has further announced that it will not, in any case, sell *more* than 48,000 chests in the calendar year 1873. This has reference to the formation of a substantial reserve of opium; an object which we have long had in view, which we have been prevented from attaining by misfortune of harvest, but which we still hope to attain. The prospects of the poppy are good as yet, but we must take 951 chests from the present crop to make up the quantity advertised for sale in 1872. If the yield should prove large enough to provide this, and leave a margin, it has been determined not to postpone longer the commencement of a reserve sufficient to enable us to mitigate the effects of such a failure of crop as we have experienced during the past year.

"It has been shown to-day how greatly the prospect of short supply has caused prices to rise during the late financial year, and how, despite fluctuations, these prices remain high. If they were to continue steady at these rates, or nearly at these rates, then, notwithstanding the diminished quantity of the first three-quarters, there would be a high revenue. But no reliance can be placed on their remaining steady. If the yield of the coming harvest in China were to be large, the possibility of fluctuations in prices, perhaps even of a serious decline, must be borne in mind. And if such a decline were to occur, we were disposing of the short quantities from last season, the falling off in fiscal receipts would be aggravated. Considering then, that we must guard our financial arrangements against disturbance from failure in this precarious branch, we have assumed the price of Bengal opium at Rs. 1,200 (or £120) per chest, a price which, though considerably less than the average of prices during the past year, is yet a good deal more than the Rs. 1,057 (£107-10s.) per chest assumed in my last Budget. This estimate will, I trust, be found to be safe, as it provides for the contingency of a fall in prices."

Malwa is estimated to send us 37,400 chests during the year, so that the total supply for China from India will be 81,595 chests.

THE INCOME-TAX.

The public interest is so much concentrated upon the question of the Income-tax, that it is as well perhaps to reproduce all Sir Richard Temple has to say in defence of its retention.

"The measure is manifestly indispensable, because, without it, there would be a deficit in the Budget, a position which we could not contemplate so long as any fair alternative remained to us. The rate of assessment is proposed to be the same as that prescribed for the last year, namely, two pies in the rupee, or a fraction over one per cent. This rate is, as explained on previous occasions, the lowest at which the tax could be levied if retained at all.

"The proposed modification is this: Last year, the minimum income liable to assessment was raised from Rs. 500 to Rs. 750 per annum; in other words, incomes below Rs. 750 a year were exempted. It is now proposed to raise the minimum to Rs. 1,000 per annum: in other words, to exempt incomes below Rs. 1,000 a year. Last year the number of persons liable to assessment was reduced by altering the minimum from 480,000 to 240,000. By the further alteration now proposed, the number will probably be further reduced to 180,000. The first-named exemption caused an estimated sacrifice of £150,000. The exemption now proposed will involve a further sacrifice of £63,000. We were glad last year to be able to propose so large an exemption. We have further satisfaction in being able to propose an additional exemption now.

"The unfavourable reports in respect to the working of the tax received from some parts of India have been duly considered, and suitable orders have been issued to prevent any just cause of complaint arising. From some parts of India however, the reports have been favourable; and in many parts there is an absence of complaint. Our general conclusion is, that whatever trouble may have existed, it has been mostly removed by the exemption of a large number of the tax-payers, and by the reduction of the rate. Whatever remnant of complaint may still exist will, it is hoped, be effectually removed by exempting incomes below Rs. 1,000 per annum. No poor or needy class would then be subject to the tax, which will be unquestionably what it was always intended to be—a tax for classes in comparatively easy circumstances.

"With all its drawbacks, the measure has done right good service to the finances. From 1860 up to the present time, it has, in various shapes, yielded 13¼ millions to the Exchequer. If our finances one year taken with another on a series of years, shall be found now to occupy a strong position, the tax has borne a creditable part in producing that result.

"During our earlier deliberation regarding the Budget in January last, it was under discussion whether it would not be desirable to re-impose the tax on this occasion in combination with reductions of other taxation either for the advantage of the mass of the people or for the remedy of politico-economic defects in our fiscal system. A mature and complete consideration of these important and complicated questions has however been impracticable under existing circumstances, and the Government have felt that, to be just and satisfactory, the discussion of changes which may still be regarded as desirable, must be reserved for a subsequent period.

"In the course which is now being adopted, we have the express concurrence of the Secretary of State.

"While proposing the re-imposition of the Income-tax for one year, we are unable to afford any indication as to whether the Income-tax should or should not, in the future, be made an integral part of our fiscal system."

The remarks made by the late Governor-General, Lord Mayo, in the Budget debate of last year, seem applicable to the present occasion. He then said:—

"We do not offer any opinion whether it" (the Income-tax) "ought or ought not to be continued as a permanent part of our fiscal system.

"The Government and this Council ought to have an opportunity of fully considering the claim for relief of some other interest which may be considered as competing with the Income-tax in regard to the reduction of burden."

It will be observed that Sir Richard Temple himself tells us in this extract that we were levying this obnoxious tax in 1870 upon 240,000 persons for the sake of a gross revenue of £150,000 only, and that the effect of confining the tax to incomes of Rs. 1,000 a year and upwards will be to exempt 60,000 more persons from its operation at a gross loss of £63,000. The tax will now, it seems, yield about half-a-million sterling. Could figures more certainly shew the mistake of imposing such a tax at all? As we have repeatedly pointed out—an Income-tax is impossible in India on the simple ground that there are really no incomes therein to tax, and when the disaffection that the tax undoubtedly begets is remembered, it surely must be held to be unwise to retain it for so unimportant a return.

By raising the limit of exemption to Rs. 1,000 a year, its incidence will now extend to not more than 180,000 persons. That is to say, in all British India with its 155 millions of people, there are but 180,000 persons in the receipt of an income of £100 a year, and upwards. But these figures mean that there really are in India *no* incomes to tax. Look at the returns of the United Kingdom, with its 30 millions of people only and vast proletariat to be deducted therefrom:—

Incomes between	£100 and £500	176,369
" "	£500 and £1,000	23,279
" "	£1,000 and £10,000	15,823
" "	£10,000 upwards	799
	Incomes	215,770

"Thus, while there are in all but 180,000 incomes to tax in India, out of a population of 155 millions, we have nearly the number of incomes at home between £100 and £500 a year, and nearly 40,000 incomes of from £500 a year up to £400,000 a class, which can hardly be said to exist in India at all, being numbered by units everywhere. In England 421,576 persons are assessed to the tax, or about one in 70 of their number, or one family in every 14. In India, we shall now have 180,000 persons assessed thereto, or speaking roughly, about one person in a thousand. At home, every penny of the tax produces a million and-a-half sterling, while the same penny produces here but a tenth of that amount from a population five times as numerous.

THE CASH BALANCES.

The Cash Balances amounted on the 1st inst., the commencement of the new financial year, to the unprecedented sum of 24¼ millions, and it is estimated that they will stand at nearly 20 millions at its close. The exact estimates are:—

	1872.	1873.
England, 31st March	£ 2,705,872	£ 2,089,672
India "	" 21,640,143	" 17,541,543
Total	£24,346,015	£19,631,215

These balances are liable however, it seems, to be drawn upon for about six millions sterling, (1) for the amount of Guaranteed Railway Capital (£3,500,000) received in London and not yet expended in India, and (2) for the proceeds of Public Works Loans which they hold to the extent of £2,615,000. As the expenditure of these monies must however be very gradual, the Cash Balances must be held, we think, to be needlessly high, and instead of allowing them to remain so, the surplus of the year might with great propriety be invested in securi-

ties, or devoted to reducing the debt. A Cash Balance of £24,000,000 is 14 millions in excess of the normal amount required, and the Finance Minister makes no sufficient defence, we think, for retaining such immense sums on hand.

By the end of the year, that is, 31st March 1873, the amount in India anticipated by estimate will be, he says, £17,541,543, or 17½ millions. "This sum, if it shall be realised, "will be more than sufficient for the standard of an ordinary "expenditure. But it would be premature to consider this, "until we are more sure t[illegible]e can be now, of really possess- "ing the money. It might perhaps be possible, the Cash "Balances continuing high, to [illegible] on expenditure after the "close of 1872-73, without [illegible]".

As the estimates for opium [illegible]ver, it is not likely that the balances will fall. They [illegible]m[illegible] likely to increase, and the retention of such a balance as 2[illegible]s in these circumstances, is certainly indefensible. [illegible] would be quite safe, we believe, to reduce them at once to 1[illegible] millions, which would effect a saving of £250,000 in interest alo[illegible]g the year, thus doubling the anticipated surplus of £237,000. Sir Richard Temple, we fear, has not yet told us his real reason for keeping the balances at this preposterous rate.

PUBLIC WORKS EXTRAORDINARY.

The £3,620,000 which was sanctioned in the Budget of last year for expenditure upon Public Works of a reproductive nature —Public Works *extraordinary* as they are technically called— was not spent after all, but a sum of £1,736,800 only, and the more we look at the trifling provision made by the Budget for expenditure upon Public Works during the present year, the more dissatisfied are we with it. The actual expenditure of the last two years, and that contemplated for the present, are in precise figures :—

Actual expenditure	1870-71	£1,167,810
"	1871-72	£1,736,800
Estimated "	1872-73	£2,615,000

These sums represent the total expenditure made, or intended to be made, throughout British India during the three years, upon Public Works of a reproductive character. Judging from the past, the grant for the present year will *not* be spent ; when the fact stands disclosed that so much in earnest is the Government to secure the country against famine, by providing it with water and means of communications, that it is positively spending 1½ millions a year upon Canals and State Railways ! It is idle to conceal that such an outlay mocks the requirements of the country. Those requirements will never be met in the present way. The Finance Minister ought to have nothing whatever to do with the expenditure upon Public Works defrayed from loans. That expenditure ought to be under independent control altogether ; for with *him*, the expenditure is a mere question of financial ease or the contrary, as is shown with almost ludicrous force when Sir Richard comes to deal with his Cash Balances. He is thinking about nothing but the amount of his Cash Balance, while a Minister of Public Works would be thinking of nothing but a people perishing for want of water. It is ten or twelve years since we first implored the Government to make a total separation between its Revenue and Public Works accounts. Until it does so, and gives us a Minister of Public Works, the reproach will lie against us of neglecting the chief want of the country.

THE HOME CHARGES.

The Secretary of State's drafts last year upon the Indian Treasury, amounted to no less a sum than £10¼ millions, and they are expected during the current year to reach the enormous amount of 13 millions :—

"The loss of exchange on these operations is set down in the Budget Estimate at £500,000. In other words, England is, during the year, to draw 13 millions from India, and the charge upon India for that operation is expected to amount to half-a-million. Thus India has to pay 13½ millions in all. The amount, though serious, can be well-accounted for, and can be discharged without embarrassment in the present state of the Cash Balances in India."

The effect of these drafts upon the Cash Balances is of the smallest possible consequence. It is their effect upon the bullion imports of the country, that is so embarrassing and dangerous. Thus, Sir Richard Temple himself says :—

The importation of treasure has greatly decreased of late. Even after the famous "drain of silver to the East" had become mitigated, still, during the first four years after the conclusion of the American war, India imported on an average 14 millions sterling worth of treasure annually. In 1870-71, however, only 5¼ millions were imported. This fact may seem at first sight, surprising. But the surprise would be lessened if it were remembered that, during the preceding years, the importations of treasure had been large, and that during this year, the drawings by the Secretary of State in London were high, amounting to 9 millions.

The bullion imports of the year 1871-72 have been seriously affected however by another cause, which Sir Richard Temple seems to have overlooked. Not only has the Secretary of State drawn 10¼ millions upon the country, but no less a sum than 5 millions of Promissory Notes enfaced for payment of interest in London, seem to have found their way back to this country as Remittances, between the 1st of July 1871, and the 24th February last.

DECENTRALIZATION AND THE LOCAL BUDGETS.

The special local taxation imposed upon the several provinces of the country, under the decentralizing scheme of last year, appears to have been as follows :—

"In Bengal, the bill for the road cess has passed into law ; but the levy has not yet commenced. The future yield is not yet known, but is calculated at £84,000 per annum at present, with prospect of increase.

"In the North-Western Provinces there is an acreage tax on permanently settled districts, and a five per cent. cess on annual value in temporarily settled districts, estimated to yield £21,000 per annum.

"In the Punjab and Oudh, there are Acts for levying rates on land estimated to yield £132,000 and £31,000 per annum respectively.

"In the Madras Presidency, there are the Town Improvements' Act and the Local Funds' Act, which seem calculated to yield in all £23,600 per annum.

"In the Bombay Presidency, there are Acts for taxing non-agricul[illegible]lasses, and for a new police rate, estimated to yield £61,000 per annum."

The receipts from these various sources during the year just closed—the first year of their introduction—have not yet been fully ascertained, but they are estimated at £754,000, or three-quarters of a million. A great outcry has been raised against the cess imposed in the Bombay Presidency, but not as we think on the right grounds. If we want to make the continuance of our rule in India impossible, we have only to persevere in harassing the people with the visits of the tax-gatherer. Be sure you do not take the money you require in a way that escapes their attention. Take it from them in the most irritating and offensive mode you can devise. Is it not an axiom of the Liverpool Reformers, that "direct taxes" are the only economic ones ?

The suggestion, more than once made by the *Indian Economist* in the last 12 months, that the Budget Estimates laid before the Legislative Councils of India should be published simply as Resolutions of the Government, unless the Government was loyally prepared to differ to the judgment of the Council thereon—seem to have been adopted by the Secretary of State, the local Budgets of Bengal, Bombay, and the North-West Provinces, having been promulgated simply by Resolution. What plainly could be more unwise than the submitting of these estimates to the Council and inviting discussion thereon, when the Government has no intention of deferring to the opinion of the Council if adverse thereto ? To do so, is simply to provoke discontent. It is of course open to question whether the Duke of Argyll has adopted the right alternative ; but the unwisdom of the course hitherto followed, admits of no question whatever.

The *Bombay Gazette* says that :—"In all countries except India, Ministers of Finance fall into disgrace when their Budgets show a deficit ; but in India the unpardonable sin for Sir Richard Temple to be guilty of, in the judgment of some of our contemporaries, is that he should have the audacity to bring forward a Budget which shows a surplus. The rancour with which a Minister who deserves some slight meed of praise for the unexampled prosperity of our finances is pursued by Calcutta journalists, is quite inexplicable to us." We think it right to add our protest upon this subject to our contemporary's. Sir Richard Temple is not getting quite fair play from the Indian press.

PAPERS ON LAND AND WATER CARRIAGE IN INDIA.

SUBMITTED TO HIS GRACE THE SECRETARY OF STATE,

BY COL. CHESNEY, R. E.—(*Bengal*),

AND LT.-GENERAL SIR ARTHUR COTTON, R. E.—(*Madras*).

(Continued from page 120.)

Note on Sir A. Cotton's First Memorandum, dated 13th May.

I have read this memorandum carefully, and although I have no wish to say anything offensive, still in view of the importance of the interests involved, I feel bound to state my opinion that Sir A. Cotton's argument, in favour of navigable canals for India, as compared with railways, is a mere tissue of the most transparent, though of course quite unintentional misrepresentations. To expose the whole would be a long task, but I will take the liberty of noticing a few of them, which may be taken as samples.

I.—PAGE 2.

Sir A. Cotton adds to the capital cost of the railways £90 millions.

The guaranteed interest on this capital.....	24	
Whence he derives their total cost to be	120	millions.
He states the interest on this to be	6	,,
And the net receipts for 1869 having been	2½	,,
He arrives at the conclusion that the payment for interest on railway capital, *out of taxes for* 1870, is	3½	,,

Had he said that the railways have cost 120 millions from first to last, and that this sum whether borrowed or defrayed from the revenues year by year, represented indirectly an annual charge of 6 millions a year, the statement might have been accepted *as in a certain sense* borne out by the facts, but this is not what he says. Now had he really wanted to ascertain the actual payments for interest on railway capital out of taxes for 1870, he could have got them from Mr. Danvers' report, or from the published accounts laid before Parliament, but then his object is to make out a case against railways, so here we have misrepresentation No. 1. The interest on the capital has not been *added to the capital account*, but has been paid *year by year*, out of the taxes of previous years, consequently the total charge on which interest has to be paid in 1870 is not 120, but only 96 millions, and the net charge for interest to be paid out of the taxes for 1870, is not 3½ but [illegible] millions.

Sir A. Cotton may perhaps reply that although the interest on railway capital has been paid year by year out of the revenue, still that the Indian Government has in the meantime been increasing its debt; that the money which has gone to pay railway interest would have gone to abate debt; that therefore the increment of debt is due, to the extent of this 24 millions to railways, and that consequently the interest now paid yearly, on this amount of existing debt, is virtually due to railway captial expenditure.

But the fallacy of such an argument is sufficiently transparent. It does not in the least follow that if the Indian Government had not made this expenditure (for interest on railway capital) a charge on the revenue, the saving would therefore have gone to diminish the amount of loans raised. It is just as likely as not that the annual loans would have been as heavy as ever, and that the saving would have gone to increase the Public Works' grant or some other source of expenditure. But when a Government is systematically borrowing year by year to cover continually recurring deficits, to say that the debt is due to any particular item of expenditure, is about as conclusive as it would be, if a man who kept a dozen horses were living above his income, to point out a particular horse in his stable as the cause of the excess, or if a man walks ten miles, to say that part of the journey was due to his right leg and part to his left.

But at any rate whatever Sir A. Cotton may have *meant*, a plain man reading his statement would certainly infer that the "actual payments out of taxes for 1870" was 3½ millions, which I submit is a distinct mis-statement of facts.*

II.—PAGE 3.

The cost of railways is set down as	96	millions.
Length of do.	4,000	miles.
Hence is deduced a cost per mile of	£21,000	

But, as is clearly shewn in the Blue Book, the cost here stated is that on the 6,240 miles made *and still in progress*: and not the cost of the 4,000 *completed*. These figures are therefore mere juggling. It would have been quite easy for Sir A. Cotton to obtain the real cost of each completed line, in fact it is hardly possible but that he knew that no line has exceeded £20,000 a mile in cost, and that several lines have been constructed for much less, and consequently that his *statement is incorrect and misleading*.†

III.—PAGE 3 & 4.

Cost of Transit by Railway.

Here we have a mere hocus pocus of figures. Firstly by means of mis-statement No. 1, the startling conclusion is arrived at, that the actual cost of carrying goods by Indian railways is 4d. per mile per ton, and double the charge made. Sir A. Cotton is of course quite aware when he makes *this absurd statement*, that all the main lines are now very nearly earning their 5 *per cent.* dividend,‡ and consequently are earning a profit of some sort, at any rate that they are not working at a loss, which must happen if the cost of transit exceeded the charge made. This result moreover has been arrived at, although the traffic receipts on the working portions are burdened by the capital charges on parts not open. The only considerable line open for its whole length in 1869 was the Bombay and Baroda. Further it is an exaggeration to say that the average rate of goods traffic charged is so much as 2d.§ a mile. If Sir A. Cotton had really wanted to ascertain the facts, he would have gone to the returns of the Railway Companies, which give them in minute detail, and shew [illegible] the amount of each description of goods carried, and [illegible] rates charged. The greater part of the traffic is in salt, grain [illegible] and cotton, carried at from 1d. to 1½d. per ton per mile.

[illegible]—PAGES 5 TO 9.

A tissue of blunder arising out of the foregoing, which it seems not worth-while to follow up. I will merely notice the blunder at page 6, where the present traffic is assumed to be a certain average amount over [illegible],000 miles open. It can be hardly necessary to point out the unfairness of assuming the traffic as thus distributed, and drawing any inference from the assumption, when a great part of these lines have only just been opened, and the traffic is quite undeveloped. In 1869, the Great India Peninsula ended nowhere, so to speak; the Jubbulpoor branch of the E. I. line had been opened only a few weeks, and also had its terminus in the jungle: the Punjaub line had two great gaps: and there was incompleteness everywhere. The traffic on lines in this state is of course quite undeveloped, in fact it can hardly have come into existence over a great part, and even if Sir A. Cotton had represented the facts correctly, which he has failed to do, any inference from them, as to the future prospects of the lines, would be quite unconsequential. It would have been *as absurd* to pronounce the Ganges Canal a failure, because for the first year or two it did not pay its working expenses, as to say so of railways before they are completed. The fact is, it will not be possible to predicate anything precise concerning the traffic of Indian railways till the main trunk system has been completed and in use throughout for three or four years.†

V.—PAGE 9.

Cost of Transit on Forth and Clyde Canal.

I submit, that in his view of these specimens of Sir A. Cotton's accuracy in figures, he should produce his proof of the statement, that this is only ½d. per ton per mile, before the statement is accepted It is quite incredible, being utterly opposed to the results obtained in other canals in Great Britian, of which the accounts have been made available. I presume he has taken the cost of *haulage only* without regard to the interest on capital, which he has so bountifully heaped up in the case of railways, and omitting also all charge for repairs and cost of management. If this be so, then his comparison is about as valid as if one were to put the cost of feeding a horse against that of making a railroad, and then to declare in favour of the greater cheapness of animal draught over locomotive power.‖

VI.—PAGE 9.

Cost of Navigation in India.

Sir A. Cotton has here shifted his ground from that taken up in his last memorandum. Doubts were expressed then as to the possibility of making a canal across the tableland of the Indian Peninsula, with a summit level of 1,500 feet, and in reply to this criticism he now babours to prove that a canal can be made on the Gangetic plain, where the fall is very small and all tending one way. No one doubts the feasibility of this for the excellent reason, that such a work has been made already over a considerable part of the line. But granting the possibility of such a work, this is no step towards proving that a canal is practicable across the tablelands of India.§

Fallacy at Page 11.

Here Sir A. Cotton again shifts his ground. The argument in this and the following page is to shew that if a canal be constructed of magnificent dimensions, and Locks of a kind and capacity at present unknown, the cost of haulage would be greatly reduced. Of course it would. So on a railway, if you have only first-class

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* How can any amount of words get rid of the simple fact that the Government have spent 120 millions, and are receiving 2½ millions a year in return, being a loss of 70 millions, or 3½ millions a year, which are paid out of taxes.

† The cost of the E. I. Line is stated in the Blue Book at 27½ millions for 1,280 miles, £21,500 per mile, *besides land*, &c., for which add ⅛ (Par. 28 B. B. 1870), making £23,000.

‡ The following is the statement in B. B. '70:—

	Net rects.	Interest.	Loss.
E. I. Line	£1,440,000	£1,460,000	£20,000
G. I. Peninsula Railway...	560,000	980,000	420,000
Madras	330,000	480,000	150,000
Bombay & Baroda Railway	150,000	370,000	220,000
Sind ,, ..	31,000	109,000	78,000
Punjaub ,, ..	24,000	109,000	85,000
Delhi ..... Defy ..	7,000	235,000	242,000
G. S. of India.....	40,000	66,000	26,000
E. Bengal	91,000	128,000	37,000
C. & S. Eastern Defy.....	3,000	51,000	54,000

To all these losses must be added ⅛ of the interest paid, on account of land, &c., besides the interest on debt of 20½ millions (Par. 41, B. B.), so that instead of *all* the main lines paying very nearly 5 per cent. *not one* is paying it, and the most profitable is deficient £20,000, besides £120,000 interest of cost of land, &c., together £140,000, and this besides the interest of the debt on this railway of 7½ millions, (Par. 41), £370,000, in all £510,000 a year paid out of taxes, to support the most profitable railway in India.

§ B. Book '71, (Par. 49,) average charge per ton 1 ⅛ D.

† A large portion of the lines have been open 10 or 15 years, and as to future development, the *falling off* this year is enormous. The interest paid on share capital is 1,810,000 in '70, against 1,500,000 in '69, an increase of £310,000 B. B. Par. 46.

‖ The total actual charge for draught by horses on the Erie canal is ⅞ D. and the estimated cost by steam to leave a large profit ⅛ D;—this where boats, &c., are laid up for 5 months in the year, and wages, &c., are much higher than in Scotland.

§ Thousands of miles of canal have been cut in India in every kind of country on which main lines would be required. There are ample data now for all such works.

gradients, the cost of haulage would be reduced. But how as to the capital account? When he is dealing with railways, every result ought, according to him, to be judged by this criterion, to say nothing of the accumulated interest, but when he comes to canals, these little items are dropped out of sight. No doubt the cost of haulage on the Colossal work, he pictures, would not be ¼th of that on the Forth or Clyde Canal, this item would then become the smallest part of the expense, as it is on railways; but then there is the interest on capital to be considered, as to which he is silent.*

VII.—PAGE 15.

Cost of Canals in India.

The average cost of the Ganges Canal per mile, is very greatly understated by him; moreover if the accumulated interest and cost in maintaining for the years during which it did not pay its expenses were added, as has been done in the case of railways, the virtual cost would be largely increased. It is further a complete delusion to regard the cost of canal-making, as a thing which can be set down at an average price, so much per mile for any part of India. The cost of making a Canal depends on three things, the supply of water, the slope of the ground, and the drainage to be crossed. The Ganges Canal was cheap, because all these conditions favourable. The Kistna and Godavery deltas are still more favourable for such works; but because the Nile affords good navigation in Egypt, it does not follow that the same river will fulfil those functions in Abyssinia. The fact is that the ground most favourable for the construction of canals in India, has already been taken up. Just as in a new country, the best soils are those selected to be brought first under cultivation, and the probability is that future irrigation works, with certain exceptions, will be more costly and less remunerative than those which have been already undertaken.†

VIII.—PAGE 15.*

Calculation.

MERE FANCY FIGURES.

A canal of the dimensions proposed from Calcutta to Delhi, would be more likely to cost £30,000 than £3,000 per mile.‡ The earthwork alone of *such* a canal, would cost nearly £4,000 per mile, without any charge for establishment. The passage of the Jumna or Ganges would cost 2 or 3 millions sterling at the least, to say nothing of other enormous works involved in the other great rivers that would have to be crossed. Moreover such a work would be unnecessary for navigation, since there is already an excellent water-carriage *which cost nothing*, namely the river Ganges itself.

IX.—PAGE 18.

Speed on Canals.

Sir A. Cotton says there is no limit to speed on canals, and that the Hudson and the Clyde are worked at 16 or 18 miles an hour. In his last memorandum the modest figure set down, was 25 miles an hour, but passing that little exaggeration by, I would suggest that Sir A. Cotton be asked to state whether he proposes to make his canal of the same size as the Hudson or the Clyde, and if not, that he will give the dimensions of the smallest channel, with artificial sides of earthwork that would not be injured by the wash of steam-boats going at 16 miles an hour. It is true no one would propose to navigate canals at that speed, but the point illustrates the utter want of reliableness of Sir A. Cotton's statements. It is found on the Ganges Canal, that steam-boats worked at a very slow speed, are extremely injurious to the banks.§

X.—PAGE 19.

Godavery Navigation.

Money has been spent upon a few miles of the upper part of the Godavery, and Sir A. Cotton talks about creating a Water Navigation at £2,000 per mile. One might just as well talk about opening a Water Navigation from London to Bombay, at £25 per mile by spending £100,000 on a Dock at Blackwall.

PAGE 20.

The Godavary Navigation "can be worked at ½d. a ton at the utmost, it (this rate) could easily be reduced to ¼d."

There is no authority for assuming even the higher rate as practicable.*

The traffic for 1869-70 is stated to be 20,000 tons. It will perhaps hardly be believed that the traffic amounted to only a few hundred tons during that year, yet such is the fact.†

On this Godavery Navigation I will only offer a few remarks :—

It passes through one of the most unhealthy countries in the world.

Except at the end there is no population or cultivation. The river runs through a fever-haunted waste people, mostly by savage aborigines.‖

The navigation will, according even to the sanguine promoters, be open only for a part of the year.§

The navigation will, at its best, be imperfect and dangerous. Only Steamers can be used, the current in parts being too strong to row against.¶

On the other hand, the river Jumna, between Delhi and Allahabad, passes through a highly populous, healthy, and fertile country, in fact through one of the greatest corn district in the world. Its natural navigable facilities** on this part, are probably very superior to anything that will ever be accomplished on the Godavery, where indeed navigation will only be kept open at a painful cost of life. Yet, while the navigation of the Jumna continues to be of the most insignificant kind, no sooner is the railway open along the same course, then a great traffic springs up.

Before the East India Railway was completed to Allahabad, there was a large steam-boat traffic to that place, on the Ganges, conducted by two Companies, each with a large fleet which used to pay fair dividends. These steamers had the free use of the Ganges, without paying even the ¼*d.* per mile per ton, which is Sir A. Cotton's favourite unit, yet on the completion of the railway from Calcutta, the steamers have been unable to compete with it, and have withdrawn from the line.¶

There is a navigation on the Ganges Canal, which although imperfect, is probably better than that of the Godavery is likely ever to be. But only the merest fraction of the traffic which goes on the neighbouring railroad has taken to it.**

Facts like these, are, I submit, worth any amount of vague predictions. Under these circumstances what reason is there to suppose that the traffic will be quite insignificant.

Sir A. Cotton speaks of the railways as failing to carry the traffic of the country. He appears therefore not to be aware that on those parts which are regularly open, the traffic estimated by the mileage receipts, although less than on some of the great commercial lines of this country, yet is quite equal to that of ordinarily prosperous railways of Europe. When then he talks about the millions of tons, and people wanting to be carried about, it may fairly be asked whether this demand has any existence, other than in his fancy. Why should the most conservative peasantry in the world want to be always travelling about? India is an agricultural country, and the traffic in agricultural countries can never be expected to come up to that of manufacturing districts; the assumption therefore that these first-class railways, which would be quite suitable for Germany, are insufficient for the purposes of India, appears utterly unfounded.

To prevent misconception, I would add that my remarks have no reference to canals for *irrigation*. It is hardly possible to over-estimate the benefit that should accrue from irrigation works, but so far the result of attempts to create profitable *navigation* in India, quite bear out the teaching of English experience.

Under certain favourable conditions, as where a back-water can be created along the level of the coast without Locks, or in the case of the deep tidal creeks of the Gangetic Delta, a great navigation can be profitably conducted, because there is little or no expenditure involved to create it. Just so is the navigation of the ocean, cheap and profitable.

But Sir A. Cotton fails to see that where these favourable conditions are absent, the case is altogether different, and when he proposes *extravagant schemes* for canals running over hilly barren tracts, with expensive Locks and artificial banks in light friable soils, and in addition a precarious water-supply, he has nothing to go upon, but his own crude assertions, unsupported by either fact or reason.

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* My whole calculations having been based on the actual cost of canals now in use.

† There are tens of thousands of miles of line for canals as favourable as those that have been occupied.

‡ At this rate the 700 miles of main line of the Ganges Canal would have cost 21 millions; it has cost 2½ millions, including 1 million spent in the hills, and all the Irrigation Works.

§ The banks of canals can be easily protected, as on the Gloster Canal. There is nothing whatever to prevent high speed on canals constructed for steam.

‖ The navigation has been completely opened for 230 miles for £600,000, and about £300,000 more will complete the 2nd barrier, when 400 miles will be open. The Locks are very large, I believe 30 by 200 feet.

* The authority is the actual report on the present navigation by steam.

† Col. Haig's Report, September 1870, (Par. 15). The total extent and value of the river freight in the past year may be thus stated :—

	Tons.	Value.
Imports	3,600	£45,000
Exports	16,800	„ 44,000
Total tons	20,400	£89,000

‡ Suppose the question of the overland communication with India were to be settled by speaking only of the heat, dangers, and want of population of the Red Sea, without a word about India or Europe.

§ The Erie Canal, "*by far the most important high-way* in the U. States," (New York State, P. W. Report 1860), is only open 7 months in every year.

‖ It is at this moment navigated all the year round by native boats.

¶ The accounts of one of the Steam Companys were lately shewn to me, showing that the total cost of navigation was ¼d. a ton a mile. I believe the steamers are still running.

** The navigation has such multiplied defects, that it's hardly possible to use it at all.

I venture to speak plainly on these points, because the interests involved are large, and much mischief has already been caused by pressing crude and unprofitable schemes upon the Government, bolstered up by inflated representations. *Three undertakings entered upon of late years are due in considerable measure to Sir A. Cotton's advocacy, all of which are likely to be financially most disastrous to the Goverment; the Madras Irrigation Company's project; the Orissa Scheme; and the Godavery Navigation. Upon the first, the less said the better; the second promises to be a permanent incubus on the Indian revenues; while as to the Godavery Navigation, I believe the Indian Government goes on with the works only, because it is ashamed to stop after throwing so much money into the river, and having sacrificed so many lives in battling with its pestilential banks.

The failure of the first two schemes, at any rate, has been already sufficiently demonstrated, and Sir A. Cotton is now wisely silent about them. His enthusiasm is now bestowed on the Godavery Navigation, and as that work is incomplete, it is of course impossible to prove that it will not be successful, but the sort of advocacy he is reduced to, may be gathered from the fact that a perfectly insignificant traffic of a few hundred tons a year is represented as amounting to 20,000 tons, and that the annual charge on the State for railways, is over-stated to the extent of 2 millions sterling.†

It is surely time that the public purse should be closed against demands based in on such vague representations. Sir A. Cotton, I submit, might be asked to give a specific design, shewing the depth and breadth of the canal he proposes for the navigation of steam-boats at 16 miles an hour, with a specification of the sort of embankment he would construct to resist the wash caused by boats moving at that speed. Also to specify the number, size, and construction of the Locks (on the proposed line from Madras to Bezpoor, with a summit level of about 1,500 feet) that would be emptied and filled "in a minute, or much less," and the size and form of the Lock gates, and the thickness of the masonry required to resist the scour caused by Locks of this novel kind.‡ If these quantities of earthwork, ironwork, and masonry, be then priced at current rates, and the figures tested by some experienced engineer, the Government would then be in a position to judge whether these schemes be sober or fanciful. Meantime I submit that the hazy figures now put forward with the omissions, additions, and manipulations, involved in these, should go for nothing. §

GEORGE CHESNEY.

Cooper's Hill,
October 4th, 1871.

(To be continued.)

THE FIRST THIRTY YEARS OF BRITISH ADMINISTRATION IN BENGAL.—JESSORE.

The Permanent Settlement Proposed.

(Continued from page 116.)

When Lord Cornwallis came out from England, instructed by the Court of Directors to effect a permanent settlement of the land revenue of Bengal, he set about collecting information from the local officers, who were naturally best able to give it. Mr. Henckell was one of the more prominent of these, and the information which he and his successor have placed on record in their reports regarding the permanent settlement afford most valuable indications of the then position of affairs.

In writing about these matters, one thing above all is necessary; we must separate ourselves from the ideas which subsequent legislation has engrafted upon the country. We have now given the zemindar a certain position as owner of the soil, and we have laid down exactly the status of the ryot; know when to call him a tenant-at-will, and when to look on him as having joint interests in the proprietorship. In 1787 these were still undecided questions, and they were also rather obscure ones. Indeed, it is exceedingly doubtful whether the permanent settlement did not proceed upon a mistake when it regarded zemindars as being proprietors of the lands whose revenues they collected from the ryots and pay to Government.

The first question which the Government referred for report regarded the assets of the zemindars; the Collectors were asked whether the zemindars realized from the ryots any sums over and above the nominal rent (jumma) which they paid, and on what principle the zemindars acted in the imposition of these additional demands. Henckell answered that the zemindars were in the habit of constantly increasing cesses upon the ryots. There was a cess for collection called "nim cess for "faujdari," a cess to be paid on all occasions of marriage, birth, or death, which, from from being a casual cess, had become a regular one, and a tax had to be paid upon certain things taken to the hât for sale. Zemindars had to give security for the revenue they undertook to pay until the Board abolished it in 1787, and his security formed another excuse for a cess upon ryots. These and other definite cesses added to the ryot's jumma usually about 10 per cent., but sometimes as much as 90 or even 120. Henckell recommended that all these cesses should be consolidated with the jumma, by increasing the latter 50 per cent. and securing the ryots from future increment by giving them written pottahs.

According to our present notions, these are matters which the authorities should leave to be regulated by the zemindar and the ryot themselves. But it was otherwise then: the ryots had no permanent fixed tenure, and when the Collector settled what the zemindar should pay to Government, he settled also what the ryot should pay to the zemindar. True to the contractor theory of the zemindar's position, the Collector, acted as if he had all right to impose upon the mutual relations of zemindar and ryot such conditions as he thought fit. The abolition and consolidation of the cesses was only carrying out on a larger scale what he had already done when he abolished the one-anna security cess in the Isafpur zemindari.

In this report the Collector points out a fruitful source of evil in the zemindar having uncontrolled liberty to appoint as Naib, or as farmer, of any pergunnah, any one whom he thought fit. The zemindar did not seek for such appointments the people who would best discharge their duties towards the ryots or towards the estate; and Henckell urged that the Collector should have a distinct power of interference in these matters.

In the year after these matters were under discussion, the Government called upon the Collectors to submit their opinions as to the possibility of a settlement of the estates for a period of years, and directed them also to report upon the question with whom, ryots or zemindar, such settlement ought to be made. It should be stated that throughout all these discussions no permanent settlement was talked of, but only a settlement for a period of years. The settlement, as finally concluded, was nominally one for ten years and it was only when everything was settled for ten years that the Government proclaimed the ten years' settlement perpetual.

At that time the idea of settlement which the Board had before them, and the idea which Mr. Henckell also had, was that settlement should be made with the ryots, and arrangements made for the collection, through the zemindars, of the rents settled with them. Mr. Henckell, in his answer, avoided entering into the question of the exact status of the zemindar, passing it over with an acknowledgment that the zemindar had *some* right, though he could not say what it was. The zemindar of course had *some* right since he was entitled to have, in preference to others, the settlement of his own zemindari, but Henckell regarded him rather as a servant to the State, employed to collect the rents from the ryots and rewarded for his trouble by a grant of rent-free lands. *All* zemindars, he said, had these rent-free lands, but as they were not sufficient to satisfy their requirements, they made up the deficiency by making a profit out of the collections. The ryots had some of them tenures at low rates, such as gantidars and jotedars; but others had tenures of less profitable nature. The Board entertained the idea of increasing the rates in these low-rated tenures, esteeming that the zemindar had no business to grant them; but Mr. Henckell pointed out that these tenures did not as a rule diminish from the revenue of the estate, because the gantidar or jotedar was usually also the farmer of the lands adjoining his own holding and having a profitable tenure in his own lands was expected to remit to the zemindar the entire realizations of his farm. The abolition of the system might increase the revenue of the ganti lands, but would diminish the revenue of the rest by adding to the expense of collection.

Whether the origin of the tenure called ganti was or was not that indicated by Mr. Henckell in this report, namely, the giving certain lands on a low rent to an individual who undertook

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* I am charged with the alleged failure of works that I neither projected nor executed. But those that I did project and execute in Tanjore and Godavery are not mentioned. But all these three works, if completed will most certainly be great successes. The Orissa and Godavery Works are already in extensive operation, and the Toombudra Works are now just ready to be used.

† Col. Haig's Report of Septmber 1870. Par. 15. The total extent and value of the river freight may be thus stated for the past year:—

	Tons.	Value
Imports	3,600	£15,000
Exports	16,800	„ 44,000
Total	20,400	£89,000

‡ I shall be very happy to do so.

§ Happily Col. Chesney's ideas are not yet quite accepted. The three best Irrigation Officers in Madras, all brought up on the Godavery, have been sent to Bengal, one of them placed at the head of the Irrigation of all India, and one that of Bengal. And there are now in hand or estimated 17 vast projects, to cost from ½ to 2½ millions each, to irrigate 15 million acres, sufficient for the food of 40 millions of people, and to include at least 12,000 miles of steam-boat Canal, the Officer who has been, as I may say, the sole cause of all this, being General Strachey.

to collect and pay in as farmer, the revenues of other lands adjacent, it is certain that in many places this sort of connection still exists between ganti and farming. In many places the gantidar of the whole or part of a village is still looked upon as the person who naturally occupies the position of farmer in some adjacent lands. The theory of this connection is supported by the terms which Mr. Henckell's successor uses in a letter where he says that almost all the cultivating ryots pay rent either to a farmer or a gantidar.

Of course it is not meant that this theory is applicable to all gantis at present existing, for many, if not most, of these date their origin from periods subsequent to the date of which I am writing, and have more to do with the zemindar's desire to fill his purse than with the land system indicated above. The Raja of Chanchra, for example, in 1706 he was getting into difficulties, created in the [illegible] estate a large number of ganti tenures, receiving of course a premium from the tenant.

Continuing his report, Mr. Henckell writes that it might be possible to increase the revenues of the land, but it would require extensive local inquiries, as settlements then made from year to year were made upon very imperfect data, even their zemindars and their officers remained ignorant of the actual resources of their estates. The ryot nominally held a few biggahs at a very high rate, but actually cultivated an area twice, or even three times, as large as their nominal holding, the excess land enabling them to bear the very high rates. But this position of affairs gave rise to continual bickering between the zemindars and the ryots. The latter were continually striving to conceal their actual holdings, and the former, aware that excess existed, continually attempted to enhance the rent, and imposed upon the ryots all sorts of cesses, which, as their imposition assumed what was far from being the fact, namely, that the incidence of the original rent or jumma was equal upon all the ryots, were the source of great oppression and hardship. Mr. Henckell thought that the ryots would be willing to accept pottahs for their holdings, even at an increased rent, if these pottahs secured to them the whole of their lands, and granted immunity from additional demands by way of cess on the part of the zemindars.

Another matter to which the Government directed their attention with reference to the proposed settlement was the question of lakhiraj or rent-free tenures: how far they were to be recognised, and how far they should be disregarded. The Government proposed to resume all tenures which had not been granted, and possessed by the grantees before the cession of the Dewany and no grant was to be considered hereditary which was not distinctly so created. Rent-free grants had been directly prohibited only in 1178 (1772), when the British undertook the direct management of the collections, and therefore all invalid grantees of an earlier date were to be permitted during their lifetime to retain half of their grants. Native officers were to be appointed to hunt out invalid grants, and were to be rewarded by obtaining the first year's assessment, and to be punished, if they concealed invalid grants, by a fine of three times the amount of the assessment.

Mr. Henckell, while admitting the extent of the evil which the Government sought to suppress, considered it almost impossible to move in the matter without inflicting great injustice. There was no doubt that immense amounts of land had been alienated by zemindars, giving rent-free tenures, and Mr. Henckell estimated the whole within the district at about 350,000 biggahs about a twentieth or more of the whole area, cultivated and uncultivated, of the lands within the district; and of this he considered two-thirds would be resumable if the orders of Government were carried into effect. The grants made before the British possession were to be respected, but the carelessness of natives in preserving documentary evidence, and the impossibility after a lapse of time of procuring oral evidence of any reliability, would place insuperable obstacles in the way of valid grantees proving their title and possession as far back as 1766. As for the grants between that date and 1772, Mr. Henckell stated that the zemindars had so long enjoyed, by custom, the right of creating lakhiraj tenures, that it was hardship by a retrospective rule to declare them invalid; and as to disallowance of hereditary right to ordinary grants, he urged that precision of language was not customary in such grants, and that many grants intended to be hereditary were not distinctly declared so. The prohibition to zemindars to create rent-free tenures had not made them cease from giving grants, but only made them antedate the sannads they gave; and forgery and fraud had been so rife in the district, that it would be impossible to avoid confounding the genuine with the false. As for the proposed establishment it would be useless, for it would only give the proposed native officers a grand opportunity for extortion and bribery. No doubt native officers have, in point of official morality, immensely improved since Mr. Henckell's time, but one can hardly accept his wholesale condemnation of them when he says, "rapacity and oppression are, I believe, the ruling passion of the generality of natives, and very few of them have sufficient fortitude to resist the temptation of a bribe."

MODERN TRADE OF INDIA—1854 to 1871.

THE JUTE TRADE.

THE great impetus and expansion which the agriculture of India has received is from two years, which like all dispensations of Providence, appear as immediate visitations, but bearing the reflex of the Giver of all good, develop themselves into permanent blessings in ways passing our knowledge. In 1835 or 1836, Mr. Hodgkinson made the first shipment of linseed to England as an experiment. The Crimean war commenced in 1854. The following comparative satistics of the exports of seeds and jute, before and during the war, will show the increase:—

	1853-54. Mds.	Value Rs.
Linseed	982,394	1,964,916
Mustard seed	202,201	405,203
Teel seed	5,541	11,087
Jute	690,558	1,557,858
	1854-55.	
Linseed	2,435,121	4,870,885
Mustard seed	515,550	1,030,905
Teel seed	23,223	46,117
Jute	900,006	2,277,211

We believe Mr. Joseph Willis was the first who shipped, in 1808, sixty bales of jute to England under the name of *koshta*, the native name in the eastern districts. Jute must have been taken from the word *jhute*, the native name for *chusum*. There is no other country in the world where jute is grown. In America an attempt is being made to grow it, and time will show how far it will succeed. Although the quality of the Bengal jute is not as superior as it was formerly, yet the demand is increasing. During the present year the export is expected to reach 1,000,000 bales. Flax and hemp do not answer all the purposes of jute, but the stalk of cottop might be manufactured into an inferior jute. Rhea might also answer, but it cannot be expected to compete with jute in cheapness. The Journal of the Society of Arts informs us that:—

'By far the most remarkable feature of Calcutta trade is that in jute the trade has set in almost entirely to Dundee, where alone the manufacture of jute seems to have taken root. Previous to 1866, the supplies were sent almost exclusively to London and Liverpool. Now the shipments are made direct to Dundee. In 1866 the shipments direct to Dundee, in 300lbs. bales, were 38,022 in 1867; 70,287 in 1868; 142,134 in 1869; 180,002 in 1870; to date 192,769, but as 18 large vessels are loading, this year will close with something over 300,000, and the season (end of July) with perhaps 400,000 bales, representing in round figures, a million sterling, or close on half both the value and out-turn of the season's crop. It is not to be wondered at that in such a position Dundee actually at this time rules the Calcutta market, on which a very few years ago it had no perceptible influence, when indeed London and Liverpool struck the key note.' The average prices of the seeds *before* and *during* the war, and their present prices, are as follows:—

Before war.		
Linseed	2 8 @ 2 11	per md.
Mustard seed	2 0 @ 2 5	per md.
Rape seed	0 0 @ 0 0	per md.
Poppy seed	2 8 @ 0 0	per md.
During war.		
Linseed	2 10 @ 3 15	per md.
Mustard seed	2 8 @ 3 0	per md.
Rape seed	3 1 @ 3 7	per md.
Poppy seed	2 8 @ 3 5	per md.
Present price.		
Linseed	4 1 @ 4 5	per md.
Mustard seed	3 8 @ 3 11	per md.
Rape seed	3 12 @ 1 8	per md.
Poppy seed	4 3 @ 1 1	per md.

In 1870 the export of all kinds of seeds was larger than in any of the nine previous years. The price of jute before the Crimean war was Rs. 1-8-0 to Rs. 2-4-0, and the present prices are Rs. 4-8-0 to Rs. 6-8-0 per maund.

THE LAND.

THE LAND SYSTEM OF BELGIUM AND HOLLAND.

BY EMILE DE LAVELEYE.

(Continued from page 117.)

One most important fact in considering land systems, is that the country itself, and not the town, is naturally the chief market for agricultural produce. It is a great error to suppose that agriculture, in order to thrive, must have a market in great cities for its productions. The cultivators, on the contrary, may constitute a market for themselves. Let them produce plenty of corn, animals of various kinds, milk, butter, cheese, and vegetables, and interchange their produce, and they will be well-fed, to begin. But furthermore, they will have the means of supporting a number of artificers; they may thus be well-housed, furnished, and clothed, without any external market. For this however they must be proprietors of the soil they cultivate, and have all its fruits for themselves. If they are but tenants who

have a rent to pay, and no permanent interest in the soil, they certainly require a market to make money. In a country where cultivators are all tenants, an external market for their produce is indispensable; it is not so in a country of freeholders; all that the latter requires is, that agriculture should be carried on with the energy and intelligence which the diffusion of property is sure to arouse in a people.

The province of Groningen was the best cultivated of Holland before ever it exported any of its porducts to England, and yet there are no large towns in it; but thanks to its peculiar system of hereditary leases, the farmers could keep almost the entire produce of their labour to themselves.

Suppose that by the stroke of a magic wand, the whole of the tenant farmers of Flanders were to become possessed of the fee-simple of their lands, what would be the result? They would then themselves consume the milk, butter, and meat which they are now obliged to sell, and in consequence have to dispense with animal food, and to resort almost exclusively to the vegetable kingdom for their support: then they would no longer have to send what they do to an English market. Would they be the worse off for that?

Look at Switzerland. In proportion to her population, she has more horned cattle than Flanders, *i.e.*, 35 head to every 100 inhabitants, against 24 in Flanders. Yet, while the latter exports butter, oxen, rabbits, &c., to France and England, Switzerland actually *imports* butter, cattle, corn, &c. The consequence is that Switzerland consumes twice as much animal food as Flanders, viz., 22 kilos of meat, 12 kilos of cheese, 5 of butter, and 182 of milk per head per annum. Of the Swiss, indeed, we may say what Cæsar said of the ancient Britons,—*Lacte et carne vivunt.*

How is it that the Swiss peasant is much more substantially fed than the Flemish? Because the former is nearly always an owner of the soil, while the latter is but too often only an occupier. The Swiss has not for his market the insatiable stomach of the London market which the poor Fleming contributes to feed; he has a better one than that, namely, his own.

Thus, Switzerland and Groningen prove that agriculture does not stand in need of a large foreign market to make progress. A peasant proprietary is the best of all markets.*

On the 1st of January 1865, there were in West Flanders, on an area of 323,466 hectares, 89,297 proprietors, and 693,904 "parcels" of land: in East Flanders, 155,381 proprietors and 845,220 parcels, towns and villages included; in the entire kingdom of Belgium there were 1,069,327 owners and 6,207,512 parcels. In 1840, the enumeration showed 758,512 proprietors and 5,500,000 parcels of land. Thus it appears that the number of landowners and of parcels has considerably increased.

In Belgium, I have never heard a complaint of the present state of things, nor any expression of alarm for the future, such as one used to hear in France before economists of eminence such as De Lavergne, Wolowski, and Passy, had undertaken the labour of demonstrating the chimerical nature of the fears that the soil would be crumbled to bits.

As regards Belgium, and more especially Flanders, foreigners should not be misled by the great number of *parcels*. The parcels enumerated are *cadastral* parcels for the purposes of the survey; and very often the surface of the soil shows not the least trace of any such divisions. Not only do many parcels often belong to one and the same proprietor, but a single estate or farm of ten or twelve hectares generally consists of many of them. The land is divided into farms of different sizes in proportion to the capitals of the cultivators; for example, fifty hectares to four horses, twenty-five to two, twelve for one horse, five or six hectares to a family without beasts of burden, and a little plot for a labourer. When large farms are subdivided it is done on economical grounds, viz., because they fetch higher prices when sold in lots: they are hardly ever divided in consequence of the law of succession. The peasant attaches too much value to the proper outline of a field to break it into pieces; he would rather sell it altogether.

Hitherto, the consequence of the progressive subdivision of land in Flanders has only been to raise at once the rental, the gross produce, and the value of the soil; at the same time that the number of landowners has increased, the condition of the cultivators has improved.

In Flanders you do not find the land subdivided in the way it is in Ireland, according to Lord Dufferin, who has shown the evils of the kind of subdivision practised there;† from his discription it appears that in Ireland, at the death of any holder and often even during his life-time, the children divide the land among themselves, each of them building a cottage on it; or, if the tenant has no children, he sublets his land to several small farmers, and allows them to settle on it, notwithstanding the stipulations of the lease. Such breaking-up of the land must lead to the most wretched kind of farming, and to pauperism on the part of the tenants. As long as the Irish farmer has no better understanding than that of his own interest and of the requirements of a sound economical system, no agricultural policy, neither fixity of tenure, nor even ownership in fee-simple could improve his condition. Although the population of Flanders is twice as dense as that of Ireland, a Flemish peasant would never think of dividing the land he cultivates among his children; and the idea of allowing a stranger to settle and build a house on it, and farm a portion of it, would appear altogether monstrous to him. On the contarry, he will submit to extraordinary sacrifices to give his farm the size and typical shape it should have.

How is it that the Fleming and the Irishman hold such different points of view? I think it is partly due to the difference of race and partly to circumstances. The Celt, being more sociable, thinks most of the requirements of members of his family, whilst the Teuton thinks more of the requirements of the soil and of good cultivation. Nowhere to my knowledge does the Celt show himself a cultivator of the first order (*cultivateur d'elite*); it is to the German, the Fleming, the Englishman, that agriculture is indebted for its greatest improvements. The Celt has, in several countries, subdivided the soil for the sake of his family, without regard to the requirements of national husbandry. Throughout Germany,* law and custom alike have always been opposed to the division of farms. In Lower Bavaria, this is carried so far that almost all the land is in the hands of wealthy peasants, keeping up a kind of entail by always bequeathing the whole of their property to one of their children, a small pittance being given to the others. But supposing the Irishman to become the absolute owner of his farm, would he learn and comply with the requirements of the land? A Flemish farmer's son always wants to have a good farm of his own; he would not put up with a hovel improvised on a potatoe field. Could the Irishman but be brought to practise agriculture as an art, and not as a mere means of bringing a subsistence from the soil, he would soon abandon the miserable system of subdivision which he has adhered to so long. But how is this taste for agriculture, as an art, to be imparted to him? To extinguish the influence of instincts or tendencies, whether inherent in the race or the historical product of centuries, would it suffice to introduce an agrarian constitution in Ireland similar to that of Flanders, or, better still, of Switzerland? These are questions which I confess myself not in a position to answer; but they are questions which those who have the Irish land question to solve ought to face, when considering the land-system of Flanders.

I think it useful to subjoin a tabulated statement, giving an idea of the number of farms (*exploitations*) and their relative sizes. These results date as far back as 1846, no returns having been published since:—

Provinces.	Proportionate Number of Farms of from								
	50 Ares and less, *i.e.* half an hectare.	51 Ares to 1 Hect.	1 to 5 Hectares.	5 to 10 Hectares.	10 to 15 Hectares.	15 to 20 Hectares.	20 to 25 Hectares.	25 to 50 Hectares.	50 to 100 Hectares.	100 Hectares and upwards.
Antwerp	13·53	8·62	28·90	10·38	4·07	2·26	1·18	1·52	0·14	0·05
Brabant	31·11	17·24	36·20	6·18	2·39	1·15	0·17	1·43	0·53	0·17
Flanders, West	57·12	7·35	19·24	6·27	2·66	2·10	1·72	2·72	0·53	0·09
Flanders, East	41·68	10·08	31·50	7·63	2·77	1·38	0·81	1·02	0·12	0·01
Hainaut	53·46	11·99	23·92	4·83	2·06	1·09	0·68	1·32	0·56	0·11
Liege	15·72	13·81	25·76	7·10	2·91	1·35	0·73	1·40	0·91	0·26
Limbourg	30·11	11·97	32·62	13·34	5·61	2·50	1·18	1·78	0·47	0·14
Luxembourg	18·92	12·75	41·88	12·67	5·28	2·75	1·18	2·78	1·10	0·93
Namur	33 87	18·97	32·02	6·26	2·40	1·19	0·76	1·60	1·44	0·77
Average of Kingdom	43·21	12·30	28·99	7·16	3·01	1·59	0·98	1·64	0·58	0·17

THE SUEZ CANAL TRAFFIC.

(From ECONOMIST, March 2, 1872.)

THE figures of the traffic for 1870 and 1871, during which the Canal has been completely open, have lately been published in great detail by Messrs C. and A. Bazin, of Port Said. The aggregate tonnage of ships using the Canal in 1870, instead of being two or three millions, as the promoters estimated, was under half-a-million—viz., 436,618 tons; and even in 1871 the figure is still considerably under a million—viz., 771,409 tons. The result, it is evident, proves the delusion of the promoters' calculations, and that the Canal had never at the best those chances of immediate profit to which original shareholders look forward.

In the total of 771,400 tons British ships counted for 546,021 tons, or 71 per cent. of the whole, the remaining 29 per cent. comprising the entire shipping of the rest of the world using the Canal. Of course the Canal traffic is likely now to increase very fast, especially as the trade of the world is getting more and more out of sailing ships into steamers; but it must take a long time yet before the business comes up to the mark which the projectors set up as the starting-point.

* Is another proof needed? No vines are better cared for than those of the Canton of Vaud, being the agricultural wonder of the Lake of Geneva. Is the wine grown there exported like champagne, claret, or port? Not at all; the Vaudois drink it themselves. Does it not do them more good?

† *Vide* Lord Dufferin on 'Irish Tenure,' chap. III.

* *Vide* W. Roscher, Nationalokonomik des Ackerbaues,' p. 229.

OBSERVATIONS ON THE LAW AND CONSTITUTION, AND PRESENT GOVERNMENT OF INDIA.

BY LIEUT.-COL. GALLOWAY, 1820.

On the nature of Tenures according to the law of India, under the Moohummudan Government.

By the Moohummudan law, there are two modes of settlement of the khuraj; the *mookautumah*, and the *mookausumah*, which will be explained below; but the khuraj of green crop (*ruthab*, signifying fresh, moist green, which some commentators have translated by the word *sebzi*, green vegetables, pot-herbs) was always paid in money; [illegible] dhums for every jureeb which produced green crop. This is explained to be "all kinds of green vegetables, flowers, roses, green [illegible]s, sugar-cane, turmeric, melons, cucumbers, bazunjaun, [illegible]old, and the like."

"Accordingly," says the [illegible]huree, "from dry crops one-third of the produce from each harvest was levied as revenue: but for musk, melons, ajwayn, onions, [illegible] other greens, readymoney at fixed rates was payable." And [illegible] the revenue for indigo, kuknar, pan, turmeric, singarhar, hemp, [illegible]ah, kuddoo, henna, cucumbers, badinjan, radishes, carrots, [illegible]yndus, and ketchery, was ordered to be paid in ready money.†

Besides these, an infinite number of examples might be [illegible]ed, to shew the identity between the regulations of the India [illegible]hummudan Government and the Moohummudan law. What I have quoted, however, must be fully sufficient.

Having, as I am persuaded I have, without doubt, established that the Moohummudan law and constitution is the "law and constitution of India;" that the Moohummudan law prevailed during the whole period of the Moohummudan Government: that by that law, the right of property in the soil does vest in the cultivators such as I have above defined, and not in the crown or zumeendar, above described: that the usages which prevailed, distinctly shew that neither the sovereign, nor the person whom we called zumeendar (not owning land by inheritance, purchase, or gift), was ever understood to have had the shadow of proprietary right in the soil, and that the usages with respect to tenures, taxation, &c., are nowhere adverse, but for the most part conformable to the principles and rules of the law in their leading features. I shall now notice the different kinds of tenures or modes by which property in lands can be acquired, as recognized by the Moohummudan law.

These are, 1st, *partition* among the conquerors, when the lands are conquered.

2nd. By fixing the *khuraj* upon the lands of conquered inhabitants, by specific assessment (and imposing also the capitation-tax), they being suffered to remain upon the lands.

3rd. By *compromise* entered into with the inhabitants of a country *before conquest*.

4th. By the *cultivation of waste land*, when with the express sanction of Government. These four are the original tenures of land.

5th. Purchase, exchange, or other mutual compact for equivalents.

6th. Dower.

7th. Gift, bequest.

8th. Inheritance.

9th. Wukf, or endowment.

It is unnecessary to notice loan and lease, because these are temporary tenures, further than to state that they not only depend on the time for which they are granted but are void of themselves by demise of either party.

The 1st., *viz., Original partition at the conquest of a country.* This is the strongest of all rights. It can, however, only exist in the person of a Moslem, or one who has acquired by purchase, or other legal mode of conveyance, from a Moslem. It cannot descend to an unbeliever by inheritance: for an infidel cannot inherit of a Moslem. Consequently, had the lands of Hindoostan been divided among the conquering soldiers, no Hindoo could be in legal possession, without a formal title from a Moslem; for by the simple act of conquest, as above shewn, every right of a non-Moslem subject ceased and determined.

I say, right by original partition is the strongest of all tenures, because it conveys a right of which the owner *cannot divest* himself, namely, that of treasure-trove. If a person, says the *Jaumeaa-oor Rumooz*, find hidden treasure in the lands of another, and it is not known to whom it belongs, a fifth shall go to the crown, the remainder to the proprietor of the land. And the proprietor here meant is the *person to whom the Imaum (the sovereign assigned) the land when first conquered*, or his *heirs*; not the owner to whom the lands may have devolved by purchase from the original proprietor, or his heirs. Such treasure shall not go to a *purchaser*, but shall *rather escheat to the crown.* This is also mentioned in the *Moheet.* The object of this statute is evidently to *create escheat.* Even now, probably, no land is to be found in the possession of an original owner or his heirs; consequently, all treasure-trove escheats to the crown.

2nd. *Assessment of khuraj.* The Moslem conqueror has the legal right of suffering the conquered inhabitants to remain on their lands as freemen, but only on condition of their paying the khuraj and the capitation-tax. The khuraj being fixed (which must be by allotment and assessment), the land becomes the property of the individual, saleable, and transferable, in the same way that, in the case of partition among the conquerors, the share of each individual becomes his property, as the law says, *on partition.*

3rd. By *compromises* as the Prophet did with several powerful Arabian tribes *before* conquest, on their paying a fixed tribute: for *after* conquest there can be no compromise.

4th. A *grant of waste land* to cultivate. The grant is permanent. The sovereign has the power of *making* such grant, on condition that the grantee pay the assessment to which such land is liable for what he does cultivate. The nature of assessment, if the grantee be a Moslem, is regulated by situation as to the water for its irrigation. But the crown cannot make any such grant without stipulating for the legal land-tax, seeing that, by law, the sovereign is merely a trustee for the community, whose property the land before partition, is held to be; and a trustee cannot give away the property of his constituent without an equivalent. If the grantee cultivate within a reasonable period (which the law limits to three years), well: if not, the land may be given to another. Timour allowed the ryot, in this case, the land for the first year rent-free; the second he took what the ryot chose to give; but the third year the full public tax was levied.

5th. *Purchase*, or *exchange* for equivalent, by any of the legal compacts. 6th. *Dower*, on marriage; which is also, by the Moohummudan law, held to be a civil compact, for an equivalent, namely, the connubial society of the bride.

7th. *Gifts* with seisin, from an owner who is competent to give; and *bequests.* These are compacts without an equivalent. So also is,

8th. *Inheritance.* All unbelievers may inherit among themselves, whatever their creeds may be, but none of them can inherit of a Moslem, nor can a Moslem inherit of a non-Moslem.

The 5th, 6th, 7th, and 8th, are all private contracts, and therefore do not weigh in this investigation.

9th. *Wukf*, or endowment, for some charitable or pious purpose. This tenure is absolute as to the *usufruct*, but does not convey the full right of property to the incumbent; though, as the law says, it annuls that right in the endower. The benefice lands, however, *even though the endowment be from the crown* are liable to the land-tax. This is a most important rule of law as applicable to India; I shall, therefore, give it in the original. The law says "if tithe-lands they are liable to the tithe; if khuraujee-lands, to "the khuraj." "The tenth (*ooshr*) is due from all benefice lands, if *ooshree*; if *khuraujee*, then *khuraj* is due;" that is, according as the *ooshree* or *khuraujee* assessment may have originally been applicable to the lands, so shall the public revenue be continued to be demanded, notwithstanding the endowment.

But an endowment by *wukf* would not be valid even from the crown, unless granted for the purposes sanctioned by law, and to some one or other of the descriptions of persons or establishments which the law recognizes as the objects of endowment. For example, a grant of lands by *wukf* to an individual who is wealthy, would be null *sue wukf*, according to all the lawyers, though according to some it would be held to be a *gift.* The object or purpose of endowment must be of a permanent, as well as a pious or charitable nature. This is doubtless the sound law; though in some books, it is stated as legal to appropriate, by *wukf*, in favour of individuals and of people who are not poor. But this is mere difference of terms; for in these cases the grant is, by a legal fiction, held to come under the law of gifts, and not of benefices; and then the law of donation will rule the case, which of course does not cancel any *public* or private demand against the land given; and if a tenure by *wukf* flowed from a subject it would *à fortiori* be good, *quoad* the profits only; the land would still be subject to the revenues of the state. These, together with tenures by *loan* and *lease*, both of which expire with the demise of either party, are those by which landed property may be acquired and held, according to the Moohummudan law.

* Jaumeaa-oor-Rumooz. † Vol. 1, p. 361

LANDLORDISM:

[BY D. SYME.]

IN ITS MORAL, SOCIAL, AND ECONOMIC RESOLUTIONS.

Not only is our present land system responsible for the deterioration of our farm labourers, and in a great measure for the advance of pauperism and crime, but to it we are indebted for the ever-increasing burden of taxation. According to the law of England, the land belongs to the Crown. When originally granted to private individuals, its tenure was subject to certain conditions, generally of military service, and it was resumable by the Crown if these conditions were not complied with. In those days the land was the only source of revenue for the State. It provided for the poor, maintained justice, supported armies, and bore all the imposts of the community.

"The early European system," says Hallam, "knew neither the necessities nor the ingenuities of modern finance. From the demesne lands the Kings of France and Lombardy supplied the common expenses of a barbarous court. Even Charlemagne regulated the economy of his farms with the minuteness

of a steward, and a large portion of his capitularies are directed to this object. Their actual revenue was chiefly derived from free gifts made according to ancient German custom, at the annual assemblies of the nation, from fines paid by the allodial proprietors for default of military service, and from the fredu, or fines accruing to the judges out of the composition for murder. These amounted to one-third of the whole weregild; one-third of this was paid over by the court to the Royal Exchequer. After the feudal Government was established in France, and neither the heribannum nor the weregild continued in use, there seem to have been hardly any sources of regular revenue besides the domainal estates of the crown."*

From the meanest vassal to the proudest noble all had a personal and material interest in the soil; and in proportion to the extent and fertility of the land held by each, were his obligations to the State increased or diminished. The feudal system was at least an equitable one, which is more than can be said of the one we have substituted in its place. Military service was then, in the strictest sense, a rent-charge on the land; the lords of the soil were simply tenants of the Crown, neither more nor less. Now, however, since military tenures have been abolished, and the expenditure of the Government is maintained by a general system of taxation, we do not find that the rents have reverted to the State. Modern landowners claim the rights, but have taken good care to disown the obligations, of their position. They had adroitly managed to relieve themselves of their burdens by transferring them to the shoulders of the people; and, being legislators as well as landowners, they found little difficulty in giving the sanction of the law to their proceedings. In the first place, they substituted a pecuniary assessment for military service, and then made the assessment so low that it was found necessary to supplement it. In other words they retained their rents and provided a substitute in the shape of customs and excise duties.

Pauperism as we now understand it had no existence under the feudal system. The poor were provided for in those days, but not out of the pockets of the rate-payers. Under the feudal system there were no rights without corresponding duties. The vassals gave their services, and in return the lord apportioned them land, and afforded them the benefit of his protection. But under the process of that revolution by which they came in time to claim their land as their own property, the landowners not only created pauperism, but contrived to cast upon others the duty of its relief. The law of settlement practically confined the poor to the place of their birth and all that the owners of property required to do in order to escape payment of the rates, was to take care that there should be no poor people living on their estates. Nor have they been slow to take advantage of the law in this respect. Systematically they have proceeded with the work of ejectment. All over the country the labourers' cottages have been pulled down, and their late occupants driven to seek shelter in the nearest village or town, where they have to pay exorbitant rents for miserable hovels. The town or village may be miles distant from the scene of his labours and in addition to his day's work, the labourer has the task of walking to and from his work without any additional compensation being allowed him. Thus he is turned out of his home, his hours of labour are increased, he is compelled to pay a higher rent for worse accommodation, and all the while his wages remain the same as before. What if the labouring poor can only find shelter in crowded and squalid dwellings in the lanes and alleys of our towns and villages, where health is unknown! The result is achieved: the landowners get rid of the poor rates; the tradesmen and shopkeepers of those towns and villages have to maintain the crowds of people thrown on their hands, to multiply in a state of ignorance, disease, vice, and finally, to give birth to an army of criminals so numerous and so dangerous to the community, that the public are at their wits' end how to deal with them.

Another evil attending our land system is, that while the land itself is constantly increasing in value, we have no corresponding contributions from that increase in aiding to defray our public expenditure. If the land in feudal times, when the soil was cultivated in the rudest manner, was able to maintain its poor and defray all the expenses of the State, ordinary and extraordinary, why should it not do as much now, with all our scientific acquirements, our steam ploughs and thrashing machines, our improved live stock, and our vast and varied experience of the capabilities of our soil and climate? To this it will no doubt be answered that the population of the country has largely increased since the period referred to; that a comparatively small proportion of the population is now engaged in agriculture, and that it is but right that those other classes of the community who may be following industrial and commercial pursuits, should contribute their fair share to the public revenue. We admit the fact as to the increased population, and the comparatively small proportion engaged in agriculture; nor do we dispute the justness of the argument that the industrial classes should bear their fair share of public taxation. It is forgotten, however, by those who put forward this plea, that the value of land has increased in quite as great a ratio as the population; that the land has derived additional value from this increase of population, and is now quite as able as it ever was to meet all the demands that may be made upon it.† It may be alleged indeed that this increase is due to the enterprise of the landlords. This is not the case however. Increased value is no doubt given to land by what are called improvements, which are made sometimes by (1) the land, as when Mr. Smith of Deanston, by a thorough system of drainage, increased the rents of his estate from 15*s.* to 40*s.* an acre; (2) more frequently they are made by the tenants, as in Scotland, when they have long leases, and in almost every case have greatly improved the leaseholds by a large expenditure in manuring, subsoiling, and draining. Rents in the lowlands have risen of late [illegible] 20 per cent., chiefly from this cause. In Ireland under another form of tenure, the small farmers have reclaimed large estates from their original bog or heather, erected the necessary fences, dwellings, and farm buildings by their own labour, and in many cases thereby doubled and trebled the value of the land;† (3) by corporate bodies in constructing works of public utility, such as harbours, common roads, canals, and especially railways; (4) by the Government as in France, Belgium, and the continental States generally, in the construction of railways; and as in India in the construction of roads, railways, and works of irrigation. Whatever in fact increases the fertility of the soil on the one hand, or decreases the cost of production on the other, proportionately increases the value of the land.

But there is a natural as well as an artificial process of raising the value of land. In a country where there is no population to consume its produce, and no means of transporting that produce to be consumed elsewhere, any expenditure of labour or capital in improving the land would be sheer waste, as land under such circumstances would have no value whatever. It is population, with its necessities, which in the first instance gives land its value. In the earlier stages of society a few wandering tribes occupy a large territory, and land is almost valueless. As population increases land is more appreciated, and flocks and herds supersede the less useful animals of the chase. After a further increase of the population, and when cultivation has been resorted to, a new and distinct value is given to the land. As yet however it is not a saleable commodity, for where every one has as much of it as he can use, there is little or no demand, consequently no purchasers, and no rent, as rent only becomes possible when a still further increase of population renders the supply inadequate to the demand. It is evident therefore that population is the source of all value in land. Without population there can be no market for agricultural produce, and without a market the produce and the land from which it is raised are alike valueless. The further removed the land is from a market, the less is its value; the nearer and better the market, the more valuable the land. In the Western States of America land is cheap and population sparse; as you proceed towards the seaboard, population becomes denser, and land more valuable. In Australia it is said, land near centres of population is let as high as 7*s.*, 10*s.*, and even 20*s.* an acre, the tenant fencing and clearing the land, and making all the necessary improvements; while equally good land is in the

* "Middle Ages," vol. i., p. 208.

† Gregory King estimated the population of England and Wales in 1688 at 849,000 families, and reckoning 5½ persons to a family will give a total of 4,669,500; and he estimates the annual income from landed property at this period as follows:—From land 10,000,000*l.*; burgage or housing, 2,000,000*l.*; all other hereditaments, 1,000,000*l.*; making a total of 13,000,000*l.* According to the census of 1861, the population of England and Wales was 20,061,725, and the return under Schedule A. of the income-tax at the same period was 121,069,903*l.* Between the two periods, therefore, there was an increase of 429 per cent. in population, while there was an increase of no less than 923 per cent. in real property. In other words, the value of real property increased at more than double the rate of population. Take another comparison. Mr. Caird found, from actual observation, that the rents for arable land and labourers' cottages in the agricultural districts of England had, since the period of Arthur Young's visit, risen exactly 100 per cent. Arthur Young made his tour in 1770, and Mr Caird has in 1851, just eighty years after. We have no means of ascertaining the actual population in England and Wales in 1770, as no census has been taken for some time before or after that date; but we know it to have been 17,027,609 in 1851, and we also know that the decennial rate of increase in the population has for a long period been, as nearly as possible, 14 per cent. If therefore we take eight decennial periods at this rate, we shall find the increase during the eighty years to have been 112 per cent. as against 100 per cent. increase in the rents. But we know for a fact that by far the largest proportion of this increase of population has taken place in the metropolitan and manufacturing, and little if any in the agricultural districts. Between census of 1851 and 1861 for instance ⅔ lbs. of the whole increase took place in the town, and the purely agricultural districts showed a decrease. Cambridge and Rutland decreased 5 per cent.; Norfolk, Whilts, and Suffolk, 2 per cent. Anglesea and Montgomery, in Wales, also sustained a loss. If therefore arable land increased in eighty years 100 per cent. in value, we may safely assume, if we do not know it for a fact, that near the great centres of population, where the pressure was the greatest, the value of the land had proportionately increased.

† "The Irish landlords, partly politically and partly to obtain additional rent by means of the potatoe, encouraged or (what was enough, without active encouragement) permitted subdivision and the increase of population. The inhabitants of Ireland, from 4,088,328 in 1792, rose to 8,175,124 in 1841. The landlords were unable or unwilling to expend money on their estates. They allowed the tenants themselves to make the provision by building and reclaiming land from its original state of bog or heather, or stony field, necessary to lodge and feed this increased population. It is thus that many estates have been created, and almost all have been enlarged by generation after generation of tenants without assistance. It was the tenants who made the barony of Ferney, originally worth 3,000*l.* a year, worth 50,000*l.* a year."—*Ireland, Journals, Conversations, and Essays*, by N. W. Senior, vol. ii., p. 240.

interior, but at a distance from market, let as low as two pence and three pence an acre. Here it is clear that population alone gives value to the land.

The landowner, however, does not expend a shilling on improvements. He may neglect his property, he may be an absentee, still its value goes on increasing with the increase of population. In the same manner the tenant would not be able to pay a high rent for the use of his farm unless he got a corresponding high price for his produce. On the consumers therefore falls the burden of high rents. Thus Mr. Caird found that while the rent of land in the districts he visited had increased 100 per cent. during the eighty years previous, the price of meat had also increased 70 per cent., the price of butter and wool 100 per cent. during the same period. It is evident therefore that if the land belonged to the State instead of to private individuals, as in England, income and expenditure would be self-adjusting, increased expenditure caused by increased population would be met by a corresponding increase in the rents from land. By a wise and beneficent adaptation of nature, the land is really capable of meeting all the demands that society, enlarged and elevated, may make upon it. The simple is, the greater the demand the greater the supply. As in nature the greater the evaporation the more copious is the dewfall; the greater the crop (so long as it is not carried off the ground) the more is the fertilizing of the soil increased. In the topics, where vegetation is most luxuriant, the soil is the richest, every successive crop only serving to increase its fertility. As the plant by its roots takes up food from the soil, so does it by its leaves from the atmosphere. Agriculture extracts wealth from the soil, but with manufactures and accession of population becomes necessary, and then a new source of wealth is added to that already in existence, and both help to enrich the soil that supports them.

Another evil resulting from our land system is the stagnation of agriculture. No one can say that agriculture in England is in a satisfactory condition at the present day. It certainly has not kept pace with manufacturing industry. In the manufacture of cotton and woollen goods, of cutlery, of steam engines, and a thousand other articles, England stands unrivalled. She supplies the world with the products of her workshops, but she cannot raise food enough for her own people. England is now the largest grain-importing country in the world, though for centuries she not only supplied herself with breadstuffs, but was also a large exporter of wheat long after the bounty system had been abolished. Within less than a century France has quadrupled her agricultural produce,* while England, according to the most eminent authorities, now produces less grain by about two millions of quarters than she did in 1770, when Arthur Young made his estimate.† The two principal Channel Islands, where the holdings are small and well cultivated, the agricultural population is in the one twice, and in the other three times as dense as in England, and the non-agricultural population respectively four and five times as dense, yet they not only produce food enough for their own consumption, but annually export large quantities to England. It has been proved beyond doubt that in Belgium, Holland, the Rhine Provinces, Saxony, Lombardy, and Switzerland, the soil is better cultivated, the gross produce and net profits greater, and (the real test) the land commands a higher price than in England, with her large population and vast accumulated wealth, while at the same time the cultivators in those countries are better fed, better educated, and in every respect more prosperous than the same class with us.‡

The full effects of this stagnation in agriculture it is impossible to estimate. We can only reason from analogy. We know the effects of a bad harvest, as it comes home to the experience of every one. It influences the rate of discount, injures national credit, checks enterprise, and lowers the rate of wages. A good harvest, on the other hand, means cheap food, cheap money, new enterprises, increased demand for labour, and high wages. If these are the ordinary results of a single harvest, good or bad, it is easy to imagine the consequences that would follow a succession of such; in other words, from a permanent increase or decrease of the means of subsistence. There is no reason why England at this moment should not supply food enough, and more than enough for her own population. There is no want of land, for out of the 77½ millions of acres in the United Kingdom, only 45½ millions are under cultivation or in permanent

* Lavergne's "Rural Economy of England," p. 144.
† Caird's "English Agriculture," p. 523.

‡ It is usual with a certain class of writers, when treating of this subject, to argue that, as it is necessary to buy in order to sell, if we do not purchase, say wheat from the United States, the United States has not the means of buying manufactured goods from us. But if this argument is good for anything, why not reduce still quantity of home-grown wheat, or even cease to grow it altogether, and so enable our transatlantic cousins to purchase more of our manufactures? Or if supply and demand have already become so nicely adjusted, had we not better cease producing any more, lest we should disturb the equilibrium? But suppose we have arrived at such a nice adjustment, would it not be better to have our own population in the double capacity of producers and consumers, and thereby develop to the utmost the resources within our reach and under our own control, and save the cost of transportation both ways? The latter, at all events, would be a clear gain.

remaining 32 millions are lying waste, though fully one-half is capable of cultivation. There is no want of capital, for English capital is going a begging all over the world. There are tens of thousands of acres of land in Canada, in Australia and other Colonial possessions, in which English capital has been invested to the amount of 40*l.* or 50*l.* an acre, which are now growing grain for the English market. And Heaven knows there is no deficiency of labour. At the present moment there are said to be no less than 150,000 able-bodied poor amongst us whom it would be a charity to turn to some profitable account. Just imagine the wealth that all the labour now going to waste might create! Why, it is not far short of the total of the able-bodied population of the colony of Victoria, who raise an annual revenue of 3,000,000*l.*, and own rateable property of the value of over 40,000,000*l.*, nearly the whole of which has been acquired in less than half a generation. But we must add to these 150,000 able-bodied paupers the number of able-bodied labourers who are continually going about in search of work, those employed on half time, and the criminal class in penal servitude, altogether making an unemployed able-bodied population of something like a million. What if increased production did lead to low prices! Are we to keep down production in order to keep up prices? Is it nothing that the standard of living throughout the country would be raised, and that the means of subsistence would be within the reach of thousands who can now barely keep body and soul together! And would not cheap food, which is so essential to cheap production, enable us to maintain our present preeminence in manufacturing industry, now endangered by the high price of provisions!

The present system is, moreover, an unwarrantable monopoly in an era of free-trade, and a mischievous absolutism in a free State. We cannot believe we are in our proper position as a people while we allow a large part of our population to starve—our resources to be wasted, and the land, which should contribute to the wealth of the nation, misappropriated in the manner it is at this moment. Unlike an ordinary commodity, land cannot be increased in quantity at pleasure. Its ownership is a monopoly. We pride ourselves on being a free people, but we submit to an absolutism on the part of the landowners which is a disgrace to our civilization. A landowner in this country is endowed with more than sovereign power. A sovereign reigns for the good of his people, a landowner for his own pleasure and profit. The public may concern themselves much about the rights of property, but the owners of property need not give themselves the slightest trouble about the interests of the public. Blackstone says that, "every Englishman may claim a right to abide in his own country so long as he pleases, and not be driven from it, except by sentence of the law, but times have changed since Blackstone's day. The landowner is the man in possession, and possession is nine-tenths of the law. The land is his, and he may do exactly what he likes with it. He may refuse to sell, let, or allow any one to occupy it. He may consign a whole county to the solitude of a deer forest. He may clear a large territory of its population as he would exterminate vermin when they become troublesome. Fifteen thousand souls, without respect to age, sex, or condition, and for no fault of their own, were turned out of the Sutherland estates in the early part of the present century. And this barbarity was committed in open day, and in the name of law! But if one landowner can act in this manner, why not all; and since all the land is owned by some one or other, where are we to draw the line? And if landlords have, as they maintain, legal right to do so, it is clear that the English people exist merely on the sufferance of the landowners, who are truly masters of the situation, and that as a nation we have no *locus standi*, no common inheritance, no territorial rights whatever.

It will be found, if we examine the subject more closely, that our notions of private property in land are altogether peculiar. The alienation of the public territory to individual proprietors is a modern innovation. The bare idea of alienation is repugnant to three-fourths of the human race. To the American Indian, North and South, to the New Zealander, the South Sea Islander, the aborigines of Africa and Australia, the idea is altogether incomprehensible. To their unsophisticated notions the land appears to be as necessary to their existence as the air they breathe. The idea of its absolute, permanent alienation, never entered their minds, as they cannot conceive of the existence of the tribe or nation apart from the soil.

Individual ownership of the soil is as repugnant to the civilized mind as to the savage—to the semi-barbarous nationalities of the West, as to the luxurious civilization of the East. Thus in Peru, in the time of the Incas, there are no traces of individual proprietary interest in the soil. We find there existed in that country a threefold division of the public territory. One part was appropriated to the sun, another to the Inca,

* In a recent number of "The Money Maket Review" it is estimated that 50,000,000*l.* of English capital are invested in foreign railways; 110,000,000*l.* in colonial railways; 200,000,000*l.* in Indian and Colonial debts; 400,000,000*l.* in foreign stocks, besides an unknown amount in foreign banks, insurance, steam navigation, dock, plantation, land and mining companies.

and a third to the people. The lands apportioned to the [illegible] were for the support of the temples, the maintenance of public worship and the support of the priesthood. Those reserved for the Inca were for the support of the State and the numerous members of the royal household. The remainder of the lands was divided into equal shares among the people.* The divison of the soil was renewed every year, and the possessions of the tenant were increased or diminished according to the size of his family. All these divisions of the soil were cultivated by the people. First, the lands belonging to the sun were attended to; next those of the old, the sick, the widows and orphans, and soldiers engaged in actual warfare; then those belonging to the people; and last of all, those of the Inca. But the produce of all the lands set apart for the Inca, as well as those consecrated to the sun, were deposited in the public storehouses, and remained there as provisions for times of scarcity.† In Mexico, also, we are told,‡ the people held the lands in common, and alienation was unknown.

MINERAL RESOURCES. BRITISH BURMAH.

TIN.

From Crawford B. Cooke, Esquire, Officiating Assistant Secretary to the Chief Commissioner, British Burmah, to A. O. Hume, Esquire, C.B., Secretary to the Government of India, Department of Agriculture, Revenue, and Commerce, No. 126-284, dated Rangoon, the 19th September 1871.

Sir,—With reference to the correspondence which has already taken place between the Government of India and this administration, respecting the district of Malewoon on the southern boundary of Tenasserim, and the applications made for leases to work for tin in that district, and in other parts of Mergui as well as in Tavoy, by General Tremenheere and Messrs. W. Strang Steel & Co., I am directed to forward a copy of further correspondence on the subject, and to submit for the consideration and orders of the Supreme Government the views of the Officiating Chief Commissioner in regard to arrangements which should be made in view to the future working of what is known as the "Malewoon farm," and to the leasing of the tin deposits under notice.

But before discussing these subjects with regard to the future, it may perhaps be useful to describe briefly what has been done in the past to utilize the rich mineral wealth of a province which has been under British rule for 45 years; and to improve a district 1,200 square miles in extent, during the 10 years it has been under lease. First as to the tin deposits,—soon after the province of Tenasserim was taken possession of at the close of the first Burmese war, attention seems to have been given to the deposits of tin, which existed in the Tavoy and Mergui districts, for towards the end of 1828, or beginning of 1829, samples of the mineral were sent to Calcutta, and after assay at the Mint, were pronounced to be of excellent quality. This appears to have led to some smelting operations being taken in hand by the Government of India, as in August 1830, a small parcel of the metal was forwarded to Calcutta and there sold, and although somewhat impure, it fetched good prices. Indeed, a very high opinion appears to have been formed of the metal, and a Mr. Duncan, who acted as agent for its disposal, suggested that the East India Company should establish a "chop" of its own, and stated that he had no doubt that tin from the Tenasserim mines would realize from 10 to 15 per cent. more than the tin imported from the Straits, if its purity were guaranteed by the Company's chop. But little or nothing however appears to have been done to work the deposits subsequently, and the next record we have regarding them is contained in some reports on examinations of the localities made in 1841, 1842, and 1843, by Colonel, now Major-General Tremenheere, R.E., then Executive Engineer of Tenasserim, which were published in the Journals of the Asiatic Society for those years. Specimens of the tin were at the same time sent to England with a hope of British Capitalists ingeresting themselves in the working of the deposits; but owing to the low price of the metal, or to other causes the matter was not taken up. Some years afterwards, one or two large tracts of land were granted for "mining purposes," but no attempts at mining appears to have ever been made, and on one of these grants in 1855, Dr. Oldham found one man only at work collecting tin; while there was no trace of proper mining operations, so that it is quite evident that nothing whatever was done to carry out, what may be supposed to have been, the original intention of the grantees.

The report drawn up in 1855 by Dr. Oldham, who appears to have been deputed by the Government of India to investigate the geological formations of the Tenasserim province, and to examine the coal and tin deposits known to exist therein, is a very interesting one; a copy is herewith for [illegible] reference. It seems however to have led to no practical [illegible], for from that day to the present, the coal veins have never been mined, using the word in its proper sense, nor the tin deposits worked, except within the Malewoon district, and there only in the most desultory and unscientific manner.

In regard to the Malewoon district,—but little notice seems to have been taken of this large tract of country [illegible] 1859, and then only because "in the Police report of the Deputy Commissioner of Mergui there appears annually a [illegible] of the commission of some two or three offences of the most aggravated character, murders generally with or without the [illegible] and the like." The country is then described as [illegible] uninhabited, except by a few scattered colonists numbering together 733, and consisting of Malays, Chinese, and Siamese, there being neither Burmese nor Talain within its boundaries. These few inhabitants gained "a subsistence in the tin workings, or provide food by agriculture, or fishing for the tin workers." Captain, now Colonel Hopkinson, was then Commissioner of Tenasserim, and he submitted a proposition to the Government of India to farm out the district in the same manner as Renoung on the opposite side of the Pakchan river, the boundary between British and Siamese territory, was leased by the Government of Siam. This suggestion found favour with the Supreme Government, and in November 1859, authority was given to the Commissioner to carry out his proposals. A copy of the correspondence is attached to this despatch. Accordingly on the 30th of June 1860, a lease of the district was granted to one Chet Syang, a Chinaman, for a period of ten years, at a fixed yearly rental of Rupees 650, besides an annual fee of Rupees 60 paid for the privilege of selling country spirits; in addition, the farmer was bound to purchase from the Government the opium required in the country, and on this a profit of Rupees 2,000 a year has been realized. The gross revenue received by the Government in the last year of the lease was Rupees 2,720, and the cost of keeping up the police, &c., amounted to Rupees 3,108, shewing an actual loss of Rupees 388. It could perhaps scarcely be expected that the district would very much improve under an arrangement such as this, with no representative of the Government on the spot, except the lessee, whose interest it was to make as much as possible out of the tin deposits within his jurisdiction during the tenure of his lease; but even the anticipation expressed by Colonel Hopkinson in submitting his proposals to the Government of India, have scarcely been fulfilled. The tin deposits have not in anyway become better known through the leasing of the country, nor has a systematic plan of operations been introduced, nor any great importation of labour taken place, and even if the "nest of thieves," has been got rid of, which is doubtful, certainly no "hive of industry" has sprung up in its place. In 1859 the population was stated by the then Commissioner to be 733; in 1870, eleven years after, it had increased to 1,213. The capitation tax had increased in the same period from Rupees 590 to Rupees 913. In 1859-60 the area under cultivation was 246 acres, yielding a revenue of Rupees 2-54; in 1870-71 the quantity of land cultivated was only 419 acres, and the land tax amounted to Rupees 420; and there are 6,000 acres of culturable land along the northern bank of the Pakchan river. The progress then has been comparatively nothing, and it is most desirable that Chet Syang's connection with the district should cease forthwith.

From the correspondence now submitted, it will be seen (1st) that Doctor Oldham reports that the sample of tin stone forwarded in June last for analysis, yielded 71 o/o of metal; (2nd) that he deprecates Mr. Theobald being transferred from Pegu to Tenasserim to carefully examine and report on the mineral deposits of the latter division, that he observes that the services of a mining geologist would be much more valuable in prospecting for, and examining these mineral deposits, than the services of an ordinary member of the geological survey department, and that he makes reference to a mining geologist who is now employed in India in opening up a colliery; (3rd) that the Commissioner of Tenasserim submits his views on the best method of administering the Malewoon "farm" or district; (4th) that the same officer forwards a report from the Deputy Commissioner of the Mergui district respecting the tin deposits, and furnishes his own opinion as to the leasing of such deposits.

With regard to the first letter from Doctor Oldham, the Officiating Chief Commissioner observes, that the analysis shows that the tin stone is undoubtedly very rich, being almost pure "black-tin," a name given to the mineral after it has been bruised down into powder, and cleaned from almost all foreign substances ready for the smelters. The price of such "black-tin" in England at present time, is from £78 to £81-10-0 per ton. As to the second communication, Mr. Eden is of opinion that it is of the greatest importance that some arrangement should now be made for bringing European capital and science to bear on the development of the valuable mineral deposits of Tenasserim; but that but little can be done in this respect until the deposits have been carefully examined and reported upon, so that some idea may be formed of

* Prescott's "History of the Conquest of Peru," pp. 20, 21.

† Robertson's "History of America," Works, vol. i. p. 234. An unfruitful season was thus more effectually provided for than by the modern discovery of free imports, which leaves the supply in a great measure to chance.

‡ Prescott's "History of the Conquest of Mexico," p. 1.

their appproximate value. The Officiating Chief Commissioner presumes, that the departmental reasons urged by Doctor Oldham against the deputation of Mr. Theobald on this duty must be held sufficient, but as f[illegible] is concerned, it matters little whether [illegible] not. Enough is known to show that it can be attended with no practical results. It is however very much to be desired in the interests of the Government that the examination of the tin deposits of Mergui and Tavoy should no longer be postponed. And indeed, there is every reason to believe that the whole Tenasserim province is full of mineral deposits. It is [illegible]d that copper is to be found in some of the hills, and you are aware from the repeated correspondence which has passed on the subject that lead has been lately found in Toungoo.

It is clear to Mr. E[illegible] that the lease of Malewoon to the Chinaman, who now has it, must [illegible]ase; that he is not prepared to make any specific recommendation in regard to the applications of General Tremenheere, or Messrs. Steel & Co., until he possesses more precise information regarding the tin deposits, their probable value and extent, and the mode in which they should be worked. This information can only be made available by the deputation of some really competent and trained mineralogist to investigate and report upon the whole question. The Officiating Chief Commissioner trusts therefore, that the Government of India will be able to make available for this duty the services of the gentleman alluded to by Dr. Oldham, and that he may be directed to undertake the duty in question early in November, in order that a prompt decision may be arrived at as to the conditions on which negotiations with General Tremenheere and Messrs. Steel & Co., may be based. The longer the delay in the settlement of this question, the greater the loss to Government. Should the services of Mr. Fryar however not be available, the Officiating Chief Commissioner would venture to suggest that the Secretary of State should be requested to send out a competent mining surveyor, who has had practical experience in the working of tin mines and of stream works, and who could not only form an idea of the value of the deposits he might examine, but give information as to the best and most economical method of working them. A gentleman of this class probably could easily be engaged through the Government school of mines.

In respect to the despatches from the Commissioner of Tenasserim, I am to state that the arrangements proposed in para. 7, of letter No. 31, dated the 26th May 1871, have Mr. Eden's entire concurrence with the exception that he has another scheme under which the Deputy Commissioner of Mergui would be transferred to another part of the country in which a new district seems to be imperatively called for, in consequence of the heavy returns of violent crime. The Officiating Chief Commissioner therefore does not desire to press immediately the administrative changes proposed, and they can lie over until the question of the leasing of the tin deposits is settled. No doubt an Assistant Commissioner might with great advantage be posted at once to the Pakchan, and might have under his control the Police stationed in the Archipelago and along the bank of the river up to Malewoon. He would, it is to be hoped, be able to put down what is called piracy in that part of the Eastern seas, and to gather around him, as Colonel Brown points out, a settlement of cultivators in this now almost deserted part of the country. Unfortunately however there are not enough of Assistant Commissioners at the Chief Commissioner's disposal to enable him to make the arrangement. But the point on which early orders are now requested is the delegation of a practical and competent mineralogical surveyor.

Mr. Eden's views do not coincide with those of Colonel Brown in regard to granting licenses to work for tin, for one year only, nor with those of Captain Fryar as to leasing the deposits of a nominal rental for five years with permission to renew the lease for a longer period. In the first place, if the value of the deposits were approximately defined, as they would be by a practical miner, no company would commence operations on the short term of one year; and in the second place, the granting of a lease for five years at a nominal rental would simply be offering a premium to the lessees to get as much as possible, in the rudest way possible, out of the ground in the five years, and at the expiration of that period they would probably object to renew their lease. The best plan, in the Chief Commissioner's opinion, would be to grant the privilege of working the deposits for a term of 14 or 21 years on a royalty of say 5 or 7 per cent. on the value of the mineral or metal sold. With such a long period a company would have some inducement for working the ground systematically and thoroughly, and a moderate royalty would lead them to carry on their operations in an open and straightforward manner, whereby their progress would become known, and if successful, would lead to other applications for grants in different parts of the country.

Mr. Eden observes that the valuation put by the Deputy Commissioner on the metal exported from Mergui is a very low one. The highest price noted is £101, and the average only £82. This rate is far below the market value. Block tin has for years past been from £125 to £130 per ton, and is now £135 with every prospect of an increase, owing to scarcity of the metal. The present time is th[illegible] very favourable for for[illegible] company to work the tin [illegible] and the Officiating Chief Commissioner hopes that no time will be lost in complying with his re[illegible] for the services of a mining surveyor, so that replies may be given on [illegible] date to the applications for leases.

PUBLIC W[illegible] RAILWAYS.

STEPS TAKEN TOWARDS THE CONSTRUCTION OF THE INDORE (STATE) RAILWAY.

From the Government of India, P. W. Department, to Her Majesty's Secretary of State for India,—No. 41 R., dated 20th February 1872.

THE correspondence ending with your Grace's Despatch No. 39 of the 9th June 1870, related to the undertaking of the Maharajah Holkar to place a million sterling at the disposal of our Government, in aid of the expense of a railway to unite the Great Indian Peninsula Railway in Nimar with Indore. The negotiations which resulted in this were reported to your Grace on the 29th March 1870, and as mentioned to be our intention in the 11th para. of our Despatch No. 40, we took immediate steps for commencing the survey of the line. A reference to a map will show that the investigation of the country between the Great Indian Peninsula Railway and Indore, demanded much engineering skill, as well as time and labour, before the Government could be justified in accepting any particular alignment. One point only was fixed, and that a terminal point, Indore; and though it was considered of great importance that Mhow should be on the line, if conveniently and economically possible, it is evident that this advantage must be foregone if found to be inconsistent with other and more imperative considerations which naturally present themselves in fixing the direction of any line uniting Indore with the Great Indian Peninsula Railway, and the decision of which practically determines the location of the Railway. Indore and Mhow are both situated on the Malwa table-land, Mhow being near to the edge of the abrupt scarp which bounds it to the south, and which is broken into short spurs affording but little base for gaining height, the Nerbudda River flowing at no great distance from its foot. The considerations referred to are three in number, *viz.*:—

(1.) The descent of the Vindhyas.
(2.) The crossing of the Nerbudda River.
(3.)—the junction with the Great Indian Peninsula Railway.

As regards the junction with the Great Indian Peninsula Railway, it will be seen from the map that, owing to the change in the direction of that line, the bifurcation of a railway to Indore cannot be at a point much to the west of Khundwa without addition unduly to length, nor can it be far to the east of that station without involving a long and expensive detour above the Ghats which would place Mhow on a branch. Moreover, it would add materially to the length of the route to Bombay, which is undoubtedly the natural sea-port of the traffic of this line. A further consideration presents itself in deciding on the point of junction, viz., the unhealthy character of the jungles which intervene between the existing railway and the Nerbudda River, and which are to some extent traversed by that railway, and extend north of the Nerbudda to the foot of the Vindhyan ranges, whose lower slopes they also cover. Water, too, is a serious difficulty throughout the greater part of this tract. The Nerbudda River flows near the foot of the mountain range, and, therefore, as the river crossing and the ghat ascent to the Malwa plateau are contiguous, these two obstacles must be considered together. Floods in the Nerbudda rise from 60 to 120 feet according to the section of the channel, and have a surface velocity of from 20 to 30 miles an hour. The cold-weather discharge is small, and the bed is rocky, but the channel varies considerably in width, and it is desirable that a bridge site should be chosen where the foundations may be laid with as much facility, and without resorting to spans of excessive length. Thus, in determining the direction for a railway to the Malwa plateau, we have had not only to consider its length and the distance to be traversed to and from the sea-port, but to choose a ghat ascent as well as a crossing of a formidable river, and to endeavour to select such a line as will present least risk in the execution and maintenance of the works by reason of the unhealthy character of the country to be traversed. The complicated problem thus presented for solution, demanded early and close attention, and we saw that only a preliminary reconnoissance could be made during the remainder of the working season after the financial negotiations for the construction of this railway were brought to a favourable termination. Their result was reported to your Grace on the 29th March 1870. By the 15th April, the Engineers began to take the field, and by the 14th June, when the rains which set in on the 5th of that month, precluded further field work. Mr. Crawford Campbell, who had been appointed to the charge of the survey, had collected sufficient data to enable

him to submit to us before the close of the following month the results of an admirably conducted preliminary enquiry. The general result of the report by Mr. Campbell was, that the line should leave the Great Indian Peninsula Railway either at Khundwa (352 miles) or Nepanagur (362 miles from Bombay) that it should cross by Sunnawad and Kheree, where he proposed to cross the Nerbudda 2 miles south of Barwaie, and ascend by the Choral valley, passing through Mhow to Indore. The proposed Nerbudda crossing was thought to be favourable, as the highest floods is only 65 feet, and the cold-weather channel may, it was expected, be easily spanned. The works on the ghat ascent on this line would be very heavy. The summit would be reached with a continuous incline of 4 miles on a gradient of 1 in 40, having about 1,200 yards of tunnelling, and three lofty viaducts, but with no gradients worse than 1 in 100 on other parts of the line. The gradients of the incline could, it was shown, be reduced, but only with great outlay, and there is no reason to anticipate such a traffic on this line as would justify a large expenditure in an improvement which would reduce the locomotive working expenses only. In his preliminary report, Mr. Campbell enumerates eight different passes or ghats from the Maunpoor Ghat on the west, by which the Agra and Bombay road is carried to the Baughlee on the east, by which it was some ten or twelve years ago proposed to carry a line of railway towards Agra. The Maunpoor Ghat line would, should be rejected, not only in consequence of the great extra length of new line that its adoption would involve, but because of the second ghat south of the Nerbudda and of the Taptee River, both of which would have to be crossed. Similarly, the extreme East Ghat the Baughlee, could scarcely be approved of, involving as it does an extra length of 12 miles of new railway. It is true that this ghat ascent would admit of a grade of 1 in 100 without much difficulty, and the crossing of the Nerbudda would be favourable, but the line would, on the whole, cost at the least as much as a shorter but steeper graded line. Mr. Campbell in fact, estimated the cost to be 50 per cent. more than his Choral valley line. But supposing the cost to be equal, the additional 12 miles of new line required, is not the only disadvantage of the Baughlee Ghat location. It would add 20 miles to the lead to Bombay, the natural port to be considered in connection with any Indore Railway scheme. It would traverse an unhealthy and desolate country, where water is a difficulty, and it would place Mhow on a branch. Moreover, the limits within which extra length may be allowable in order to gain a better gradient, would be exceeded by this line, considering the probable traffic. Of the remaining six ghats, we had facts regarding two—the Simrole and the Choral. The Simrole was surveyed by the Great Indian Peninsula Railway Engineers, and a line traced.—

	Miles.	Chains		Gradient.
With	4	57	of	1 in
,,	3	30	of	1 in
,,	4	22½	of	1 in
Total.....	12	30	of	1 in and steeper grades.

besides five tunnels, aggregating in length about 1,900 yards, and six lofty viaducts. The Nerbudda River crossing would require a central span for the cold season channel of 500 feet. Of the Choral Ghat the particulars have been given, and the Lodhya Ghat might, it was thought, be utilized in connection with the former, but it had not been sufficiently examined. On its east is the Simrole already referred to, and between the Simrole and the Baughlee is the Peepuldah Ghat, of which nothing was really known from a professional point of view. One objection to the Peepuldah is, that if adopted, Mhow would have to be accommodated by a branch, and unless this ghat were found to offer great advantages, it would be excluded from adoption by reason of the great additional length of new line that it would demand. So also as respects the Chota and Mota Jam Ghats, no exact facts were on record. They are on the west between the Choral and the Maunpoor Ghats, but if these ghats should on examination prove at all superior to the Choral or any ghat to its east, it was probable that the line could be carried across the Nerbudda at the Kheree crossing. It is evident, however, that this would involve the passage of much cross drainage.

On the other hand, the jungles on the south of Nerbudda that would have to be traversed by a more westerly crossing are very deadly. Moreover, the ground between their summit and Mhow, was reported to be much broken by ravines. The information obtained by the preliminary reconnoissance and and thus summarized, was evidently insufficient to admit of our accepting the Choral Ghat ascent, and it was therefore necessary to order further investigations with the object either of finding a better ghat than that through which the Choral River flows; or, failing that, to prove and to place on record the grounds for the conclusion that there is no better ghat within the specified limits. Mr. Campbell accordingly took the field immediately the season permitted, and we now have the honour to report to your Grace the result of the last season's work, which includes skilfully-executed topographical survey of part of the Vindhyas range, and a project for this railway. The scheme as considered by us is not complete in details, as, although the designs are prepared, the estimates for sixteen miles of railway between the top of the ghat and Indore are not ready, the officers engaged upon that division having had extra work thrown upon them in the Vindhya survey. For a comparison of the several lines and ghat ascents, we refer your Grace to pp. 36—7 of Mr. Campbell's report. The general [illegible] has confirmed his preference of last year for the ascent by the Choral valley. After full consideration of the various lines examined and reported on, with the aid of Mr. Molesworth, our Consulting Engineer, we have accepted this line. We are of opinion that a railway capable of being worked throughout by locomotive power should be made, and we are satisfied that, looking to the traffic that may be expected, we should not be justified in incurring the great outlay that is shown to be necessary in order to avoid the long gradient of 1/40. The length of this incline is however reduced to 3¼ miles, and its cost to £114,000, and the length of tunnelling now proposed is less than 300 yards. No part of the line is on a worse gradient than 1 in 100, and though steeper grades could be introduced in places, it is shown that no sensible economy would result. Khundwa is adopted as the junction, because it is an engine-changing and refreshment station on the Great Indian Peninsula Railway, has been occupied for a long time by Europeans, and has been proved to be unobjectionable in a sanitary point of view. It is the largest town in these parts, with about 10,000 inhabitants, and the Bombay Government and the Agent to the Governor-General for Central India, are in favour of its adoption. The only [illegible] alternative was to find the line of shortest length for construction between Indore and the Great Indian Peninsula Railway. To save 9 miles in through distance to and from Bombay, it is certainly worth-while to avoid a junction in the jungles, at Jawar for instance, though it would lead to a small saving (perhaps 2 miles) in the length of new line. Starting then from Khundwah, the line falls 434 feet to the Nerbudda in 37 miles. It then rises in 13 miles about 308 feet. In neither of these sections are the works heavy, and the 50 miles are estimated to cost £181,000 without stations, rolling-stock, shops, and residences. This gives a mileage cost of £3,600. At the 50 h mile the ghat-work really begins and continues for 19½ miles to the table-land: ascending 945 feet in this distance, of which 432 are gained in the 1/40 incline. The cost of this section is estimated at £276,000, and eliminating the 3¼ miles of incline, costing £114,000, the remaining 16¾ miles of this section are estimated at £9,672 per mile. The last section of 16 miles from the ghat summit to Indore, is roughly put down at £93,000, or £5,780 per mile, but this amount will probably be reduced when the estimates are submitted; although there are three large bridges, aggregating 660 lineal feet of water-way, which will swell the cost of this small section. A sum of £200,000 has been put down for the Nerbudda Bridge, 2,500 feet long, but notwithstanding the height of piers required, it is expected that the bridge will not cost so much. Including this amount, the Engineer's estimate for the 86 miles of metre gauge line is £751,000, and adding £1,000 a mile for rolling-stock, stations, station machinery, and shops, the cost as estimated by Mr. Campbell, may be taken at £840,000, and including Engineering establishments, £900,000. Having thus satisfied ourselves that the line which had been chosen was the best, and that the Engineer's estimate of quantities and prices, gave an approximately correct view of the probable, cost, we determined to invite tenders for the execution of the work to be done in India on a schedule of rates and specification similar to those on which we recently let a contract for the construction of the railway between Agra and Sambhur to Messrs. Glover and Co., and we desired our Consulting Engineer for State Railways to inspect the country, and to prepare a design for the Nerbudda Bridge, after he had learnt the nature of the foundation and the quality of available stone. For our orders on this project we request a perusal of enclosure No. 2, from which it will be observed that there are several details to be settled by our Consulting Engineer, who is now on tour. Many influential firms submitted tenders which varied much in amounts, some being far above the estimates of our Engineers, which we thought were sufficiently liberal, while others again fell below those rates. Such variation might be expected, as the cost of extensive work in the Nerbudda valley has not been thoroughly ascertained. Among the lowest tenders was one from Messrs. Hood, Winton, Mills and Oag, a firm which is well-known in Bombay, and which has been engaged in connection with the Great Indian Peninsula Railway for many years in the valley of the Nerbudda. Messrs. Hood, Winton, and Co. are we believe, a wealthy firm, and as their rates are certainly under those at which we could except to construct the railway departmentally, we have entrusted the work to them, and our Solicitors are now drawing up a formal deed of contract. In the meantime a commencement will be made without delay. The contractors will carry out materials and construct the line north of Khundwah. Rails, sleepers, and bridge-work, being delivered to them by us at that station. The railway from Khundwah to Indore is one presenting considerable physical difficulties, and we have therefore described the project in more than usual detail. We now ask for your Grace's concurrence in the commendation we have given to the staff engaged on the survey, and for the approval of Her Majesty's Government to the steps which we have taken.

COMPARATIVE ABSTRACT OF TRAFFIC ON INDIAN RAILWAYS FOR THE FOUR QUARTERS OF 1870 AND 1871.

Quarters.	East Indian. Main Line.		East Indian. Jubbulpore Line.		Eastern Bengal.		Calcutta and S. E. (S.)		Oudh and Rohilkhund.		Punjab and Delhi.		Madras		Great Southern of India		Carnatic.		Great Indian Peninsula.		Khamgaon Branch.		Coimbatore Branch.	Bombay Baroda and Central India.		Sindh.			
	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871	1870.	1871.	1870.	1871.	1870	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1870.	1871.	1871.	1870.	1871.	1870.	1871.	1870.	1871.
First Quarter.	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Total earnings	718,404	658,700	38,956	40,188	41,989	54,986	2,023	2,774	6,572	6,965	86,271	84,513	127,741	119,924	17,330	16,012	837	728	510,207	526,91[illegible]	1516	951	433[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	£	£
Mean mileage open	1,131	1,279	223	224	113	156	28	28	42	42	530	567	707	845	168	168	19	19	1,064	1,258	7	7				312	106	106	4,4[illegible]
Average receipt per week..	55,262	50,669	2,845	3,091	3,221	4,230	156	213	505	536	6,636	6,524	9,826	9,225	1,333	1,232	61	56	39,247	40,532	59	73	72	10,957	9,521	1,521	1,270	131,[illegible]	127,236
Average receipt per week per mile open	48·8	39·6	12·8	13·9	28·5	27·1	5·6	7·6	12·0	12·6	12·5	11·5	13·9	11·5	7·9	7·3	3·1	3·0	·68·9	·52·2	9·1		14·4	35·1	30·5	14·3	12·0	2[illegible]·6	25·6
Second Quarter.																													
Total earnings	703,584	576,605	32,143	36,200	39,069	52,126	1,915	2,352	6,016	7,617	96,065	79,760	125,258	127,392	18,233	17,989	1,150	1,248	541,330	540,[illegible]	775	965	680	171,727	162,396	23,741	17,873	1,761	[illegible],623,297
Mean mileage open ...	1,131	1,279	223	223	113	156	28	28	42	42	554	567	707	832	168	168	19	19	1,184	1,[illegible]		7	5	312	318	106	166	4,[illegible]	5,019
Average receipt per week..	54,122	44,354	2,473	2,785	3,005	4,010	147	181	463	586	7,454	6,135	9,635	9,799	1,402	1,376	88	96	41,641	41,554	[illegible]	74	52	13,210	12,492	1,826	1,375	135,527	[illegible],969
Average receipt per week per mile open	47·8	34·7	11·1	12·5	26·5	25·7	5·2	6·5	11·0	14·0	13·5	10·8	13·6	11·8	8·4	8·2	4·6	5·1	35·2	32·[illegible]	9·6	10·6	10·4	42·3	39·3	17·2	13·0	2[illegible]·6	25·0
Third Quarter.																													
Total earnings	542,823	408,963	16,314	21,705	44,154	54,029	1,519	1,438	5,778	4,481	72,137	46,254	104,803	140,267	17,975	17,491	795	839	215,997	286,[illegible]	117	171	312	69,180	60,963	16,438	20,652	1,098,939	1,063,[illegible]
Mean mileage open ..	1,131	1,280	323	223	113	156	28	28	42	42	559	534	707	832	168	168	19	19	1,154	1,274	7	7	5	312	326	106	106	4,599	5,0[illegible]
Average receipt per week...	41,756	31 459	1,255	1,593	3,396	4,156	116	111	443	345	5,549	3,558	8,052	10,790	1,382	1,339	61	65	16 615	22,074	16	13	24	4,629	4,682	1,264	1,589	84,546	81,[illegible]
Average receipt per week per mile open	36·9	24·6	5·6	7·1	30·1	26·6	4·1	4·0	10·5	8·2	9·9	6·7	11·4	13·0	8·2	8·0	3·2	3·4	14·0	17·3	2·3	1·8	4·8	14·8	14·4	11·9	15·0	18·[illegible]	16·4
Fourth Quarter.																													
Total earnings	636,191	659,011	36,652	45,269	53,041	39,960	1,756	1,624	7,188	6,608	84,455	94,310	117,693	142,359	17,291	19,884	730	742	370,494	476,034	65[illegible]	244	484	104,567	120,093	14,212	18,213	[illegible],333	1,624,865
Mean mileage open	1,131	1,280	223	223	113	156	28	28	42	42	572	565	716	832	168	168	19	19	1,198	1,274	7	7	5	312	335	106	106	4,635	5,040
Average receipt per week..	48,938	50,693	2,819	3,482	4,080	3,074	135	125	553	508	6,497	7,257	9,053	10,951	1,330	1,530	56	57	28,500	36,618	14	19	37	8,044	9,238	1,093	1,40[illegible]	111,112	124,990
Average receipt per week per mile open	43·3	39·6	12·6	15·6	36·1	19·7	4·8	4·5	13·1	12·1	11·4	12·8	12·6	13·2	7·9	9·1	3·0	3·0	23·8	28·7	2·0[illegible]	2·9	7·4	25·8	27·6	10·3	[illegible]	24·0	24·8
Total for the year.																													
Total earnings	2,601,002	2,303,279	122,095	142,362	178,133	201,101	7,213	8,188	25,534	25,574	339,768	305,772	475,495	529,942	70,829	71,189	3,513	3,755	1,638,030	1,830,111	1,030	2,331	1,999	478,910	467,121	74,170	[illegible]	6,015,722	5,9[illegible]1
Mean mileage open ...	1,131	1,290	223	223	113	156	28	28	42	42	554	558	709	825	165	168	19	19	1,157	1,269	7	7	5	312	323	10[illegible]	106	4,569	[illegible]09
Average receipt per week.	50,019	44,294	2,348	2,738	3,426	3,867	139	157	491	492	6,534	5,869	9,144	10,191	1,362	1,369	68	68	31,501	35,184	48	45	46	9,210	8,983	[illegible]	1,109	115,713	[illegible],723
Average receipt per week per mile open	44·2	34·6	10·5	12·3	30·3	24·8	5·0	5·6	11·7	11·7	11·8	10·5	12·9	12·4	8·1	8·1	3·6	3·6	27·2	27·7	6·5	6·4	9·2	29·5	27·8	13·5	13·3	25·3	22·9

(*a.*) Receipts for 2 weeks and 4 days. (*b.*) Receipts for 6 weeks. (*c.*) These are the corrected figures for the 2nd Quarter of 1871. (*d.*) Receipts for 2 weeks and 4 days. (*e.*) Owing to damage done to the permanent-way by the heavy floods during this Quarter, the mean mileage open has decreased. (*f.*) 1st to 31st December (*g.*) Includes Rajghat to Mooltan, 6 miles. (*h.*) Excludes Rajghat to Mooltan, 6 miles.

PRICES before the close of the following month.—INDIA.—MARCH 1872—SEERS ($2\frac{2}{35}$ lbs.) PER RUPEE.

		Sorts.	Seers.	Rupee.
	Calcutta	32	16	,,
	Nuddea	20	20	,,
	Jessore	19	15	,,
	24 Pergunnahs	28	10	,,
	Balasore	34	16	,,
	Cuttack	21	12	,,
	Pooree	31¼	10½	,,
,,	Durrung	21	8½	,,
	Goalparah	17	30	,,
	Kamroop	29	20	,,
	Luckimpore	13	10	,,
	Nowgong	16	.	,,
	Seebsaugor	16	10	,,
Dacca ,,	Dacca	27	11	,,
	Backergunge	24	13	,,
	Furreedpore	27	18	,,
	Mymensing	22½	18	,,
	Sylhet	24½	16	,,
	Cachar	19	13 5-16	,,
Patna ,,	Patna	24½	24	,,
	Gya	24	24	,,
	Chumparun	24	27	,,
	Sarun	22	20½	,,
	Shahabad	24	22	,,
	Tirhoot	24	21	,,
Bhaugalpore ,,	Bhaugalpore	30 5-16	27½	,,
	Monghyr	27	27	,,
	Purneah	29	27	,,
Sonthal Pergunnah.	Godda	.	.	,,
	Nya Doomkah	30	16	,,
	Rajmehal	30	32	,,
	Deoghur	20	21	,,
Presidency Division.	Calcutta	.	.	,,
	Nuddea	.	.	,,
	Jessore	25½	15	,,
	24 Pergunnahs	21¼	19	,,
Rajshahye ,,	Rajshahye	27 3 16	21 9-16	,,
	Bograh	33¼	15½	,,
	Dinajpore	35	17½	,,
	Maldah	30	28	,,
	Moorshedabad	28	25	,,
	Pubna	21	20	,,
	Rungpore	25 11 16	18	,,
Chota Nagpore ,,	Lohardugga	26	14	,,
	Hazareebagh	25	20	,,
	Manbhoom	32	16	,,
	Singhbhoom	90	18	,,
Chittagong ,,	Chittagong	21	11½	,,
	Bullooah	25	.	,,
	Tipperah	26½	15	,,

NORTH WESTERN PROVINCES. (Wheat and Joaree, the staple food)		Rice.	Wheat.	Joaree.	Bajra.
Meerut Division	Dehra Dhoon	13	24	18	21
	Saharunpore				
	Moozuffurnugger				
	Meerut				
	Boolund-Lahur				
Kumaon ,,	Kumaon	10	10	11	12
	Gurhwal				
Rohilkund ,,	Bijnour	16½	22	25	26½
	Moradabad				
	Budaon				
	Bareilly				
	Shahjehanpore				
Agra	Terai Pergunnahs	19	19	..	18½
	Muttra	14	19	17½	18
	Agra				
	Furruckabad				
	Mynpoorie				
	Etawah				
	Etah				
Jhansie ,,	Jaloun	11	21	25½	23
	Jhansie				
	Lullutpore				
Allahabad ,,	Cawnpore	15	20	22	21
	Futtehpore				
	Banda				
	Allahabad				
	Humeerpore				
	Jounpore				
Benares	Goruckpore	16	15	..	..
	Bustee				
	Azimgurh	14½	13½	19½	19
	Mirzapore				
	Benares				
	Ghazeepore				
Ajmere ,,	Ajmere	14	18½	27	18½

OUDH. (Wheat and Joaree, the staples.)		Rice.	Wheat.	Joaree.	Bajra.
Lucknow Division	Lucknow	14	16	19	19
	Oonao				
	Barabunkee				
Seetapoor ,,	Seetapoor	15	20	22	22
	Hurdui				
	Kheree				
Fyzabad ,,	Fyzabad	16	17	21	17
	Baraich				
	Gondah				
Roy Bareilly ,,	Roy Bareilly	14	17	18	18
	Sultanpoor				
	Pertabghur				

PUNJAB. (Wheat and Joaree, the staples).		Rice.	Wheat.	Joaree	Bajra.
Delhi Division.	Delhi	9	20	20	21
	Gurgaon				
	Kurnal				
Hissar	Hissar	10	18	21	19
	Rohtuk				
	Sirsa				
Umballa	Umballa			20	24 20
	Ludianah				
	Simla				
Jullundhur.	Jullundhur	12	21	26	23
	Hoshiarpore				
	Kangra				
Amritsar.	Amritsar	10	18	22	21
	Sealkoto				
	Gurdaspore				
Lahore.	Lahore	9	18	21	20
	Ferozepore				
	Gujeranwalla				
Gujerat.	Rawul Pindi	8	16	21	21
	Jhelum				
	Gujerat				
	Shahpore				
Mooltan.	Mooltan	8	17	25	23
	Jhung				
	Montgomery				
	Mozuffurnuggur				
Deera I. Khan.	Deera I. Khan	7	21	31	27
	Deera G. Khan				
	Bunnoo				
Peshawar.	Peshawar	7	14	19	18
	Kohat				
	Huzara				

CENTRAL PROVINCES. (Wheat and Joaree, the staple food)		Rice.	Wheat.	Joaree.	
Nagpore.	Nagpore	17	19	20	2nd sort Rice quoted.
	Bhundara				
	Chanda				
	Wurdah				
	Balaghat				
Jubbulpore.	Jubbulpore	15	26	29	
	Saugor				
	Dumoh				
	Mundla				
	Seonee				
Nerbudda.	Baitool	13	19	20	
	Hoshungabad				
	Chindwara				
	Nursingpore				
	Nimar				
Chutteesghur.	Raepore	19	43	...	
	Belaspore				
	Sumbulpore				
Upper Godavery	Seroncha	15	14	26	

MADRAS. Rice and Cholum (Joaree) the staple food.		Rice.	Joaree.	
Northern Section.	Ganjam	246	125	Quotations are—so many Rupees per Garce = 8,960 lbs. 2nd sort Rice quoted.
	Vizagapatam	311	166	
	Godavery	194	107	
	Kistna	272	180	
	Nellore	235	133	
Ceded Districts.	Cuddapah	294	157	
	Bellary	286	131	
	Kurnool	344	154	
East Centre.	Madras	260	184	
	North Arcot	221	114	
	South Arcot	207	91	
Cauvery.	Tanjore	220	124	
	Trichinopoly	232	127	
Southern Section.	Madura	315	146	
	Tinnevelly	340	152	
West Centre	Coimbatore	291	137	
	Neilgherries	427	213	
	Salem	243	110	
West.	South Canara	272	...	
	Malabar	300	...	

BOMBAY PRESIDENCY. (Rice, Bajra, and Joaree, the staples.)		Rice.	Joaree.	
Northern Division.	Ahmedabad	Rs. 4	Rs. 2½	No Returns since January 1870. Rupees per maund of 82 lbs.
	Kaira	3½	2½	
	Surat	3½	2½	
	Tannah	...	...	
Southern Division.	Poonah	3½	2½	
	Ahmednuggur	...	...	
	Kullaghee	3½	1½	
	Rutnagherry	3	...	
	Belgaum	3	1½	
	Dharwar	3	1½	
	Sattara	4	2½	
	Carwar	...	...	
Sindh	Kurrachee	...	...	
	Hyderabad	...	...	
	Sukkur	3	2½	

BURMAH. (Rice, the staple.)		Rice		
Arakan.	Arakan	2 4 0	Per maund of 82 lbs.	No Returns since April 1870. ,,
	Ramree			
	Sandoway			
	Northern Arakan			
Pegu	Rangoon	2 7 0		
	Bassein			
	Myanoung			
	Prome			
	Tounghoo			
Tenasserim	Amherst	3 0 0		
	Tavoy			
	Mergui			
	Shevegyeon			

THE BANK OF BENGAL.

Statement of Affairs.	2nd April 1872.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	2,20,00,000 0 0
Reserve Fund	15,36,366 1 8
General Treasury Balance at Head Office	3,07,17,424 0 11
Do. Do. at Branches	2,00,80,330 9 3
Other Deposits at Head Office and Branches	2,26,31,411 10 11
Bank Post Bills, &c.	9,28,134 12 1
Cash Credit undrawn	.....
Sundries	10,40,658 13 4
Total Rs.	9,89,34,326 0 2
Assets.	
Government Securities	94,19,950 12 0
Loans on Government Securities at Head Office and Branches	66,84,050 2 5
Accounts of Credit on do. do.	1,20,33,387 4 9
Mercantile Bills discounted at do.	1,94,4 ,357 1 11
Dead Stock	11,87,615 15 3
Stamps	13,598 15 0
Balances with other Banks.	8,26,222 7 10
Sundries	74,772 12 8
Cash and Currency Notes at Head Office.	1,31,18,946 9 1
Cash and Currency Notes at Branches	3,61,35,423 15 3
Total Rs.	9,89,34,326 0 2

THE NEW BANK OF BOMBAY.

Statement of Affairs.	6th April 1872.
Liabilities.	Rs. A. P.
Proprietors' Capital, paid up	50,00,000 0 0
Subscriptions on account of new Capital	10,00,000 0 0
General Treasury Balance at Head Office	4,18,70,509 0 0
Do. do. at Branches	33,61,513 0 0
Deposits at Branches	1.61,06,810 0 0
Bank Post Bills outstanding	41,958 0 0
Reserve	5.00,000 0 0
Undrawn Cash Credits	18,78.159 0 0
Total Rs.	6,97,59,249 0 0
Assets	
Government Securities	59 86,504 0 0
Loans at Hd. Office & Branches on Gov. Sec. &c.	24,25,417 0 0
Credit Accounts do. do. on Gov. Sec.	69.53.832 0 0
Current accounts, overdrawn	6.028 0 0
Bills discounted and purchased at do.	1,28.29.010 0 0
Dead Stock and Less written off	4.35.093 0 0
Stamps.	6,807 0 0
Balance with Agents and Correspondents.	5,52 319 0 0
Government Reserve Cash.	.....
Cash and Currency Notes at Head Office.	3.79,18.318 0 0
Do. do. at Branches	.....
Bullion at Head Office and Branches	26,12,831 0 0
Total Rs.	6 97 59 249 0 0

THE BANK OF MADRAS.

Statement of Affairs.	6th Apr 872.
Liabilities.	Rs. A. P.
Capital.	56,25,0 0 0
Public Deposits at Head Office	67,92,7 1 3
Do. at Branches.	85,00, 0 2
Other deposits at Head Office and Branches	89,38, 8 0
Cash Credits undrawn at do	8,09,8 3 3
Post Bills	4,4 6 7
Reserve Fund.	5,50,0 0 0
Rest	1,20,5 10 3
Total Rs.	3,13,41, 13 6
Assets	
Silver and Notes at Head Office	34,53 8 10
Silver and Notes at Branches	85,82 0 9 0
Government Securities	10,6 4 6 1
Government Reserve Cash	42,9 0 1 3
Securities	... ...
Loans at Head Office and Branches	24,50 29 13 11
Accounts of Credit at Head Office and Branches	15,5 0 0 0
Mercantile Bills discounted at Head Office and Branches	53,14, 10 10
Dead Stock at Head Office and Branches.	2,40,7 15 7
Bills of Exchange do	22,13,62 12 0
Due by other Banks.	16,75,37 0 0
Total Rs.	3.13.41,090 6

Government Promissory Notes enfaced for Payment of Interest in London, under deduction of Amount re-transferred to India, and Outstanding in the Books of the Bank of Bengal.

Particulars.	3½ per cent. Loan of 1853-54	4 per cent Loans. of 1824-25.	of 1828-29.	of 1832-33.	of 1835-36.	of 1842-43.	of 1854-55.	Transfer of 1855.	4½ per cent. of 1856-57	Transfer Loan dated 15th July 1871.	5 per cent. P. W. of 1854-55.	of 1856-57.	5½ per cent Loan of 1859-60.	5 per cent. Debentures for 2 years. Repayable Jan 1869	4½ per cent Transfer Loan.	3 years. Repayable Jan. 1871	4½ per cent Transfer Loan.	5 years. Repayable June 1872.	10 years Repayable June 1877.	15 years. Repayable June 1888.	T...	16 4
15th Aug. 1871 .	53,100	28,906	2,347	19.52.213	40,87,200	1,49,36,200	1,23,50,000	1.42,71,000	14,500	39 24,200	67,700	5.23.95,600	4.30.37.100	.....	55,000	1,65,000	18,60,000	33.46.000	36,76,000	8.72,000	1.333	1,624,865
15th Sept. 1871	53,100	28,906	2,347	19.52,213	40,88,700	1,49.79.900	1.22,53,300	1 41 22,000	14.500	33.32.800	10,700	5.09.77.100	4,32,52,800	.....	26,600	1,65.000	10,61,000	27.03.000	33,46,000	36,76,00	4,635	5,040
31st October 1871.	53,100	28,906	2,347	19.52,213	40,75,300	1,49,85,200	1,22,15,400	1,38,53,400	14.500	32,98,900	10,200	5,02,41,200	4.23.14,300	.....	.....	.....	.....	27,03,000	33,46,000	36,65,0	111,112	124,900
15th Nov. 1871	53.100	28,906	2,347	19,51.893	40,76.400	1,51,33,300	1,21,36,000	1,37,38.500	14 500	33,24,200	10,200	5,02,95,100	4,16,01,200	.....	.....	.....	.....	27,02,000	33,46,000	36,48,	24-0	24-8
15th Dec. 1871...	53,100	20,374	2,347	19,98,615	40,59.700	1,49,51,400	1,22,56 700	1,33,86,400	14,500	33,36,200	...	2,42,42,600	4,14,43,400	.....	.....	.....	.....	22,82,000	33,14,000	36,5	40 6,015,722	5,96
31st Jan. 18722...	53,100	20,374	2,880	19,83,680	39,97,300	1,48,79,400	1,21,73,500	1.30.34,000	14,500	33,78,300	.....	1,09.57,100	4,04,93,000	.....	.....	.....	.....	22,81,000	33,11,000	3	106	4,569
19th Feb. 1872 ..	53,100	20,374	2,880	19,83,680	39,53,000	1,47,59,900	1,20,65,300	1,29,57,900	14,500	34,30,700	.....	79,84,400	4,12,44,200	.....	.....	.....	.....	20,60,000	33,11,000		1,409	115,713
31st March 1872 ..	53,100	20,374	2,880	19,83,680	39,58,600	1,47,13,000	1,20,16,400	1,23,60,400	14,500	34,53,400	.....	55,84,200	4,18,66,300	.....	.....	.....	.....	17,34,000	33,81,		13·5	13·3	25·3

... the permanent-way ...

made of his secret project must well excite alarm and astonishment all over Europe. As we affirmed in our last issue, it is not French but Prussian ascendancy that Europe has to fear; but English [illegible] are as slow now as they were in the American war, to arrive at any clear insight into the position. General Turr's letter will, we may hope, put an end to further doubt as to the real author of the conspiracy which has so justly agitated the mind of England. The hands, it may be, are the hands of Esau, but the voice is Jacob's voice; and it is well that Europe recognizes it as she does.

PRUSSIAN SUCCESSES

AND THEIR GLORY.

THE "critical faculty" would almost seem to be in abeyance with two thirds of our contemporaries in presence of the Prussian successes in this war. Where defeat would have been disgrace, victory cannot be glorious. If an army of 50,000 men overthrow a force of 100,000 as well appointed and well drilled as themselves, there is much of what is popularly called "glory" in such a victory. But if an army of 100,000 men cut to pieces another of 50,000 only, there is no glory in such an achievement at all. The first Napoleon's victories were so frequently of the former kind, that we can understand the intoxication which they produced in France. They were victories gained by pure generalship and smaller forces, over armies greatly superior to them in strength, in arms, and equipments, and everything but courage and leadership. There was no glory in Napoleon's victory at Jena, for he outnumbered the Prussians two to one; but there was great glory in Davoust's victory at Auerstadt, gained the same day, for the French Marshal had but 27,000 men in position against 66,000 Prussians. Now it is clear, that from the outset of the campaign in progress, the French troops have been overwhelmed by the pressure of superior numbers. They have plainly fought with a courage as desperate as ever. A man can do no more than be killed, and the death roll is satisfactory enough we hope. The fact is now becoming clear, that France was just as little prepared for the bloody strife forced upon her by the intrigues of Bismarck, as the Austrians were in 1866. In both cases the Prussians in over-whelming numbers and perfect completeness of preparation, have been hurled against forces altogether inferior in strength, and in each case disorganized by the vast reductions that were being made therein. We now know that the French Emperor's statement that he was "not prepared for war" was the simple truth. In point of fact, the Ministry were disbanding 100,000 men at the very time the Spanish intrigue disclosed itself, in the hope that Prussia at Lord Clarendon's instance would be induced to follow their example. The English papers, according to their wont, have utterly misled the public as to the facts of the case. Instead of being prepared for war, anxious for war, and ministering to the war passions of the people, the French Emperor was not prepared for war, and was anxious, if possible, to avert it. When the crisis unexpectedly arose, there were but two alternatives before him—to declare war, or to abdicate. France is suffering for her temerity in rushing into a conflict for which Bismarck stood so fully prepared, that within the short interval of time between the 19th of July and 3rd August, he had 1,085,000 men under arms, and 500,000 of them massed upon the frontier. The history of 1866 has been repeated to the letter. Confiding in the loyalty of the Prussian King, Austria although distrusting Bismarck, was in the midst of immense military reductions, in consequence of her financial embarrassments, when the war broke out. France in 1870 was in the midst of a great disbandment of forces, in the hope that she might induce Prussia to follow her example. In the various engagements of 1866, Austria had not only to face the needle gun, with troops of various nationalties under her standard, but was altogether outnumbered by her adversary. The Prussian force that fell upon Bohemia was more than 300,000 strong, to oppose which Benedek had in all less than 200,000 men. At Koniggratz, the Prussians had 250,000 men in the field, the Austrians but 185,000. Bismarck staked and threw upon his exact knowledge of the Austrian resources as he has staked and thrown upon his exact knowledge of the force which [illegible] shame in these terrible disasters for the French, as there is no real glory in the successes of the Prussians. Of what use is all this loose talk about the perfection of the Prussian military system, and the superiority of the needle gun, until both have been tried in a fair field, under equal conditions? We are as satisfied now, as we were at the commencement of the campaign, that 100,000 Prussians are very doubtfully to be matched against 100,000 French troops at any time, but no reasonable person in these days will expect 100,000 Frenchmen to snatch a victory from 150,000 Prussians, unless under generalship miserably bad. We believe still that, man for man, the French soldier, and the Austrian soldier are superior to the Prussian, but the fact cannot be ascertained under such conditions as those which prevailed in the campaign of 1866 and now in 1870. Let a Prussian force of 100,000 men meet the same force of Austrians or Frenchmen in the field, and the chances are heavily we believe against the former. In spite of the numerical inferiority of the Austrians at Sadowa, it needed a gross tacticall error on the part of Benedek "unequalled even at Austerlitz" to give the Prussians the victory. In spite of their superiority in numbers, their needle gun, and the moral advantage of their recent successes, there were "three terrible hours of uncertainty" for them at Sadowa. Those hours would have showed a different close in all probability, had there been a Wellington, or a Napoleon, in stead of Benedek upon the field. No one will understand us we trust to be depreciating the Prussian troops; we are simply pointing out, since none of our contemporaries have done so, that these Prussian successes are by no means to be regarded as evidence of the superiority either of the Prussian military system over that of France or Austria, or of the needle gun over the chassepôt.

These successes have a latent significance, moreover, greatly to be regretted. It evidences a strange want of knowledge of human nature, still more of French human nature, to suppose that they can lead to enduring peace. They will simply make it impossible, and the guilt of this man Bismarck, in awakening deadly passions that had slept for half a century, and that under wise government might have slept on till the Millennium, is overwhelming. Who can suppose for a moment that Frenchmen will remain at peace after such an overthrow as this at the hands of a foe, for whom every French soldier feels more or less contempt? A decisive overthrow *under perfectly equal conditions of combat* might lead to an enduring peace, but an overthrow like this by the brute force of numbers renders it impossible. And the guilt of this new era of wars is entirely Prussia's own.

The hatred with which the Prussians regard the French is an exceedingly deadly hatred, and has very little to be pleaded in its excuse. Throughout the first ten years of the struggle between Europe and the Revolutionary armies of France, Prussia, relying upon the army she had inherited from the Great Frederick, affected to regard the military successes of Napoleon with indifference. Unconscious that her own military system was effete, she affected no surprise at the reverses sustained by the Austrian troops, and hardly concealed the boast that Napoleon would find a very different enemy to deal with, if he directed his forces against the army of the Great Frederick. To the astonishment of Europe, the great Prussian army disappeared in a single day. The battles of Jena and Auerstadt, fought on the same day, simply pulverized it. The defeat and demoralization were so complete, so utter, that division after division and fortress after fortress surrendered at discretion, at the first summons of even inferior French forces.

In all the after events of the long war that ended at Waterloo, the Prussians were beaten almost as often as they fought, unless where, as at Leipsic, they were giving battle with the allies

at enormous odds. Now, the Prussian hatred of the French largely arises from this fact. Prior to the rise of Napoleon, Prussia engrossed the chief military renown of Europe and the Prussians have not yet forgiven the contempt into which the nation sank after the overthrow of their army, relying upon the Prussian Court had pursued a course of diplomacy towards the rest in Europe, so base in its meanness and rapacity as to make it impossible to recal it even now without a burning sense of anger. Thus while at profound peace with ourselves, this magnanimous power did not scruple to annex Hanover, as a reward from the French Emperor, for its neutrality in the campaign of Austerlitz. Most righteously was Prussia herself trodden under heel the very next year; and conscious of the position she has since occupied in the eyes of Europe, she cannot forgive the French that she was first made their tool and then their washpot before all Europe; her own incredible baseness having been the real cause of her humiliation. The numerous battles fought between the two races, in which the Prussians were almost uniformly unsuccessful, did but intensify their hatred of the conqueror. The final overthrow of the French at Waterloo, two days after the Prussian defeat at Ligny, simply whetted the Prussian desire of vengeance, and Paris would undoubtedly have been *sacked* by Blucher but for the presence of the English Army. There is a real feeling of contempt for Prussia in the French people, with a full conviction that the Prussians, unaided, are not able to meet them in the field. The French would therefore have been glad to efface the memory of Waterloo, which they regard with some reason as a victory wrested from them by the arrival of the Prussian troops. There is something of contempt mingled with their dislike of Prussia, while there is a deadly hatred on the other side for the memories of the last war, and of the terrible but deserved humiliation to which the French Emperor subjected the Prussian kingdom. The Prussian animosity is more malignant far than that of France, for it is simply the spirit of unsated revenge. They call it, meanwhile, and persuade themselves it is, patriotic feeling. These late successes of mere brute force will do nothing but intensify the hatred on both sides, for both will be conscious of their indecisive nature, as trials of the courage and endurance of each nation respectively. Who can speak in fitting terms of the two men who have unlocked the gates of hell, and let these passions loose upon Europe?

EDITORIAL NOTES UPON THE WAR.

We may reasonably doubt whether Bismarck and the Prussian King would have been so ready to engage in this war, had they foreseen its issue. The Empire has fallen only to disclose the Republic. The presence of the Prussian army upon French soil will inflame to madness the terror, wrath, and energy of the Revolution, while Europe is undermined by democratic forces, the awakening of which is looked for with vehement impatience in Spain, Italy, France, and Germany itself. This terrible war will but hasten the great consummation, or catastrophe, in which "the dynasties" with their crimes fresh upon them are doomed to perish. But who can foretell what shall come after? Will the reign of the people inaugurate a millennium of peace and brotherhood, or will it be "the beginning of troubles"? "It may not," said Sir Henry Bulwer lately in the House of Commons, "be "perhaps altogether beside the present question to point out to "this House, and through it to the country, that since we have "heard so much of military and naval armaments being superseded by international obligations—since we have been told "war was to be done away with by philanthropic understandings "—we have witnessed such an utter disregard for international "obligations, and such sudden, such reckless, and such unjust "wars as we had scarcely ever witnessed before."

Let the reign of "the people" come attended by what follies it may, it will be difficult for it to surpass in turpitude the conduct of the Prussian Court and its Minister.

Bismarck would not be unlikely, we think, to re-establish the Empire, if Europe allowed him to do so, upon a compact with the Emperor, that France should no longer interfere with the establishment of Prussian hegemony in Europe. The aims of the Prussian Count are well understood. The unification of Germany simply means Prussian domination from the Atlantic to the Italian Alps, Denmark, Holland, Saxony, and the minor German States being abolished or mediatised for the purpose.

"There are those among the most advanced Liberals of Germany," says a late writer, "who with a full knowledge of the "complete duplicity of Bismarck think nevertheless that he "may serve their cause by bringing about changes which "of legality and good faith could not attempt. * * We "as Englishmen are cordially desirous to see the steady "progress of Germany in the two-fold direction of free-"dom and of unity. We have certainly nothing to appre-"hend from the increasing power and influence of Ger-"many, *were that power exercised under the control of Parlia-"mentary government. It is the irresponsible nature of that "power which makes it at this moment a curse to the world.* We "greatly doubt, and indeed entirely deny, that a united Germany, "formed more or less on the Imperial model, based on demo-"cratic institutions and crowned by bayonets, could be regarded "as any gain to true freedom. It is on the contrary the latest "and worst form that despotism has assumed, for it is despo-"tism disguised in popular sympathies. Such a state would re-"duce Germany herself to be a bad copy of the French Empire. "No result would be more fatal to the cause of liberty in "Europe. It is easy to foresee what would be the fate of "small and free States as Holland, Denmark, Belgium, and "Switzerland lying at the mercy of such neighbours as France "and a Prussianized Germany which would despise them for "their weakness and hate them for their freedom. One by one "the lesser lights would be put out, and England would again "find herself the only free asylum in the old world."

The claims which France prefers to the Rhine as her frontier are inadmissible. It is not generally known however, that these pretensions arise out of the conduct of Prussia in the revolutionary war. With dismay, Europe witnessed the treachery of this power in admitting the claim of the French Republic to the Rhine as its frontier, by the treaty of Basle in 1794. While Austria in alliance with ourselves was striving to arrest the revolutionary torrent that threatened to overwhelm Europe, this respectable power not merely abandoned the Rhine to the Republic, but positively offered a guarantee of neutrality to any of the German states that would join it in retiring from the contest. Many of the minor Princes were carried away by the base example of the Prussian Court. In the Malmesbury letters recently published, we find Lord Malmesbury, who was ambassador at Berlin at the time, writing to the English ministry on the 27th June (1794) as follows:

"I should feel myself undeserving of any indulgence if I "could impute to myself the failure of this great measure, (the effort to keep Prussia faithful to her engagements); but no "experience nor habits of business, no prudence nor care can "read so deep into the human mind, as to foresee that a great "sovereign and her ministers would be so regardless of *their "personal honor* and so forgetful of their public interests and "glory as to refuse to be bound in *June* by a treaty ratified with "their full consent and approbation in *May*."

This is Prussian diplomacy to the core. The maxims, says a writer in a late number of the Edinburgh Review, by which the "conduct of the Prussian Court has been governed since it assumed a place among the greater powers of Europe are so incredibly cynical and immoral, that the authority of the document which contains them has been denied. But the *acts* of the Prussian government for the last hundred and fifty years transcend even the language of her rulers. No other government has laid it down as an avowed principle that self aggrandizement justifies the breach of every engagement, and the partition or seizure of unoffending neighbours. Prussia alone, since the fall of Napoleon, has done more than proclaim these principles, she has given effect to them." There can be no question says an

American writer that "Prussia, in her recent history, has acted "on the maxim of the Greeks, that oaths were invented to "cheat fools. She has regarded, in a spirit of the most impudent "indifference, her own pledges, made with all the circumstances "that gives the sanction of law to treaties."

THE PERMANENT SETTLEMENT.

IN BENGAL.

IV.

The Permanent Settlement of 1793 was advocated and introduced in the honest belief that it was "an indispensable step towards the prosperity and solid improvement of the country." Lord Cornwallis himself argued that if the settlement were deferred on the ground of want of information, "the commence- "ment of the happiness of the people and the prosperity of the "country would be delayed for ever." Too much, however, in this controversy has been made of the benevolence of His Lordship's intentions. When we calmly review the magnitude of the interests with which the settlement dealt, the real ignorance of its framers as to the nature and extent of the rights which it proposed to define, and the ruin it has wrought in the Provinces, we can pass no other judgment upon it than that the impatience with which it was forced upon the country was a great political crime. It is now widely known that the settlement has destroyed and blotted out from the Provinces the very best of the people. The village cultivating Zemindars, an honest, manly, independent class to be met with in every village of Upper India, the Settlement has either annihilated or entirely changed in their character. All interest, moreover, in husbandry has been destroyed in the Provinces. No such thing is known in Bengal as an improving landlord. "There is no such thing, as "improving husbandry known in the Provinces; reservoirs, ponds, water-courses, dikes, everywhere going to decay."

Ignorant of the rights of the people, the framers of the settlement handed over the whole agricultural population of the Provinces, with their property, possessions, and privileges, into the hands of a class proverbial for their oppressions, even under the stern check placed upon their rapacity by our predecessors. Lord Teignmouth's portrait of the Bengal Zemindar in the discussions of the time, ought of itself to have been sufficient to have arrested the measure. What he, foresaw as likely to happen occurred to the letter. The Zemindars with whom the settlement was originally made became its first victims, being ousted and destroyed within a few years by the peremptory action of our Revenue Courts upon defaulters. The successors of these unfortunate men, the present Zemindars, inherit the traditional vices and characteristics of the class. Their fortunes are built upon the ruin of the ancient proprietors on the one hand, and of the cultivating class on the other. And it is with this mushroom order that the controversy rests. "The *nouveaux riches* of Bengal," as the *Friend of India* calls them, "do nothing for the State, nothing for the "country, nothing for their tenantry. They are the opponents of "all reform, the upholders of a superstition in which they no "longer believe, except as an engine of vast social influence; "recipients of a high English education, three-fourths of which "is at the cost of the public." Had the *Friend of India* spoken consistently upon this subject, this description of the Zemindar, from the hand of so thorough-going a defender of the settlement, would have been conclusive.

The Missionary Memorial forwarded to the Duke of Argyll a few weeks ago, upon the subject of Education in the Province, tells us that "the permanent settlement, while "enriching the Zemindar, has reduced the cultivator "to a state of abject poverty and misery." Language could hardly be stronger than this, and coming as it does from a non-political body, possessing very exact information as to the condition of the people, must be held to be conclusive. Now, the State has done all this mischief, brought all this ruin upon the people, within the last comparatively few years. We have destroyed the people by mistaken legislation, and built up the fortunes of a few thousand Zemindars upon their ruin. And so sacred is our work it seems, that though the people perish by it, it must not be undone. For that is the exact contention of the upholders of the wrong. The fate of the millions of these Provinces is shrouded in the gloom of an injustice that is irreparable. In the name of Eternal Justice—away with such drivelling folly! Every thing which is unjust must take the fate that God has appointed it in the world. The rights of property, though ancient as the Irish Church, must give place in these days to the right of the people. There is not a circumstance, nor an accident attaching to this "landed property" in Bengal to be pleaded in its favor. It is the growth of a *known* injustice which dates from but yesterday, and to claim for it a prescriptive right to endure, in face of the general ruin it is working and has already wrought, is to ask the State to abdicate all right to govern the relations between man and man. If the interests of the Commonwealth require that we should do in Bengal what we are at this moment doing in Ireland, we must do it, and ride rough-shod over the mawkish sentimentality that talks of a "breach of faith" with the Zemindars. The abolition of slavery was a breach of faith of the very same order. In the attempt to redress the injustice and the misery which the Cornwallis Settlement has inflicted upon the masses of Bengal, the conscience of the country will sustain the State. Neither private nor governmental that suggests the course, but a sense of responsibility for the people's welfare, and an effort to undo the wrong which we have unintentionally done. But then we are reminded of the *impolicy* of all interference. "It is of the "utmost importance, it is essential for the safety of the State, "to conciliate the great body of landed proprietors, to attach to "the British Government this class of persons whose influence is "most permanent and most extensive. The landholders enjoying "their estates under a nominal assessment fixed in perpetuity, are "not ignorant that a change of government would be followed by "the exaction of an enhanced assessment." What honest mind plied with stuff of this order, does not reject it with loathing? British rule is to be supoprted by maintaining the Zemindar in the enjoyment of what we have conferred upon him in violation of the ancient rights of the people, and at the cost of their well-being and happiness for all time. Perish the British rule ten times over rather than maintain it in this way. We are to bribe the Zemindar to allow us to remain masters of the country! Such stuff needs only to be stripped of the rhetorical rags in which it comes dressed out. If our rule is to last in India, it will only be by its commending itself to the consciences of the people as a rule of "righteousness;" and we cannot too soon enter upon a careful revision of the *unrighteous* Settlement of 1793. It has been well said that "we "want now-a-days a little of the nerve which prevailed in 1793 "in disposing of *particular* rights when they were supposed to "militate against the *general* interests of the country."

TRAVANCORE.

A STUDY.

The economic condition of the little province of Travancore deserves the most careful study; for there are plainly being worked out therein certain problems which very much interest ourselves. Government could hardly do better than depute an officer with special aptitudes for the work, to make exact personal observations upon the industry and institutions of the province. Judging from the statistics which the Administration Reports give us, we have no hesitation in saying that Travancore is at this moment the wealthiest and happiest province of India.

In his Administration Report for 1868-69, Sir T. Mahdava Row points out that the exports of the province for the year were Rs. 72,76,200; and that 58 lakhs of this amount represented "the produce of lands classed as garden lands, while the total assessment upon such lands throughout the province was but four lakhs." The facts are altogether very striking, and

deserve careful attention as indicating a degree of prosperity without parallel. According to the latest accounts, the population of Travancore is 1,262,247; its area 6,653 square miles; its gross revenue 51 to 52 lakhs; its expenditure 36 to 37 lakhs; its subsidy to the Supreme Government 8 lakhs; and its surplus of income over expenditure, 6 or 7 lakhs a year. The [illegible] are

Population	1,262,247	Area 6,653 Sq. miles.
Revenues	1867-68	Rs. 51,88,944
Expenditure	,,	,, 44,81,231
	Surplus	Rs. 7,07,713

The estimated value of the exports made during the year from the small territory, and by this small population is declared to have been Rs. 72,76,200 in detail as follows :—

Copra	Rs. 26,70,500
Coir	10,29,700
Cocoanuts	4,83,000
Vettupauk	4,77,100
Cocoanut Oil	3,74,000
Dry Ginger	2,68,500
Tamarind	2,55,600
Coffee	2,51,300
Palmyra Jaggery	1,62,300
Pepper	1,44,300
Salt Fish	1,41,800
Timber	1,42,800
Coir Fibre	96,000
Poonaka Oil	90,000
Arrowroot & Flour	65,700
Hides	58,200
Molasses	53,600
Turmeric	50,500
Paddy	38,100
Lemon grass Oil	15,000
Rice	7,700
Horse gram	5,900
Peroom Pyr	5,000
Other Miscellaneous goods	64,500
Free Goods.	
Cardamoms	2,89,600
Ivory and lac	6,100
Teakwood, &c.	29,400
Total	Rs. 72,76,200

Thus the exports of Travancore average 6 rupees per head of population. Every man, woman, and child in the province has a surplus industry of 6 rupees per head to dispose of each year, although the province grows neither oil seeds, nor indigo, nor opium, nor cotton—the great staple articles of Indian export. The population of India is believed to be nearly 200,000,000, or according to the latest returns 196,884,002, and the total exports of the country averaged £50,000,000 sterling during the seven years 1860 to 1867. Leaving out cotton and opium as exceptional productions, the total exports of India are but about £20,000,000 a year representing a surplus industry of about 1 rupee per head of population against 6 rupees per head in Travancore. Including both cotton and opium, and treating them as ordinary exports, and their prices as normal we still have but a total of £50,000,000 of exports for 200,000,000 of people, or 2½ rupees per head against the 6 rupees of Travancore :

	Population.	Exports.	Per head.
Travancore	1,200,000	Rs. 72,76,000	Rs. 6
All India	196,000,000	,, 50,00,00,000	,, 2½

When we turn to the Revenue Accounts we have a fact almost as significant. Travancore levies no tribute upon the Chinese for opium, nor upon neighbouring States for the protection it affords them. To compare the pressure of taxation in British India with its pressure in Travancore, we must therefore deduct the revenue derived by us from opium and from tributes form the returns. The comparison will then stands thus :

	Population.	Revenues.	Pressure of Taxation.
Travancore	1,200,000	Rs. 50,89,000	Rs. 4¼ per head.
British India	1,48,500,000	,, 35,50,00,000	,, 2½ ,,

The most curious contrast of all is that which the fiscal systems of the little province and of the Empire, respectively present, when carefully looked into. We may state it thus :

	Travancore.	British India.
Land Revenue	Rs. 17,00,000	Rs. 22,00,00,000
Salt	,, 8,50,000	,, 5,50,00,000
Customs	,, 3,50,000	,, 2,00,00,000
Tobacco	,, 3,00,000	Nil.
Cardamoms	,, 3,00,000	Nil.
Opium	Nil	Rs. 7,50,00,000
Stamps	Nil	,, 2,00,00,000
Miscellaneous	Rs. 10,00,000	,, 3,00,00,000

The Land Revenue in Travancore thus represents but one-third of the annual income, or including the cardamom monopoly about Rs. 20,00,000 out of a gross revenue of Rs. 50,00,000. The Custom House yielded Rs. 3,96,790 in the last year, but Rs. 3,56,000 of the amount came from exports, shewing how hopeless it is, even where the people are wealthy in India to look for a revenue from import duties.

The Salt Tax is a monopoly, and presses at the rate of nearly 12 annas per head upon the population :

Population.	Revenue.	Per head.
1,200,000	Rs. 8,50,000	Rs. 0·7

This tax would seem oppressive to ourselves, who are accustomed to regard the Bengal duty of 3 rupees per maund as excessive. From a statement in the Report (para. [illegible]) that the province requires about 4000 garce a year, it is clear however, that the duty has very little effect upon consumption. For 4,000 garce represent 40 millions of lbs., or an average consumption of 40 lbs. per head of population! Such a consumption is unprecedented anywhere, and it is worth enquiring, for our own guidance, what the people do with so enormous a quantity. In parts of our own territories the consumption is as low as 6 lbs. and 7 lbs. per head. As we are about to remodel our own system altogether, it is very desirable we think that enquiry should be made of Sir T. Mahdava Row as to the nature and working of the Travancore monopoly. We gather from the Report that the Government has no less than 33 depôts for the sale of salt, thus bringing "this necessary of life as near to the consumer as possible," with this further advantage, that the "multiplicity of these stations, acts as a tolerably efficient check to certain mal-practices on the part of the petty servants in charge of the sales; for, the moment the purchasers are treated with appreciable injustice at any one station, they cease purchasing there, and resort to another, and the diminished collections consequent upon such desertion tell their own tale."

Here also surely we may get a hint to our profit. It has been before suggested, that we might interest the railway companies of India in a salt monopoly, by requiring them to maintain depôts of salt at their chief stations. In our territory it is the carriage of salt, and not the duty, and the difficulty of getting at a near source of supply that are the evils to be removed.

THE PERMANENT SETTLEMENT

IN THE PUNJAB.

(By Sir D. F. McLeod.) *

AN expression of opinion on this very important subject of introducing generally or partially a Permanent Settlement into the Punjab has been called for, and the call reiterated by Government, for years past. Mr. Prinsep was called upon to state whether he considered any, and what, portion of the districts settled by him fitted for the application to them of the principles of permanency under the rule laid down or suggested by the Secretary of State, that when ¾ths (I think) of the culturable area of the district, or part of a district, has been brought under cultivation, and there is no prospect of canal irrigation being introduced into such village, its assessment shall be declared permanent. Mr. Prinsep, in spite of numerous reminders, has not yet replied; and this is the cause why an answer has not yet been sent to the Supreme Government. Mr. Prinsep lately promised me that he would send in his reply immediately, but it has not come. Although no longer entitled to record my opinion as Lieutenant-Governor, yet, as the subject is one in which I have long taken a deep interest, and which is one of vast importance to the well-being of the Province, I think it is right that I should leave my opinion on record, in connection with this reference still undisposed of. I consider that it would be quite a suicidal act on the part of Government to declare permanent the *money* assessment of any lands whatever in this Province, as was done by us in Bengal, at a time when we had but little information as to the true state of the

* We have been favored with an early copy of this minute just recorded by Sir D. F. McLeod.

ED. *I. E.*

case, and when opinions on the subject were crude and conflicting to a much greater degree probably than they are now. If is admitted that money is an altogether unreliable standard of value, and the great fall which has taken place in it during the last ten years should warn us what is likely to take place in the future. I have myself little or no doubt that 50 years hence, if peace and prosperity continue, the purchasing power of money will be less than half what it is now,—not in consequence of large importations of bullion or coin, as some suppose, (though this measure will necessarily be resorted to, from time to time, to restore equilibrium,) but in consequence of the increased producing power of the country, which I believe to be the [illegible] measure of the relative value of money in different countries; and should it then prove the fact that the demand assessed upon land represents but half the real value it did when first fixed, we may, I think, feel assured, judging from past experience, that it will be a matter of the utmost difficulty to find other sources from whence the enormous deficits can be supplied, and the effort to realize it will be attended with exceeding danger. If, however, in making our assessments, instead of using a cash standard, we were to employ some other standard, supplying a more correct increase of value, I should be entirely in favor of permanency of settlement wherever cultivation shall have attained to the required proportions. The value of labor and the price of corn are, I believe, accepted by political economists as the two most correct and permanent standards of value which are readily available; and of these the cash is, in my opinion, the most convenient. If then after a money appointment has been fixed, its equivalent in corn collected at the average of (say) five years preceding were determined and recorded, on the understanding that it would be liable to revision at intervals of 10 years or 20 years, or such periods as might be preferred, according to the average price of corn during the years preceding the time of each revision, and such revised jumma were on such occasion substituted for that previously in force,—the Government would be thus secured from the loss which would otherwise result from a fall in the value of money; while the agricultural population would be relieved, almost as effectually as by a permanent assessment, from the annoyance and loss which inevitably result to them from the detailed enquiry now necessitated by each recurring revision of settlement.

"From this principle of permanency, however, I would, for the present at least, exclude all that relates to irrigation; and would fix the permanent assessment at "Barani" rates only. I believe the true theory of the irrigation demand in India to be, that Government is entitled to a seignorage on all water used for irrigation, wherever that water yields a value in excess of the profits of capital expended upon it, whether the water be taken from above the surface or below it. This theory applies alike, in my opinion, to irrigation from rivers, canals, reservoirs, or wells. It has been practically enforced in all ages in Eastern lands, and unless it continue to be enforced for the future, not only will Government lose vast sums to which it is by immemorial usage entitled, but great relative injustice will be done to those now paying irrigated rates unless these be remitted, a measure which would obviously involve enormous loss.

"The ascertainment of the amount of this irrigation demand is fortunately not necessarily attended with the same minute and vexatious inquisition involved in the ascertainment of the ordinary assets of land. As regards rivers, canals, and reservoirs, it is now effected yearly by well-known processes—which processes will doubtless become simplified as our experience increases; and as regards wells, in all the settlements made by Mr. Prinsep, the assessable value of a well in each homogeneous circle has been recorded, and it is proposed that this lump sum be in future levied from each well in use, without any detailed reference to the area or the crops that may be irrigated from it in each year. All then, that will be necessary, in order to determine the well irrigation demand will be to ascertain the number of wells in use in the village or other assessment circle—a matter which it will be at all times easy to ascertain with little or no chance of error.

"The only further remark I have to make in connexion with the subject is, that the irrigation rates, of whatever kind, should undergo the same periodical revision, with reference to the average value of corn as has been above suggested for the "Barani" assessment, and as is still, I believe, the practice in Great Britain, in relation to tithes."

NOTE BY THE EDITOR.

We remark upon this paper, *first*, that far too great importance is attached therein to "that annoyance and loss" which are declared "inevitably to result from the detailed enquiry now necessitated by each recurring revision of settlement." It seems to be forgotten that let the annoyance be what it may, it will occur once only in a generation of years, as the revision takes place but three times in a century, since the leases run for 30 years. In the *second* place, this so much talked of "annoyance and loss" as inevitably attendant upon the renewing of the leases, has almost no basis in fact to rest upon. Under wise and thoughtful arrangements, there need be no annoyance and no loss at all in the re-arrangement of the leases. The only, and the sufficient, precaution against the annoyance and loss gratuitously imagined to be inevitable, is to be found in the simple measure of resettling the terms upon which the lands will be relet, *four or five years before the leases expire*. This simple precaution will, of itself, do away with all annoyance and all possible loss from the uncertainty of the cultivator as to the new terms. The truth is, that all this talk about "the annoyance and the loss" attendant upon the revision of settlements, is *doctrinaire*. It has no real basis of fact, to rest upon, since we may extinguish it altogether, or reduce it to the veriest minimum by the most ordinary administrative skill. If, moreover, it is desirable for the State to possess exact information concerning the agricultural industry of the country, the detailed enquiry which will attend the periodical renewal of the leases, will place it in possession of much valuable information, in the absence of which we legislate by guess and in the dark. Where—ever in the world yet, except in this country, was it thought necessary for agriculture that the cultivator's leases should be made perpetual! In England there are no leases at all. In Scotland they run but for 19 years, and all improvements revert to the landlord. In India, where all improvements belong to the tenant for ever, it is thought necessary not merely to fix the rental at a fraction of the true rent, but to make the leases perpetual. It is political economy gone mad. The assessments are already too low over two-thirds of the country for due incentive to careful husbandry, and with the land at its minimum value, the State, from a fancied necessity of *doing* something, is to abandon for all time the important powers in its hands for the education and improvement of the people. In Heaven's name why cannot we let matters alone for a little while! What necessity is there for doing *anything?* Agriculture is flourishing as it never was in any period of history before. The people are profoundly content and happy with their leases. *They* want no change, and ask for none. What in other lands might possibly be conceded to a country excited to the point of revolution in its determination to get it, is here to be conferred upon a people that ask not for it, that are a great deal better without it, and that will hardly understand or believe in it when they have got it; and all this because an agitation upon the subject has been got up inside the machinery of Government itself. The State has simply "got the itch" and is mad to rub it out against institutions of the country which are as old as civilization itself therein, and which if but wisely worked are the very happiest a people can live under. We do trust Lord Mayo will be proof against these morbid, insane longings to be *doing* something, while true wisdom plainly and imperatively requires us to do *nothing*.

Sir Donald McLeod's proposal is a shade less obnoxious to these remarks, than other schemes for perpetually settling the land revenue, and that is all. Foreseeing the probability of a continued fall in the value of money, he would have the State permanently settle the tax at its present pressure, but would provide that any change in the present value of produce, should

be followed by an equivalent enhancement, or reduction, as the case might be; in the money assessment. The proposition is open to the same objections as every other having for its end the permanent settlement of the revenue. Closely looked at, it means that we are to abandon our reliance upon the land revenue as the back-bone of our finance, and are to rely upon some other tax instead. Suppose we adopt Sir Donald's plan and settle the revenue permanently at the quantity of corn which the present £20,000,000 of land revenue would purchase, say that quantity is 20,000,000 quarters of wheat. Ten years hence if £20,000,000 sterling will buy only 15,000,000 quarters, we are then to be at liberty to increase the assessment from £20,000,000 to £27,000,000. Well, this is a shade better than fixing the demand permanently at £20,000,000, but the same radical error underlies it as every other such proposal. *It overlooks the fact that the one source of revenue upon which we can count to meet the* GROWING *necessities of the State is the land.* The land is now at its minimum value and agriculture at the worst. To improve the status of the cultivator, we are levying only a quit-rent upon the land while we are at the threshold of an enormous outlay upon great public works for developing its powers. How mad is it in these circumstances to listen to any proposal whatever, permanently to settle the revenue which this land is to give us. We have spent £100,000,000 upon Railways alone in the land, and nothing is more certain than that we shall have spent £200,000,000 more within 20 years time upon it. And in the midst of the vast revolution which all this portends, nothing will do but we must tie up our hands in one way or another from all real increase of land revenue, because the State has "the itch." We trust the vulgarity of our illustration will be forgiven. We cannot conceal our impatience at the State-begotten revolution urged upon us in all shapes and ways. In Heaven's name do—*nothing*!

Get up another war on the Frontier—anything that will rub the itch out of you—without the infinite harm this tampering with our one source of the revenue will do. Were we Governor-General to-morrow, we would announce a fine of Rs. 1,000 upon every official use of the words "a permanent settlement" for ten years to come, to cure the disorder that afflicts, *not* the country, which knows nothing of the malady, but the *doctrinaires* inside the State machinery who have been striving these ten years past to propel it to the devil. Who wants a permanent settlement? Not the people, not the cultivator, not the citizen; but the men "with the itch" inside the State. Were Lord Mayo to compel them to take sick-leave in a body—the whole regiment of them with Sir Richard Temple at their head—we should hear no more of the Permanent Settlement in any corner of India, till some of them found their way back, cured as we may hope, and denouncing their former folly. When beginning this note, we had no idea of its reaching its present length. Sir Donald McLeod's proposal is substantially the same as that put forward in an article in the last *Calcutta Review*, the consideration of which, follows.

THE CALCUTTA REVIEW
UPON THE PERMANENT SETTLEMENT.

"SEVEN years ago," says the *Reviewer*, "when Baird Smith's "views had won their way, who among us had not come round "to the belief that the principle of Permanency was a sound, "nay the only sound, one, and that the mistakes made by Lord "Cornwallis in Bengal were the results of accidental causes "having nothing to do with the essence of the measure. Four "years ago a conference of Revenue officers in the North West "Provinces pronounced strongly in favour of permanence. "Who among them now holds to that view, or looks with other "than dismay on the prospects of the results likely to come "from the Permanant Settlement as it is being introduced into "those Provinces?"

"The empire has reason to be profoundly thankful," we are told, "for the delay in stamping these setlements with the seal of irrevocable sanction," since every one is now convinced that we have "thereby escaped the perpetration of a great error. It is true that "the errors of Lord Cronwallis" have been avoided in the settlements awaiting sanction in the N. W. Provinces, but a vice of a different character therein "menaces at this time "the well being of every interest in the land, and through them "of the empire at large. Detect that mistake, discover the "proper remedy, and you may confirm the settlement work "which during the last 13 years has been progressing in the "North West Provinces with absolute confidence in its results."

The *Reviewer* proceeds accordingly to point out that the vice of these settlements is—that they make no provision for possible change in the value of money, and that if that contingency is but provided against, the settlements may be sanctioned at once "with absolute confidence in the results."

"Say that the land tax of a village has been fixed by the Settlement Officer at Rupees 1,000 which is to say equivalent to the price of 400 maunds of wheat, the average price during the last fifteen years. Fix then the payment of the village at 400 maunds of wheat in perpetuity, to be commuted into its present price, *i. e.* Rs. 1,000, and say fifteen or twenty years hence into the amount given by the average prices of the intervening period."

The Reviewer does not seem to be aware that the suggestion is as old as the controversy itself. A perpetual settlement in *corn* would of course be a trifle better, than the ruinous folly of a perpetual settlement in *money*. But the proposal of such a settlement, as a compromise of the question, shows a fatal want of insight into its real nature. It is the fact, that while Colonel Baird Smith's followers in India were advocating a perpetual assessment in money, the Indian Reform Society in London were supporting the proposal, under the belief that the settlement was to be in *corn*. This curious fact came out at Manchester (1866) where Mr. Dickenson assured Mr. Knight that he had supported the permanent settlement proposal under the conviction that the assessment was to be fixed in grain; and it was difficult to persuade him that he was in error. The writer in the *Calcutta Review* seems to think that the suggestion is new, and that he points out something that has been overlooked, whereas it is as old as the settlement of the Ceded Districts by Munro.

The Reviewer says that nowhere are the arguments "which have this year been revived by the *Indian Economist* against a Permanent Settlement so succinctly or ably stated as in a very clever, and in most respects admirable paper recorded by Sir George Wingate." It will surprise the Reviewer to learn that this paper first saw the light as a series of articles in the *Times of India* in 1865. The paper was written by Sir George Wingate in 1862 and sent by him to the India Office to arrest, if possible, the folly about to be perpetrated. The India Office burked the paper, at all events they did not publish it. Sir George Wingate made Mr. Knight, then in England, a present of it in 1865, and as it very clearly and forcibly expressed our own convictions, we threw it into the form of a series of leading articles, and sent them out for publication in the *Times of India*. No one but ourselves, it seems, could see their force then; but when years afterwards the paper was published with Sir George Wingate's name attached thereto, men's minds upon the subject were changing. The Conference at Manchester had done its work; and the paper told heavily upon public opinion.* Since then the tide has fully turned, and to-day every man can see what almost no one could in 1862. The very same conviction that we had in 1862 of the unwisdom of a Permanent Settlement in *money*, have we ever had of the all but equal unwisdom of this other form of it, a Perpetual Settlement in *corn*. We can have *no* Permanent Settlement whatever, to which there are not the same fatal objections at the very foundation of the

* No man in our day has exercised such powerful influence indirectly upon Indian affairs as Sir George Wingate. We sat at his feet very early, and have but reflected in popular form in our writings the doctrines which we learned thereat. The conviction of the profound folly of the Permanent Settlement, however, was learned by us not from Sir George Wingate but from a writer with whose pages every civilian in India ought to be familiar, while the work unfortunately is out of print. We mean the *The Law and Constitution of India*, by Colonel Galloway. Had this work not fallen unfortunately into oblivion, the Permanent Settlement school would never have arisen, and the greatest service perhaps any one could now do the State would be to publish a new edition of it with the chapter on Land Tenures in Wilkes's Mysore as an appendix to it.—ED. *I. E.*

proposal. The proposal to settle the land revenue in perpetuity, whether in *money* or in *corn*, involves a complete fiscal revolution in the Empire. It matters not which form it takes, it is a proposal to us in both cases *to abandon the land as the chief source of our revenue, and to trust to the increment of something else.*

Fifty years hence the annual expenditure of the Empire, at the rate at which it is now progressing *and must progress*, will not be less than £100,000,000 a year. Indeed we cannot tell what it may rise to. Now if we fix the land revenue in perpetuity at its present amount of £20,000,000 in *money*, we shall have, within 50 years upon the supposition, to raise £,80,000,000 in other ways. If we fix it at £20,000,000 in *corn*, we may perhaps find from a further rise in prices that the £20,000,000 have become £25,000,000, or £30,000,000, but there will still be the awful chasm of £70,000,000 or £80,000,000 to be bridged over, in some way independent of the land revenue. Is it not plain, palpable madness in these circumstances *to settle the land revenue in perpetuity at all, or in any shape whatever*! Were the country clamouring for such a revolution, were agriculture perishing for want of it, were economists agreed in recommending it, instead of denouncing it with united voice, were there in fact any single consideration whatever in its favor, we might speak with less moderation upon the itching madness of the times. In the name of Common Sense why can you not let the Land alone! Go and potter over the Customs Duties or the Stamp Tax if you will, but in the name of Heaven leave the future resources of the State in the land untouched! You admit that an error of the most awful magnitude was made in Bengal, and that you escaped a yet more calamitous blunder but yesterday. And yet you will *potter* over the thing although the fortunes of 200,000,000 of people are bound up therein for all time, and may be ruinously compromised by your course. We shake ourselves free from all complicity in this crime– for that is the proper designation of it.

The future of this country with its two hundred millions of people is in great peril. With the purest intentions moving them, our statesmen have shewn for years the most patent incapacity in the conduct of the national finances, while the tendencies they avow concerning the land revenue, if finally allowed to guide the Imperial counsels, will result not merely in the permanent insolvency of the country, but in the overthrow of all peaceful rule therein. Every clear-sighted man sees as plainly as he sees the sun, that we have but *one* source of revenue upon which we can count with reasonable certainty, to meet the increasing charges of the administration, and the heavy liabilities which we are incurring in the promotion of works of public improvement. Happily, that one source of revenue is not only sufficient in itself for all the wants of the State, but by the consent of all authorities on economic science, is the very best source a nation can possess the right of in the State to a share in the rental of the soil.

And yet against this one source of revenue upon the preservation of which, in its full integrity, the future well-being of the people depends; against this one source of revenue, to which neither social, nor economic, nor political objection of any kind exists; against this one source of revenue –the *only* one exhaustless and unexceptionable, the statesmen of the country are constantly leaguing themselves that they may destroy it. If you ask why?—the only answer is, that we may avoid "the annoyance and loss" incidental to the renewal of the leases three times in a century! We refuse reply to folly so profound, so incredible. Bengal was a desert when Lord Cornwallis made *his* benevolent but stupendous error, under frightful pressure. The reproach will be ours of making this calamitous revolution at a period when the wonderful prosperity of the land demanded that legislation should be at rest. Everywhere thoughout the country, the people admit cheerfully the right of the State to take a third of the gross produce of the fields. We are not taking a twentieth, and need not, but who does not see how important it is to keep alive this conviction in the minds of a people so impatient of what is new, that we may hand down in its integrity to those who shall come after us, the State inheritance in the soil? The administration that finally carries a Permanent Settlement whether in *money* or in *corn*, will be infamous in Indian history for the ruin it will introduce.

A ROYAL COMMISSION OF ENQUIRY.

THE resolution of the East India Association to move Parliament early next season to appoint a Select Committee to enquire into Indian affairs—is we fear an error. It is well understood in the House that the appointment of a Select Committee to report upon any subject, is but a convenient way of hanging up all action thereon indefinitely. It is because of this that Mr. Knight bequeathed his legacy, as "J. M. M." calls it, of "the Royal Commission delusion," to the Association. If there is to be only further talk on the matter, then a Select Committee will be the very thing for us: but if we really want something *done*, then should the Association move for a Royal Commission. The Resolution adopted by the Association in 1868 was as follows:

"That in view of the recent discussions in Parliament concerning our financial relations with India, this Association cannot but fear that the true history and nature of these relations are very imperfectly understood by English statesmen; and that it is very important, in the opinion of the Association, that a Royal Commission should be appointed to inquire into the economic condition of that country, as it is affected by our financial relations therewith."

Sir George Wingate it was who first preferred this demand, and the terms in which he did so are just as applicable now as they were in 1858:

"What appears," he said, "to be most urgently required in the present disastrous condition of the Indian finances, is the appointment of a Royal Commission of first rate men, thoroughly competent to the investigation of economical, political and moral questions, for the purpose of enquiring into the present financial relations of Great Britain and India, as compared with those of Great Britain and our other dependencies, and colonies; and of ascertaining the various items of the Home charges which may properly be viewed as a tribute paid by India to this country, as well as their total amount since the commencement of the present century; and to report upon the probable effect of this tribute on the condition of India, and the best means of adjusting the financial relations of India and Great Britain, for the future, so as to secure the greatest amount of advantage to both countries; and also to propose such measures as might appear to them to be best calculated to rescue the Indian finances, from their present state of embarrassment at the earliest possible date. Such a Commission would have no occasion to proceed to India, for the purpose of collecting information, as the whole of the data necessary for the formation of sound judgment upon all the questions that would be referred to them for investigation is already to be found in this country in an available shape. A few months at the utmost would suffice for the prosecution of their enquiries and the preparation of their report, which would go forth to the country, with all the weight of authority attached to the conclusions of men selected for eminent ability and familiarity with the questions submitted to their judgment. The report might be published in time to prepare the public mind for legislation on this all important subject of Indian finance, at the commencement of the next Parliamentary Session."

We venture to think that a Commission of this nature would do more for India than any double-barrelled committee whatever in the Lords and Commons.

COTTON.—BOMBAY.

In our next *Statistical Reporter* we propose to summarize the statistics of the Cotton Trade of Bombay for the two years ending 31st July last, in a shape which will be found useful, we hope, by the merchants of that city. The general results of the two years' trade are as follows :

COTTON IN BOMBAY.

	1868-69.	1869-70.
Average weekly Receipts.....	23,205 Bales.....	23,941 Bales
Average ...	24,389 ,, ...	21,780 ,,
Consumption by the local	1,500 ,, ...	1,500 ,,
	25,889 ,, ...	23,280 ,,
Stock on Board-ship and in 1st Augt 1868 ...	328,280	,,
Godowns..... ,, ,, 1869 ...	199,200	,,
,, ,, ,, 1870...	230,928	,,

Thus, while the average receipts of the last year were 736 bales a week in excess of the receipts of 1868-69, the average exports were 2,699 bales a week below the exports of 1868-69. The stock, which on the 1st August 1868 was 328,800 bales was reduced by the heavy exports that followed to 199,200 on the 1st August 1869 ; to be again increased by the smaller shipments of 1869-70 to 230,928 bales on the 1st ultimo.

The total receipts and deliveries for the two years were :—

Receipts.	*Bales.*
August 1868 Stock	328,000
1868 69. The year's Receipts	1,113,855
1869 70. ,, ...	1,149,187
	2,591,042
Deliveries.	
1868-69. The year's deliveries	1,242,655
1869-70. ,, ...	1,117,459
	2,360,114
1st Augt. 1870. Stock remaining.....	230,928
	2.591,042

The Exports classified, were :

To Great Britain, .	Bales 959,903 ..	Bales 851,624
,, France (Europe . .	,, 178,844 .. .	,, 152,293
,, China	,, 36,908	,, 41,542
	1,170,655	1,045.459

The total receipts of the year ending 31st July last (1,149,187 bales) exceeded those of the previous year (1,113,855 bales) by 35,332 bales.

THE ENGLISH PRESS ON THE WAR.

The evil influence which the Prussian successes in this war are exercising upon English opinion, as expressed by its chief exponents in the Home press, is painfully manifest. The discovery was reserved for this 19th century, that satisfactory relations between neighbouring peoples are no longer to be maintained by their respect for public law, by the keeping of good faith, by an honorable adherence to engagements, and by the cultivation of a willingness to submit international disputes to the arbitrament of neutral powers—these things are delusions of the past. The right thing for nations to do, in particular for ourselves, is to imitate the example of Prussia, which for pure purposes of aggrandizement and that she might violate the rights of her neighbours with impunity, has converted her whole male population into an armed force, drilled and organized to the highest pitch of efficiency, and ready to be hurled in masses half a million strong at a few hours' notice, upon the people she has outraged into foes. It is guilty France, not Prussia, that has imposed upon us the necessity of doubling or trebling our military expenditure, and of converting the kingdom into a great standing camp, from which *we* may by and bye, vomit forth our half million of armed men to shew the world that Englishmen can eclipse the "glories" of 1866 and 1870. It is guilty France that has brought all this upon us ; guilty France that was striving at the very time the war broke out to get Europe to disarm, and was herself setting the example. The truth is these Prussian wars of 1866 and 1870 have put an end to all hope of peace in Europe. To this basest of kingdoms belongs the infamy of having introduced an era of political complications and of wars, the course and end of which none can foresee Purely for her own aggrandizement, she kindled a conflagration in the Danish war, which will yet wrap the world in flames. But let none imagine that the Nemesis at her heels will fail to overtake her. As to those "leading journals" which tell us that our own civilization is incomplete until we adopt the peculiarity of savage life which compels every man to be a warrior—it is permitted us to hope that the heart of England is yet too sound to be corrupted by such 'leading.' It is well for the country that its guidance is in the hands of Gladstone, Bright, Argyll, and Lord Hatherly, and not those of the *London Times* and *Saturday Review*. That this portentous Prussian hegemony gives cause of anxiety to English statesmen as well as Continental, is quite true—but it was very guilty indeed of France to be agitated in its presence at all !

EDITORIAL NOTES.

According to the *Madras Mail*, the income tax is likely to produce no more than £250,000 in that Presidency, "an amount altogether insignificant when balanced against the dissatisfaction which the tax causes on all sides."

Mr. Stephens has obtained leave, to introduce a Bill into the Legislative Council of India for the purpose of bringing the insolvency law of India into harmony with recent legislation upon the subject at home. The system proposed to be established, is as follows :—

"When a man has committed any one of a certain number of acts of insolvency and is unable to meet his engagements, he is to be adjudicated an insolvent upon petition by his creditors. His property will upon adjudication pass to a trustee, whose duty it will be to realize it under the inspection, and according to the directions, of a committee of creditors, and to divide it amongst them rateably. If the dividend paid amount to eight annas in the rupee, or if the creditors are of opinion that the failure to pay so high a dividend arose from circumstances for which the insolvent could not justly be held responsible, and they desire his discharge to be granted, he can be discharged. If a smaller dividend be paid, the insolvent will have three years in which to make payments to the amount in question, and any balance that remains unpaid at the end of that period will constitue a judgment-debt, which may be enforced by leave of the court. English experience seemed to point to the conclusion (after many experiments), that this was a fair compromise between the object of favouring commerce and the object of enforcing a complete execution of the contracts into which a trade might enter."

The Bill proposes further, to following English example of separating the two questions of the distribution of an insolvent's assets, and the punishment of fraudulent debtors. The latter question will be dealt with separately, and if it is decided to revise the Penal Code, the addition of several provisions upon this subject will form an important part of that process.

A Correspondent suggests that Government should try the following taxes :

1—*A Sumptuary tax on bangles and personal ornaments.*

A tax of this nature was levied, in the native state of Goomsur no later than a generation ago. "To the best of my remembrance," says our correspondent," I was told that 64 rupees were paid for the right to wear gold ornaments ; 16 Rupees for silver, and one rupee for lac. A simple payment privileged all the members of the family."

2—*The old and productive tax levied in Native States on brass pots.*

"Brass utensils, are purely luxuries, while they are of almost universal use among all classes (Salem) but the poorest. Existing pots in use might be stamped one anna, and two annas, where in the dealers hands. A lower rate of one anna for pots and chemboos holding less than one gallon and a higher rate of fourannas for those of capacity exceeding eight gallons, might be the ultimate rates."

3.—*A Government monopoly of the manufacture of weights and measures.*

"Government could make both weights and measures very cheaply, and traders might be allowed for a stated time to buy as cost price. Government might subsequently sell them at a large profit without any difficulty."

A *zukaut* of 2½ per cent. was levied according to Galloway under Mahommedan rule upon gold and silver bullion, ornaments, and plate, but we doubt the wisdom of attempting any such levy ourselves. Not one of the proposed taxes, would be productive, we fear, of anything but vexation.

THE prices realized at the opium sales on the 5th instant were :

Behar.....	2,150 chests	Rs.	1,162 average.
Benares.....	1,850 „	„	1,091 „

The budget estimate, our readers may remember, was Rs. 975. Throughout the year 1868-69 the price averaged 1,379 ; and last year, Rs. 1,199.

We had hoped that the improved prospects of the opium revenue might have induced Government to reduce the income tax for the second half of the official year to its former rate of one per cent. The reply from Simla to the memorial of the Chambers is, however, unfavourable. It is admitted that "there is promise of a prosperous harvest and of a larger revenue from opium than was anticipated ; but on the other hand, it is alleged that owing to the war in Europe and other causes, there may probably be some failure of revenue and some expenditure in excess of grant. Upon the whole the general prospects of the year are by no means improved since the financial statement was made."

We are bound to believe that Government is exactly informed as to the disaffection which the tax is creating in the country. With what trumpet-tongue does the alleged necessity of clinging to this tax in face of the excitement it has begotten, for a wretched million of revenue, tell us of the madness of further tampering with the Land Revenue,—the one tax paid cheerfully and without a murmur in the country, and economically the very best way in which the people *can* pay.

THE recent enhancement of the price of salt in Madras has, we are glad to note, been completely successful. The immediate effect of the rise was to stop sales, but the demand, is now "as brisk as ever." The total sales of the year are but 2,488 tons less than those of the previous year, the figures being,

1868-69	Actual sales	254,419 tons.
1869-70	do.	251,931 „

The salt duty has not yet, we believe, reached its maximum yield. The administrative reforms in its collection which are under consideration, will not interfere permanently with its yield. We have noticed above that the consumption of salt in the admirably administered little State of Travancore is 4,000 garce (40,000,000 lbs.) a year, 40 lbs. per head ; in our own territories it is frequently 6 or 7 lbs. only.

The revenue from salt received by this State from its population of 1,200,000 only, has for the last 3 years been as follows :

Fusly	1,042.....	Rs.	8,06,722
„	1,043.....	„	8,20,640
„	1 041.....	„	8,58,557

The trade is a government monopoly, which is administered at a cost of 31 per cent. upon the sales. The nett revenue is thus 69 per cent. of the sales, or about 5,50,000 rupees a year. The Government has established 33 station depots to bring the necessary "as near to the consumer as possible," Sir T. Madhava Row points out that "the multiplicity of these "stations acts as a tolerably efficient check to malpractices on "the part of the petty servants in charge, since the moment "purchasers are treated with appreciable injustice at any one "station they resort to another, while the diminished collections "consequent upon such desertion tell their own tale." Our own excise covers the consumption we suppose of 160,000,000 of people, and were it as productive as Sir T. Mahdava Row's monopoly would yield us a revenue of eleven millions a year instead of six.

THE Americans are paying off their debt at the almost incredible rate of seventeen to twenty millions of dollars, three to four millions sterling, a month. The reduction in June was over twenty millions, and in July upwards of seventeen million dollars. The people may well say that the debt (which is £500,000,000) "is a bagatelle" to their country. They expect to pay the whole off in fifteen years.

We know nothing more humiliating in the history of the English press during the last ten years, than its incessant carping at French and American finance. The London *Times* wearied its readers during the war, with incessant proofs that American finance was being so managed that [illegible] insolvency, and a complete break down at Washington, were inevitable every few weeks. The singular wisdom with which those finances were managed is now matter of history. So also with French finance. The most elaborate [illegible] has been thrust upon us that it was reckless and insane, and we know not what else, while it as certain [illegible] well can be, that in the main, the ex-Emperor's finance was as far-seeing and wise, as it was bold and comprehensive.

Both nations have used their credit fearlessly, while our own financiers have done, and are still doing, their best to cramp and fetter the nation's progress by the restrictions which in their dullness they impose upon it. England is progressing in spite of its miserable currency arrangements, by the sheer courage and enterprise of its people, while India is held back by the timid dullness of men, who in 1870 have not yet recovered the shock given to their nerves by American repudiation half a century ago. We are too full of appreciation of ourselves, of the wretched conceit that every thing English must be the perfection of wisdom, to learn anything from others, until they have so distanced us that we find we must abandon competition with them, or condescend to adopt their practice. Towards the close of the century, men will begin to discover in England how fatal is the effect of their Bank Act upon the industry and commerce of the country; about the same time also that the Indian debt might have been extinguished twice over, by a merely courageous and wise use of the *credit* of her rulers in her behalf.

THE trade returns of the Bombay Presidency for the last three years, are as follows :

EXPORTS.	1867-68.	1868-69	1869-70
Merchandise, Country	23,68,75,537	21,89,42,904	21,59 83,340
„ Foreign.....	3,73,51,897	3,22,38,934	3,69,25,975
Stores on Govt. account ...	.....	7,50,317	1,76,774
Treasure—Private Trade ...	1,12,79,787	66,34,910	1,02,54,909
„ Government.....	54,32,345	61,62,178	3,40,000
Total...	29,09,39,566	26,47,29,243	26,36,80,998

IMPORTS.	1867-68.	1868-69.	1869-70.
Merchandise	16,62,50,889	17,24,93,815	16,34,59,892
Stores on Govt. account	34,11,158	53,44,382	33,55,814
Treasure – Private Trade ...	6,73,86,305	9,21,89,775	8,24,14,359
„ Government	24,00,000	82,93,666	7,000
Total...	23,94,48,352	27,83 21 638	24,92,37,065

The imports have thus fallen short of the exports during the three years, by upwards of £5,000,000 sterling. The deficiency is in fact considerably greater, since the imports are swollen by £1,200,000 worth of Government stores, and by railway material and stores for probably £2,000,000 more during the period. A nation's imports under a healthy condition of things will always be in excess of its exports. The heavy remittances which this country is required to make on account of its liabilities in England, reverse the normal order of things here.

The reassuring feature of these statistics is that the foreign demand upon the industry of the country does not as yet interfere with the flow of bullion into it. As long as Western India is able to import seven or eight millions sterling of silver every year, the annual strain upon the country will be borne without difficulty. The trade of Bombay has now fallen to what will probably be its normal dimensions for some years to come. During the American war the trade was as follows :

	EXPORTS.	IMPORTS.
1862-63	£30,139,203	£28,640,736
1863-64	41,268,026	36,010,410
1864-65	45,320,827	34,287,394
1865-66	40,124,803	35,359,567

The trade has thus fallen from a gross annual amount of £75,000,000 sterling to a little over £50,000,000. When the

East Indian Company's charter was abolished in 1834, the Bombay trade was under £6,000,000 a year: and that of all India below £16,000,000.

ONE or two of our contemporaries find it difficult to believe that "the strange story," as they call it, told in our letter to the Duke of Argyll, which appeared in our last issue, is really true. They cannot think it possible that the Parliament of 1832 should have so [illegible] its command of the revenues of this country. And yet the story is true from beginning to end. To procure the consent of the East India Company to the abolition of their monopoly of the China trade in favor of English merchants, the people of India were required to pay them an annuity of £630,000 a year for 55 years, and at the end of that time to recoup them their capital of £6,000,000 *twice* over. As though this wrong were not enough, India was further required to pay *Compensation annuities* to the whole Commercial Staff of the Company, amounting to a capitalized sum we suppose of not less than £3,000,000 sterling. To secure the eventual payment of the capital at the end of the 55 years, India was further required to invest £2,000,000 sterling in Consols as a guarantee fund. Now this single transaction alone has already cost the people of this country, calculating interest at 5 per cent. only, about £90,000,000 sterling; *in other words, the whole amount of the Indian debt.* Refusing to touch this heavy burden, made binding upon our shoulders, and which parliament would not touch with even with its little finger, the statesmen of England would not even guarantee the stock, although it would not have cost them one shilling, while it would have saved India many millions sterling. And yet we have writers among us who affect indignation at our remonstrances against *the tribute* which is taken from this country by our own. It is only charitable to suppose that they are ignorant of the history of the relations of the two countries. We have striven for many years to awaken the consciences of our countrymen at home to the wrong that has been done: and we appeal to our contemporaries to echo our remonstrances. As the guarantee fund amounts to no more than £6,500,000, we are still £5,500,000 in debt, and shall have to go on paying the £630,000 a year for 20 years to come, if we are to wait for the fund to extinguish the liability. Had Parliament guaranteed the stock in 1832 and allowed the fund to be invested in the Company's own debt, the liability would have expired in the present year. As it is, India must either pay down a sum of £5,500,000, or go on paying these dividends of £630,000 a year for 20 years to come. Now we say, that England is bound in conscience to stop this draft upon the industry of India. Let her take the Accumulated Guarantee Fund as it stands, and without asking us for any further contribution, make the East India Stock a part of her own national debt. This is the smallest measure of redress which she can honestly propose for this great wrong. Let this single item of injustice be set right, and the income-tax may be withdrawn to-morrow.

CONDITION OF THE COUNTRY.

BENGAL.

Cooch Behar.—Reports up to the 31st July of the prospects of the Garrow Hills are any thing but favorable owing to the lateness of the rains. Every thing sown, including the staple crops, rice and cotton, have failed either wholly or partially to come up. Fruits of the pumpkin and melon kind have grown well but nothing else, and the Deputy Commissioner when writing anticipated great scarcity. The Commissioner, however, is sanguine that the early failures will have been made up by sowing and planting during favorable weather since the Deputy Commissioner's report.

Orissa.—The rain-fall in ports of Cuttack and Poonee has been deficient, and the crops in cultivation are consequently backward. A continuation of the present dry weather with hot sun will cause serious anxiety throughout those parts of the country not provided with artificial irrigation. A good steady fall of rain just now would probably do all that is required and relieve further anxiety regarding the main crop, but the Bealla has, it is feared, suffered materially.

Dacca.—The recent floods have totally destroyed all the backward crops as well as those lying on low level lands in the Dacca district. It is estimated that on an average rather more than half of the whole rice crop of this district will be entirely destroyed. The floods have also caused considerable damage to the crops in the Furreedpore and Backergunge districts, and detailed inquiries are being instituted for the purpose of ascertaining accurately the extent of the injury, and the probable resources of the people to meet their losses. Hitherto no damage to crops has been reported from either the Mymensing or Tipperah districts, and if these have escaped there need be no fear whatever of a scarcity of food for the people.

Patna.—On the 2nd August the river Soane overflowed and inundated the country as far as Arrah. It is not yet known what damage has been caused to the crops, but it is expected that any damage will be found to be very slight as these floods have occurred almost regularly for the past three years without resulting in any harm beyond a little damage to a portion of the Bhudai crops and to some of the communications.

Burdwan.—The crops, especially the sugar-cane crop, have been almost totally destroyed in Pergh Bogree, Midnapore district, by an inundation of the river on the 2nd instant and subsequent days.

Rajshahye.—The accounts received from this division are very favorable indeed. Crops in the several districts have suffered more or less considerably from recent inundations. The prices of rice and wheat prevailing in each district of the several divisions of the lower provinces of Bengal for the week ending the 20 instant are annexed.

THE INDIGO DISTRICTS.

The accounts from the Indigo districts are to the effect that there has been too much rain everywhere during the past week. In Bhaugulpore it has been exceedingly heavy, and the yield of the plant has consequently fallen very considerably. In Tirhoot and Chumparun it has been heavier than could be wished. In Chuprah all appears to be going on satisfactorily. Torrents of rain in the Benares districts are also complained of, the roads having in consequence become almost impassable for carts, and manufacturing operations have been therefore checked.

As regards tea, the accounts have been unfavorable from Cachar, where very heavy rain has fallen, completely flooding some of the low lying lands. Blight also has made its appearance (a not unusual thing after excessive rain) and caused much harm in some gardens in the Hylacandy Valley. From Assam, and also from Darjeeling, fine weather is reported, and these districts promise to produce tea of a very fine quality this season.—*Pioneer, Sept. 6, 1870.*

ORISSA.

The *Indian Daily News* fears that another famine is impending in Orissa. The information of the *News* is not at present so precise as it was in 1865, and it hopes the calamity impending is not so serious as that which followed its unheeded warnings in the above year. But the news from the province is not at all assuring as it could wish. Its informant says: "We appear *now* to be on the eve of another famine. We are almost as unprepared for it now as we were in 1864.

WESTERN INDIA.

FORTNIGHT ENDING 15TH AUGUST.

Ratnagherry.—Owing to the favorable fall of rain during the fortnight, transplanting of rice crop, &c., was completed. Small-pox and dysentery prevailed to a slight extent in almost all the talookas.

Sholapoor.—The weather was good. In some places the khureef crops were doing well; while in others, where there had been an excessive fall of rain, their condition was not so favorable. The state of public health was reported to be good, with the exception of Kurmulla, where fever and cattle disease prevailed.

Belgaum.—During the fortnight there was a general and heavy fall of rain throughout the district, with the exception of Chikodee and Uthnee, where it was moderate. The rice and other crops were good. In Gokak and Uthnee the sowing of jowaree had commenced. The state of public health was good, with the exception of Beedee, where fever slightly prevailed. Disease among cattle slightly prevailed in Belgaum talooka.

Poona.—The fall of rain was abundant in the Bheemthurry and Seeroor talookas, good in the talooka of Mawal and petta Moolse under Haveilly, and considerable in the remaining talookas. The khureef crops were doing well in the district, though in a few villages of the talookas of Bheemthurry, Poorundhur, and Indapoor, the heavy rains delayed the weeding and caused some damage. Transplanting of rice, &c., in Moolsee petta, under Haveilly talooka, had almost been completed. The health both of men and cattle was good throughout the collectorate, with the exception of the Mawul talooka, where in a few places cattle disease slightly prevailed.

Dharwar.—The rain-fall was heavy, and the crops of all sorts were in good condition, except in a few places where they suffered a little through over much rain. Public health was satisfactory. Cattle were also free from disease, except in the Savanoor talooka, where it was slightly prevalent.

Kulladghee.—Rain fell more or less in almost all the talookas. The state of public health was reported to be good.

Ahmedabad.—The weather was rather hot during the fortnight. The several crops were reported to be fair, save bajree in the talookas of Dholka and Purantej, this crop having been injured by excessive rain. Public health was good. Cattle were free from disease.

CENTRAL PROVINCES AND BERAR.

Khangaum, 27 August 1870.—Since last report there has been no rain here, and the plants have therefore benefited much by the uninterrupted sunshine, and are now looking strong and healthy.

Oomraouttee, 27th.—We have had no rain, during the past week. The cotton plants still wear a healthy appearance, but if no rain falls within the next week, they will suffer again.

Wurdah, 27th. The weather during the past week has been fine, and rain is now desired by the cultivators; but however, at present there is

no appearance of it. The young crops said to be in good condition throughout the district, and in some parts blooming, are now ascertained to be considerably backward compared to those of last year.

Throughout the Central Provinces the monsoon has been a heavy one, and some parts of the country have been visited by serious floods. The last week, however, has done much towards brightening the prospects of the season, and the reports which a forthnight ago were dolefully detailing spoilt crops and lamenting the excessive moisture, are now cheerful over the favourable weather, and promising a satisfactory out-turn. —*Friend of India.*

AJMERE AND MHAIRWARRA DISTRICT.—9TH AUGUST 1870.

CAPT. H. M. REPTON, *Deputy Commissioner*, *To* GOVERNMENT, *North-Western Provinces, Nynee Tal.*

I have now the pleasure to inform you that our suspense terminated on the morning of the 22nd ultimo, when a regular and good fall of rain was vouchsafed, and since that date, I am glad to add, it has been general all over the district, in and some places the quantity has been too much for the dams, which have burst.

For eight days we have had more or less rain, and it has not been confined, as is usual, to one part of the district, but seems to have rolled up from the Gulf of Cambay, and to be hovering over and around Ajmere, as if to make up for the want of the past two seasons.

Mendicity is reported by the Cantonment Magistrate of Nusserabad to be greatly on the increase, and labour not accepted, but the rain having now fallen so plentifully, no excuse is left for begging.

The prospects are now assured, and the spirits of the people have revived; there is no further cause for anxiety if it should only please God to spare us from the visitation of plague and pestilence during the remainder of the year.

At present, with the exception of fever, caused by the change of climate, and the prevalance of guined-worm, we are very healthy.

NORTH WEST PROVINCES.—JULY 1870.

The weather during July was close and damp, clouds overspread the sky nearly all through the month In the first three or four days rain fell, and often very copiously. After the 8th, in all the stations to the west and north-west, but little rain fell till the 14th or 15th; but in the easterly stations, notably Goruckpore and Benares, the first ten days were very wet. In the former place nearly all rain-fall of the month was confined to the first ten days. The latter half of the month was generally a rainy period, and in many places, as Dehra, Bareily and Allahabad, rain fell on every one of the last ten days. The humidity of July of this year is higher than that of preceding years. The mean air pressure of July was about five hundredths below that of June. *Official Report.*

"It would be no use," says the *Pioneer*, "that the North-West Provinces, in this year of disgrace, are going through a severe ordeal. Though there is neither famine nor cholera, intermittent fever of a malignant type is becoming endemic in many places; while, owing to financial incapacity in high parts at the same time that less care is being taken of their well-being, tax upon tax is harassing the people in the present, and filling them with distrust and anxiety as to the future."

OUDH.—WEEK ENDING 26TH AUGUST 1870.

Lucknow.—"Prospects most favorable."

Oonao.—"Heavy rain fell during this week, but no injury to the crops has been reported by the tahsildars as yet."

Baraibanka.—"The rain during the week has not, it seems, done damage to the crops."

Sultanpoor.—"Prospects favorable."

Hurdoi. "Rain has been incessant. It is feared joomi and bajra crops have been injured in some places, but on the whole the prospects are favorable."

Kheree. "This rain has somewhat damaged the kodu and jear crops Fair weather is anxiously looked for."

Fyzabad.—"Tahsildars from all quarters report that paddy crops look favorable. Moto has been sown and fields are being prepared for rabi harvest."

Baraich.—"At Baraich and Korasn the standing crops are good. In the high lands of Nanpara very little of the crop is saved, but in the low lands nothing is left."

Gondah. "The prospects of the kharif crops are favorable. The only damage done has been partial injury of the juar crop."

Roy Bareilly.—"A break of 8 days did much good, and though we had a regular downpour at the commencement of this week, no damage is reported and prospects are said to be favorable."

Sultanpoor.—"In Sultanpoor and Kadipoor tahsils the rain-fall during the week has been moderate and crops are getting on well. In Mossafirkhana and Amethi tahsils the rain-fall has been excessive, and much damage has been done in both divisions. From Jumoo to Amethi the country is all flooded, and the embankment of road to Roy Bareilly from Sultanpoor has been carried away in several places."

Pertabgurh.—"There has been heavy rain during the past week by which sowing of urd and bajra has stopped in places, the earlier kharif sowings seem to be in good condition."

REMARKS BY FINANCIAL COMMISSIONER.

The rain fall of the week has been very heavy, as much as 20 inches three tenths were registered at one tahsil (Poorwa in Oonao.) But the reports generally speak of favorable prospects, and while the promise of the rain crop is good, there may yet be secured an average if not more than average, kharif. Prices continued to fall during the week.

MYSORE.—JULY 1870

Bangalore District.

—The crops are doing well. Vyshaka paddy is being harvested, and paddy, ragi, baller, tuvar, same, and huchellu seed sown. Murrain among cattle prevails in the Magadi, Channapatna, Anekallu, and Sarjapura Talooks. 1,859 head of cattle died during the month.; of these 438 were from murrain, and 52 were carried off by wild beasts

Kolar District.

Ploughing operations for sowing ragi have ceased. In many places this and other dry grains have grown to some height, and are generally reported to be thriving. The loss of cattle during the past month was 1,733, against 2,197 in June 1870. The average price of the principal grains, *viz.*, ragi paddy, rice, horse-gram and baller was Rs. 5-2-0, 4-10-0, 12-2-0, 5-13-0 and 9-12-0, respectively, per kandy.

Shimoga District.

Rain fell in all the talooks, and the tanks received a good supply. Crops are reported to be in thriving condition in all the talooks. The mortality among cattle both from diseases and seizure by wild beasts, was reported to be 1,208 head.

Kadoor District.

The fall of rain has been general throughout the district. The tanks have to more or less extent received a supplies of water and the crops growing have also very much benefited by these very seasonable showers which have induced the ryots to take up lands yielding a kindayem of Rs. 2,971-4-1 for cultivation. In the Maidan talooks the crops are in a healthy condition, while in the Malnad talooks the paddy nurseries are flourishing and ready for transplanting; but in some parts of the Chikkamagalura talook the excessive rains are reported to have produced rank vegetation to such an extent that it has in a measure considerably tended to impede their growth.

Hassan District.

In the western talooks of the district there was a long break in the monsoon in the early part of the month with only occasional light showers which were very favorable for planting out coffee trees. The second burst of the monsoon took place on the 25th, and as 7 inches of rain fell on the 27th at Bago near Sakalespura, the Hemavati river rose to 15 feet at the bridge. The talooks to the eastward were not so fortunate, and great distress is felt at the want of rain for the crops and for drinking water. Where the rain-fall was considerable the crops are flourishing, but this is not the case in the talooks to the eastward. Water has been supplied for the first time for many years, to all the lands situated below the Sriramadevara channels in the Narasipura Talook. The latest quotations are, 1st sort table rice 12½ seers, 2nd sort 14 seers, ragi 32¾ seers, and gram 23 seers, for the rupee The loss of cattle continues very heavy, being 2,844 head during the month.

Tomkoor District.

The weather throughout the month was cool and pleasant, and favorable to the young wet and dry crops which are promising, a portion of the sugarcane in the Kunigallu Talook, is fit for the mill. Ragi, baller, dal, castor-seed, harka, same and paddy, were sown in all the talooks of the district. The loss of cattle was 1,159, against 1,130, the greater proportion of this large number of deaths being in the Maddagiri and Toomkoor Talooks, where the disease Dodda Roga was most prevalent.

Mysore District.

The crops in the district are generally healthy. The crops chiefly sown during the month were hyne, ragi, harka, thogari, avare, black and green gram, castor-oil seed, chillies, paddy, same, navane, sugarcane thadagani, alasandi, and sessamum seeds. Sessamum seeds and jawari have been cut in some parts of the Mallavalli talook. The mortality among cattle is less than in the previous month. The loss from murrain was 179 against 310 in the previous month.

Chitaldroog District.

Rain fell in all the talooks of the district during the month, but the tanks have not received an additional supply of water. The seeds sown during the month were jola, gram, sejje, cotton, castor seed, navane, &c. The crops are reported to be healthy in some parts, in others to be fading for want of rain. The cattle appear to have been healthy and the epidemic which prevailed among them has abated to a great extent.

Coorg.—July 1870.

Wet land.—Transplanting paddy has been the principal occupation of the ryots during the month, but owing to the rain being late and not close heavy, some of the upper fields are insufficiently flooded and have not yet been planted.

Dry land.—The ragi crops in the Nanjarajapatna and Yelusavirasim talooks are thriving, and a large portion of the land which the ryots in the latter talook threatened to resign, has, through the exertions of the Subedar, been since cultivated.

Coffee.—The planters are still weeding and transplanting. The heavy mists with light rain have been very favorable to the growth of the young plants. The berries on the older trees are swelling and where the borer has not appeared the plantations are generally looking well.

Cardamoms.—The cardamom jungles have also improved in appearance since the late rains.

PUBLIC WORKS.—RAILWAYS.

A Berar correspondent of the *Pioneer* writes:—"The proposed branch lines of Railway to Oomrawuttee and the Coal-fields in the Woon district will be taken in hand immediately after the rains." This will give the Executive Engineer a fair working season, and compensate for the very short period during which the works could be pushed on last year, and we may, therefore, expect re-doubled energy. Before the month is out we may also, we presume, expect accurate accounts of the capabilities of the coal-fields of the Woon district."—*Mofussilite.*

The final links of the Trunk Railway system are being rapidly supplied. In the course of the present month, the Madras Railway will open to the Toongabuddra River, and by the close of the year, the Great Indian Peninsula Railway will be extended to the banks of the Kistna. In March 1871, the two lines will meet at Raichore, and Railway communication between Calcutta, Bombay and Madras will then be complete, and without a break except at the Kistna. The bridge over this river will consist

of thirty-seven spans of 100 feet each, and can hardly be finished before 1872-73. The Toongabuddra Bridge which is nearly finished, has fifty-eight spans of 70 feet each.—*Pioneer.*

The representatives of the East Indian and Great Indian Railways have held a conference at Jubbulpore on the subject of the transit of mails between Calcutta, Allahabad and Bombay. As the railway officials were unanimous their recomendations are likely to be adopted by the Government of India. From 1st November next [illegible] of the Chord Line, the daily mail train will leave Bombay at noon instead of 1 o'clock at present, and will reach Calcutta at 5 in the morning instead of half past nine as at present. The mails will leave Calcutta at night, as now, but will arrive in Bombay about 1 P. M. so as to give the Post Office four or five hours for computing the postal charges. The steamer will then start on Saturday night except during the monsoon now about to cease. This arrangement will accommodate the Madras Mails which will meet at the Callian Junction, and there need be no traffic on the two Ghauts at night. The running speed of the mail-train will be only 23½ miles, including stoppages. Third class carriages will be added to the train, under the belief that the Natives are learning to value time. Bombay will thus be brought within 64 hours of Calcutta. But for the Ghaut difficulty the daily mail train might run with ease in 55 hours when the new sections from Jubbulpore towards Bombay have become more consolidated. The public should not rest till at least the English mail and first-class passengers are conveyed, in the palace cars now being built, between the two capitals in forty-eight hours. —*Friend of India.*

The Duke of Argyll has not been slow to recognise the importance of the example set by Sir Salar Jung in offering to provide funds for a railway, to be constructed and worked by the Government of India for the Hyderabad State. As His Grace remarks the proposal of His Highness on behalf of the Nazam's Government "affords a very gratifying proof of the confidence he has learnt to repose in the British Government." Further "the most appropriate return that can be made to His Highness will be the construction of the railway, within the shortest time, and in the most efficient manner possible." This is a recommendation which the Viceroy in Council is not likely to lose sight of. A distinction is drawn between the statesmanlike action of the Hyderabad Durbar, and the purely commercial spirit which seems to have actuated the Maharajah Holkar. His Highness proposes to place one million sterling at the disposal of the Government of India for the construction of the Indore line by a series of annual payments as under:—

In 1870-71	£250,000
,, 1871 72	£200,000
,, 1872-73	£110,000
,, 1873-74	£110,000
,, 1874-75	£110,000
,, 1875-76	£110,000
,, 1876-77	£100,000
	£1,000,000

For these advances he will receive an annual payment of 4½ per cent. and, should the railway succeed, a moiety of the profits realised. This places him in the position of a holder of guaranteed stock. His Grace thinks, however, that the position of the Maharajah in the matter is an example of a form of guarantee free from some of the worst defects of the system. The example, however, set by these two native governments is a matter for congratulation. If it were followed in Rajpootana, the line which is to open up that vast and fertile region would at no distant date be one of the most flourishing branches of the Indian Railway system.—*Daily Examiner.*

MINERAL RESOURCES.

COAL IN CUDDAPAH.

To the Editor of the Madras Mail.

Sir,—The Indian coal-bearing rocks not being known to occur anywhere south of the Kistna river, the notice, in your issue of the 1st instant, of a reported discovery of coal under the limestone formation in the Cuddapah District is rather startling, and I among others, feel very impatient for further revelations concerning this remarkable find by "*An Experienced Miner from the Chanda Coal-field.*"

If he be right, the Geological Survey of India is certainly wrong, for Messrs. Charles, Oldham and King, by whom the Cuddapah District was geologically surveyed several years ago, reported that district to contain no coal, nor any rocks of the Indian coal-bearing series. At present, from my personal knowledge of that region, I believe in Messrs. Oldham and King in preference to the "*experienced miner from the Chanda Coal-field*";—but he can of course show his coal seam, in situ, and demonstrate the reality of his discovery; let him then do so at once, as at present some sceptics recollect that in another place in this Presidency the discovery made was not one, of coal, but of a "mare's-nest!"—I am, Sir, yours faithfully,

R. Bruce Foote, F. G. S.,
Govt. Survey of India.

Vercaud, 6th Sept., 1870.

THE SILVER MINES OF KOOLOO.

To the Editor of Indian Public Opinion.

Sir,—In your issue of 23rd ultimo you state that these mines being 200 miles from any railway, renders it impossible the copper, &c. could be exported with profit. How is it, then, that Russia supplies nearly all the copper used in India? How is it that mines in Namaqualand S. Africa, hundreds of miles in the interior, make £20,000 a year profit? How is that £16,000 of borax is brought from Pegu, 900 miles north of Kooloo and sold in the plains at 8 to 10 Rs. per maund and yet pays a profit! (*Vide* Cunningham's Ladak p. 939.) The fact is the question of the copper or any other mines paying, depends entirely upon the cost of production, the mere transit to a railway not being 2 Rs. per maund, while the value is about 40 in the Punjab where it will sell readily "exported." You are probably not aware also that an immense trade offers for copper not only in the Punjab, but also north to Ladak, to which place large quantities of copper goods pass up every year through Kooloo on mules. But when it is considered that all the copper used in the Punjab is imported at great cost from extreme distances, there can be little fear of finding a sale for it when produced in the midst of us. The same may be said of silver which—if it pays for mining—(and I hear Dr. Oldham has pronounced the ore very rich by assay) there can be no doubt that it will find a market. As to lead, antimony or anything else, if there is any demand for it, either on the spot or in the plains, the mere carriage of 200 miles, most of which I am informed is by a good cart road, will not prevent the sale of it. Salt has also been discoverd, I hear, in two places in Vazeeri Rupi.

I think you also wrong are about the *leasing*. Only one mine has been *leased* by Government—that is at Shigri in Lahoul—and the Government have refused to lease any other mine in Kooloo, after parties have been for ever a year searching for them—the so called Kooloo mines are in "Vazeeri Rupi," the silver country of the Vaseers which covers over 670 square miles. The Government waived their right in the minerals in favour of the Rajah of Kooloo, of whom they were purchased, so that Government does not interfere. It was in this country, years ago, Runjeet Sing used to make raids and carry off lacs upon lacs of silver, but the natives built up the mines and planted them over when the Sikhs come, so that even to this day many have escaped detection. But every week or two new discoveries are being made by the exploring party who have been at work now over eighteen months.

A Subscriber.

COAL BETWEEN BILASPUR AND RANCHI.

From T. Oldham, Esq., LL. D, *To the Government of India*
Calcutta, the 14th June 1870.

In continuation of Report on the Coal at Korba, in Bilaspur, submitted with my letter No. 727, dated 17th May 1870, I have now the honor to send a brief Note, also by Mr. W. T. Blanford, on the extension of the coal rocks to the eastwards and north-eastwards.

All these papers bear out the promise of a very large area and amount of fairly good fuel in the country referred to, which will at some future time prove most valuable.

Note by Mr. W. T. Blanford, *on the occurrence of Coal, east of Chatisgarh, in the country between Bilaspur and Ranchi, Calcutta, the 31st May* 1870.

The coal-bearing (Damuda) beds of Korba extend for about *forty miles* to the eastward, as far as Rábkub, in Udipur (Oodeypore). They also extend far to the south-east towards Gangpur, and to the northwards towards Sirguja, and in all probability are continuous, or nearly so, with the deposits of the same nature known to occur in those Districts.

Main Pat and the neighbouring hills, and all the country on the road from Main Pat through Chándargarh and Jashpur to Ránchi, consist of metamorphic rocks with the exception of a cap of trap and laterite on Main Pat.

The lateness of the season prevented my searching to any extent of coal seams, indications of the existence of which were afforded by the occurrence of fragments of coal in the rivers, especially in the Mand. I found a few seams near Chitra, twelve miles west of Rabkub and nearly thirty east of Korba. Two or three are seen in the Mand about three to four miles east north-east of Chitra, but they are only from a foot to 18 inches in thickness In a small stream, the Kopa Naddi, which runs

south of Chitra, one seam about 3 feet in thickness is seen near the village of Tendumuri, more than a mile south-west of Chitra. It is nearly horizontal, having a very low irregular dip to the west or south-west. Part consists of fair coal, the remainder is shaley.

The only seam examined from which it is possible that a useful supply of fuel might be obtained, is exposed in the same stream rather nearer to Chitra, being about a mile from that village, close to the boundary of the village of Tendumuri. It is very badly seen, but appears to be of considerable thickness, perhaps 20 feet. The upper portion is so much decomposed that no trustworthy estimate could be formed of the quality without digging into the seam; the lower portion appeared to be fair in places. The dip is about 15° to north north-west.

The villagers, as usual, would give no information, so that I could only trace out the coal seams by the laborious process of searching the beds of the stream, and from want of time I was unable to ascertain whence the greater portion of the fragments seen in the Maud were derived; but when passing through Ránch, Lieutenant Sale, in charge of the Chota Nágpúr Topographical Survey Party, told me he had found a seam of coal about four miles north-west of Rábkúb in a small stream running into the Mánd, and it is probable that this may be the source of the blocks I saw on the river bed.

I should add that several coal localities have been lately found by the officers of the Topographical Survey and recorded in their maps. They are all north of Korba and Udipúr.

When passing through Jashpúr, the Rajah told me that coal occurred in his territory in the Khurea country, twenty-four miles north-west of Jashpúr Nagar. This would be about one hundred miles, or rather more, west by south of Ránchi.

SILVER MINES IN KOOLOO.

Kooloo! Where is Kooloo? Kooloo is a valley isolated from all the world, comparatively speaking, by mountain ranges of considerable height. It is intersected, and may be formed, by the Beeas, one of the five and the shortest of the rivers that give the plain country the name of Punjab. It rises at the head of the valley, runs south for about twenty-five miles, and then turns sharp to the west, passing through a series of deep gorges in the Mundee (independent) country, into the more spacious valley of Kangra. It is therefore cut off politically as well as geographically from the district to which it is attached as a subdivision, and placed under the executive charge of an Assistant to the Deputy Commissioner of Kangra. The Kooloo valley forms the point of departure for travellers going to Ladakh and Iskardo, and is therefore frequented by Englishmen in considerable numbers during the summer. When first annexed, with the Jolundhur Doab, to British territory in 1846, it was placed under charge of Capt. W. Hay, who resided there for several years, and did a good deal towards making the riches of the country known, his special attention being then drawn to antimony. A Mr. Marcadieu was deputed to visit these mines, but did little towards eliminating their value, depending for information on the people of the country, whose anxiety was the reverse of progressive, for they wished to keep intruders out. It is needless to go through the vicissitudes that attended the attempts at obtaining something like the truth as to the value of the mineral productions of Kooloo. Accident or design, we do not know which, led Mr. Calvert, a civil engineer possessing much geological knowledge, and formerly an employé of the Punjab Railway Company, into the valley of Kooloo; and a careful examination induced him to conclude that not only did antimony exist in Kooloo, but that the copper and even silver mines—of very considerable extent and of a great comparative value—had only to be worked to yield large and profitable returns. Imbued with the prospect of ultimate success, Mr. Calvert proposed to rent these mines from the Punjab Government, and after some correspondence succeeded in obtaining a lease. It is said that a company is being formed in England to work these mines; and we trust the information is correct, for the prospect is good if the amount paid for Mr. Calvert's present rights be not too great.

The only obstacle to the scheme is that of conveying the metal that may be obtained from Kooloo to the plains. The hill roads, which extend nearly one hundred miles between Kooloo and the head of the Kangra valley at Baijnath, will admit of bullocks and mules as the only beasts of burden that can be used, but wheeled carriages can—or rather will—receive the produce there when the Kangra valley road to Noorgsoor is completed. It was undertaken three or four years ago, and carried on with such vigour by Captain James Brown of the Royal Engineers, that hopes were entertained it would be opened for traffic in 1870. But these hopes have been doomed to disappointment—sudden orders brought the whole of the works to a complete stand still, and it is more than probable that they will not be resumed until one half of those in hand have been washed away, damaged, or otherwise destroyed. Such is the fate of many recent important undertakings in India. A paper was read the other day at the Royal Geographical Society, regarding discoveries in Western Thibet, which contained, said Sir Roderick Murchison, the president, matter sufficiently encouraging to lead to the formation, within a week, of half-a-dozen commercial companies. Sir Roderick forgets that the regions described are beyond our boundary, and that the want of good communication is a bar to the effectual realisation of his theory, except in the matter of gold. Let us hope that [illegible] hundred miles of hill road between Kangra and Kooloo may not prove a serious bar to the carrying out on a large scale of the talked of mining operations.—*Indian Public Opinion.*

PUBLIC WORKS—IRRIGATION.

CANAL WATER-RATES AND COLONEL ST[illegible]'S BILL.

Sir,—I concluded my last letter, as you will remember, by premising that it was the duty of the public to suggest, for the general good, schemes by which economy without loss of efficiency might be secured. This promise granted, I have no hesitation in proposing a scheme which has for its essence the smallest percentage of cost of collection; and I cannot but hope that with this special object it will receive attention at this particular juncture. If we can once fix on the amount of water the canal is capable of supplying to a given village, and have ascertained the area in such village capable of irrigation from the canal, we have only then to fix a rate on the whole and levy it with, and by the same agency as, the Government revenue.

Now let me consider, first, what it is I propose to do, and next what are the obstacles. We are to ascertain the amount of water we can supply to a given village. It appears to me that nothing is easier than this to a professional engineer. The only thing to be guarded against is the supply of an insufficient quantity, in point of fact extending our area of irrigation beyond the water-carrying capacities of the canal, so that in order to carry out my project it will be necessary to determine to what villages, and to what extent, complete irrigation can be given. Such villages would be immediately brought under the new system, the Canal Department merely guaranteeing not to increase the area of irrigation until the carrying capacities of the canal have been enlarged.

Next, in order to ascertain the area capable of irrigation from the canal as it is, I imagine the area irrigated during the dry years of 1868-69 would give me an outside and overall estimate. But it would be unnecessary to depend entirely on that. The Canal Department would be able to state what villages were watered up to their full extent, and what villages at present not fully watered could be given a full supply, and they would be charged for the water whether they took it or not. Take it they certainly would in a dry year, and therefore it is but fair they should pay in wet seasons what they could hardly subsist without in dry seasons. Moreover, under the proposed plan, all chance of a diminished supply is done away with by the Canal Department guaranteeing not to increase its irrigated area until an additional supply of water is turned on.

It would, of course, be necessary whenever the carrying capacities of the canal are increased, or a revision of settlement brings to light the fact of a greater area in a given village being irrigated from the canal than was originally arranged for, to revise the canal jummas of such villages as are affected in either way. It must always be borne in mind that the Government have disclaimed all intention of making a profit out of these irrigation works, and we cannot do better than quote the words of His Excellency the President of the Legislative Council in proof of this:—"When the inhabitants come to understand what the object really is, and that in return they are to be guaranteed by Government that the profits of these irrigation works, above that which is absolutely necessary to defray the cost of payment of interest, repayment of capital and maintenance, is to be all their own." Therefore, as the Canal Department have professed to have made a profit last year of 6¼ per cent. on the area that was then irrigated, it is evident that, under our proposed scheme, they will make the same interest, plus all they have expended in costs of collection; for our system, it will be observed, is self-collecting, and therefore it can be no object to make a larger income than last year.

It may be urged by the Canal Department that there are certain villages which we have been supplying with water, which, under this new system, will be debarred from water until we can enlarge the carrying capacity of the canal, and that we shall not only lose the revenue derived from those villages, but shall be guilty of a breach of faith to the inhabitants. But as regards the loss of revenue, that will be more than compensated by the rate paid for irrigable lands, not yet irrigated in those villages which are considered to be capable of receiving a full supply; and as regards the breach of faith, it is not one, as the delivery of water is only postponed until a sufficient supply can be provided. Indeed, it were a breach of faith not to fully supply those villages who were the first to take water, and hence have been the best constituents of the canal.

I now come to the fixing of the rate, and for this purpose I

would suggest two rates, one for flow and one for lift. The rate might be fixed as a percentage on the rental of the irrigated area, and this would have a double advantage, for not only would it do away with all detail between the Government and the lumberdar—it being decided at the onset from the canal records, the average area of lift and flow respectively [illegible] village—but would also frame the simplest of issue between the lumberdars and the occupier of the land. This rate, less whatever percentage was allowed the lumberdar for his trouble and risk, would then be entered in the towjee of the land revenue and be collected with it.

The only obstacles I can see to a scheme of this kind would be, first, the preservation of the kolabas or exits for the water from the canal into the villages. They must of necessity be built of solid masonry and the Executive Engineer would have to determine the size of each exit, with due regard to the area to be irrigated, so that no one village should be able to defraud his neighbour.

The other obstacle is the chance of the sides of the canal being opened on purpose to steal water. This might be provided for by holding the lumberdar strictly responsible, and any breach in the canal other than accidental would be not only punished by due course of law, but would also be punished by forfeiture of the percentage on the year's collections.

The advantages of the scheme are, it is absolutely without expense and saves to Government an enormous establishment of canal chowkeedars, burkundazes, zillahdars, many of whom though illiterate, receive higher salaries than sepoys, overseers and a whole army of ameens and mohurrirs for writing the jumabundee. It is an introduction of nothing new, but merely applying the system of the land revenue to the canal water-rate. It relieves the engineers of an immense amount of work, for which they have no special training, and in the nature of things probably no special aptitude, and its immediate results will be an increase of revenue to the Canal Department

It does away with all irregular receipts and fines which the law at present does not countenance, and which, from their irregularity and illegality, are a means of extortion to the underlings of the department. And by decreasing the engineers' work it will enable Government to utilise their services in increasing the irrigation works of the country. Of course, engineers would have to be maintained to look after the canal works and arrange for the distribution of the water down the respective channels, but the establishment for this purpose need not be very large.

In a short sketch like this of course only the broad outline of such a scheme can be given; but I feel certain, if Sir Richard Temple is ready for another fight with the giant, and has not doffed his armour now that he is at Simla, he will find many officers ready enough to assist him in any effort to overcome the giant, now that he has assumed such a very unpleasant style as a three per cent. income-tax.

A District Officer.

INDUSTRIAL RESOURCES.

PROCESS OF TANNING AND CURRYING LEATHER AT THE CAWNPORE GOVERNMENT TANNERY.

By Captain John Stewart, R. A., Commissary of Ordnance in charge.

The tannery consists of a long building, in the floor of which are masonry pits plastered with chunam. The floor is on two levels; the lower contains the beam house and lime pits, where the hair and flesh of hides are removed by the action of milk of lime, and also the bark taps and spenders, where the bark is infused. The latter are large masonry pits, with false bottoms of wood, through which the infusion drains off by plug-holes into a well adjoining, where a pump is fixed, and the liquors are raised and carried into the tan pits on the higher level; these are the pits in which the hides are tanned, and they drain off into the spenders and taps on the lower level.

The currier's shop is a long two-storied building; the lower story is furnished with currier's beams and scouring tables of stone, where the hides are shaved and scoured preparatory to being oiled and dubbed. The upper story is for finishing the currying process. It is furnished with wooden tables for setting out and dubbing the hides, which are hung up to dry on battens suspended from the roof. There are arrangements for hanging the hides on both stories.

The hides and skins tanned and curried are—buffaloe, bullock and cow, and goat and sheep skins. Buffaloe hides are obtained from the slaughter markets of Cawnpore and adjacent towns and cities. They are either green direct from the butcher or dry salted. They are best suited for tanning in the former condition, as the salt cure of the North-Western Provinces is inferior and imperfect, absorbing so much moisture that in the damp heat hides are apt to rot; while the dry heat of the climate so hardens and contracts the fibres of the skin, that much labour is required to loosen the [illegible] to receive the lime and tan. Great precaution, therefore, is necessary in the selection of dry salted hides, especially as native dealers lay on the kharee or salt very thick to gain weight. If the hides are fresh slaughtered, and have been lightly cured they soak down to a natural state; but if they are stale, that is, have been cured some months, and are besmeared with kharee, the tanner should reject them for they will very likely decompose in soak before becoming soft.

The buffaloe is the only available hide that will produce leather thick enough for harness work in this country, and there is no doubt that much of the inferiority of country leather arises from the poorness of the skin of that beast. It is poorly fed, not generally cared for, and usually killed when too old to breed or give milk.

The hide of the male buffaloe is too coarse, and it gets such bad treatment in the plough or cart that it is generally full of sores and goad marks. In large towns there is a market for buffaloe beef for the low caste and poorer Mussalman population, and also for grease, and younger and better cattle are slaughtered; it is from these that the local tanners select their hides for the finer uses of harness, saddlery and accoutrements.

Many good hides are ruined by the butchers in flaying, from inefficient arrangements in the slaughter-houses and from injudicious use of their tools.

Bullock and cow hides are also procured green and dry salted, and the same care is necessary for selection. Those slaughtered in the Commissariat Department are usually the best; but they are small and unfit for any thick work. This class of hides is much exported to England, and extensively used there for boot and shoe upper leather, for which it is much esteemed. In the English market there is great objection to North-West cure. Patna, Dacca, and Durbungah cures, though the hides are no better, are far preferred. The finest hides of this description are those killed at Agra, Delhi and Meerut; much damage is done to the hide by branding on the butts and shoulders.

Goat and sheep skins are always obtained green from the local market. Goat skins are generally very good; sheep are poor and small.

Lime is brought into Cawnpore chiefly from the Banda District, and is used for loosening the hair and flesh of hides and killing the grease. It should be taken in lumps, unslacked.

Bran is obtained from the Commissariat Flour Mills or from the bazaars, and is used to produce an acid, when fermenting in water, which plumps up the skin, opens the pores, and takes out the excess of lime.

Babool bark is obtained locally, the wood being extensively used for firing. The bark season extends from January to June, that is the spring of the year, when the sap is upon the tree; from six to ten years old trees are the best for bark. It should be peeled from the trees immediately after they are cut down.

The natives are rather careless in this particular, and ill use the bark; for, to get it separated from the wood, they beat it with wooden mallets and gash it about to get it loose; they then peel it off by hand; each gash is a wound in the bark through which the tannin evaporates. In England a peeling iron is used, and long strips of bark are taken off without any beating; but of course this must be done before the sap has dried. The tannin is contained in the whith or inner stratum of the bark.

The tannin is stronger in babool than in oak bark, but the quality is not considered so perfect. Experiment tried lately in England under professor Abel, the Chemist to the War Department, proved it to have keeping qualities quite equal to oak bark, if not superior; and thus it is valuable as a tannin agent. It has more colouring matter, that is, gives a reddish liquor, which is somewhat against it, and great advantage is found from mixing with it "Hurr" or "Bahaira" (the Myrabolams of commerce, the dried fruit of "Terminalia Chebula") which is plentiful in the markets, and is used extensively as a dye. The liquor from the "Hurr" or "Hurra" is powerful in tannin; and though it is not reputed to be of a quality that would make good leather of itself, it is highly esteemed in England to mix with other tannin agents, owing to the bright colour it imparts, and herein is its usefulness in combination with babool. The "Hurr" is a product of the forests, and is very common, but the natives of Cawnpore use it only as a dye.

Sumach is another tanning substance, which has been used in small quantities here, but only for finishing and imparting colour. It is imported from England, and is therefore very expensive. It will not be much used hereafter, as the myrabolams are found to answer quite as well.

Kutch is a very powerful astringent, and rich in tannin. It is the inspissated juice of "Acacia Catechu," the "Khair" of the forests, and is used by the natives for a dye, and also eaten with pawn. Its tannin is three or four times stronger than that of oak, but of poor quality; the leather made of it is dark in colour and does not last well, but it tans so quickly, and therefore so cheaply, that it it used extensively in England; such leather is believed to be unsuited for wear in this climate. At Cawnpore the kutch is used only for darkening colour, when hat is required.

Divi Divi is the seed pod of a shrub that is a native of South America, but grows well in the Madras and Bombay Presidencies; it is called the "*Libidibia Corriartia.*" The is exported to England from Bombay, but in small quantities. The tannin is strong, and considered good for mixing with barks. The shrubs were grown from seed at Cawnpore, and a few are still living. Government has now sanctioned a plantation of it, and some hundreds of plants are doing well in a nursery. It has been little used as yet, but will probably be an useful auxiliary in tanning.

The barks of *sal*, *asseja*, and are *amultas* known to contain tannin, and experiments are being carried out with them.

The only oil used for currying is cod-oil; it is obtained from England, and is the best known for the purpose. Indian fish oils would answer if more carefully extracted.

Mutton or goat tallow is used either alone or mixed with cod-oil; in the latter state it is called dubbing, which is applied to all leather intended for harness or straps, and like pliable purposes.

Native tanners and curriers are all of the Chumar caste. The former are Runghias, a trade class of that caste. Such labour is very plentiful about Cawnpore. The wages vary from Rs. 9 to Rs. 5 per mensem according to skill,

The hide when received green is only washed and put into a pit of milk of lime; when it is dry salted it has to be soaked in soft water before it can go into lime. It is often so hard dried that it will not soak down, and heavy fulling stocks are required to break it down and soften it.

These stocks have not as yet been set up at Cawnpore for want of power to drive them; and until they are used, the tannin of dry hides cannot be satisfactorily carried out.

The hides are first put into a weak lime, and then into a stronger, until the hair is loosened and the skin plumped up; they are then placed over tanners' beams made of wood and convex, so that a two-handled, blunt, concave knife can be worked over them to push off the hair; when that is done the hide is turned over on the same beam, and the flesh and fat which was left on and has now become loosened by the action of the lime, is shaved off by means of a two-handled concave fleshing knife, which has a sharpened edge, and takes off a greater or less shaving as required. Some dexterity is needed in this work, as a slip of the knife may shave too deep and cut into the hide. The most skilled tanners are employed in this and are called beamsmen.

There is great diversity of opinion in the trade as to the use of lime. It is generally allowed that it is an evil, but a necessary one. It is not good for leather, but the hair and flesh must be removed, and there is no safer way of doing so. In France and in some American tanneries they remove the hair by sweating the hides and producing partial decomposition; but this would be too dangerous in a climate like that of India.

Lime being an evil, it becomes necessary, after it has done its work, to obliterate all trace of it in the fibres of the hide; and this forms the second process of the tanner, and is called "graincing" or "batting." Sole leather does not require this process, but for all harness or dress leather and for every soft purpose it is essential. The hides, after being unhaired, fleshed and washed, are thrown into a pit called a "grainer," in which bran and water have been allowed to ferment; the acid thus produced removes the lime from the fibres of the skin, and loosens and distends the pores, so that they are cleansed of every foreign substance, and brought to a state that is very sensitive to the action of tannic acid.

Much caution is needed in India for the management of "grainers," for if the hides are left a few minutes too long, the acid dissolves the gelatinous fibres, the action being quicker than in England owing to the higher temperature.

Bran being sometimes expensive, the acid or ammonia from pigeon or hen dung has been tried with some success; this is the usual grainer in England, but there has been difficulty in collecting sufficient quantities of it at Cawnpore, and it is usually so full of dirt that bran is preferred.

The native tanners of Cawnpore use a grainer of stale fermenting tan liquor, and it is so inexpensive that it would be well to introduce it gradually in the Government Tannery. It is notable that the French use stale rotten liquors to bring down or soften their skins, and they are most successful in their soft pliable leathers.

Weak solutions of sulphuric acid have been tried to plump up the skins, but it is more expensive here. All these grainers give more or less the same results.

An experienced tanner can tell by feeling the hides whether they have been brought down enough and are fit for the next process, which is the tanning proper.

After the grainer and before going to the tan pits, the hides are once more put on the beam, and all dirt, short hairs, &c., that may have been left in the pores, are driven out by means of the blunt knife.

Babool bark is broken and ground in a "bark mill with breakers." The latter breaks the fibres of the bark, and the mill crushes and grinds it, and renders it easy to infuse in cold water, for the tannin to be extracted. One bark mill is driven by bullock power, but another has now been set up for steam power. The mill resembles a coffee mill on a large scale. The same power which works it is made to work the tannery pump.

Myrabolams is pounded or crushed to a powder, when dry, in a soorkee mill. Other barks and tanning agents are also either ground, crushed, or pounded.

First infusions are made in the bark taps before de[illegible], with fresh cold water; soft water is of course the best for this and for soaking hides in the first stages in the beym house, and it should be free of lime for the tanning process.

Cheap tanners in England infuse with hot water; but this is not considered good, as it extracts too much of the colouring and other earthy matters, and hastens the development of [illegible]id, which is injurious to the liquor.

After a pit of bark has given off a [illegible] half-spent material is cast over into one of the spenders, [illegible] afterwards a half-spent liquor is put on it, and is freshened up with it, and so on till the bark is quite spent, when it is thrown out. The liquors are continually worked over and over to spend the bark.

The hides are first put into the oldest or weakest liquor. In the state in which they come from the grainer they should not be subjected to the too sudden action of tannin; they are therefore continually handled or taken in and out of the pits. The pits are called "Handlers." For the first month the hides are handled first hourly, then gradually allowed to remain longer and longer till they are fit for the next stage, which is called "Dusting." The pits are called "Dusters;" and the hides are put into a stronger liquor with some finely-ground bark thrown in between each layer of 4 or 5 hides, to keep the strength of the liquor up as the hides drink in the tannin.

In the "Dusters" the hides are taken up weekly, and then fortnightly, when new liquors are supplied and fresh bark as before.

The dusting goes on for 3 or 4 months, and then the hides are ready for "laying away." The pits are now called "Layers," and the hides are put into a new strong liquor, with quantities of fine bark between each hide. In these pits they lay for a month or two at a time feeding on the tannin. The half-spent liquors from layers, dusters and handlers are always drained off on to the top of the spenders, and these after being freshened up are brought up again by means of the pump; thus they are kept moving, which is very important, as it retards the formation of gallic acid, which is injurious to the tannin, and which is too apt to form in hot weather.

Babool bark and myrabolams are infused together, and the addition of the latter adds great strength and takes from the deep colour of the liquors.

The hides are kept 3 or 4 months in layers, and by that time in general the tannin has struck right through them, and they are tanned. Buffaloe hides take from 9 months to a year from first to last, according to weight and substance; cow hides are tanned in from 4 to 6 months; sheep and goat skins are done in tubs, and take from a month to two months.

The climate of India is favourable to the penetration and combination of tannin with the gelatine of hides. The chief object to guard against is the fretting of liquors and production of gallic acid, which is more readily given out owing to the atmospheric heat.

After the hides are tanned, they can be dried and stored; but in this country they are apt to dry so hard and to darken so much by the action of light and air, that it is thought best to curry them at once, especially for harness work or dress leather. For sole leather or crop hides no currying is required, but they are "struck," that is, pressed down and rolled, and then stored.

Native tanners carry out the liming process very much like any others; they, however, rather over-lime the hides, according to English ideas. Their grainer is very effectual as far as softening the skin; they then rinse out all moisture, and while the pores are yet open, they work the hides in liquor, and afterwards they sew the hide up into a bag having one end open. This bag is filled with finely-pounded bark and hung up over a pit, from which liquor is ladled into the bag, and there a very strong infusion is formed, which percolates through the pores of the hide. The tannin, therefore, goes right through the hide, but it has not time to make a chemical combination, which is considered so essential for leather.

Native tanning does not occupy more than a week.

For harness and all dress purposes, the currying is a most necessary and important process. By tanning the hide has become leather, but it is not fit for use without currying. This consists of a number of manipulations—stoning, shaving, scouring, oiling, re-shaving or flattening, setting, re-setting, dubbing and finishing.

For ordinary harness leather, a buffaloe hide, as it comes from the tan pits, is hung up till it is half dry, when it is stoned out with rough stone on a flat table, to straighten it as much possible. It is then thrown over a currier's beam, an upright thick plank faced with lignum vitæ. This is the beam board for shaving on. The hide is smoothed down the board, and the currier with a two-handled shaving knife, having a turned edge, takes off the outer flesh and inequalities from the flesh side; in fact, levels the hide as nearly as he can do so, having regard to economy in

not wasting leather. The object of this shaving is to get the hide to lie flat on a table, so that the scouring stones and sleekers may touch each each part of the surface with equal pressure, and thus thoroughly clean it, as well as press out all dirt and bloom, or earthy deposit from the bark that remains among the fibres.

The preparation and use of the currier's shaving knife requires skilled men. Each man sharpens and turns the edge on his own knife. He first grinds it and clears a perfect straight edge, then places his knife, edge upwards, before him on the floor, holding it between his knees, and resting it against the wall; in this position he takes in both hands a heavy steel, and presses along the straight edge with more or less pressure as is required on the edge. This edge catches the lumps and inequalities on the flesh side and shaves them off.

When shaved the hides are laid flat on a stone table, and undergo a series of scourings and pressings out on both sides, to remove bloom and dirt and take out creases. After this it is steeped for two days in sumach or myrabolam to give it a finishing colour. These infusions are made with boiling water.

The hides are then taken to another table and sleeked out on both sides with an iron sleeker; then, while still wet, cod-oil is rubbed on lightly on the flesh, and more heavily on the grain. They are thus hung up for the oil to be drawn into the pores of the skin as the water evaporates.

When about three parts dry, they are taken down and for a second time placed on the currier's beam to be lightly re-shaved on the flesh side; that is, the roughness is taken off without sacrificing much of the leather. This process is called flattening.

After this they are hung up again to dry a little more. They are then stoned out on a table. Then the table, or sufficient surface on a table for the hide to lay on, is rubbed over with dubbing (a mixture of oil and tallow). The hide is laid on the dubbed table grain upwards, so that the flesh adheres to the table; in this state it is well set out, that is, the hide is stretched out as much as it will go by pressure with a hard setting stone with a smooth edge. To do this the hide is damped down in any places that it may have dried too much.

When fairly set it is allowed to dry a little, then stoned out on the flesh side, and afterwards re-set on the grain side to prepare for the dubbing, which is now laid on with a brush and rubbed in and smoothed down with the palm of the hand. Care must be taken that the hide is equally damped all over before it is dubbed, otherwise the dry parts will remain dark in colour. In this dry climate, it is very necessary to watch that hides do not get too dry in the processes of currying. When dubbed the hides are hung up to dry, and when the grease has gone well in leaving a white coating of refuse tallow on the outside, they can be taken down and finished off, which is done on a table. First, the flesh side side is smoothed with a pebble or glass, then the grain is sleeked with a fine sleeker to remove the coating of tallow, then sleeked with the pebble and glass to make smooth and bring up a gloss. After all this, the hide is ready for the saddler and harness-maker. It is prepared for various other purposes with more or less dubbing, as the leather is required for a soft or for hard purpose.

Cow hides do not require so much setting as buffaloes, but they have oiling and dubbing in proportion to their thickness. For very soft uses the cow hides are softened by hand labour with a crippling board which loosens the grain.

Sheep and goat skins are only oiled and softened; they are not set or dubbed.

The following tools are used in tanning:—

Tongs, for lifting hides out of lime-pits.
Unhairing knives.
Fleshing do.
Rounding do.
Tanners' hooks, for lifting hides out of tan-pits.
Scudding knives.
Striking pins.

The following tools are used in currying:—

Currier's shaving knife.	Setting stone.
Sharpening steel.	Finishing sleeker.
Turning do.	Pebble.
Scouring stone.	Gloss sleeker.
Do. sleeker.	Stuffing brush.
Pumice stone	Crippling board.

Rub-stone and clearing-stone for sharpening knives.

The natives neglect the currying process with their leather. There is no trade corresponding to the currier's in this country. The best harness-makers curry their leather before cutting it up into strips; they curry it in strips of a foot wide, and apply tallow only; very often they apply nothing but butter-milk, which gives the leather a very bright appearance, but the moisture very soon evaporates, and the leather becomes hard and brittle.

Cawnpore, the 25th February, 1870.

Government Reply, Camp Ramnaggur the 29th March 1870.

I am directed to acknowledge the receipt of your letter No. 50, dated 9th instant, and to request that His Honor the Lieutenant-Governor's best thanks may be communicated to Captain Stewart, R. A., Commissary of Ordnance in charge of Tannery, for his exhaustive and most interesting report on the process of tanning.

The paper will be published in the Selections from the Records of Government, North-Western Provinces, as containing much practically useful information, especially on the barks and substances used in the process.

The attention of Mr. W. Jameson, Superintendent of the Botanical Gardens, will be drawn to the importance of endeavours to naturalize the *sumach* and *divi-divi* plants.

The Lieutenant-Governor will be glad to be favoured with the result of the experiment which Captain Stewart is carrying on of the tanning powers of the bark of sál, asseyna and amultass.

CASH BALANCES IN THE GOVERNMENT TREASURIES IN INDIA, 1869-70 CONTRASTED WITH PREVIOUS YEARS.

	Jan.	Feb.	March.	April.	May.	June.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Government of India	1,30,34,989	1,58,42989	2,07,91,308	1,62,44,872	1,11,67,665	1,13,96,105
Bengal	1,62,02,868	1,31,22,941	1,99,10,203	1,40,51,667	1,27,91,234	1,49,51,970
British Burmah	22,89,610	27,60,781	36,67,030	36,16,189	37,54,864	27,50,490
North-Western Provinces	2,14,02,495	1,99,27,391	1,57,86,570	1,39,17,001	2,05,84,544	2,11,33,186
Oudh	41,91,395	39,36,141	41,31,215	35,92,342	47,80,982	63,08,804
Punjaub	1,15,61,592	1,18,04,491	1,06,78,688	94,15,066	89,94,758	1,14,10,931
Bombay	2,13,88,959	2,98,13,815	3,50,28,701	3,67,57,721	3,72,42,836	3,39,55,116
Central Provinces	58,84,166	56,33,383	48,54,141	56,89,548	66,58,281	68,20,440
Madras	2,21,28,894	2,37,79,348	2,49,40,140	2,72,70,925	2,89,32,294	3,04,71,972
Total	11,83,90,968	12,69,71,285	13,98,20,999	13,05,88,334	13,63,02,461	14,22,29,014
1867-68	10,91,06,741	1,09,66,080	1,17,62,049	10,24,66,923	11,49,73,101	11,62,04,798
1868-69	8,87,68,635	8,69,65,712	1,03,60,599	10,45,09,269	11,73,38,501	11,81,90,260

SILVER RECEIVED AND COINED IN THE MINTS OF CALCUTTA, MADRAS, AND BOMBAY, 1869-70

	Calcutta.			Madras.			Bombay.		
	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.	Bullion or Coin received during the month valued in Rs.		Coined and examined during the month valued in Rupees.	Bullion or Coin received during the month valued in Rupees.		Coined and examined during the month valued in Rs.
	Govt.	Merchants.		Govt.	Merchants.		Govt.	Merchants.	
February	2,746	20,69,155	31,42,350	...	..	...		26,96,376	22,99,353
March	1,58,444	5,29,702	17,19,083	...	...	..	1,22,684	8,95,338	23,99,295
April	6,517	12,28,916	5,59,260	...	192	..		30,86,611	21,99,388
May	691	8,04,000	22,18,782	...	10,906	..	2,48,438	7,24,594	23,99,310
June	1,148	24,650	10,38,778	...	14,509	...	18,577	14,07,061	22,11,376
July	1,201	2,722	9,80,351	...	8,594	...	85	1,03,558	26,51,675

THE INDIAN MONEY MARKET.

CALCUTTA SHARE LIST.

Stocks.	Paid up.	Last ½ year's Div'd.	Quotations.
Banks.			
Agra Bank, Limited, A	£10	2 p. c.	110 @ 112
Ditto, new contributory A	£10	2 p. c.	108 @ 110
Ditto Certificates B.	....	....	£ 45 @ 47
Agra Savings' Bank	Rs 100	4 p. c.	120 @ 125
Allahabad Bank, Limited	100	5 „	101 @ 102
Bank of Bengal	1000	4½ „	1395 @ 1379½
Bank of Calcutta, Limited, A	50	2 „	25 @ 28
Ditto ditto B.	50	2 „	25 @
Bank of Upper India	50	6 p. c.	61 @ 62
Delhi and London Bank, Limited	£25	2 p. c.	175 @ 180
Mussoorie Savings' Bank	100	7 p. c.	135 @ 137
National Bank of India	£12½	„ „	122 @ 127
Oudh and United Service, Limited	100	nil.	30 @ 40
Punjaub Bank, Limited	100	4 p. c.	560 @ 570
Simla Bank, Limited	500	6 „	590 @ 595
Uncov. Sec. Bank (Agra)	100	4 „	90 @ 95
United Bank (Simla)	100	5 „	95 @ 95
Commercial Companies.			
Beerbhoom Coal Co., Limited	1000	nil.	410 @ 420
Ditto ditto	200	nil	81 @ 86
Bengal Coal Co., Limited	1000	7 p. c	1112½ @ 1125
Bonded Ware-house Assn	115	18 p. sh	550 @ 555
Brunton's Press Co., Limited	300	4 p. c	170 @ 175
Burdwan Stone Co, Limited	100	0 „	18 @ 20
Calcutta Docking Co, Limited	700	nil	250 @ 270
Ditto New ½ Shares	350	nil.	125 @ 130
Delhi Railway Co.	£20	2½ p. c	225 @ 240
Eastern Bengal Indigo Co.	100	nil	30 @ 35
Eastern Bengal Railway	£20	2½ p. c.	236 @ 237
Eastern Steam Tug Co., Limited	250	nil.	100 @ 120
East India Railway Co	£20	2½ p. c	217 @
Equitable Coal Co., Limited	250	5 „	245 @
Goosery Cotton Mills Co.	200	6 „	210 @ 212
Gourepore Co., Limited	1000	6 p. c.	1320 @ 1325
Ditto ¼ Share	125	..	165 @ 170
Great Eastern Hotel Co.	250	6 „	165 @ 167
Howrah Docking Co, Limited	500	nil	170 @ 175
India General S. N. Co.	1000	2 p. c.	375 @ 380
Ditto ditto, ½	500	2 „	195 @ 205
Ditto ditto, ¼	250	2 „	97 @ 102
Landing and Shipping Co.	100	3 „	34 @ 35
Nasmyth's Pat Press Co.	500	2½ p. c.	650 @ 700
Oriental Gas Co	£5	1½ „	70 @ 75
Ditto (Contributory)	£1	1½ „	15 @ 16
Oudh and Rohilcund Railway	£10	2½ „	105 @ 107
Port Canning Land Co.	1400	nil.	295 @ 297½
Punjab Railway Co.	£100	2½ p. c.	1100 @ 1150
R. Scott Thomson & Co.	500	4 „	235 @
Tirhoot Indigo Co, Limited	200	nil.	35 @ 40
Tea Companies.		*yearly.*	
Assam Tea Company	200	2½ p. c	195 @ 105
Bengal Tea Co, Limited	100	5 p. c	50 @ 51
Ditto (Contributory)	60	5 p. c	18 @ 20
Bishnauth Tea Co, Limited	200	nil	98 @ 100
Ditto (Contributory)	50	nil.	21 @ 22
Central Cachar Tea Co,	200	nil.	60 @ 65
Dehing Tea Co., Limited	85	nil.	10 @ 15
Dehra Doon Tea Co, Limited	100	nil	5 @ 6
Durrang Tea Co, Limited	100	nil	25 @ 28
Eastern Cachar Tea Co.	100	8 p. c.	100 @ 102
East India Tea Co, Limited	100	nil	24 @ 25
Jellalpore Cachar Tea Co	250	6 p. c.	260 @ 270
Kunchunpore Tea Co, Limited	1000	nil.	nominal.
Ditto (Contributory)	800	nil	.....
Kurseong and Darjeeling Tea Co.	250	2 p ct	62 @ 53
Ditto (Contributory)	200	2 p. ct	42 @ 43
Kuttal Tea Co, Limited	....	....	.....
Lower Assam Tea Co., Limited	£5	nil	.....
Luckimpore Tea Plnt Co	200	nil	65 @ 70
Monacherra Tea Co, Limited	90	nil.	28 @ 30
Moran Tea Co, Limited	65	nil.	nominal
Muttuck Tea Co, Limited	125	nil	35 @ 40
New Golah Ghat Tea Co.	£10	..	100 @ 105
New Mutual Tea Co	30	15 p. c.	60 @ 65
Punkabaree Tea Co., Limited	100	nil.	20 @ 30
Soom Tea Co., Limited	100	nil.	35 @ 40
Tuckvar Tea Co, Limited	200	nil.	35 @ 40
Upper Assam Tea Co, Limited	£10	nil.	nominal
Victoria Tea Co, Limited	250	nil.	5 @ 10

BOMBAY SHARE LIST.

Banks.	Shares.	Amount.	Paid up.	Last Div'd.	Rate per Share.
		Rs.	Rs.	per an.	Rs.
Agra Bank	100,000	100	all	4 pr. ct.	100
Bank of Bengal	22,000	1,000	all	9 pr. ct.	1,450
Bank of Bombay (New)	10,000	500	all	6 pr. ct.	595
„ New Issue Do.	10,000	500	100	6 pr. ct.	167½
Bank of Madras	5,250	1,000	all	12 pr. ct.	1500
Chartered of India and China	40,000	200	all	6 pr.	175
Chartered Mercantile	80,000	250	all	6 pr. ct.	275
Delhi and London	48,000	250	all	6 pr. ct.	300
National Bank of India	37,006	250	125	10 pr. ct.	125
Oriental Bank	60,000	250	all	8 pr. ct.	400
Railway Companies.					
G. I. P. R. Co., Consolidated Stock	....	£20	218-3-0	5 pr. ct.	237
Do. New £20 shares	....	£20	109-1-5	do.	113
Bombay, B. & C. I. R. Co.	....	£100	1,000	do.	1,100
Do, New shares	....	£18	196-5-1	5 pr. ct.	200
Land Companies.					
Elphinstone Land	10,800	1,000	all	30	1,050
Ditto New Issue	10,800	1,000	650	11-14	670
Frere Land	8,000	150	all	nil.	168
Mazagon Land and B.	1,750	2,000	2,000	nil.	1060
Port Canning	4,000	2,000	1,400	nil.	200
Colaba Company	4,000	3,000	all	70	1,555
Press Companies.					
Akbar Cotton Press Co.	150	5,000	2,850	200	2,175
Albert Press Company, Kurrachee	200	2,000	1,100	100	750
Alexandra Press Co	250	3,000	850	60	450
Apollo Press Co	150	12,000	11,000	200	7,200
Bombay Press Co	200	2,000	all	375	2,300
Ditto (New)	200	500	all	93¾	550
Colaba Press Co.	500	1,880	all	800	6,500
East India Press Co.	350	2,000	all	....	3,000
Fort Press Co	150	8,500	all	1,000	9,000
Framjee Cowasjee Press	300	2,000	1,800	.....	950
Hydraulic Press Co.	200	6,000	all	246	2,300
Kurrachee Press Co	1,000	6,300	2,000	20 p. ct	8,400
Mofussil Press & G. Co.	2,000	4,000	350	35 p. ct.	315
Prince of Wales Press Co.	125	2,500	all	350	2,460
Victoria Press, Madras	220	2,000	750	200	1,450
Spinning & Weaving Cos.					
Albert Mills Company	400	2,000	1,700	50	1,800
Alliance Spinning Co.	500	2,500	all	115	2,100
Arkwright	100	2,000	all	....	2,800
Bombay	100	5,500	all	....	3,000
Bombay United	200	1,000	all	30	800
Broach Mills	800	150	150	....	180
Coorla Spinning	....	....	2,000	....	....
Great Eastern	750	2,000	all	150 p. ct.	1,485
Manockjee Petit's	2,500	1,000	all	80 „	825
Oriental	800	2,500	all	80 „	1,775
Royal	600	2,500	2,300	....	1,500
Shipping Company.					
Bombay Shipping Co	1,000	5,000	3,500	1,800	700
Miscellaneous					
Mechanics' Building Co	4,000	50	all	5p.c.t.	30
Kurrachee Landing and Shipping Co.	500	2,000	300	21	170
Treacher and Company	2,000	500	all	25	375

BANKS AND COMPANIES IN LIQUIDATION.

Banks.	Date of Liquidation.	Number of Shares.	Amount paid up.	Amount Returned.	Rate per Share.
			Rs.	Rs.	Rs. exd
Bank of Bombay	Jan. '66	500	500	75	19
Bank of China	....	4,000	5	3	5
Bank of Presidency Bank	Aug. '67	40,000	250	....	
Bombay T and F Association	Sept. '67	20,000	200	35	6
Broker's Banking Co.	Sept. '67	20,000	200	40	15
Central Bank	Mar. '66	40,000	250	2	1
East India Bank		25,000	...	....	15—16
Indian Peninsula Bank	Feb. '67	25,000	200	10	6
Royal Bank of India	May '67	50,000	200	68¼	5
Old Financial	Apr. '67	30,000	130	71	1
Companies.					
Back Bay Reclamation Co.	Nov. '66	1,000	5,200	1,750	700
Bombay and Bengal S. S.		892	3,500	2,440	15
Victoria Spinning Co.	55	5,000	5,000	2,400	100

EXCHANGE ON LONDON.

	Calcutta. s.	d.
Bank Bills, at 6 months' sight	1	10¼
Do. at 3 month's sight	....	
Do. on demand, ditto	1	10¼
Credit Bills (1st Class) at 6 months' sight	1	10 15-16
Documentary Bills at 6 months' sight	1	11¼

BANK RATES OF DISCOUNT.

	Per cent
Discount on Private Bills and Notes	7 to 9
Ditto on Acceptance of Local Banks	7 to 9
Int. on Loans on Security of Govt. Papers	6

GOVERNMENT SECURITIES.

	Calcutta.		Bombay.
Five-and-a-half per cent	113¾	to	113¾
Five per cent.	107	to	107
Four & half per cent. (Public Works Loan)	103½	to 103-10	103½
15 years' Debenture Loans	108	to	108
10 years' do. do.	107	to	107
15 years' do. do.	106½	to	106
Six per cent. Municipal Loans	112½	to	112½

THE FREIGHT MARKET.

CALCUTTA.

London	Cotton	£2 0s. 0d.	Nom. p. ton
	Cases	£2 0s. 0d. to £2 15s. 0d.	„
	Seeds	£1 10s. 0d.	
Liverpool	Iron Ships Cotton	£1 12s. 6d. to £1 17s. 6d.	
	Wooden Ships „	£1 12s. 6d. to £1 15s. 0d.	
	Myraboltns & Colr bdls.	£0 10s. 0d. to £0 12s. 6d.	
	Seeds	£0 15s. 0d. to £1 0s. 0d.	
Havre	Cotton	£2 5s. 0d. to £2 10s. Nominal	
	Coffee	Nominal	
Overland	Steamers	£4 10s. 0d. to £5 0s. 0d.	
Liverpool via Suez Canal		£3 5s. 0d.	
China	Steamer Cotton	Rs. 6 per bale.	
	„ Opium	Rs. 25 to 30 per chest.	
	Sailing Ships	Nominal	
Calcutta	Salt	Rs. 3 0 0 to 4 0 0 per ton.	
Calcutta to Bombay		Rs. 13 to 14 and Ca[illegible] Port charges	
Mauritius		8 annas per bag nominal.	

BOMBAY.

For Liverpool—	
Iron ships	£1 0 0 to £1 2 6
Wooden ships	£1
For London.—	
Cotton	£1 15
Seeds	£1 5 0 @ 1 17 6
For Overland Route—	
P. & O. Steamer..	£3 5 0 to 3 12 0
B. & B. Steamer..	£3 10 0 to 3 12 6
For China—	
Cotton—Steamer	Rs. 8 to Rs. 10 per bale.
Opium—Steamer Hong Kong	Rs. 25 @ 30 per chest

INDIAN SECURITIES.—LONDON.

Amt of Share.	Paid.	INDIAN RAILWAYS.	Closing Prices August 4	Closing Prices August 11.
	100	Bombay, Baroda, and Central India (gua. 5 per ct.)	102 to 103	102 to 103
20	20	Ditto Ext. do. (as at 12p	20 to 21	20 to 21
st.	—	E. Indian Stock (gua. 5 p. ct.)	108 to 107	108 to 109
st.	—	Eastern Bengal (gua. 5 p. ct.	103 to 104	103 to 104
20	[illegible]	Ditto, ditto, 5 ditto	— —	— —
st.	[illegible]	Gt. Ind. Peninsula (g 5 p. ct.)	103 to 104	104½ to 105½
20	[illegible]	Ditto, New (gua. 5 p. ct.)	¾ to ⅞ prem.	¾ to 1 prm
20	[illegible]	Ditto, New (gua. 5 p. ct.)	¾ to ⅞ prem.	¾ to 1¼ prm.
—	all	Ditto, scrip, ditto, ditto	— —	— —
—	all	Ditto, scrip, ditto, ditto	— —	— —
st.	[illegible]	Ditto [illegible]	85 to 90	85 to 90
st.	100	[illegible] of India (g. 5 p. c.)	102 to 104	102 to 104
st.	100	[illegible] (4½ per cent)	98 to 100	95 to 100
st.	100	Madras (guar. 5 per cent)	102 to 103	102 to 103
st.	100	Ditto, (4½ per cent)	95 to 100	95 to 100
st.	100	Ditto, (4½ per cent)	90 to 95	90 to 95
—	100	Ditto	— —	— —
st.	100	Oude & Rohilkund (g. 5 p. ct.)	101 to 102	102 to 103
10	4	Ditto, shares (ditto)	par to ¼ prem	par to ¼ prem.
80	4	Ditto ditto, ditto	prem.	prem.
st.	100	Ditto Nulhatee	— —	— —
st.	100	Scinde (guar. 5 per cent.)	101 to 102	101 to 102
st.	100	Ditto, Delhi (gua. 5 p. c.)	101 to 102	101 to 102
20	5	Ditto, ditto (gua. 5 p. c.)	⅛ to 1¼ prem.	⅞ to 1 prem.
st.	100	Ditto, Punjaub (g 5 p. c.)	101 to 102	101 to 102
st.	100	Do. Ind. St. Rlo. (g 5 p. c.)	102	—

INDIAN GOVT. SECURITIES.	Closing Prices, August 4.	Closing Prices, August 11.
Indian Stock, 10½ per cent ....April, 1874	— 20-⅜	203 to 205
Ditto. for Account.....	— —	— —
Ditto 5 per Cent .....July 1880	107 to 109	108½ to 109
Ditto 4 per Cent .....Oct, 1888	100¼ to 100⅜	100⅛ to 101
Ditto 4 per Cent. Certificates	— 92	90
India Entaced Paper 4 per Cent.....	92	90
Ditto 5 per Cent .....Jan. 1874	— 100	— 100
Ditto 5½ per Cent.....May, 1879	101½	— 101½
Ditto 5 per Cent. Rupee Deben. 1874	90 to 92	90 to 92
Ditto ditto 1877	— 107	107
Ditto ditto 1884	— —	— —
India Debentures, 5 per Cent....Aug 1871	101½	— 101½
India Bonds, 4 per Cent.....	par	10s. prem

Amt of Share.	Paid.	MISCELLANEOUS.	Closing Prices, August 4	Closing Prices, August 11
5	all	Bombay Gas (Limited)	5½ to 6	5½ to 6
5	1	Ditto, New	½ to 1 prem.	½ to 1 prem.
20	10	Ceylon Co Limited	5⅛ to 1½ dis	5⅛ to 4½ dis.
20	5	Ditto, A Shares	3½ to 2½ dis	3½ to 2½ dis
50	7	East India Land Credit and Finance (Limited)	6 to 5 dis.	6 to 5 dis
100	st.	Madras Irrigation & Canal (guar 5 per cent by the Indian Government) ..	99 to 102	95 to 99
1	6 6	Nerbudda Coal and Iron	par to ⅛ prem	par to ⅛ prem.
5	all	Oriental Gas (Limited..) ..	8 to 8½	7½ to 8½
5	1½	Ditto, New	1 to 1½ prem.	1 to 1½ prem.
50	all	P. and O. Steam Company ..	39 to 41	39 to 41
50	10	Ditto, New, 1867	5 to 4 dis.	5 to 4 dis

Amt of Share	Paid.	JOINT STOCK BANKS.	Closing Prices, August 4	Closing Prices, August 11.
10	all	Agra Limited, A	8 to 9	8 to 9
10	-	Do., do B.....	— —	— —
20	all	Char. of India, Aus & China	15 to 16	15½ to 16½
25	all	Chartered Mer of India, London, and China	25 to 27	25 to 27
20	all	Eng Scot. and Aust. Chart.	17 to 18	16½ to 17½
20	4	Land Mortgage Bank of India	3⅜ to 3½ dis.	3⅜ to 3½ dis.
100	all	Do., 5 per cent Debentures, 1864 for 30 years	83 to 86	83 to 86
25	all	Oriental Bank Corporation..	37 to 39	37 to 39

INDIAN RAILWAY DEBENTURES.

Principal and Interest Guaranteed by the Secretary of State for India in Council

Debenture Capital.	Rate	COMPANY.	Closing Prices, August 4.	Closing Prices, August 11.
£237,595	5	Bombay, Baroda, and Central India	101 to 103	101 to 104
881,700	5	Ditto ditto....	101 to 103	101 to 103
100,000	4½	Ditto ditto....	98½ to 100	98 to 100
1,292,400	5	East Indian	105 to 107	106 to 108
1,806,300	5	Ditto	105 to 107	106 to 108
3,000,000	5	Ditto	99 to 101	99 to 101
1,000,000	4½	Ditto	98 to 100	98 to 100
440,000	4½	Ditto	98 to 100	98 to 100
—	5	Eastern Bengal.....	100 to 102	100 to 102
1,068,600	5	Great Indian Peninsula	100 to 103	100 to 103
1,074,450	5	Ditto ditto....	101 to 103	100 to 102
883,900	4½	Ditto	98 to 100	98 to 100
175,500	5	Great Southern of India	102 to 104	102 to 104
10[illegible],000	4½	Ditto	98 to 100	98 to 100
4[illegible],900	4½	Madras	— —	— —
9[illegible],800	5	Ditto	100 to 102	100 to 102
4[illegible],800	5	Ditto	102 to 104	102 to 104
[illegible],000	5	Oude & Rohilkund (Ltn)	101 to 103	101 to 103
1[illegible],800	5	Scinde (Indus Flotilla)	— —	— —
650,000	4½	Ditto	98 to 100	98 to 100

GOLD AND SILVER.	Per Ounce.
Foreign Gold in Bars	£3 17s. 9d.
Silver in Bars (Standard)	5s. 0½d.
Mexican Dollars....	4s. 11d.

THE EXCHANGES.	
Banks Drawing rates on Calcutta	1s. 10½d.
Madras	1s. 10½d.
Ditto on Bombay	1s. 10½d.

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Calcutta, January 1870. Iron Founders and Mechanical Engineers.

HOWRAH IRON WORKS.—WROUGHT IRON BRIDGES, Roofs, Irrigation, and Pumping appliances, Cotton, Jute, and Oil Presses, Pug Mills, (the latest Akra Pattern.) Jute, Flax, and Cotton Mill Gearing and Shafting; Machinery for Collieries, Indigo Concerns, and Silk Filatures, Iron Steamers, and Barges, Ships' Capstans and Windlasses, Portable, Stationary, and Marine Engines, Hydraulic Presses, High and Low-pressure Boilers, Tanks, Gasholders, Railway, Mining, and Contractors' Plant; Turn-Tables, Crossings, and improved jointed Levers for Switches, Road Rollers, Cranes, Winches, Traversers, &c., &c., manufactured

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ARE completely prevented by the Preservative Composition patented by Major Forbes, R. E., Executive Engineer, D. P. W.

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BROADWOOD & SONS new Cottage 7 Octaves, with three Unisons throughout.
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A consignment of the above expected very shortly from Germany. These Instruments are made expressly for India, and will be sold at 25 per cent below the usual price charged for similar Instruments in Calcutta.

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Among the present extensive stock of the above firm will be found the best modern, as well as the most advanced classical productions of the best Masters. Constituents are respectfully informed that for *immediate* Cash payments the publisher's marked price will be charged for single pieces, and for every six pieces purchased, a seventh one of equal value will be added to the parcel without additional charge.

C. GOULD,
Calcutta, April 1870. Proprietor.

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GOODS and PARCELS TRAFFIC of all kinds will also be received at all Goods Stations on the G. I. P. Railway for transmission, via Jubbulpore, to any Goods Station on either of the above Railways and vice versa, and Consignments of Goods of two Tons or more in weight will be sent through to their destination in the waggons in which they are originally loaded to all those places on either line where there is through Railway communication.

The FARES and RATES of the respective Companies will be ADDED together to make up the through charges, but no addition will be made for Terminals at the various Junction Stations upon Goods invoiced through

The Classifications of the several descriptions of Goods when invoiced through is the same on all the Railways concerned, except that the undermentioned Goods will be charged upon the G. I. P. Railway at the class rates named below when consigned to or from stations on either of the abovementioned Railways, viz :—

China Ware, Cotton with Silk (Piece Goods), Drapery, Embroidery, Glassware, Globes, Millinery, Opium, Silk—Fourth Class.

Boots, Broad Cloth, Calico, Carriages (cased), Cotton Piece Goods, Crape, Garlic, Hosiery, Linen, Twists not pressed, Wearing Apparel, Woollens—Third Class.

Corks, Earthware (foreign made), Fish (dry), Hides (loose), Jaglee, Leaves of all kinds, Sugar (not candied), Vegetables (perishable)—First Class

Cotton and Wool, Engines and Tenders on Wheels, Grass, Hay, Kirbee (fodder), manure, Reeds and Rushes—Special Rates.

Fish Fresh, as parcels by Passenger Train only.

These arrangements will be in force until further notice.

All information can be obtained from the undersigned

HENRY, CONDER,
General Traffic Manager.

Bombay, 20th August 1870.

THE BOMBAY TRADING AND BANKING ASSOCIATION, LIMITED, (IN LIQUIDATION.)

AT a GENERAL MEETING of the Rgistered Shareholders of the Bombay Trading and Banking Association, Limited, in Liquidation, held at the office of the Association, No. 24, Victoria Buildings, Parsee Bazaar Street, Fort, on THURSDAY, the 1st day of September instant, at 3 o'clock in the afternoon, 32 shareholders and the company's solicitors being present, the following resolutions were passed

"That Dinshaw Manockjee, Esquire, be take the chair"

"That the Report of the Liquidators, and the Final statement of Accounts of the winding up, to 31st August 1870, now read, be adopted and passed"

"That the cash balance Rs. 6,905 3 3 now held by them be paid to the Manager, Mr. Cowerjee Rustomjee Mody, for his valuable service, to the Association in the conduct of its affairs"

"That the affairs of the Bombay Trading and Banking Association, Limited, are fairly and fully wound up"

"That all Books, Vouchers and Papers belonging to the Bombay Trading and Banking Association, Limited, be deposited with Messrs. Herin, Cleveland and Petit, the company's solicitors, but that they be not responsible for any loss or damage they may sustain while in their custody

"That the best thanks of the shareholders are due to the Liquidators and their Manager, Mr Cowerjee Rustomjee Mody, for the able and satisfactory manner in which the Liquidation of the Association has been completed"

"That the best thanks of the Shareholders are due to the company's solicitors, for their valuable assistance and able advice rendered to the Association in the conduct of its affairs"

"That the best thanks of the meeting be given to the Chairman for his able conduct in the chair"

DINSHAW MANOCKJEE,
Chairman.

Bombay, 3rd September 1870.

NOW READY

THE HANDY-BOOK

OF THE

WAR.

Being a complete Guide to the important events now taking place on the Continent,

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4.—The King's Speech.
5.—England's Neutrality
6.—The French and Prussian Armies
7.—The French and Prussian Navies.
8.—The French Commanders.
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SPARKLING NONPAREIL, in one doz. cases		Rs. 24	per doz.
Do. MOSELLE,	do.	22	,,
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The wheels are formed of open segments of iron or steel, which, when bolted together, form a skeleton-wheel, to the periphery or which the ordinary wooden felloe is fixed, with bolts going through the tyre, the tyres also being in segments

The advantages over the old style of wheel are that they last longer, run easier, and are unaffected by temperature of climate, obviating the shrinking which occurs to tyres and spokes in the case of ordinary wheels

The segmentary tyres can also be renewed by any ordinary workman or cart-driver.

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The advantage of Addis's Permanent Way in addition to its cheapness and durability, consists in its being a longitudinal sleeper Road, it combines the office of sleeper and fish-plate, and thus empties chairs, spikes and trenails to be dispensed with. The parts being fewer, in case of shipment to foreign countries, is of great importance in saving of freight, as well as for facility of close packing of carriage over long land distances.

It has also great advantage in simplicity of laying, and cheapness in maintenance The staff needed for this purpose may be limited, and no special or previous knowledge is required

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ROHNEE TEA AND COTTON ASSOCIATION.

Prospectus.

The Estate—The land extends from near *Gandhoura* to *Kapraé*, all along the East side of the Darjeeling and Silligoree road, and may be said to be *the finest soil in the country*—well suited to the growth of Tea, Coffee, Cotton, Tobacco, Ginger, Castor Oil, &c. The area of the Estate is 1,777½ acres, and the leasehold has cost the undersigned Rs 15,993 exclusive of stamps, conveyancing, &c. A small annual rent has to be paid to Government

Sixty acres are in tea, planted 4' by 2' so as not to lose altogether the cold season of 1869-70.

To be worked by a private Company—The undersigned proposes to associate with himself seven partners and to utilize the land by gradually putting five hundred acres of the very pick of the soil under tea, reserving the remainder for cotton and timber, unless the Association would prefer selling portion at a profit.

It is a very fine lay of land and is quite worth 17 Rs. per acre, on an average.

Management—Payments of calls to be made quarterly or monthly to Lloyd's Bank, Darjeeling; Mr Lloyd to be Agent, charging sixty Rupees monthly for his time, trouble and responsibility. The garden to be in charge of an experienced manager who would have to hold at least one anna share in it.

Yield of tea, and estimate of outlay and profit.—From sure data already obtained from similar or somewhat inferior soil in the neighbourhood, the yield of tea may be taken at ⅜ md. per acre the 2nd year, 3rd year 2½ mds., 4th year 4 mds, 5th year and afterwards at least 5 mds per acre. During the cold weather of 1869-70 only 60 acres were planted out, in the following season 240 acres, and the year after that 200 acres or as much as the funds economically used, will admit of The land would have to be paid for during the 1st year by quarterly instalments, with interest at six per cent. per annum, on the unpaid quarterly balances. The price of the tea has been taken at the moderate figure of 55 Rs. per maund, but ordinary *teas* has hitherto sold at an average of 14 annas per lb.

It is now proposed, as being the most practicable arrangement, that there be 10 one anna shares and that any one may take one, or more of these anna shares and pay Rs. 200 per anna share monthly, or if he prefers it Rs. 600 quarterly, in advance and that the most be made of this money.

The project is not intended for large capitalists but for the savings of poorer men with salaries. Mr. Lloyd is prepared if necessary to take ¼ of the shares.

He is already in 5 similar associations in the teral and he started this last one to utilise this fine block of waste land. The teral gardens are all doing remarkably well. If present circumstances continue, and there is no reason to anticipate any change whatever, this garden will pay 40 per cent. per annum.

Amount of calls to be paid in Darjeeling free from loss by exchange, so that all the shareholders may be on equal terms. Cheques on any Indian or English Bank or good house of business, will be found the best ordinary means of remittance.

There need be no fear of this Company being anything but a success; *vide* the Commissioners last report on our *young teral* gardens, Northern Bengal.

WILLIAM LLOYD.

Darjeeling, 1st August 1870.

MESSRS. SHAIKH KASIM & CO.,

TENT MAKERS,

FUTTEHGURH.

WHO received a certificate from H. M. Mackenzie, Esq., Commissary of Ordnance, Futtehgurh, on the 11th November 1867

respectfully beg to inform the public, that they make tents of every size and description to order, of best materials, handsome shape, and good workmanship at very reasonable prices, in support of which they have obtained a highly complimentary testimonial from the above gentleman.

They beg also to announce that they have a large stock of tent materials always on hand to execute all orders promptly and with much care and attention. Mosquito nets will be supplied in lieu of leather ones in every tent, also ventilators will be made in under fly of large tents.

I.—Double-poled tents of 4 cloths throughout, and 4 feet verandahs, complete with carpets, chicks, purdahs, gunny-bags, pegs and mallets, as follows

No. 1, 30 feet by 18 feet	.. ..	Rs	825
„ 2, 28 do. by 16 do.	.. ..	„	690
„ 3, 24 do. by 14 do	.. ..	„	625

II.—Single-poled tents of 4 cloths throughout and 4 feet verandahs, complete as above, viz :—

No. 4, 20 feet square,	.. ..	Rs	440
„ 5, 18 do	.. ..	„	340
„ 6, 16 do.	.. ..	„	275
„ 7, 14 do.	.. ..	„	220

III.—Hill tents, double fly and single kanats of 4 cloths, complete as above, viz

No. 8, 14 feet square, with 2 saibans, 3 cloths, 5½ feet high,	..	Rs.	270
„ 9, 12 do. do. do.	... ..	„	225
„ 10, 10 do. do. do.	.. ..	„	190
„ 11, 8 do. do. do.	.. ..	„	170

IV.—Swiss Cottage tents, double fly and circular saibans, the rear one being closed by 6 feet kanats to form a dressing room of 4 cloths throughout, complete as above, viz :—

No. 12, 14 feet square,	.. ..	Rs	375
„ 13, 12 do.	... .	„	340
„ 14, 10 do.	... .	„	285

V.—Swiss Cottage tents, double fly and circular verandah, and 3 feet saibans, the rear one being closed by 4 feet kanats to form a bath room, 4 cloths throughout as above, viz —

No. 15, 14 feet square,	.. ..	Rs.	290
„ 16, 12 do.	.. ..	„	240
„ 17, 10 do.	.. ..	„	200
„ 18, 8 do.	... .	„	175

VI.—Rooties of 4 cloths in fly and 4 cloths, in 6 feet kanats, complete as above, viz :—

No 19, 16 feet by 14 feet,	.. ..	Rs.	225
„ 20, 14 do by 12 do.	... ...	„	200
„ 21, 12 do. by square,	.. ..	„	180

VII.—Sleeping pals for gentlemen, of 4 cloths, including chintz, and with 4 feet kanats, wooden poles, complete as above, viz :—

No. 22, 12 feet square,	.. ..	Rs	100
„ 23, 10 do	.. ..	„	90
„ 24, 8 do.	.. ..	„	80

VIII.—Bechoba tents of 4 cloths in fly and kanats, complete with durree, &c. :—

No. 25, 12 feet square,	.. ..	Rs	110
„ 26, 10 do.	... .	„	125
„ 27, 8 do.	... ...	„	110

IX.—Shamenaahs of 4 cloths in fly and kanats, 7 feet high, with 5 feet curtains, hanging from above, of 3 cloths, complete with 8 wooden poles, as above, viz :—

No. 28, 24 feet square,	.. ..	Rs.	440
„ 29, 18 do.	.. ..	„	325
„ 30, 16 do.	.. ..	„	290

X.—Sepoy pals of 3 cloths, with bamboo poles :—

No. 31, 16 feet by 15 feet,	.. ..	Rs.	60
„ 32, 14 do. by 12 do servants' pals do.	.. ..	„	50
„ 33, 12 do. by 10 do. do. do.	.. ..	„	45
„ 34, 10 do. by 8 do. do. do.	... .	„	40

NECESSARY TENTS.

No. 35, 5 feet square,	... ...	Rs.	30
„ 36, 4 feet square,	.. ..	„	27

XI.—Swiss Cottage tents for hills, double fly and circular saibans of 4 feet, the rear one being closed by 4½ feet kanats to form a bath-room, and two bath-rooms will be two sides, the upper fly 3 cloths, under fly 2 cloths, complete with wooden poles, as above, viz :—

No. 37, 12 feet square	.. ..	Rs.	250
„ 38, 10 do.	.. ..	„	210
„ 39, 8 do.	.. ..	„	185

XII.—Mess tents, three-poled, of 4 cloths throughout and 4 feet verandahs, complete, with glass shades with 4 branches with a brass clasp and two punkhas, complete as above, viz. :—

No. 40, 40 feet by 20 feet,	.. ..	Rs	1,500
„ 41, 32 do. by 16 do. of two-poled do. do. with one punkha..		„	1,250
„ 42, Bath-room, 6 feet square, with top for single-poled tent, without durries	.. ..	„	38
„ 43, Zanana kanat, 3 cloths, 7 feet high, 72 feet long, in two pieces	.. ..	„	72
„ 44, Shutrinjee of best materials, per square yard, (14) fourteen annas	.. ..		

TERMS.—Two-thirds the price of the tent in advance, the remainder on delivery. Risk and cost of transport to be borne by purchasers, as also any charges for discounting their cheques and hoondies No orders will meet with prompt attention without a remittance mentioned as above.

Apply to

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No 4.—20 feet square ..	..Rs. 440	No 7 14 feet square ..	..Rs. 220
„ 5.—18 do ..	.. „ 340	„ 8.—12 do ..	.. „ 190
„ 6.—16 do .	.. „ 275		

III.—Hill-tents, double fly and single kanat of 4 cloths, with 2 outriggers of 3 cloths, complete as above :—

No. 9.—14 feet square ..	.Rs. 270	No 11.—10 feet square ..	..Rs. 200
„ 10.—12 do. . ..	„ 225		

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No. 12.—14 feet square .	..Rs 380	No 13.—12 feet square ..	..Rs 340

V.—Swiss Cottage tents of 4 cloths throughout, double fly and circular verandah and 3 feet saibans, the rear one being closed by 4 feet kanat to form a bathing-room, complete as above —

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